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MINISTRY OF FOOD
(Food Planning and Monitoring Secretariat)
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REPORT ON

THE EXISTING SYSTEM OF PUBLIC FOODGRAIN DISTRIBUTION IN BANGLADESH AND PROPOSAL FOR RE-STRUCTURING

BEACON CONSULTANT
Namazi Chamber (1st Floor)
16 Motijheel Com. Area
Dhaka, September, 1986

STUDY ON

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PREFACE

This report represents the work put in during a period of one year by a team of professionals. The research involved was mainly conducted by the undersigned as the Project Director, Dr. Quazi Shahabuddin as the Agricultural Economist, and Dr. Omar Haider Chowdhury as the Economist. The services of Dr. A.H.M. Sadeque, rural sociologist were also utilised during the course of the study. Mr. A.K.M. Ashraful Huq, Managing Partner, Beacon Consultant was the Project Manager, and Mr. A.N.M. Azim, Partner, Beacon Consultant, was the Project Co-ordinator.

The burden of the research work was divided in the following manner:

- Project Director: Chs. 1, 2B, 2C, 4A, 7, 8, 9, 10, 11.
- Dr. Quazi Shahabuddin: Chs. 3, 4B, 4C, 5 & 6.
- Dr. O.H. Chowdhury: Chs. 2A, 2D, 12.
- Project Director
  Dr. Q. Shahabuddin: Chs. 13 and Executive Summary.
  and Dr. O. H. Chowdhury

We of this team, would like to express our sincere appreciation for the Government of Bangladesh, particularly the Secretary, Ministry of Food, Mr. A.K.M. Kamaluddin Chowdhury for being instrumental for the execution of this study on a matter of national policy of a vital importance. We are also very grateful to the members of the Functional Committee of this study for giving our team the benefits of their long years of professional experience reflected in their interaction with us during several meetings during the tenure of this study. We personaly called on Section Chief, FPMS; Director SDM; Director, Agricultural Marketing; Mr. R. Nevin, US-Aid, on occasions other than during meetings of the Functional Committee to discuss our work and enrich ourselves by feed-back from them. We also met the Director-General, Food, twice, to discuss various issues of interest to this study. To all these kind gentlemen, our professional interaction on the said occasions, with whom being extermely useful to us, we wish to extend our heartfelt gratitude and a good part of the accomplishment, if any, that is this report - though none of its deficiencies, if any. Besides, the Additional Director, MIS, Food D.[illegible] rate, was very co-operative with our several and exacting indents of data requirements.

We are also thankful to Dr. Wahidudin Mahmud, Professor of Economics, Dhaka University, Dr. A.K.M. Ghulam Rabbani, Secretary, Statistics Division, Mr. Kazi Maziruddin, Director Agriculture Marketing and Mr. Muzammel Hussain Chowdhury, Joint Chief Planning Commission for their invaluable constructive criticism and comments on the Draft Report which benefited us immensely in the preparation of the final report.

Thanks are also due to two more officers of the Food Ministry namely Mr. Ruhul Amin, Asstt. Chief, FPMS and Mr. Kabir of the office of Director, SDM, Food Directorate who gave us very useful support in accessing secondary data.

Finally, we wish to express our sincere thanks to the US Aid Authorities for financing the study and taking keen interest in it during the course of our work.

In a resource-constrained Bangladesh, where six-tenth of the people live in poverty, subsidies on foodgrain should, in the main, be a privilege of the poor. As this report began to take its shape, the dimensions of the poverty of Bangladesh outlined in Ch.2 and again in Ch. 9 were constantly in focus. The technical evidence that we have amassed in the core of the study has logically driven us to certain recommendations whoes distinctive ethos has been: food subsidies to the poor, if at all, and to the highly vulnerable. (Recommendations have also been made of the price incentive and stabilisation dimensions of PFDS). Quite naturally, our egalitarian posture has not been allowed to take over the brink: we have, whenever necessary, taken into account considerations of a pragmatic nature. We hope our recommendations will be seen to be useful, from a technical view point at any rate.

September 30, 1986

NUIMUDDIN CHOWDHURY
Project Director.

GLOSSARY OF TERMS USED

PFDS	=	Public Foodgrain Distribution System
HES	=	Household Expenditure Survey
BBS	=	Bangladesh Bureau of Statistics
SR	=	Statutory Rationing
MR	=	Modified Rationing
LE	=	Large Employers
FM	=	Flour Mills
EP	=	Essential Priority
OP	=	Other Priority
FFWP	=	Food-for-work Programme
VGFP	=	Vulnerable Group Feeding Programme
IF	=	Institutional Feeding
MR	=	Market Operations
OMS	=	Open Market Sales
FS	=	Free Sale
CD	=	Canal Digging
GR	=	Gratuitous Relief
MRR	=	Ministry of Relief & Rehabilitation
BIDS	=	Bangladesh Institute of Development Studies
IFPRI	=	International Food Policy Research Institute
WFP	=	World Food Programme
CV	=	Coefficient of Variation
D-W	=	Durbin-Watson Statistic
GOB	=	Government of Bangladesh
PIO	=	Project Implementation Officer
UFO	=	Upazilla Food Officer
DC	=	District Controller, Food
UP	=	Union Parishad
UNO	=	Upazilla Nirbahi Officer
DG	=	Director General, Food
FAO	=	Food & Agricultural Organisation
FPA	=	Food Policy Analysis
R&D	=	Research and Development
FPMS	=	Food Planning & Monitoring Secretariat
BUET	=	Bangladesh University of Engineering and Technolog
MRS	=	Marginal Rate of Substitution
FPS	=	Fair Price Shop

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EXECUTIVE SUMMARY

The Setting of the Study:

1 We have taken the position that both economic and pragmatic-cum-administrative rationale can be cogently adduced for the maintenance of a PFDS in a developing country. Since the research team is composed of economists, in the work our approach has under-standably been conditioned by our disciplinary training. We believe that PFDS in Bangladesh ought to have four rationale, namely price stabilisation, contribution to the provision of incentive producer prices for grains, preventing the excesses of food insecurity for the poorest of people in rural and urban areas - especially in the latter; and, finally direct targetting of subsidised even free, food to highly vulnerable demographic and social categories of people, most importantly female-headed households with dependants. This analytical perspective governing the raison detre of PFDS should, therefore, be kept in view as we review this summary of our conclusions.

2 Agriculture pre-dominates the economy of Bangladesh in the sense that it accounts for around half of GDP, directly or indirectly employs more than two third of the entire labour force of the country and earns around ninety percent of the foreign currency in terms of agricultural and primary products (para 2.1). The share of manufacturing on the other hand is still less than ten percent. In fact, shares of ohter sectors in the GDP have remained almost stable from mid-sixties to mid-eighties reflecting that there has not been any significant change in the structure of the economy of Bangladesh over the years.

3 Per capita income in real term in Bangladesh has virtually remained the same from mid-sixties to end of the seventies with moderate rise during the eighties (para 2.9). On the other hand income in equality in both the rural and urban areas, as well as in the country as a whole increased between mid sixties and the end of seventies. Thus the period between mid-sixties and the end of seventies was not only a period of decline in per capita income but also one of increased inequality. It is obvious that low per capita income combined with increasing inequality will have accentuated poverty during the period. More over, Nutrition surveys based on dietary intakes show a consistently declining food and energy intake over the last two decades covering mid-sixties and early eighties. Further more, the rate of decline seems to have gathered momentum since mid-seventies. Hence it is clear that economic welfare in Bangladesh has decreased between mid-sixties and early eighties according to all its indicators such as growth, inequality and or poverty.

Food Availability, PFDS, Foodgrain-mix of Rationing, 1960-1985

4 Per capita availability of foodgrain has on average remained fairly constant at a level of 0.97 lb. in the twenty-five years since 1960/1 (para 2.20). In aggregate terms, wheat has made quite an inroad into foodgrain mix of Bangladeshis - its proportion in total availability rising from a mere 2.4% in 1960/1-1962/3 to 8% in 1972/3-1974/5 and then to about 19% in 1982/3-1984/5 (para 2.21). The economy remains essentially a rice economy, however, PFDS has clearly expanded relative to total foodgrain availability between the 1960's and the post-liberation decade-and-half. Offtake-availability ratio is found to be 3.57% and 4.98%, respectively, for rice and wheat for the decade ending 1969/70, while the corresponding proportions are 3.73% and 9.8% for the thirteen years ending 1984/5 (para 2.22). There was no evidence that the proportion of rice in the PFDS had dramatically risen in the 1970's compared with the 1960's, as suggested by Clay (1979). If anything, the proportion of rice in PFDS for the decade ending 1984/5 is lower than during the decade ending with 1969/70 (para 2.23).

5 The proportion of both SR adn MR have declined in the 1970's and 1980's compared with the 1960's. However the rate of decline is very much faster for MR in the 1970's than for SR. The expansion of the PFDS is certainly not, whatever else may be its reason, due to SR and even more emphatically, not due to MR. The system expanded in 1970's in part because of the expansion of the rationing effort for the civilian, military and security establishment, and in part because two new mechanisms of augmenting targeted food supplies have been introduced in the 1970's (para 2.25). About one-third of rice offtake in the 1960's went into SR, while another one-half or so into MR. In contrast, while SR's share of rice offtake rises to an average of 51% during 1973/4 through 1978/9, SR's share in rice offtake did, however, fall to an average of 22% during 1979/80 through 1983/4. In contrast, again, the share of MR in rice offtake fell from the level of one half or so, to about 23.5% during 1973/4-1978/9, and to 27% during 1979/80-1983/4. As regards the wheat-to-total-offtake ratio for SR and MR, while the SR's ratio remained virtually unchanged at about 15% or so during the entire period, MR's share in wheat offtake plunged very sharply in the 1970's (paras 2.26-2.27). All in all, the shares of SR and MR - the traditional channels of PFDS - in the 1950's and in 1960's in Bangladesh have declined very perceptibly. Channels other than SR and MR have gained prominence in the 1970s (Table 2.8 and 2.9).

6 Self sufficiency in food production is a major objective of the Government of Bangladesh. But it has to depend on food grain import to feed its population even though Agriculture pre-dominates the economy and food production is the major activity within Agriculture (para 2.36).

7 "Seed - Fertilizer - water" technology has substantially increased rice production in the recent years (para 2.43). Expansion of technology in the absence of possibilities of extending cultivable area in the country - remains the major vehicle of increasing food output in future (para 2.46). But it is now clear that the prices of modern inputs i.e. fertilizer and water primarily responsible for the recent growth in foodgrain productivity of the country has been rising steeply as a result of dramatic reduction in the rate of subsidies (para 2.52). Thus profit in the cultivation of high yielding varieties which are water and fertilizer intensive, declined during the recent years. It is argued that since the current rice price in the country is close to world price, any further increase will be harmful both from equity and efficiency points of views. Farmers should be provided incentive to grow more food by giving input subsidies (para 2.55).

Interrelationship in the PFDS under Different Production Scenario and Alternative Foodgrain Policy Variables

8 On the basis of empirical work analysing the interrelationships under different production scenario, the following conclusions can be drawn.

(i) The impact of a production shortfal in a "bad" crop year is quite severe as a 10% shortfall in foodgrain production leads to about 16% increase in market price of rice (wholesale, coarse variety) in the absence of specific intervention by the Government in fixing the levels of imports, rationofftake, domestic procurement and open market sale. Similar price increase was reported by Ahmed (1979) for a comparable production shorfall in 1980 (Table 3.1A)

(ii) Consumption of foodgrains, however, declines by only 4% as the potential decrease in consumption is partially offset through increased offtake from the rationing system (by about 5 lakh tons) made possible by an increase in imports (by about 1.0 million ton). Such a massive increase in imports is needed, in the absence of any internal procurement to ensure adequate availability of foodgrain for distribution through the rationing system. (Table 3.1A).

(iii) The impact of a production increase in a "good" crop year is almost symmetrical. Market price of rice declines by 18%, import goes down by 1.1 million ton and volume of foodgrains internally procured increased by about 5 lakh ton. (Table 3.1A).

9 The following conclusions drawn based on empirical exercise analysing the interrelationships under alternative policy variables.

(i) The effects of a policy of reducing ration distribution through an increase in ration price on foodgrain consumption and market price of rice was considered. It is observed that a 7.7% reduction in ration distribution brought about through an incrase in ration price by Tk. 40.0/md. results in about 2.0% increase in market price of rice in a "normal" crop year. A reduction of foodgrain distribution by 0.18 million ton results in a market price increase of about Tk. 6.5/md. This relationship varied with the level of ration offtake but not by much. It is also observed that a 38.0% reduction in ration distribution through almost doubling of ration price leads to a market price increase of about 11.0%. (Table 3.3A).

(ii) The impact on foodgrain consumption of such a reduction in ration distribution is observed to be rather small. A 7.7% cut in ration distribution results in a less than 1.0% decline in per capita consumption of foodgrains. If the desirable consumption level of foodgrain is accepted to be an average of 15.5 oz. per capita per day then it would seem that such an objective is attainable in a "normal" crop year for 1985-86 even with a reduction of ration distribution by 9.0 lakh tons. Such conclusion, however, needs to be qualified at least in one essential way. (Table 3.3A). Per capita consumption figure, like all averages, conceals some gross disparity in foodgrain consumption for the low-income, disadvantaged groups in the society. A policy of reduction in ration distribution of the magnitude suggested above would need to protect these groups by ensuring that the cut in ration offtake are confined to those channels which benefits more the relatively better-off people. Even some redirection of existing ration distribution may be necessary to insulate the disadvantaged groups from the resulting price increases to which such groups become very vulnerable.

(iii) The effect of a policy of reduction in ration distribution of foodgrain brought about through a reduction in ration quota instead of an increase in ration price was also explored. It is observed that the impact of a reduction in ration distribution in

terms of market price increase and decline in pe capita foodgrain consumption were similar to tha obtained in (i) and (ii). However, the impact of larger reduction in ration distribution could b analysed now. A reduction of ration distribution t almost half from its base level of 2.33 million ton would lead to a market price increase of about 15% This is as much as one could go if one would like t protect the per capita foodgrain consumption targe of 15.5 oz. The results also indicate that complet abolition of the ration system would result in a 30 increase in market price of rice for a normal cro year in 1985-86. (Table 3.38).

(iv) The impact on market price of rice and foodgrai consumption of a policy of reducing the share of ric in ration distribution was analysed. It is observe that changes in the share of rice in total ratio offtake has only a modest effect on both market pric and foodgrain consumtpion. A reduction of share fro 35% to 20% results in a price increase of only 2.2% Also, if rice is completely substituted by wheat i the ration distribution, this would lead to a pric increase of 4.5%. On the other hand, this polic would lead to some marginal increase in per capit consumption. This happens because of an induce decrease in internal procurement and increase i ration offtake due to increase in market price o rice, brought about by changes in the share of rice. (Table 3.4).

(v) Finally, the impact on market price of rice an foodgrain consumption of a policy aimed at bot reducing the ration offtake through an increase i ration price and also reducing the share of rice i foodgrain distribution through rationing system wa explored. The combined impact of such a policy i obviously greater than either of the policies i pursued alone. A reduction in ration offtake fro 2.33 to 1.84 million tons brought about through a increase in ration price from Tk. 190/md. to Tk. 310/md., and a reduction in the share of rice i ration distribution from 35% to 20% results in a price increase of about 9%. Per capita consumption of foodgrain declines due mainly to reduced ration distribution. A further reduction in ration offtake to 1.47 million tons brought about by still greater increase in ration price to Tk. 390/md. combined witha policy of reducing the share of about 14% increase in market price of rice. Per capita consumption declines further but still remains above the target consumption level (Table 3.5).

Seasonality of Rice Prices, and the Effectiveness of Procurement Program:

10 During the 1970's, an important change appears to have occured in the seasonal incidence of peak prices of rice. June and July represented the seasonal price peaks in 4 out of 5 years during the quinquennium ending 1977/8, while the matched frequency in the 6 years following 1977/8 in 2 out of 6. In the second period, both September and October, not involved in peaking cycles earlier, experience such a participation. The period preceeding the harvest of aman and boro presently appears as important peaking points in the seasonal rice price calender (para 4.3). The seasonal price troughs for rice remain essentially a matter specific to the depressive influence of the aman harvest and, to a smaller degree, of the boro crop (para 4.3). For both rice and wheat, intra year seasonal spreads have declined during the 1970's. For wheat, in addition, such decline has continued in the 1980's (para 4.5). Seasonal price spreads for coarse rice have more often than not been less than 20%, which has widely been considered as defining reasonable provision for normal trading profits via intra year storage and costs for carriage (para 4.7). Procurement programme appears to have helped raise floor wholesale prices within the year; between the early 1970's and 1980's, the ratios to moving average gain about 8 percentage points for January and February. This can, at least to a large degree, be attributed to the output procurement programme and, in part, to the rapid build up of paddy processing capacity within mechanised rice mills. (para 4.7).

OMS as a Tool for Seasonal Price Stabilization:

11 Experience of 1982/83 has demonstrated that OMS program can serve as an effective tool of supply and price stabilization if adequate quantities of foodgrains are released in time. In 1982/83, OMS was initiated in September when market prices rose rapidly the retail price of coarse rice and wheat rose to about 27% and 37% over procurement prices. Substantial amount of foodgrains totalling about 1.36 lakh tons (of which 0.60 lakh ton was rice and 0.76 lakh ton was wheat) was released through OMS, which accounted for about 27% of total PFDS distribution during the Sept. Nov. period. This had an immediate and noticeable impact on market prices of foodgrains. Rice and wheat prices were brought down to about 22% above procurement prices by November 1982. Thus OMS operations in 1982/83 was quite successful in containing seasonal price increases within reasonable limits. Montgomery (1983) study using a disaggregated price model has also shown how OMS offtake during Sept. Nov '82 period largely succeeded in moderating seasonal fluctuations in market prices by targetting the foodgrains to meet the anticipated shrotfall in aman harvest in various subdivisions. (para 4.56).

12 In 1984/85, on the other hand, market prices were already well above the trigger price for initiating OMS as early as July 1984 due to bad boro and aus harvests in 1984. Although OMS was initiated in July 1984, they accounted for only 12% of total PFDS distribution during the period. Even when relief distribution is excluded, OMS in 1984/85 accounted for only about 15% of total PFDS distribution during the lean season period. Thus, the impact of OMS on market price of rice was much less pronounced as compared to 1982/83. This is also reflected in the estimated set of regressions in this study, which failed to link significantly OMS offtake with the degree of price decline following the peak period. An additional reason for the relatively modest impact of OMS on foodgrain prices in 1984/85 was a limited amount of rice sold under OMS. Proportion of rice sold under OMS was reduced from about 44% in 1982/83 to about 22% in 1984/85. Since the cross elasticity of wheat to rice is estimated to be only 0.58, it takes almost twice as much wheat sales as rice in order to achieve only the same effect on rice prices. (para 4.57).

13 OMS represents a special channel designed to be activated during the lean season when there is greater pressure in the grain market. However, if the grain market is not characterised by shortfall, the seasonal price increase may remain confined within the limits set by economic costs of storage. The role of OMS in such a situation will necessarily be limited both because the sales operation will be initiated for a shorter period in a limited number of areas, and also because there will be little incentive on the part of the consumers to participate in such program since the price differential between OMS and prevailing market price may not be sufficient to compensate for the quality differences, inconvenience of distance and queuing costs involved. The experience with OMS offtake in recent years may be indicative of such phenomenon (Para 4.58 and 4.59).

PFDS and the Behaviour of Rice Traders

14 Information were collected through field survey from a sample of rice traders in Bangladesh. The survey was so designed as to elicit information pertaining to rice traders' behaviour particularly with respect to their stocking decisions, and how these decisions are affected by various PFDS operations in Bangladesh. The results of field survey pertaining to such behaviour are summarised below:

(a) There was an overwhelming tendency on the part of the traders, particularly among the wholesalers to resort to stocking of foodgrains in the event of an expected production shortfall. Within the wholesaler gorup, this tendency was observed to be more pronounced among bepari and general wholesalers. Surprisingly though, the average period of stocking was observed to be greater for the retail traders (6.5 days) as compared to the wholesalers (4.9 days). The difference, however, may not be statistically significant. As expected, the average amount of stock as recorded in the sample was considerably greater (about fifteen times) for the wholesaler as compared to retail traders. There were noticeable variations within the wholesalers group, with aratdars recording the largest (315 mds.) and bepari the smallest (69 mds.). Table 5.3A.

(b) It was observed that traders' stocking decisions were influenced by prices expected in the future but that the time frame of such price expectations was confined to only seven days. Within this one-week time-frame, however, there were considerable variations in price expectations affecting stocking decisions between the wholesalers and retailers, and among the four category of wholesalers. About two-fifth of the wholesale traders were observed to be influenced in their stocking decisions by one-day-ahead (tomorrow's price) price expectation, about one-third by one-week-ahead price expectation and only about one-fiftn by three-day-ahead price expectations. More retail traders, on the other hand, were motivated in their stocking decisions by three-day-ahead price expectations (about one-third of them) than one-day-ahead (about one-fourth) or by one-week-ahead (only 8%) price expectations. Among the wholesalers, the aratdars were influenced by tomorrow's price most (about 60% of them) and the miller wholesalers least (only 11% of them), while the miller wholesalers were motivated in their stocking decisions by on-week-ahead price expectations the most (about two-third of them) and the beparis the least (only 10% of them). Table 5.3B.

(c) Regarding relative importance of different factors affecting stocking decisions of various category of rice traders, it was observed that for most of the wholesalers, present market condition seemed to be an important factor. Also, about half of the wholesalers took into consideration, other traders' behaviour and one-third of them the condition of rice harvest

in making their stocking decisions. Retailers, on the other hand, cited both present market condition and other traders' behaviour almost equally frequently as factors affecting their stocking decisions. It is significant to note that none in the sample considered future scarcity as a factor influencing his stocking decision. In our context, this makes sense only when the future refers to a time period not exceeding one week as we observed earlier when discussing the role of price expectation in traders' stocking decisions. (Table 5.3C).

(d) While analysing the set of factors specifically related to the operation of PFDS that affect traders' stocking decisions, it was observed that none of the ration variables such as ration price, ration quota and/or ration offtake entered into the stocking decisions of traders in the sample. This remained true for both wholesale and retail traders. On the other hand, more than 90% of traders in both the wholesale and retail groups consider open market sale (OMS) of foodgrains by the government as a factor affecting their rice stocking decisions. This was true for almost every category of traders among the wholesalers. Import of foodgrains by the government also feature prominently as a factor affecting traders' stocking decisions. This was more pronounced among the wholesalers as compared to retailers in the sample. Very few in the sample, however, consider govt. stock as a factor influencing their stocking decisions. Thus traders' stocking decisions would seem to be influenced by the expected build up of government stock through import of foodgrains rather than by its existing stock. (Table 5.3D).

(e) Government OMS operation was observed to play an important role in traders' stocking decisions. This happens because most of the traders (all wholesalers and more than 80% retailers) are aware of such an operation, and also believe that it is effective in arresting the price hike during the lean period. It was also observed that more than 90% of wholesalers and 75% of retailers consider the government OMS operation as an important factor influencing the amount of rice they decide to stock but the impact was likely to be quantitatively insignificant - only 11% for wholesalers and 18% for retailers in the sample. Also, not much variation was observed among different categories of wholesalers in this respect (Table 5.3E).

Principles of Price Setting Over Time in PFDS

15. A framework for setting ration prices over time was developed with the objective of protecting consumer welfare (in te sense of maintaining foodgrain consumption at some base/desired level) in the face of changes in money income and/or prices of foodgrains in the open market while at the same time ensuring that fiscal burden of the Govt. due to budgetary subsidy on foodgrains does not exceed an acceptable limit. The framework suggests a process of iteration for deriving the set of ration prices over time. If the set of ration prices (calculated in first step) required to maintain base level consumption of foodgrains result in an amount of budgetary subsidy, given the procurement costs and volume of PFDS offtake, considered acceptable then the exercise stops here. If it does not i.e. the resulting budgetary subsidy imposes an excessive fiscal burden on the government then this would call for an upward revision of ration prices computed in the first step. The process continues till the revised set of ration prices conforms to the level of budgetary subsidy considered acceptable by the government. In any case, at the revised set of ration prices, the base/desired level of foodgrain consumption cannot possibly be maintained if the volume of PFDS offtake remains unchanged. There is clearly a trade off here between supporting consumption at some given/desired level and maintaining budgetary subsidy on foodgrain within an acceptable limit. The nature of trade off is obvious. The magnitude of such trade off, however, can be established only through a com-prehensive empirical exercise. The results of empirical work carried out in this study are summarised below: (para 6.5 - 6.11).

(i) Ration price of rice seems to be quite sensitive to changes in per capita income and market price of rice. An increase in per capita income by 1% leads to an increase in ration price by Tk. 19.20, while an increase in market price of rice by 1% leads to a <u>decrease</u> in ration price by Tk. 16.50. This shows that changes in per capita income has a relatively greater impact on ration prices of rice. (para 6.14, Table 6.1A).

(ii) What is more interesting, however, are the set of ration prices associated with an increase in <u>both</u> per capita income and market price of rice but confined to 2% - 3% differential in their relative rate of increase. Further, within this subset, ration prices associated with greater increase in per capita income relative to market price (e.g. 7% or 10% increase in per capita income combined with a 5% or 6% increase in price) would appear to be more feasible in practice from budgetary point of view, particularly in view of the enhanced procurement cost of foodgrains over time. (Table 6. 1A).

(iii) Changes in per capita income has a rather modest effect on wheat ration price[1]. Ration price of wheat increases from Tk. 158.95/md. to Tk. 167.40/md. for a projected increase in per capita income by 5% and to Tk.183.50 if per capita income increase by 15%. This should be attributed to the very low budgetary share on wheat (6.3% for the MR household, so that a given increase in per capita income results only in a very small increase in the absolute level of expenditure on wheat. (Table 6.1B).

(iv) The exercise was repeated for the sample of SR household representing urban households in Bangladesh. Ration not as much as in case of MR households. Calculated ration price are generally observed to be greater (particularly in higher market price and lower expenditure range) for the SR household as compared to the MR household. This happens because although the level of per capita expenditure differ widely between these two category of households, the amount of expenditure on rice does not; at least not by as much. The calculated set of ration price of wheat due to increases in per capita income remains exactly the same for the SR and MR households. This is not surprising in view of the fact that for a given percentage increase in per capita income, the ratio of budgetary share ion whaet between these two households remains unchanged. (para 6.17 - 6.20, Table 6.2A and 6.2B).

PFDS in Bangladesh: Some Further Statistical Perspectives.

16 While we have seen that the relative shares of SR and MR in the 1970's and 1980's in total PFDS had declined relative to the 1960's, the trend towards a declining relative share within one sub-periods of the post-liberation period to another is quite marked for SR and, albeit slightly less so, for MR as well. The same was found to be true of LE. The share of OP, FFW and a combination of OMS and MO has risen consistently through the period. The share of EP has remained pretty much the same during the 1970's and beyond. The shares of FM and VGFP have unpredictably fluctuated (para 7.3). A part of the decline in the relative share of MR during the 1970's has been offset by an increase to the tune of 7% in the share of OP, it being noted that during this period there has been a relocation of beneficiary categories out of MR and into OP. However, the share of MR has fallen by far more - nearly sixteen percentage points between early 1970's and 1980's - than that of OP has risen. MR has, therefore, taken a sizeable cut in its relative share during the 1970's (para 7.4).

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1 Since the entire consumption of wheat was supplied from rationing, no purchase of wheat from the open market was presumably involved and hence it was logical to assume that changes in market price of wheat did not have any impact on the calculation of ration price of wheat.

17 An almost continuous decline in the unit rates of subsidy, for both rice and wheat, has occurred right through the period following 1974/5 (Table 7.2). Rice has enjoyed a preferential rate of subsidy throughout the period. In overall terms, the unit rate of subsidy has fallen by 30 percentage points in 8 years beginning 1974/5 (para 7.9). We have found that urban-proneness of the PFDS - measuring it by the ration of estimated number of urban beneficiaries of the PFDS to estimated urban population - has quite rapidly and unambiguously fallen through 1970's and beyond. Between 1974/5 and 1981/2 in 7 years - the ratio has declined by one half or more (Table 7.3). In contrast, the rural ratio suggests a pattern of crawling improvement in the rural ratio, although the pattern is hardly spectacular (para 7.18).

Urban and Statutory Rationing in Bangladesh in 1973/4, 1984/5

18 Income transferred due to urban rationing was estimated to contribute 7.05% of with-rationing expenditures per capita in 1973/4 - a year when participation in rationing by eligible households must have very extensive and full. On some plausible assumptions, the corresponding figure for 1984/5 is found to be 3.21%. In 1973/4, rationing improves the distribution of expenditures per capita by about three percentage points, while in 1984/5, it does so by slightly over one percentage point. The implication is clear that urban rationing has more recently come to have very little redistributive influence (paras 8.6 - 8.7). The rationing benefit-to-income has been estimated to be 0.3% or less in three SR areas surveyed recently by A. Abdullah. Our own surveys in two SR areas returned average benefit-to-expenditure ratio of 0.7% (para 8.7). The much lower benefit-ratio in the SR area makes good sense as we show the average expenditures of randon samples of SR households to be significantly higher in 1984/5 than reasonably, even generaously, estimated average incomes of representative urban households in Bangaldesh.

19 In this study, standards of living were measured in terms of per capita expenditures, and not measured income, as the latter was frequently understated and could not, in addition, account for own-account production that is consumed (para 8.10). Per capita expenditure of the overall SR sample was found to be Tk. 7762, while the corresponding income was estimated at Tk. 7058. (Table 8.2). The living standards of the SR sample were found, for each of the four quartiles, to be significantly higher than those of representative urban households in the corresponding quartiles in 1984/5 (Table 8.3). The latter figures were

based on 1978/9 HES data, and estimated urban inflation rate.) The SR sample has an average budget share of food of 61%, while the corresponding figure estimated for representative urban households was found to be 68%. In both cases, the average budget share of food declined with higher quartiles, but the rate of decline was found to be slower in the case of estimated 1984/5 percentages (para 8.12). On careful comparison of 1984/5 SR sample data, and 1984/5 estimate of representative urban households (on the basis of using 1978/9 HES data), we concluded that the average recipient of SR in Dhaka and Khulna must be considered as significantly better off in 1984/5 than the average urban household in Bangladesh (para 8.14). Average budget shares of both wheat and flour products (including flour) are found to increase with average expenditures on teh SR sample households (Table 8.5). Household procured a preponderant part of their combined consumption of wheat and atta in the form of wheat, and not atta (Table 8.5). Consumption of flour and flour-products is found to be unequal; top half of the distritution of households accounts for three-quarters of the expenditures on flour and flour-products (para 8.16). The SR households overall allocate only 34% of food expenditures to cereals while about 56% of food expenditure are allocated to fish/meat and pulses/vegetable categories. The clear preference for protein-rich food points to the fact that SR beneficiaries are in general reasonably well-off households (para 8.17). This is further confirmed by the fact that overall calorie intake is high indeed at 2297 kcal per day. Caloric intake by representative urban households in 1973/4 was estimated at 1920 Kcal/day and, from somewhat less firm data of HES 1976/7, at 1897 for 1976/7 (para 8.13). SR was thus judged in this study to reach mainly the non-poor in the areas where they operate (para 8.19). One important reason why the poor in major urban centres are outside the direct province of SR is that the fresh issue of SR cards has been banned since 1974, except to priority categories like government servants on transfer to SR areas (para 8.20). The second important reason why SR mainly benefits relatively better-off households is that households, already in residence before 1974 and had been issued ration cards may be suposed to have through time improved their economic situation (para 8.21). Dhaka and Khulna have been cities of opportunity in the last decade or so (para 8.21). Even the poor who landed in Dhaka upto 1974 and managed themselved accommodation by SR have often witnessed some improvement in living standards through 'multiple-earner' basis (para 8.24).

Rationing Behaviour of SR Sample. 1984/5:

20 The heads of 72% of sample households were born outside these SR areas but came into permanent residence in them subsequently. 24% of the sampled heads were residents since their birth. Mean length of residence of households headed by men not born in the SR areas at hand (72% of sample) was found to be 20 years. Only 3% of the heads reported that their movement into these two SR areas were occassioned by transfers on duty. The category of those who settled down in Dhaka and Khulna in preference to the places of their births, reflects, by virtue of its shear dominance (72% response), the fact of the selection by many households of these cities especially Dhaka, as providing many opportunities, not the least important of which has to do with those of SR (para 8.28 - 8.29).

21 82.5 of about 3026 SR households interviewed in Dhaka in April, 1985, had some defined employment status. Of these, the largest single category is that of government servants, with men in profession, trade, industry and services being the next important category. Occupations with low socio-economic rating, e.g. artisans, rickshawwalas, maid servants are not much in evidence in this lot (para 8.31). The occupational distribution of the 156 SR sample households was found to be pretty much the same. We believe that our SR samples have been drawn from the same structural universe as the much larger ration shop survey sample (para 8.32).

22 The SR sample was found to have more minor cards than they have minors, and have less adult cards than they have adults in the family. This means that the status of ration cards has not been changed in the light of changing ages of the members. This constitute indirect evidence of an attitude by households of the lack of acute concern with getting the maximum benefit possible under the SR rules prevailing (para 8.34). It may also be that the transactions costs of the upgradation of the entitlement on a particular card may be higher than the expected gains from the change.

23 For the SR sample, average number of weeks that ration is lifted in 1984/5 is found to be 42.5. The corresponding average reported by the larger survey of April 1985 was 45.4. Considering that the latter average was almost certainly an overstatement, the similarities between the two averages are reassuringly close (para 8.35). The quantity of ration (rice plus wheat) lifted per capita on our sample works out at 98.5 lb. This compares with an overall urban average lifting of 275 lb. in 1973/4 by Ahmed (1979) (para 8.35). In overall terms, about 58.6% of quota per adult equivalent card is lifted in 1984/5, the percentage being 59.6% for rice and 58.7% for wheat (Table 8.15). The proportion of quota that is lifted declines with ascending

expenditure quartiles, but the rate of decline is clearly slower for wheat than for rice. Wheat is, therefore, seen as the preferred commodity by his well-off sample (para 8.37). In overall terms, partial lifting, rather than irregular lifting, is found to account for over half of the total unutilisation of ration entitlement, and this appears to hold good for both rice and wheat (para 8.40). This means that the card holders attend the ration outlet relatively regularly. Whether, however, he lifts fully or partially depends on the quality of the rice or wheat being distributed on a particular day. The problem of lack of utilisation of ration is not so much one of card holders who rarely visit the ration shop as one of discriminating customers who base their rationing quantity decisions on considertions of quality, relative price and so forth. Regular attendance at ration outlets could also be due to the fact that commodities other than foodgrains, too, are available for rationing (para 8.40).

24 SR sample households failed to accountfor all of what they admitted having lifted off-ration in what they consumed out of lift-off. The difference between what they consumed off-ration and what they lefted off-ration should be properly treated as a leakage. On an overall basis, the households are found to have lifted 9 kg. of wheat per adult card more than they have consumed ex-ration. In contrast, they w e conceding to leakage only to the extent of 0.71 kg. of wheat per adult card, thus leaving about 8.3 kg. of wheat per adult card that remains unaccounted for. This accounts for about 20% of what is lifted or about 12% of the total quota. In sum, 40% or so of household entitlement of ration foodgrain were not lifted in 1984/5. Of the quantity lifted, about 20% and 24% in the case of wheat and rice respectively are not consumed but is probably leaked out (paras 4.45 - para 4.47).

25 In two-thirds of cases, the head of household or his son was found to be lifting the ration. This was seen as evidence that households attach some importance to the act of lifting the ration. Perhaps, this was because the exercise of responsible discretion relating to the extent of lifting of the quota is involved (para 8.49). We argued that there is no contradiction between the fact that households appear to take seriously the quality of decisions about the quantity to be lifted and the fact that about 20% or more of what was lifted in 1984/5 probably leaked out-side the households consumption. This is so because households take all the trouble of <u>regular</u> lifting, however partial it may be relative to the quota, since they consume a lion's share of what they lift (para 8.50).

26 The overall conclusion of this chapter was that SR is geared in the main towards nonpoor households, that the now greatly diminished income transfer rate arising of subsidised prices amount to much less than 1% of household's permanent income, that the SR represents a grossly inequitable instrument of food policy, that a reorientation of the SR is now due. (we discuss in ch.13 some concrete recommendations relating to the suggested reorientation of SR.) Further it is our belief that recipients in OP and LE are on average clearly more deserving, on the basis of need, than SR households to receive income transfers through subsidised foodgrains.

Modified Rationing in Bangladesh:

27 An analysis of the comparative variability of quarterly offtake in five channels of PFDS showed quite convincingly that MR was the channel with the greatest variability (Table 9.1). MR is alone among the monetised channels of PFDS to have the rural poor as its de-jure constituency. This particular channel has the distinction of taking the deepest cut in its average quarterly offtake country-wide, and of having the highest volatility from one quarter to the next. Besides, the volatility has remained practically the same in all time periods considered: its degree did not fall at all even when the scale of MR was slashed by almost two-thirds. This situation arises of course because MR is officially meant to be a residual category. The uncomfortable fact remains, however, that this dispensation sound as though the problem of food security for the rural poor - the silent majority in Bangladesh can well be treated as of residual importance when, on the other hand, the better-off urban people are given priority in routinised delivery. This is one of the most notable "double standards" implicit in government's food policy (para 9.5). MR is very much of a residual when its coverage is measured against the rural population in poverty. On highly generous assumptions, we estimate that in more recent years (e.g. 1978/9), the proportion of the rural poor covered by MR according to maximum allowable MR quota is 3.6% (Table 9.2). The highest that it has been in the 1970s in the table is 10.9%. The MR quantities may thus be seen to benefit a very small fraction of poor rural population.

Comparative Incidence of MR within Pourashavas and Villages:

28 About seven-tenth of the foodgrains in MR get distributed in villages through UPs (Ahmed, 1979; Table A9.1 of this report). But absolute quantities have to be standardised for number of MR cards. On a per-card basis, rural areas receive far less accommodation within MR than the pourashavas. In 1983/4, the rural-to-pourashava ratio of MR distribution was 18.4% only, it being only slightly higher, 22.3%, in 1984/5. The rural poor are accorded far less importance in the actual modalities of MR distribution (para 9.19). We do not as yet know, however, what is responsible for this - the government, or the fact of the poverty itself of the rural poor. This is worth examining in greater detail than was possible in course of this study (para 9.20).

Territorial instability of MR:

29 Perhaps due to factors specific to the peculiarities of the upazillas, MR off-take was found to display considerable territorial volatility, and across time within a broad period. This uncertainty appears to have important influence on population perceptions about MR (para 9.22).

Assessment of Eligibility of Households in MR:

30 Our surveys show that, out of the 249 households randomly drawn out of the A and B categories on the DPL, 174 (70%) in fact did belong to A category, viz. paid zero chowkidari tax in the year preceding the survey and another 63 (25%) belonged to B category. Only 2 and 5 belonged to C and D categories. (These may have belonged to A or B category when the present DPL was drawn up many years ago). 95% of the MR covered sample were being deservedly serviced by it.

31 For every household in A and B categories that is properly benefitted by MR, it appears that an equal number of A and B category households are not accommodated within MR, although they ought to be. This is so because 70.4% of the households who were introduced to us by our MR-covered respondents as never having received any MR foodgrain turned out to be in category A, and another 25.6% in category B (para 9.43). The close similarity of the percentages of A and B categories households as between the MR-inclusive and MR-exclusive households can have only one explanation, namely that both samples, although very differently selected in fact, have come from the same universe, namely households that represent the bottom of the rual income distribution.

Control of Supplies in MR:

32 The DC, food, in a district decrees the upazila-level allocation of what remains of MR allotment of the district after the claims arising from the pourashava DPL are met. It is our understanding that the total quantity of MR foodgrains for distribution in non-pourashava jurisdictions, i.e. through the UPs, are prorated among upazillas on the basis of the number of MR cards at issue in them. The upazilla allotment is then further prorated among unions on the basis of the number of MR cards at issue in them. However, the number of MR cards at issue is frequently lower than the number of members belonging to A and B catagory households maintained on the DPL. We, therefore, find that, while the quantity of MR foodgrains distributed per MR card in villages is 25.8 seer (Table 9.3), the quantity distributed per member in A and B catagory households in six syrvey unions was 6.5 seers only in 1984/5. This shows how supply of foodgrains in MR is allocated.

Incidence of Rural Rationing on Household Food Intake:

33 Four channels of PFDS can potentially reach rural households: FFWP, VGFP, disaster relief adn MR. The wheat distributed under MR in 1984/5 could potentially reach households qua wheat, or qua atta via the instrument of suggests that, in 1984/5, MR and FFWP made an important contribution to the daily food intake of households, of 17.5% (para 9.29). Our MR-covered household sample is overall a poverty-stricken sample, as measured by caloric intake per capita per day (para 9.26). And yet the incidence of wheat ration under MR for these households is a meagre 3.9 seers/capita out of a total ceral intake of 190.4 seer/capita/year, viz. at only 2.1% (Table 9.8). Consumption of atta contributes 21.3 seers/capita/year or 11% of the cereal intake. Even FFWP participation contributes more per capita than MR distributing wheat (Table 9.8). The dominance of direct purchase of atta, relative to that of wheat, on this poverty stricken sample is striking and would appear to be higher than has been the case for poor rural households, historically (para 9.29). The following conclusion can be reached. The income re-distribution among rural households arising from the working of rural rationing (including MR foodgrain and FFWP wheat, but excluding the atta) is insignificant. The fall in the Gini coefficient of rural households in the with-rationing situation would be no more than 0.5 percentage points. The fall in the Gini coefficient of the distribution of caloric intake in the with-rationing situation would be even lower. Atta is properly to be excluded from such a calulation because households receive no subsidy on the atta they consume.

34 Average MR foodgrain distribution (rice plus wheat) is found to be 4.2 seer/capita/year, which is quite consistent with the average, reported for six out of ten of the unions surveyed, of 6.5 seer/capita/year distributed per member in A and B categories (Table 9.11). That the sample exepriences both poverty and the want of accommodation by MR is not surprising; the UPs themselves have been allotted quantities which simply do not stand up to the union's requirements even if measured by the number of MR cards at issue. What happens, therefore, is that only households who manage to doggedly pursue the UP chairman and his concerned member do in fact get a larger quantity of MR foodgrains. The general run of MR covered households receives a good deal less. This, we believe, is reflected by the difference between the 6.5 seers and the 4.2 seers in average receipt of MR foodgrains on our households.

Non-participation by the Poor in the MR:

35 75% of the MR-exclusive households sampled felt that they deserved benefits from out of MR (para 9.42). All these households were in A and B categories, and hence their grievances were quite legitimate. All of them had tried in the past to secure issue of MR cards in their favour, but without any success. The most oft-cited result that our respondents quoted was that they were assured accommodation next time there was a fresh issue of cards (para 9.42). The last time cards were issued was 4.7 years ago (Table 9.10). The waiting time can, therefore, be quite considerable. About one-fifth of this sample, therefore, never sought to ensure issuance of cards. Their reasons for avowed non-participation are (i) that open market prices frequently equal issue prices in MR and (ii) that buying atta in day-to-day quantities is so much more convenient (para 9.42).

Leakage out of MR and FFWP:

36 Households surveyed, both in SR and MR areas, were understandably evasive in matters of whether they leak foodgrins into the market out of their rations. We have concluded in the case of SR sample that households had most certainly and grossly understated their involvement in leakage (para 8.45). Leakage is estimated to be much less at the level of rural households, in view of their poverty, and of the meagreness of typical MR distribution on average.

The Chakkiwala Vs MR:

37 In May, 1983, the Government decreed that thenceforward all MR wheat would be first issued to approved chakkiwalas at MR issue rate who, after milling it, would market it, whether to MR cardholders, non-card households, or to bazar retailers. The percentage was brought down to 50% in September, 1983. In the entire 1983/4, the percentage was about 40% or so. Consumption of atta has quite a favourable reception on the poor households (para 9.45). A move towards using the mechanism of atta-chakkis to the exclusion of the prevailing regime of MR involving UP chairman/members and MR dealers strikes us as a basically correct decision of the Government. It has the following advantages: (a) it potentially de-politicise the distribution of "non-preferred" cereal in which the poor are in the main interested; (b) the chakkiwala, once he lifts an allotment from the LSD, has greater incentive to mill the wheat in his facility than has the MR dealer to sell his allotted quantity in his constituency; (c) the atta, once it has been milled, has a limited sack-life and hence does not lend itself as much to inter-district hualage as wheat in a sack; and (d) finally, such a move edges the system of food distribution toward a greater dependance on market mechanism. The price of atta, the average household on our sample has paid almost certainly included a premium of about Tk. 0.75 per seer, give or take Tk. 0.25. But we believe that this resulted from a demand-supply mismatch, resulting in large part from the fact that in 1984/5, our sample of chakkiwala received an average only 330 mds. of wheat each - a fraction only of their milling capacity. It is possible, according to us, to establish parity in supply and demand for atta by doing something fundamental about the modalities of MR (this is detailed in Ch. 13.)

Assessment of FFWP and VGFP in Bangladesh

38 Bangladesh PFDS incorporates schemes which seek to target food supplements primarily on poverty consideration, as also highly targeted special nutrition-cum-development programme. The first is exemplified closely by FFWP, and the second by VGFP. In the parlance of Ch.7, both, including the small Institutional Feeding Programme, are called Relief, as opposed to monetised, channels of PFDS in Bangladesh.

39 The working of the FFWP in Bangladesh have demonstrated a very large degree of self-selection by the poorest of rural households into its scope (para 10.4). Earthwork is the archetypal manual work, and even in rural setting in Bangladesh manual work for a living can be adjudged to be a reliable indicator of poverty (para 10.9). Poverty thus acts a very effective screening mechanism for regulating the distribution of benefits out of FFWP. It does not suffer from some of the limitations which afflict some of the other anti-poverty programmes for the landless (para 10.9). There were, to be sure, denials to the labourers of their rightful wages in the past. BIDS-IFPRI estimated such underpayment to be as much as 26% in the FFW season 1981/2 in the WFP-sponsored FFWP (para 10.6). But the WFP claims to have brought such underpayment down to the order of 5% or so in the 1984/5 season (para 10.8). Such improvement has been made possible by strengthening field monitoring outfit at the disposal of the WFP. Field officers (FOs) now frequently tour randomly selected FFWP sites. WFP FOs have been given the mandate by the Government of recommending to the PIO at the upazilla the suspension of an approved scheme if foul play is strongly suspected - although such privileges are rarely exercised. But the mere possibility is deterrent to possible abuse. Criteria for approving FFW projects have been improved. Suitable technical inputs now are increasingly going into pre-work measurement of the earthmoving work: BUET students are being used for this end. A more rigorous post work measurement, again possibly by BUET students, is on the cards. In sum, the FFWP in Bangladesh has improved noticeably in its implementation.

40 VGFP have, under rigorous evaluation, also acquitted of itself with credit. They do reach the target group (para 10.10). VGFP and IF may, therefore, be said to be performing reasonably well its role of nutritional intervention. There was until about 1984, widespread and genuine concern that VGFP was not performing well its developmental function involving improvement of health/nutritional education of the recipients of their standards of functional literacy and of their level of gainful skills. However, some concerted attempts have been made by the Ministry of Relief and Rehabilitation to improve VGFP from this view point. Besides formation of a National Co-ordination committee, and a working committee in the Directorate of Relief and Rehabilitation (DRR), a VGF cell with WFP experts has been formed in DRR. The cell officials have started monitoring the developmental performance of VGF rather closely. Progress made so far is modest but the movement is surely in the right direction. Despite some success a good deal of

time and effort must take place before the ultimate developmental goal of VG FP can be realised. Accomplishing such transformation towards economic self sufficiently involving poor and illiterate women is exceedingly difficult particularly in a social setting where pace of change has been and remains slow. One cannot, therefore, make a case for expanding the present level of VGFP before an independant evaluation of the developmental endevours noted above is undertaken.

PFDS and Food Security in Bangladesh

41 In this study we have examined the issue of food security once from the aggrentive and once from disaggregative prspective (apra 11.1-11.3). In the aggreate, instability is measured by CV around the trend. Aggregate instability in foodgrain output and availability was observed to be of the same order of magnitude, viz. 0.5 0.6 percent (Table 11.1). This is understandable in that, after all, domestic production contributes about 85% or so of availability. The relatively small degree of this instability is in a sense a positive evidence that suggests that PFDS, as the most important part of food policy of the Bangladesh Government, has succeeded in achieving its food security goals, at least in its aggregative dimension, reasonably well (section 11.8).

42 The disaggregated view of the food insecurity uses as its basis the precarious food intake circumstances of vulnerable groups of indivivuals that require direct targeting. Such vulnerabilities can arise form the independant or interdependant working of at least three categories of influence, viz. personal/demographic/social, ecological/regions regional and policy induced (para 11.20). Remote and backward regions with unfavourable ecology can suffer low priority in the Government design of investment, say, on roads or market building Thus the regional handicap may interact and evolve with handicap arising from the design of policy. Households with personal/demographic/social traits that increase proneness to the lack of food in such remote and policy neglected regions are clearly at the greatest risk to food shortage.

43 The aspect of food insecurity in disaggregation in Bangladesh that offers itself as the most practicable basis for gearing PFDS toward food security goals involve what we call the geography of distress A famine map could also be analogously used here. A succession of studies has now confirmed the general empirical validity of a mapping of poverty drawn right down to the upazilla level (para 11.10). WFP has, in addition, operationalised that concept by

incorporating it into their criteria of determining upazilla wise allocation of FFWP assistance (para 11.10). Having reconfirmed the validity of the gradations of famine proneness originally suggested by Dr. Currey using a study by Chowdhury (1984), and again using our sample survey results (Ch. 9), we specifically recommend that a reorientation of the PFDS that seeks to achieve a greater pursuit of food insecurity ought to systematically incorporate the geography of famine proneness into the allocation-principles of MR, VGFP and FFWP (this is further elaborated in Ch.13). Further, there is also a geography of food vulnerability within statutory rationing areas which needs to be taken into account, especially if SR has, as we believe, to be abolished. We suggest that the establishent of FPS within poor neighbourhoods in SR areas merits serious attention. These FPS would utilise the principle of locational self selection to ensure that only, or mainly, the poor have access to them. Targetting by commodity could also be used (para 11.22).

44 In its role of supply and market price stabilization, OMS program has immense potential in contributing towards removal of food insecurity in the country. In Banglapdesh, a significant number of people live near or below the poverty line. Also, it periodically suffers from aggregate foodgrain shortages. Therefore, the welfase contributions of a distribution mechanism such as OMS that is exclusively oriented towards stabilising foodgrain prices in the open market must be quite large. The territorial dimensions of food security can also be effectively handled through OMS operations by targetting the foodgrains in the traditionally deficit areas which are ecologically more vulnerable, and therefore, more famine-prone. Also, OMS program by exerting a stabilizing influence on market prices can contribute towards mitigating the difficulties faced by the government in fixing procurement prices in periods of rising domestic foodgrain prices.

Experience of PFDS in the neighbouring Countries:

45 Alternative schemes of food distribution ranging from untargetted food price stabilization programme in Indonesia to geographically targetted ration shop or fair price shop scheme in West Bengal in India and the recent food coupon system targetted by income as well as the earlier untargetted subsidized food ration system in Sri Lanka are reviewed for drawing lessons for designing food distribution system for Bangladesh. (Chapter 12).

46 Indonesia's food distribution policy of adequate supply of food at stable prices for the country's large and growing population require both holding and maintenance of an adequate buffer stock which in its turn have both domestic and foreign exchange cost implications as well as having impact on domestic food production (para 12.3 - 12.9). This untargetted system benefits everyone in the country and the operational cost of such a system is also quite large requiring foreign exchange to import food during thebad crop years, building enough storage capacity and procurement cost from domestic production at a minimum price set before the harvest and distributing it at a subsidised price for maintaining price stability. Such untargetted schemes are not only the most costly for the state budget but usually increase the food consumption of the well nourished.

47 Sri Lanka also started off with an untargetted ration scheme similar to that of Indonesia as a part of its overall welfare oriented development programme founded on the rock of resource constraint had to be substituted by food coupon system targetted by income in 1979. In India a net work of ration shops or fair price shops distribute government procured and imported food at below market prices in such big cities as Calcutta and Bombay (para 12.10 - 12.20). These shops are located geographically in slums and poor urban areas.

48 It is found that targetting by region and commodity reduces cost of programme and increases its efficiency (para 12.36). Hence it would be advisable for a poor developing country such as Bangladesh to design its food distribution system targetted by region and commodity. Wheat is considered as an inferior commodity compared to rice in Bangladsh. Hence distribution of poor quality wheat at subsidised prices through fair price shops located in slums and poor areas may be given serious consideration while designing food distribution system for Bangladesh.

Recommendations for Re structuring of PFDS in Bangladesh

Recommendations for Re structuring of PFDS in Bangladesh logically followed the evidences which we have been able to amass in the core of the study. These recommendations together with their implications and justifications have been embodied in chapter 13 of the Report. The specific recommendations are reproduced below:

It is recommended that:

(i) SR be abolished altogether

(ii) the rationing quota in the remaining three priority channels viz. EP OP and LE be halved in the phased manner, say, during the period of Third Five Year plan of the country.

(iii) the ratio between issue price and market price in four channels namely EP, OP, LE and MR be maintained where they are in 1985/6.

(iv) wheat be substituted for rice in the remaining traditional rationing channels where both rice and wheat is presently distributed (i.e. EP, OP, and MR) in a phased manner, so that only wheat is distributed in the last year of the Third Five Year Plan.

(v) wheat, not distributed in EP, OP, and LE due to recommendation (ii) be redirected into FFWP and MR on a 50:50 ratio.

(vi) the allocational criterion of the MR be revised to include the following. The entire MR wheat allocation be allotted to approved millers in pourashavas and in the unions who in turn would market the atta. Three sets of eligible MR beneficiaries are to be recognised, in order of their respective priority to be duly reflected in their "notional" entitlement per card per unit of time; namely (a) MR card holders in famine prone upazillas (b) MR card holders in non-famine prone upazillas, and (c) MR card holders in Pourashavas. The allocation of MR foodgrain, both wheat and rice, among these locational entities should be governmed by the principle that an adult card in (a) should have the weight in terms of entitlement 1.25 times that of an adult card in (b) and that a card in (c) should have the weight of 0.67 that of (b). The allocation of MR among districts should similarly be derived from a country wide compilation of MR card at issue in (a) famine-prone and non-famine prone upazillas and (b) in pourashavas, similar weight being applied. Rice in MR may be distributed among card holders through the medium of MR dealers, so long as rice is distributed.

(vii) field monitoring capabilities at the disposal of the PIOs at the upazilla be increased so as to prevent abuse and enhance effective use of the expanded scale of the FFWP. The availability of such monitoring input on the side of the implementing agencies involved will likely to improve further the effectiveness of the WFP monitoring outfit.

(viii) in roder to contain the speculative activities in rice market leading to excessive hoarding, an effective OMS program should be undertaken during the lean season.

(ix) OMS Program be strengthened by making available larger amount of foodgrains with greater share of rice diverted from SR and other preferred categories (EP, OP and MR) so that it can serve as an effective tool for price stabilization during the lean season period.

(x) the suggested principle (as enunciated on chapter 6) may be accepted as the basis of setting ration prices over time.

(xi) in order to moderate price during a period of short market supply, no new channel of PFDS be created. Instead, timely triggering of the OMS as a policy decision, followed up with appropriate degrees of grain releases in OMS will, we believe, contribute to moderate what may otherwise be excessive increases in market prices. In addition, it is recommended that the government has at fiscal year-end total stocks of about 1.00 million tons.

(xii) the VGFP be operated at the existing level until there were to occur a demonstrated improvement in the capability of its recipients to use the food assistance as an effective catalyst in their reasonable achievement of economic self-reliance during the tenure of the feeding program.

(xiii) procurement programme be continued but efforts be made to ensure that small and marginal farmers might benefit from the incentive prices to a greater degree than has been thought to be the case in the past.

(xiv) Fair price shops (FPS) be opened on pilot basis within particularly poor neighbourhoods within what are now the six SR areas. The idea is that when subsidised foodgrains are distributed from rationing outlets located in poor neighbourhoods, the poor will primarily participate in the program. Besides locational targetting, further targetting by commodity may also be feasible. It is further recommended that the FPS be operated by individuals who are themselved residents of the poor neighbourhoods. Foodgrains to be distributed will be so priced as to allow two-thirds the unit subsidy provided via MR.

(xv) the government should seek to quicken the pace of farm technology modernisation at the same time as to redirect a growing part of its benefits in favour of the landless, functionally landless, marginal - and small farm households via the mechanisms of the labour, land and capital markets. PFDS can at best make a shortrun contribution to the problem of rural poverty, but the real challenge in the countryside of Bangladesh is to initiate and sustain an efficient, secure and egalitarian growth involving the agricultural sector in general, and its food sector in particular.

CHAPTER 1

THE OBJECTIVES OF THE STUDY

A1 : Some Analytical Considerations

1.1 This is one of three studies being concurrently executed by the Government of Bangladesh (GOB) on various important dimensions of food policy. The other two studies are focusing, among other things, on (a) estimation of economic subsidy and the distribution of food subsidies among various income groups in rural and urban areas, and (b) the relative economic efficiency of input subsidy versus price support programme for small and marginal farmers in Bangladesh. All three studies are aided by the US AID. The study referred to at (a) evidently has a commonality with this study in that both are concerned with the consumption side of the food distribution, while the study at (b) is more properly seen as mainly concerned with the production side of the Bangladesh's food system. Our own study is focussed on the character, administration and economic, especially distributional, consequences of the PFDS.

1.2 It is apt to remember that the general topic of this study is subsumed within a broader category of thought and research which may be called food policy analysis (FPA). FPA provides a framework for relating society's objectives for its food sector to the technical, economic and political constraints facing public and private decision makers. From the process of balancing objectives and constraints emerges a set of policies and programs that reflect the government's effort to build an environment that is conducive to meeting society's objectives. These objectives usually have four basic dimensions, according to Timmer (1981, p.1):

1. Efficient growth in the food and agricultural sector;

2. Improved income distribution, primarily through efficient employment creation;

3. Satisfactory nutritional status for the entire population through provision of a minimum subsistence floor for basic needs; and

4. Adequate food security to ensure against bad harvests, natural disasters, or uncertain world food supplies.

In other words, the major objectives of food policy of the government of a developing country are improved nutritional status through better income distribution in the context of rapid and secure growth in food output. Meeting these objectives is facilitated if the environment confronting decision agents in the food sector - both consumers and producers - under score, inter alia, stable incentive-giving producers prices, strong performance by investment in agriculture, especially R & D, usually led by the public sector, strong government commitment to deal with the short-run generalised consumption consequences of an incentive-led food production strategy, and the capability to institute direct food consumption intervention in favour of the individuals most vulnerable to hunger and malnutrition. This leaves us with four major desiderata of food policy options in developing countries, viz. incentive producers prices, price stabilisation, gearing public foodgrain distribution to deal with generalised poverty, and direct targeting of food subsidies for the most vulnerable.

1.3 It is no exaggeration to say that these four imperatives are also those of the PFDS in Bangladesh. Public distribution of foodgrain in Bangladesh should subserve price stabilisation both intra-year as also over time, should provide a mechanism for operating a procurement program that both provides incentive foodgrain prices and then utilises the grains so procured in distributing consumption more equally among households, should facilitate direct nutritional intervention in favour of the particularly vulnerable, and should be an important, though not the sole or even the most important, source of food security in general.

1.4 Much has to be said for a study like this in Bangladesh, a country with an extremely dense population, an absolute scarcity of physical natural resources (except gas), a depressing economic history of a virtual stagnation in its long-period rate of growth, and a problem of poverty of truly gigantic proportions.

The objectives of food consumption policies are as exacting in Bangladesh, as are the constraints to meeting then within an acceptable time horizon severe. The titanic proportion of the problem of poverty and malnutrition, for one thing, serves to make the objectives so demanding. On the other hand, one of the focal points for understanding the nature of these constraints is to note that a relatively high degree of inequality in the distribution land and agricultural resources results in a situation where the

short and midterm adverse consumption effects of an incentives-led production strategy are of a relatively large magnitude. Besides, the relatively "minifundist" organisation of Bangladeshi foodgrain agriculture makes rapid diffusion of the 'water-seed-fertilizer technology', notwithstanding its claims for divisibility with regard to scale, relatively faltering. On another level, the country is perennially confronted with a precarious and trying budgetary situation (see below). The serious budgetary situation urgently warrants close examination of the pattern of public expenditure, including food subsidies. In the context of food consumption policy analysis one of the focal questions to be posed is what are the effect of PFDS on price, distributional, nutr'tional and food security aspects of the food system in Bangladesh. In addressing some of these issues, we have several important recent precursors. Mention may be made of World Bank (1977, 1979) and Ahmed (1979). All these works made original contributions in bringing primary and secondary sources of information on various aspects of food policy options in Bangladesh and shed significant first lights in hithertofore under-researched territories.

1.5 More recently, there have been several contributions which have addressed, with various degrees of details, some of the issue of the study. These include Clay (1979), Clay (1981), Islam (1981), Rahman (1984), Reddaway (1984), Ahmed (1985), Abdullah (1985). Coming in their wake, this study has in our view the merit that it represents probably the first systematic attempt to present the past evolution, present administrative modalities and economic consequences of the workings of the PFDS, with particularly detailed documentation, almost entirely based on primary data regarding the character and consequences of Statutory and Modified Rationing. We hope that this work will have answered many interesting questions but, in the act, will have raised new ones. We certainly do not claim that even in answering the question that we do, our conclusions are unexceptionable. But we would like to say that our conclusions have been derived out of our sifting through a wealth of evidence, embracing practically all the levels of their disaggregation possible within the time available, and been avowedly conditioned by what we have presented above to be the rationale of PFDS in a poor and agriculturally backward economy like Bangladesh.

1.6 Food operations are an important source of public expenditure in Bangladesh (Table 1.1). During 1980/1 through 1983/4, food account expenditure as a percentage of total government expenditure has been 6.8% (col.6)[1]. Admittedly, this proportion was 9.6% in the quinquennium immediately preceding the period just noted, and hence one has to say that the Government has strenuously sought to slash down the food account outlay. Such outlay remains sufficiently large nevertheless in more recent years, thus raising the important question about what the existing priorities are that condition the distribution of the benefits of this stream of expenditures. In macro terms, what are the effects of the PFDS variables, particularly the level and the commodity mix of the offtake, one other policy variables, especially market grain prices and average consumption? What is the distributional effects of urban rationing, in terms of expenditure per capita and food intake per capita? Does PFDS contribute to price stabilisation, intra-year and across years? How exactly does the MR really operate? Are beneficiary households properly screened for eligibility? Do they get an adequate, a predictable ration in a manner convenient to them? How large is the proportion of the rural poor which is left out of the ambit of MR benefits on the most conservative assumptions? What is the degree of rural and urban-proneness of PFDS? What is the degree of rural and urban-proneness of MR, the supposed rural channel? What impact do the FFWP and disaster relief operations typically have the food intake of average poor rural households? These are some of the questions which we seek to study in this study.

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1 Food account expenditure in Table 1.1 equals costs, on the government's valuation bases, of running the PFDS, net of inflows of receipts in government exchequer owing to it. The percentage of such net expenditure to total expenditure is an useful indicator of PFDS' place within the fiscal context of the country.

Table 1.1

Expenditure on Food Account, Revenue Expenditure, Bangladesh 1973/4 - 1983/4

(Crore take)

Year	Actual expenditure				Food expenditure as % of total expenditure
	Revenue	Food account	Develop -ment.	Total	
1	2	3	4	5	6
1973/4	345	97	401	844	11.5
1974/5	479	102	505	1081	9.4
1975/6	535	374	866	1776	21.0
1976/7	693	100	1033	1877	5.3
1977/8	835	208	1207	2250	9.2
1978/9	1029	65	1649	2743	2.4
1979/80	1070	380	2279	3728	10.2
1980/1	1337	537	2593	4467	12.0
1981/2	1607	133	2867	4604	2.9
1982/3	1754	270	2912	4336	5.5
1983/4	2261	408	3428	6097	6.7

Note : Total in Col. (5) may differ from the sum of Cols. (2) through (4) due to rounding errors. A few figores for earlier years are revised budget estimates rather than 'actual'.

Source:Osmani et al.(1985, Table 1)

1.7 It may not be amiss to briefly touch upon the background of this study. The conception of the study grew out of the debates that have gone on for some years now within the Food Ministry and the major donors to Bangladesh. Eversince 1982 when there was a change in the political leadership, improvement in economic management has been stressed as a cornerstone of policy. Naturally enough, improvement in management of the food system suggested itself as an important area for deliberation. In this context, the contents of the study were first visualised by the Government, especially the Food Policy Monitoring Secretariat (FPMS). In the process of their conceptualisation of the terms of reference (TOR) for the study, there naturally was interaction between the Food Division, the FPMS, and the US AID. The consultants would like to congratulate the Government and the other agencies named above for thrashing out a TOR that were as detailed as they were challenging. For a more integrative view of the objectives of this study, we may now refer to its TOR.

1.8 A2. The Terms of Reference of the Study :

i) To review and evaluate the existing PFDS with its historical and present time objectives and performance.

ii) To assess the impact and utility of individual channels of PFDS in respect of benefits to different income groups in urban and rural areas.

iii) To examine the impact of different categories of PFDS on market price of foodgrain over the years.

iv) To assess to role of PFDS in reducing the speculations in private grain trade.

v) To suggest new channels of PFDS for supply of foodgrain for moderating the price during a period of short market supply.

vi) To suggest distribution mechanisms which will serve the food needs of low income groups and poorer section of the community in the rural and urban areas.

vii) To examine the comparative merits of traditional rationing system in Bangladesh and other systems of public foodgrain distribution like fair price shop in India, open market operation in Indonesia and food stamp in Sri Lanka.

viii) To Examine the feasibility of large scale OMS organising the grain traders with the concept of free market sale for achieving the price and supply stabilization goal.

ix) To examine the criteria for identifying the groups like vulnerables, socially handicaps or otherwise incapable of earning income and suggest ways and means of supplying foodgrains to those groups.

x) To examine the methods of supplying foodgrain as relief or succour to the people affected by disasters, flood, cyclone, drought or production shortfall in localised areas or in the case of nation-wide calamities.

xi) To suggest the principle of price setting overtime for foodgrain distribution taking into consideration the level of procurement price, consumer's income, inflation, and price of food and non-food items in the open market.

xii) To examine the desirability of offering only wheat through traditional ration system and selling the whole paddy or rice in the open market.

xiii) To study the effects of rationed food on food intake and nutrition level of consumers along with the welfare and income distribution.

xiv) To assess the role of PFDS as a tool for food security system under the existing channels and under proposed reorganised system.

xv) To recommend a suitable structure for PFDS and modus operandi for the same.

IC : Methodology :

1.9 In executing our methodology, we used both secondary and primary data. Food-sector variables (e.g. production, procurement, import, prices, offtake, stocks, per capita consumption etc. have been taken by official publications. In some cases, especially where we were amassing evidence of a historical nature, published secondary materials have been used. Chs 2,3,4,7,11 and 12 are based on secondary sources of data, although such data have been invariably processed

painstakingly so as to impart them a measure of originality. Chs 5,6,8 and 9 are almost entirely based on primary data generated through sample surveys conducted specifically for this study. The detailed methodologies for conducting two of these, namely the SR household survey, and a set of rural surveys, are outlined at the end of the chs. 8 and 9 respectively. Besides, the team conducted an elaborate Ration Shop survey in April 1985 during which over 3000 ration-lifters were interviewed. The results of that survey have also been drawn upon in reaching our conclusions about the effects of SR.

1.10 We must also note here that despite strenuous effort on our own part and on the part of the Ministry of Food, it has not been possible to obtain requisite computer processed data relating to 1981/2 HES from BBS which forced us to omit analyses of the distributional effects of rationing in rural and urban areas in that particular year.

1.11 Again, we have to note here that we made an attempt to obtain information about the breakdown of offtake, by rice and wheat, corresponding to various components of Essential Priority (EP) channel, as also about the issue prices therein of the two commodities. This information was needed in order for us to compute comparative rates of consumption subsidy for the beneficiaries in the various components of EP. A concrete idea as to comparative rates of subsidies received by beneficiaries within various priority channels, e.g. SR, EP, OP etc. was deemed by us to be essential in the context of making recommendations about restructuring the PFDS in terms of extent of benefits to be provided to various economic groups. It has not, however, been possible for the Directorate of Food to supply the relevant information sought. This has resulted in that we were forced to bracket beneficiaries in EP and OP, on the basis that both are priority recipients of ration supplies. It is admitted freely that such an equation begs a question owing to the common knowledge that supplies in EP involve a much greater subsidy than in OP. We had, however, no options left, due to the unavailability of the requisite data.

With these background, we may now turn to our findings.

CHAPTER – 2

A HISTORICAL PERSPECTIVE ON THE MACRO AND FOOD ECONOMY OF BANGLADESH

2A. Macro-Economic Setting in Bangladesh

Structure of the Economy

2.1 Table 2.1 gives a summary view of the structure of Bangladesh economy and its change over the years from mid sixties to mid eighties. Since an integrated time series data on national income is not available for pre-and post independent periods we had to be satisfied with the analysis in terms of current prices and in ratios only. Agricultural sector continues to pre-dominate the structure of the economy by accounting for around half of the gross domestic product of the country in recent years. Its overwhelming impact on the level and changes in national income and its distribution becomes obvious when one considers that more than two thirds of the labour force are directly or indirectly employed in this sector and its contribution to the crucial foreing exchange earnings of the country comes to around ninety percent in terms of agricultural and primary products (jute, fish, tea, hides and skin, etc.)

2.2 Th[illegible] of manufacturing in the economy is still less than [illegible] Shares of other sectors have remained almost [illegible] slight fluctuations. One can then reasonably con[illegible] from the evidence that the structure of Bangladesh ec[illegible] remained more or less unchanged from mid-sixties to [illegible] mid-eighties according to the contribution of diff[illegible]t sectors to the economy as a whole.

Table 2.1

Sectoral Share of Gross Domestic Product (at current factor cost) 1964/5 - 1984/5

		1964/5	1969/70	1974/5	1979/80	1984/5
1.	Agriculture	55.6	57.2	68.5	50.3	48.4
2.	Mining	0.1	0.02	0.002	0.5	0.001
3.	Manufacturing	7.2	6.6	4.8	9.9	8.6
4.	Construction	4.8	6.6	3.8	4.7	5.3
5.	Utilities	0.6	0.9	0.01	0.3	0.6
6.	Transport and Communication	6.5	6.3	3.9	5.8	6.8
7.	Trade	11.0	9.4	8.8	9.6	8.8
8.	Banking and Insurance	0.5	0.8	0.1	1.6	1.5
9.	Housing	6.0	5.3	4.3	7.9	6.9
10.	Public Administration and Defence	3.2	3.8	2.1	2.1	4.5
11.	Professional and Miscellaneous Services	4.6	4.3	4.8	7.8	8.6

Source Upto 1969/70 taken from Alamgir M. and L.J.J.B. Berlage (1974), Bangladesh. National Income and expenditure 1949/50-1969/70, Bangladesh Institute of Development Studies, Research Monograph No.1 and 1984/85 Statistical Yearbook of Bangladesh.

Population and Labour Force

2.3 According to the Census of 1981, the population of Bangladesh in March 1981 was 89.91 million. The percentage of urban population was 15.2 while that of rural 84.8. The intercensus growth rate of population between 1974 and 1981 was 2.3 and that between 1961 and 1974 was 2.5 per cent per annum respectively. Therefore, it seems that there has been a slight reduction in the rate of growth of population in Bangladesh in recent years.

2.4 Labour force in Bangladesh grew at a higher rate between 1974-1983/4 compared to that between 1961/64 as can be seen from Table 2.2. This may have occured due to a high rate of growth of female labour force (10.0 per cent) in the later period compared to a very low rate of growth (0.8 per cent) during the earlier period as can be seen from the table.

2.5 It is clear from the table that the rate of absorption of labour force in different sectors varied widely. In fact the largest sector, agriculture, experienced an absolute decline in its labour force during 1974-1983/4 while it was absorbing labour at 1.3 per cent per annum during 1961-1974. But other sectors, particularly, public utilities, construction and services accounted for a high rate of growth of employment in recent years.

2.6 Employment in non-agricultural sector increased at 9.7 per cent per annum during 1974-1983/4 compared to 4.5 per cent per annum during 1961-1974. Hence, it may be argued that this sector may have employed some of the incremental labour force during the recent years. But when one considers that there has been an absolute decline in labour absorption in agriculture that accounts for about half of GDP, the implications of such diverse rate of labour absorption in different sectors for the rate of unemployment in Bangladesh becomes very complicated.

Table 2.2

Growth Rates of Population and Labour Force

		1961-1974	1974-1983/4
1.	Population	2.5	2.3
2.	Labour Force	2.0	2.7
	(i) Male	2.1	2.3
	(ii) Female	0.8	10.0
3.	Growth of Employment by Industry groups		
	(i) Agriculture, Forestry fishery	1.3	-0.3
	(ii) Non-agriculture	4.5	9.7
	(a) Manufacturing	1.8	7.5
	(b) Electricity, gas & Water	-2.5	29.6
	(c) Construction	-7.5	24.5
	(d) Transport and Communication	4.3	13.2
	(e) Finance and Business	14.7	11.1
	(f) Trade and Services	2.4	14.6
	(g) Community and personal services	8.5	3.8

Source : Preliminary Report on Labour Force Survey 1983/84.

2.7 Unemployment in Bangladesh cannot be measured by using the conventional definition. Agricultural production is seasonal in nature, and as such the demand for labour in agriculture is also seasonal varying considerably over time. During peak agricultural activity such as sowing and harvesting a situation of labour scarcity developes when farmers work for long hours while at other periods considerable unemployment exist.In general rural labour market is characterised by considerable variation in work hours, over time and activities. Furthermore, rural workers both self employed and wage labour - frequently engage in more than one activity a day. Therefore, accounting for employment for any measure of unemployment becomes very difficult. Agriculture being the major economic activity of the country such problems both theoretical and empirical - have produced widely varying measures of rate of unemployment for Bangladesh. Generally it is accepted that the rate of unemployment in Bangladesh lies between 30% to 40%.

Growth in per capita income:

2.8 It is difficult to compare the growth rates in per capita income between the pre and post liberation years of Bangladesh due to lack of an integrated time series data on national income for the periods as pointed out earlier. But a World Bank[1] estimate puts the annual average growth rate of per capita GNP during the period 1960-77 at -0.4 per cent. Estimates available for pre- and post independent years show that both phases had low but positive growth rates. Furthermore, the post - liberation years started from a lower base than 1969/70, the last normal year before independence as a result of destruction and dislocation due to the war of liberation. However these problems can be easily tackled to draw general conclusions about the level and growth of per capita income for different periods in Bangladesh as will be clear from the following section.

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1 See World Bank (1979) p.126

2.9 In the absence of any integrated time series data for national income for the sixties and seventies Osmani and Atiq[1] has used the GDP series prepared by the Planning Commission for the decade of the seventies that also contains an estimate for 1969/70. By using this link year they have prepared an index of real income in Bangladesh as given in table 2.3. It shows that even in 1979/80 Bangladesh has not reached the level of per capita income it enjoyed in 1969/70 in real terms. Furthermore, it was shown that per capita income in 1963/4 was 3.6 percent lower than it was in 1963/4. Therefore, it seems that per capita real income virtually remained the same from mid-sixties to end of seventies. Recent moderate increase in per capita income in real terms since 1979/80 to 1984/5 will not be sufficient to make any impression in the growth of income over the last two decades.

Tables 2.3

Index of Per Capita Real Income in the Seventies

(Base 1969/70 = 100)

Year	72/3	73/4	74/5	75/6	76/7	77/8	78/9	79/80
Index	82	87	86	92	91	95	96	97

Source: Osmani, S.R. and A. Rahman (1981), A Study On Income Distribution in Bangladesh, Bangladesh Institute of Development Studies, Dhaka, pp.8

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1 See Osmani, S.R. and Atiq Rahman (1981) A Study On Income DIstribution in Bangladesh, Bangladesh Institute of Development Studies, Dhaka.

Distribution of Income:

2.10. Several studies on the distribution of income[1] has been carried out in Bangladesh. Some of these studies dealt with both rural and urban income distribution, some dealt with the conditions of the poor. The studies not only differ in focus but also in coverage, data base and methodology as well. A recent study carried out by Osmani and Atiq[2] compares changes in the distribution of income for rural and urban areas as well as for the country as a whole in current and constant prices for the period starting from mid sixties to the late seventies. There has not been any study on distribution of income based on household expenditure surveys (HES) for any later period. Therefore, findings from this study will provide us with some ideas about what has been happening to the distirbution of income over the period from mid sixties to late seventies.

2.11 The study is carried out in terms of household income distribution rather than individual income distribution. Individual income distribution for any given year, for either rural or urban Bangladesh, will be lower than the household distribution, as the size of the household varies positively with the level of income. Table 2.4 presents the Gini coefficient of household income in current prices for the year for which the HES data are available. The table shows that in both rural and urban areas, inequality declined towards the end of the sixties, but went up in the seventies. By 1976/77 inequality in both the areas as well as in the country as a whole was higher than in 1963/64.

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1 See for example, Bergan, A. (1967), "Personal Income Distribution and Personal Saving in Pakistan, 1963/64" Pakistan Development Review, Vol. VII, No. 2. Alamgir, Consumption, Saving and Poverty in Bangladesh", Bangladesh Development Studies, Vol.II, No.4 Islam, R. (1981), "Trends in Rural Income Distribution in Bangladesh" in Mahmud, W. (ed.) Development Issues in An Agrarian Economy - Bangladesh, Centre for Administrative Status, Dhaka, etc.

2 See Osmani, S.R. and Atiqur Rahman (1981), "A Study on Income Distribution in Bangladesh", BIDS, Dhaka.

Similar results were obtained when the analysis was carried out in constant prices. The period between end-sixties and mid seventies was thus not only a period of decline in per capita income, as we have already noted, but also one of increased in equality. We have seen that per capita income has increased since late seventies upto mid-eighties. But there is no estimate of any measure of inequality for the recent years in Bangladesh. But one can reasonably argue that even if there has been any improvement in inequality it will not be significant. And it should be remembered that inequality combined with low per capita income, as is the situation prevailing in Bangladesh, has a sinister implications for absolute poverty.

Table 2.4

Gini Coefficients of Household Income in Bangladesh
(in current prices)

	1963/4	1966/7	1968/9	1973/4	1976/7
Rural	0.34	0.32	0.27	0.36	0.44
Urban	0.46	0.39	0.37	0.38	0.51
National	0.36	0.31	0.29	0.36	0.45

Source: Osmani S.R. and Atiqur Rahman (1981), A Study On Income Distribution in Bangladesh, Bangladesh Institute of Development Studies, Dhaka, Dhaka, p.11.

Nutritional Status:

2.12 Our analysis in terms of real per capita income and distribution of that income shows that between mid-sixties and end seventies there was a decline in per capita income and an increase in inequality in Bangladesh. It is obvious that increase in inequality in the presence of constant average income will accentuate poverty. Focus of attention of less developed countries have been increasingly shifting from reducing inequality to eliminating poverty. Poverty can again be regarded both as a relative or an absolute notion. In the case of poor under developed countries such as Bangladesh, it is argued that poverty should mean a standard of living below which even the minimum physiological requirements of a person cannot be adequately met. In other words, the notion of absolute poverty is to be considered relevant for a poor country such as Bangladesh. Thus nutritional requirement of a person can be used as the poverty line. Information on food intake can then provide a measure of poverty as well as nutritional status of a person.

2.13 Table 2.5 based on dietary intakes found in the Nutrition surveys show a consistently declining food and energy intake over the last two decades. Furthermore, the rate of decline seems to have gathered momentum since the mid-seventies. Hence, it is arguable that poverty has been increasing over the years in Bangladesh.

2.14 Our analysis of Bangladesh economy in terms of aggregate per capita income, its distribution and poverty shows that real income in per capita terms has not improved, inequality increased and poverty accentuated over the two decades covering from mid-sixties to mid-eighties. Thus welfare in Bangladesh has decreased during this period according to all its indicators such as growth, inequality and/or poverty.

Table 2.5

Changes in Food, Energy and Protein Intake, 1962-64 to 1981-81

Year	Food Intake (gm)	Energy (K. calorie)
1962-64	841	2251
1975-76	806	2094
1981-82	765	1943
Rate of growth per annum		
1962-75	-0.4	-0.6
1975-81	-0.9	-1.2

Source: Ahmad Q.K. and Mahabub Hossain (1984), An Evaluation of Selected Policies and Programmes for Alleviation of Rural Poverty in Bangladesh, Bangladesh Institute of Development Studies, Dhaka, pp.8.

2.B Food Consumption and PFDS in Bangladesh a Historical Perspective[1]

2.15 It is common knowledge that public rationing in Bangladesh dates back to 1943. In that year, the Government of undivided India introduced urban rationing in East Bengal. This was a belated response of the government to the historic famine of Bengal. Modified Rationing (MR) featuring a rural card system was first introduced in 1949, on the strength of East Bengal Modified Rationing order. Only rice, edible oil and sugar were considerable.

2.16 Public rationing was retained in East Pakistan, except for a brief interlude during August 1955 through January 1956, when rationing system was abolished. The 1955-56 aman harvest was one of the worst in the entire period of the 1950's and 1960's. Rationing was re-introduced on January 31, 1956 and has existed since. MR was being used, as before, as an instrument for diverting surplus stocks into non-SR areas. The MR thus represented at this time an extension of the scope of public subsidies among others, to the inhabitants of rural areas. (The regime of MR will be described in greater detail below). The extension of the coverage of public rationing in 1956 came in another way, too, in that residents of 19 areas other than what were the three SR areas (viz. Dhaka, Narayanganj and Chittagong) were guaranteed a weekly ration. (This was discontinued in 1959). Certain priority consumers (member of armed forces, the police, East Pakistan Rifles), which were recipients of subsidised ration right since 1947, were not affected in any way by these development of 1956.

2.17 MR traditionally subsumed three channels of supply of foodgrains, until the dismemberment of Pakistan. First, there was the foodgrain allocated to government employees staying outside SR areas and primary teachers (since 1957, extended in 1968), to large employers of labour, employing more than 200 people (since 1958), and to students residing in hostels and halls of recognised educational institutions.

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1. It was beyond our terms of reference to identify, let alone analyse, the cause of every historical change in the PFDS during the long period we have chosen. This is naturally so, in that understanding causes of changes in PFDS in the Pakistan era must be adjudged to have little practical value in an independent Bangladesh with changed circumstances. We have, however, analysed relevant causes of changes that occurred in the 1970's

Second was rationing out of MR allocation favouring households inhabiting pourashavas according to pourashava Distribution Priority List (DPL). Third was the distribution in rural areas by Union Councils or Parishads. (The eligibility conditions of this rural part of MR will be dealt with in greater detail later in the report). Note that until the early 1970's, all of these categories used to be treated as of MR's preserve[1].

2.18 The changed socio-political and economic circumstances of the period following the independence of Bangladesh made for far-reaching alteration of the structure of the PFDS. The Government of the day was committed to socialism which dictated greater political sensitivity to the aspirations of those identified with the public sector. With the nationalisation of most of large-scale industries, banks, insurance companies, this amounted to a very sizeable constituency. Besides, students and teachers had played an important role in the war of liberation, and their aspirations were also worthy of fulfilment. The immediate post-liberation years witnessed substantial deficit financing which, coupled with speculative outlook of the surplus units in the food economy, resulted in rampant inflation of foodgrain prices in 1973 and, more alarmingly, in 1974. Saving already low real incomes from further ravages of increases of food prices was, therefore, a matter of top priority for all social categories consitituting the preserve of MR.Allocation of foodgrains in MR was not guaranteed, was not a weekly routine, but predicated on availability. The most distinctive change of the PFDS during the 1970's has, therefore, been that categories that hithertofore were part of MR moved themselves out of it and into Other Priority (OP) consumers. Appendix-1 to this chapter presents a list of categories of recipients that at present belong to OP. All of these social categories were a part of MR as of the period immediately after liberation.

2.19 At present moment, PFDS has twelve channels of distribution of foodgrains. They are as follows : (1) SR - covering allotees in six urban centres, viz. Dhaka, Narayanganj, Chittagong, Khulna, Rangamati and Rajshahi; (2) Essential Priorities (EP) --- covering the Armed Forces, Police, Bangladesh Rifles, employees of Ordnance factories, Jail Staff and Ansars;

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1 Besides SR,MR, and essential priorities, this was the fourth channel in these early decades, viz. relief operations in case of natural disasters.

(3) OP --- government servants out-side SR areas, employees of all parastatal bodies, etc. (4) Large Employers (LE) - covering employees in enterprises with more than 50 workers; (5) MR --- covering urban or rural households which pay little or no taxes because of their poor economic status; (6) Flour Mills (FM) --- covering approved mills who are allotted wheat at subsidised issue rate; (7) Food For Works Programme (FFWP); (8) Open Market Sales; (9) Canal Digging; (10) Vulnerable Group Feeding Programme; (11) Market Operations; (12) Gratuitous Relief.

2.20 Tables A2.1. and A2.2. present the trends of food availabi lity and the role of public rationing in the context of per capita food availability in the 1960s, 1970's and 1980's. An interesting feature of the tables is that they permit a historical perspective on government food intervention in influencing foodgrain availability, in the total and by types of foodgrains. The highlight of the table appears to be that per capita availability in the aggregate has pretty much stagnated during the twenty five years. Average per capita availability during both the 1960's and the second period is found to be exactly 0.97 lb. The co-efficients of variation during both these two periods have been about the same, 3.7% in the 1960's, and 3.9% in the second. While per capita availability from all sources considered has stagnated, it is well-known that per capita availability of foodgrain in Bangladesh for domestic production has declined over this period (Hossain, 1984), despite a considerable acceleration in per capita real agricultural investment.

2.21 The second important change to note is about the proportions of rice and wheat in foodgrain availability. It is obviously clear that wheat has made some in roads into the foodgrain-mix of Bangladeshies -- its proportion in total availability rising from a mere 2.4% in 1960/1-1962/3 to 8% in 1972/3-1974/5 and then to about 19% in 1982/3-1984/5. The 1 economy remains, however, basically given to rice consumption.

2.22 Table 2.6 presents the changing role of public foodgrain distribution in influencing foodgrain availability. PFDS has expanded relative to total availability between the 1960's, and the post-liberation period. Ration offtake as a proportion of availability is found to be 3.57% and 4.98% for rice and wheat, respectively, for the decade ending with 1969/70. The corresponding proportions for the 13 years ending with 1984/5 are found to be higher, especially for wheat: 3.73% and 9.8%. There is no doubt that public

Table 2.6

Offtake - Availability Ratio of Rice and Wheat, 1960/1 Through 1984/5.

Year	Ratio of offtake to availability			Year	Ratio of offtake to availability		
	Rice	Wheat	Total		Rice	Wheat	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1960/1	3.4	1.9	5.3	1972/3	3.6	18.9	22.5
1961/2	3.8	2.4	6.2	1973/4	1.0	13.0	14.0
1962/3	6.6	7.1	13.7	1974/5	1.5	13.5	15.0
1963/4	2.3	4.1	6.4	1975/6	4.0	9.1	13.1
1964/5	2.3	4.7	7.0	1976/7	6.7	5.7	12.4
1965/6	4.1	5.3	9.4	1977/8	4.6	9.5	13.9
1966/7	5.2	5.9	11.1	1978/9	4.2	9.3	14.1
1967/8	2.2	3.9	6.1	1979/80	4.9	12.2	17.1
1968/9	2.3	6.9	9.2	1980/1	3.7	7.2	10.9
1969/70	3.5	7.6	11.1	1981/2	4.8	8.5	13.3
				1982/3	3.9	9.2	13.1
				1983/4	3.2	9.8	13.0
				1984/5	2.4	13.1	15.5
1960/1-1969/70	3.57	4.98	8.55	1972/3-1984/5[a]	3.37	9.8	13.5
(CV)	(38)	(37)	(31)	(CV)	(40)	(24)	(11)

Note:a) In calculating these numbers, 1972/3 is excluded, because a casual glance at the table would appear to show this as an abnormal year, especially in matter of wheat offtake ratio. If 1972/3 is included, the offtake-availability ratio rises to 14.4%, and the CV to 19%.

Source: Tables A2.1 and A2.2

intervention in influencing food availability has risen quite considerably in the post-liberation period. The system of public food distribution has indeed expanded relative to overall supply in this period. A second difference between the two periods lies in the stability and continuity of the public distributional effort in this second period. While the CV of the offtake-availability ratio for the 1960's is 31%, the matched CV for the post-liberation period is considerably lower. This period is longer than the first, and has experienced greater variability in both foodgrain production and foodgrain availability. A higher degree of stability in the 1970s to date in the extent of government intervention on the consumption side of the food system of Bangladesh in the face of greater production instability is indicative of the central role now accorded to the food system management, in the changed politico-economic contexts confronting the governments in power, especially after the famine of 1974, in this period.

2.23 We next look at the foodgrain mix of annual offtake, presented in Table 2.7. There is no evidence in this table to support an assertion, made by Clay (1979), that the proportion of rice in the public distribution had dramatically risen in the 1970's as compared with the 1960's. Ignoring the abnormal years of the early 1970's, say, upto 1974/5, the proportion of rice in the public distribution has basically been on a declining trend, while the converse is true for wheat[1]. If anything, the average proportion of rice in public distribution in the ten years ending in 1984/5 is lower than during the decade ending in 1969/70. This happens inspite of the fact that there is a measure of domestic procurement of rice in the post-liberation period not present in the 1960s. One of the reasons for this is that the primary raitonale of domestic procurement is farm price support, not necessarily augmenting the importance of rice in the commodity-mix in public distribution.

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1. For the 1960s we have relied upon a part of the World Bank sponsored Bangladesh Land, Power and Water Study, 1972, contributed by Lodewijk Berlage. Berlage presented annual estimates, by rice and wheat, of offtake from government stock for 1950/1 through 1969/70. Clay (1979, Table 4) presents quinquennial averages of rice and wheat offtake for East Pakistan for the two decades ending with 1969/70, attributing his source to unpublished Misnistry of Food data. Both have used basically the same source. An elementary error has, however, crucially affected Clay's interpretation of the averages. The quinquennial averages shown against rice in Table 4 of his paper quoted above are simply wrong: they should be in terms of 10,000 tons, not 1000 tons as shown. Correction for this would demolish the evidence he goes on to make such of non p.17.

Partly because there have been only a handful of years of really good crop, and partly because of the relative lack of decentralised capacity and budgetary allocation required for purchase, the volume of rice procurement has not been very substantial. It is important to note, though, that the decline in the proportion of rice in the overall offtake in the 1970's and beyond has not been evenly shared by the various components of the rationing system. An idea of distribution of the decline in the share of rice is suggested when we look at foodgrain mix of offtake of SR, MR and all other types of enduses. The next two tables are concerned with this.

Table 2.7

Foodgrain-mix of Aggregate Offtake, 1960/1-1984/5

(Three year moving averages)

Year	% in total offtake		Year	% in total offtake	
	Rice	Wheat		Rice	Wheat
(1)	(2)	(3)	(4)	(5)	(6)
1960/1	66.4	33.4	1972/3	-	-
1961/2	54.8	45.2	1973/4	12.5	87.5
1962/3	48.0	52.0	1974/5	16.8	83.9
1963/4	40.9	58.9	1975/6	32.0	68.0
1964/5	38.2	61.9	1976/7	39.2	60.7
1965/6	42.1	58.0	1977/8	38.9	61.2
1966/7	42.9	57.1	1978/9	31.3	68.8
1967/8	36.0	64.0	1979/80	31.1	68.9
1968/9	30.2	69.7	1980/1	32.5	67.5
1969/70	-	-	1981/2	32.8	67.2
			1983/4	22.6	77.4
			1984/5		

Notes: Moving average is adopted in order to take care of random year-to-year variations in offtake.

2.24 Tables 2.8 and 2.9 show the comparative offtakes in the aggregate, in SR, MR and all other channels taken 'en-bloc' during the last twenty five or so years. They show, in addition, the changing role rice and wheat have each played in each of the three major categories of offtakes[1]. Several findings emerge from the table. First, as already discussed in terms of offtake - availability ratio, the system has expanded in the post-liberation period relative to the decade ending in 1969/70. It is important to note, however, that the expansion of the 1970s represents more properly a quantum jump from an absolutely lower to an absolutely higher level, at which the offtake has subsequently been reasonably stabilised (Graph-1). The expansion in the 1970's is not for example a result of a higher growth rate in that period versus the 1960's. Quite the contrary is the case:annual compound growth of moving averages of offtake of 1973/4 and 1983/4 is found to be 0.75% as against the corresponding rate, 8.1%, for 1960/1 through 1968/9. This pair of growth rates suggests, in addition, that the system has continued to expand, inspite of the quantitative jump in the early 1970s.

2.25 A second important finding is that, in overall terms, while the proportion of both SR and MR declined in the 1970s and 1980s versus the 1960s, the rate of decline is very much faster for MR in the 1970s than for SR. This is shown vividly by graph-2. The expansion of the PFDS of the 1970s is not due to SR and, even more emphatically, not due to MR. The system expanded in part because of the expansion of the rationing effort for the civilian, military and security establishment, and in part because two new mechanisms for augmenting targeted food supplies have been introduced.

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1. Knowledgeable readers may at first be intrigued by this particular categorisation, in that the category involving other than SR and MR is more inclusive in the 1970's than in the 1960's. Neither FFWP nor VGFP existed in the 1960's, but they existed in the 1970's and beyond. Nontheless, we have made use of this for the following reason. This was found to be the highest feasible degree of disaggregation of comparative offtake levels in the 1960s and 1970's by mode of rationing and by type of foodgrain. Greater disaggregation is feasible for the 1970's and beyond, but not for the earlier decade. In any case, the tables shed important historical light on comparative significance of SR, MR offtakes versus the other types of offtake.

2.26 When we look at the comparative proportions of these three categories in rice and wheat offtake separately some interesting contrasts emerge. First, just slightly over one third of the rice offtake in the 1960s went into SR, with MR taking up about one-half or so. As for wheat, about two thirds of it went into MR, the rest being distributed among all other channels, and SR, in that order of importance. Wheat consumption, then new in Bangladesh, was by and large a phenomenon associated with rural population, and poorer people living in pourashavas. The situation changes quite dramatically, in the 1970's and beyond. The share of SR in the total rice offtake is higher during practically the whole of the 1970's than in the 1960's. However, beginning with 1979/80, SR's share in rice offtake began to fall rapidly. The drastic decline of the share of MR in the overall offtake in 1970's is shared by its share in rice and wheat offtake separately, especially the latter[1]. It is paradoxical but true that, during the 1980's while the share of SR in rice offtake was falling, the share of MR was rising.

2.27 The most dramatic contrasts between the 1960's and 1970 is perhaps provided by the other categories. Their share in both total rice and wheat offtake in the 1970s is far higher after the fall of the first government of post-liberat on Bangladesh, than has been the case, historically. Noting that FFWP was started first in 1975/6 (and VGFP and OMS somewhat later) and noting that these two channels almost overwhelmingly mediate wheat supplies, the thought suggests itself that the dramatic increase in the proportion of rice offtake by all channels other than SR and MR is the result of the expansion of civil, military and security establishment. It becomes necessary to examine the changes in the offtake of the individual categories within this broad category, but this is in fact postponed to Ch.7.

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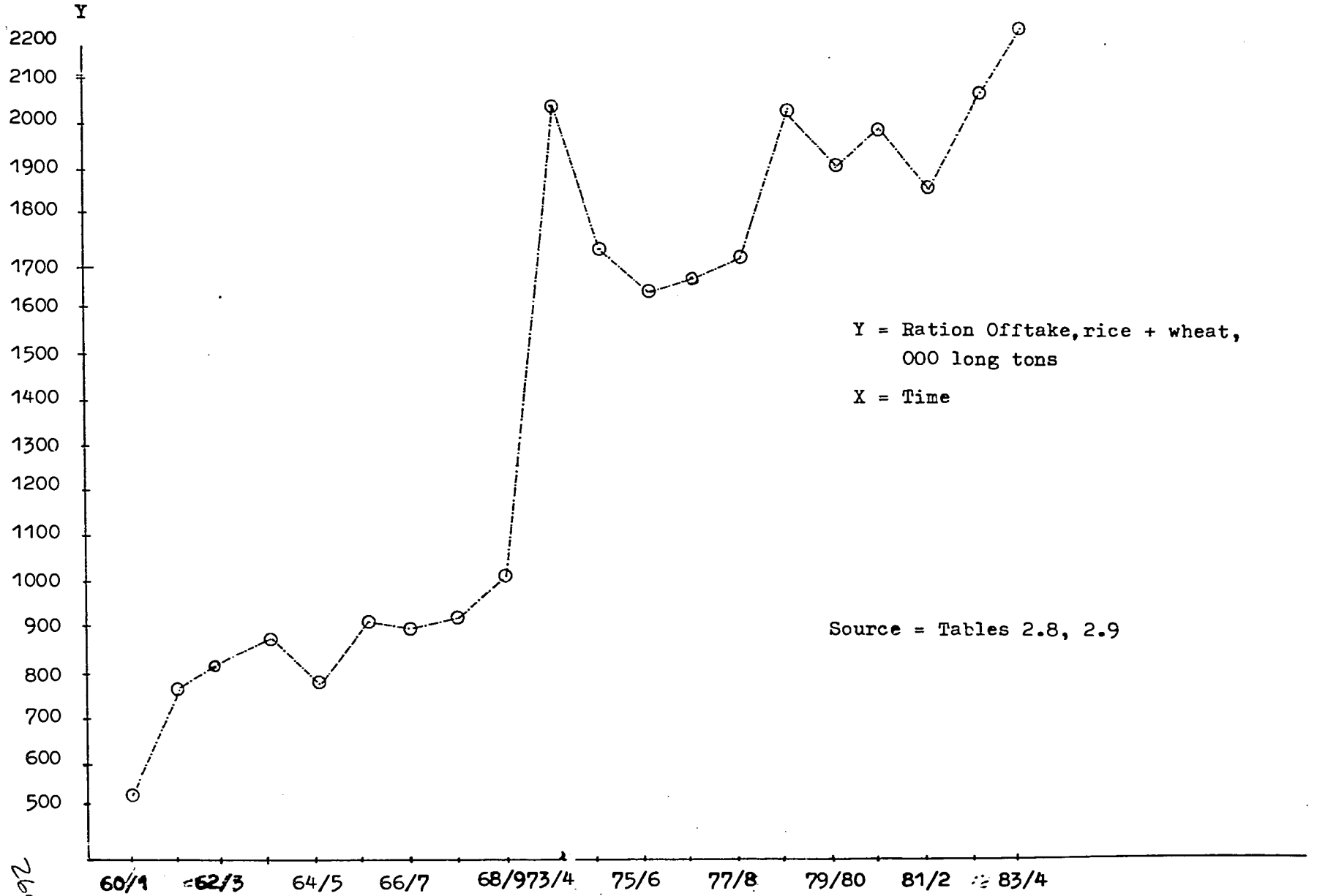
1. It is known that many categories within the population in the non-SR areas were re-located within the category of other priorities during the 1970s. These categories were formerly a part of MR. This explains a part of the drastic decline in the share of MR, as well as of the sudden increase in the share of categories other than SR and MR.

Graph 2.1: Quantity of Offtake in Bangladesh PFDS, 1960/1 - 1983/4



26a

Graph 2.2: Relative Shares of Offtake in SR and MR, 1960/1 - 1983/4

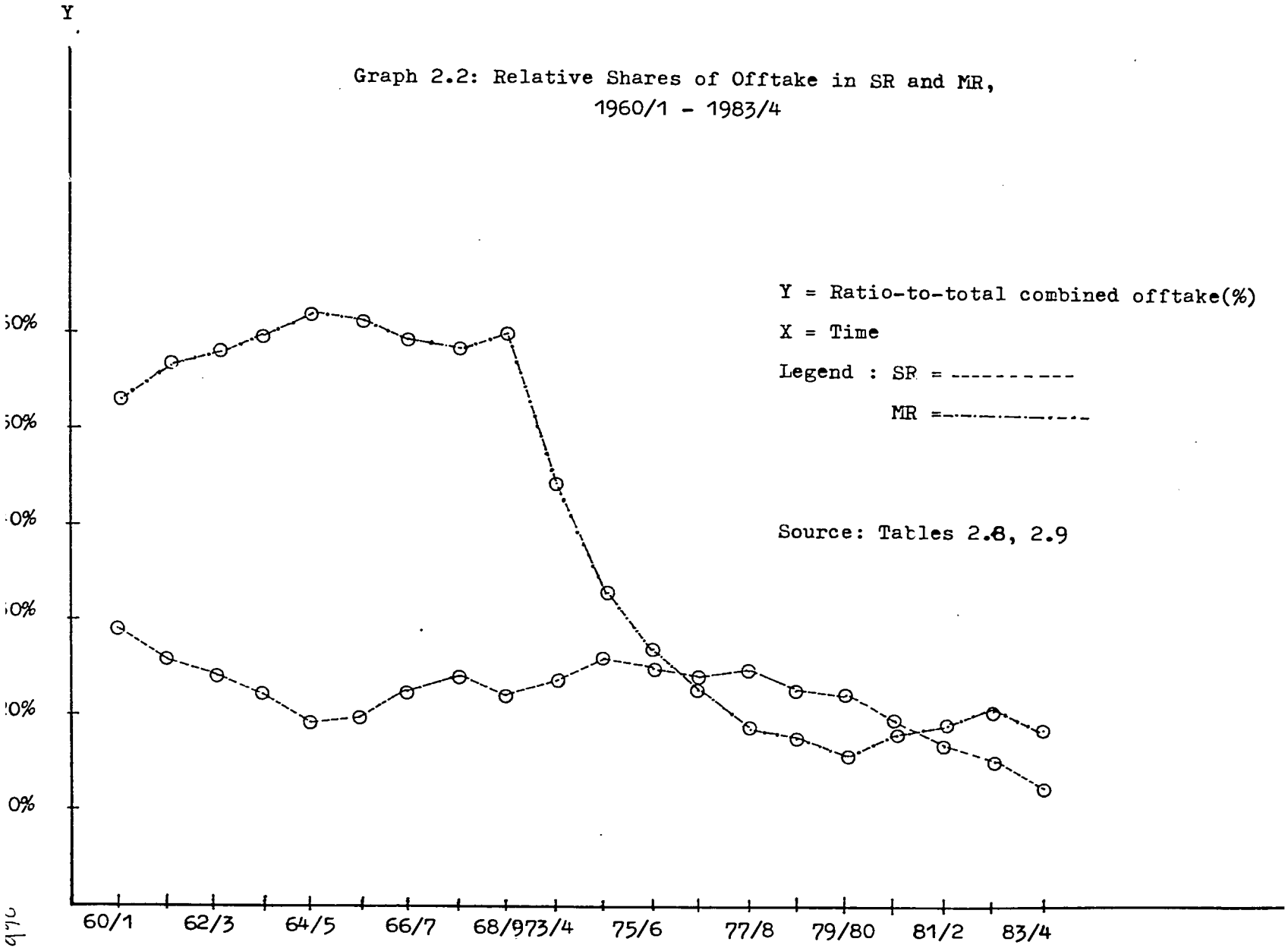


Table 2.8

Structure of offtake Quantities by three Broad Channels, 1960/1-1968/9

(Quantities are 000 long tons)

Year	Rice				Wheat				All foodgrain			
	Offtake	% in annual offtake due to			Offtake	% in annual offtake due to			Offtake	% in annual offtake due to		
		SR	MR	Others		SR	MR	Others		SR	MR	Others
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1960/1	356	36.5	46.1	17.1	179	14.0	67.0	19.0	536	28.9	53.0	17.9
1961/2	420	35.5	46.4	18.1	346	13.6	67.6	18.8	766	25.6	56.3	18.4
1962/3	396	34.8	46.7	18.4	429	13.5	67.8	18.6	825	23.9	57.8	18.6
1963/4	357	35.9	45.9	18.2	514	12.5	68.9	18.9	872	21.9	59.6	18.6
1964/5	297	31.6	48.8	19.5	480	11.3	69.6	19.0	777	19.0	61.8	19.2
1965/6	384	30.2	50.0	20.1	529	12.1	69.0	18.9	913	19.72	61.0	19.3
1966/7	383	31.3	57.7	19.6	509	15.1	66.6	18.3	892	22.2	59.1	18.8
1967/8	329	38.0	54.4	17.6	585	15.9	66.0	18.1	914	23.8	58.2	17.9
1968/9	302	39.7	54.3	17.2	698	14.5	67.0	18.3	1000	22.1	59.9	18.0

Note: All figures are 3-yearly moving averages.

Source: Annual offtake data are from Berlage (1972). The decomposition of total rice and wheat offtke into SR, MR, and others is provided by Berlage for five years, viz. 1964/5 through 1968/9. The structure prevailing on average during these five years have been extrapolated in relation to total offtake for the other years.

Table 2.9

Structure of Offtake by Three Broad Channels, 1973/4-1983/4

(Quantities are 000 long tons)

Year	Rice				Wheat				Total			
	Offtake	% in annual offtake due to			Offtake	% in annual offtake due to			Offtake	% in annual offtake due to		
		SR	MR	Others		SR	MR	Otbers		SR	MR	Others
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1973/4	242.0	59.3	24.7	16.0	1792.7	18.5	46.5	34.9	2034.3	23.4	44.0	32.6
1974/5	217.0	54.1	29.9	16.0	1447.7	20.1	33.5	46.4	1718.7	25.5	32.9	41.6
1975/6	491.7	40.3	30.9	28.7	1137.0	17.6	24.9	57.2	1628.7	24.5	26.7	48.8
1976/7	630.0	39.8	28.2	32.0	1027.3	13.7	19.1	67.8	1657.7	23.6	22.6	53.8
1977/8	647.7	40.5	22.2	37.3	1051.3	14.4	16.0	69.6	1699.3	24.4	18.3	57.3
1978/9	616.3	41.7	21.0	37.3	1397.3	14.0	15.7	70.3	2014.0	22.5	17.3	60.8
1979/80	586.7	36.1	20.9	43.0	1311.3	15.6	12.8	71.6	1898.0	22.0	15.3	62.7
1980/81	652.2	25.4	27.1	45.9	1286.9	16.7	13.4	68.3	1978.2	19.2	17.6	61.6
1981/2	620.6	18.1	30.0	50.8	1228.4	16.7	12.5	69.7	1849.2	16.1	18.5	64.3
1982/3	617.5	14.8	34.0	49.7	1407.4	14.8	14.4	69.3	2025.6	14.7	20.4	63.4
1983/4	498.6	15.5	32.7	50.9	1708.7	12.2	14.1	72.8	2207.4	12.0	18.3	68.8

Note: All figures are three yearly moving averages.

Source: Records from Food Directorate, Government of Bangladesh.

2C Major Developments in the History of PFDS in Bangladesh

2.28 The following gives an account of some of the major developments as we see it, of the history, to-date, of PFDS in Bangladesh. The adjective major is used here in a descriptive, not prescriptive sense. In other words, some of these major developments can be seen as being partly undesirable. They are nevertheless to be treated as major, because they affected the scope and/or consequences of the PFDS on one or the other of what may be considered three of its major economic dimensions, viz. effect on prices, on distribution, and total quantum of food subsidies. The changes we have in mind correspond to each least three orders of relevance : (i) those that increase, in net terms, the scope of priority distribution of subsidised foodgrain on a basis sustained by guaranteed access to the system; (ii) those seek to bring the rationing segment of foodgrains market closer to the open market; (iii) those that seek to increase the importance of the principle of need-based targeting where the target-groups are self-selected. It is possible to assign the major developments affecting the PFDS in the 1970's and 1980's into one of these categories. The following schemes suggests the nature of causation between conceivable major changes in PFDS with respect to the three of its salient objectives.

2.29 Table 2 list nine major types of changes that can happen as indeed have happened, within the prevailing range of PFDS-related policies. Each row details out the likely effect of a given policy change on one or more objective of food policy. Some of the specific instances of change are somewhat ambiguous: hence they are suffixed by a question mark. We believe the other suggested causation are correctly specified. Unfortunately, there is not sufficient space here to pursue individually the lines of and logic behind each suggested causation. Let us now take up the major policy changes that have actually occurred in the order that they are treated in Table 2.

2.30 Scope of guaranteed access: First, Rajshahi and Rangamati were brought into the purview of SR in April 1975 and October 1976, respectively. This extended the scope of guaranteed access of residential basis. Second, throughout the 1970's, a large number of categories of people were classified out of the province of MR and into OP. Table A2.3 gives a list of the categories of individuals, mostly on the basis of their employment status, resident in non-SR areas, who were previously treated as within the jurisdiction of MR, but who, at various points of time between 1974 and 1978, were accorded the status of OP. The relocation of these categories into priority distribution categories increased the net scope of public rationing.

2.31 Scope of access on availability basis: The one occasion when a policy change of the type noted at 2 and Table 2 has taken place was in May 1983. The change was that, thence-forward, 100% of the district-level monthly allocation of wheat for MR would have to be sold to approved atta-chakkis at the same price that MR dealers would normally be allowed to lift MR wheat allotment. This amounted to a decrease in the scope of the MR. (Great uncertainty prevails as to the likely effect of this change. Some information arising out of our survey will be presented later, which will be of use). In September 1983, however, the proportion to be earmarked for the atta-chakkis was lowered to 50%. Figures relating to 31 new districts suggest that the actual percentage of wheat mediated through the atta-chakkis during 1983/4 was 24.6% while for 1984/5, the percentage was slightly higher, at 29.1%.

2.32 Per capita quota, priority or other access: The relevant data about the changes in per capita quota per week for three major categories -- two priority, one non-priority -- are shown in Table A7.1 in Ch.7. It is clear from that table that unit quota remained virtually unaffected until about 1980/1. This appears to be true for all the three channels shown in Table A7.1. The year 1981/2 seems to mark a water-shed, in that the quota is brought down by one-fourth or so-where it has stabilised as at the end of the period.

2.33 Relative price, priority or other access: The relevant data about the changes in the price -- both absolute and relative -- of rationed foodgrains are presented in Table A7.3 (col.7 shows relative price of rice, and col.13 relative price of wheat). Changes in relative prices are, however, triggered in part by changes in absolute retail ration issue prices, and in part by changes in open market price. The absolute ration retail issue price is a policy variable.

However, the government cannot always be sure of influencing the ration price relative to market price in a desired direction, because market prices may change for quite autonomous reasons. For this reason, we should look at absolute as well as relative ration prices. Absolute prices are presented in cols.5 and 11 of Table A7.3. Absolute retail ration prices for both rice and wheat have risen at fairly steady rates throughout this period. Hence, from this particular viewpoint, no single part of this period really stands out. Even so, one of the major developments on the prices has been that the ration-to-market-price ratio of both rice and wheat have also been on an upward, if fluctuating, trend.

2.34 Open market sales was introduced into the PFDS of Bangladesh in 1979 as far as public wheat marketing is concerned. OMS in rice was first tried in 1981. (OMS is covered in greater detail in ch. 4).

2.35 Food-for-Works Programme (FFWP) was introduced in 1975/6, and VGFP in 1976/7. Both of these will be described in greater detail in ch. 10.

Table 2.10

PFDS-related Policy Changes and Nature of Causation Relating to Objectives

Sl. No.	PFDS-related Policy	Nature of Change	Category as above	PFDS Objectives: Price Stabilisation	Income Distribution	Food subsidies	Poverty alleviation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	Scope of priority access on employment-status pre-determined basis	Increase	(i)	-	worsen(?)	Increase	-
2.	Scope of guaranteed access, on basis of availability, and economic stress	Decrease	(i)	-	?	-	?
3.	Per capita quota, priority access	Decrease	(i)	-	-	Decrease	-
4.	Per capita quota, access on basis of availability, economic stress	Decrease	(i)	worsen	worsen	Decrease	worsen
5.	Relative price in rationing, priority access	Increase	(ii)	-	-	Decrease	-
6.	Relative price, access on basis of availability, ec. stress.	Increase	(ii)	-	worsen	Decrease	worsen
7.	Open market sales (OMS)	Increase	(ii)	improve	improve	Decrease	improve
8.	Food-for-work programme (FFWP)	Increase	(iii)	-	improve	Increase(?)	improve
9.	Vulnerable Group Feeding Programme (VGFD)	Increase	(iii)	-	improve	Increase(?)	improve

Note: Scope refers to coverage priority access in Bangladesh has mainly been in terms of residence, as also employment and social status. SR, EP, OP and LR are the channels which meet this criterion. Guarnateed access on basis of availability and economic stress refers to MR : it is guaranteed only in a nominal sense, however. (-means unchanged.)

2D. A Review of Food Policy Issue

Food Promotion

2.36 It has already been pointed out that agriculture predominates Bangladesh economy. Foodgrain production is again the major activity within agriculture. Different varieties of rice and wheat and other non-cereals account for more than ninety percent of the share of total crop production. They also account for more than ninety percent of the total cropped land. Yet Bangladesh has to depend on foodgrains import to feed its population.

2.37 An estimate shows that between 1949/50 and 1983/84, production of cereals (practically all rice) grew at an annual rate of 2.2% compared to the all-crop record of 2.23% (Hossain, 1984b). As Table 2.15 shows, the growth rates were spectacular for certain food crops for certain years.

2.38 Between early fifties to early eighties, rice production grew at the rate of 2.32% while wheat and potato showed a very fast growth rate of over 13% and 6% per annum. Important productions of foodcrops like pulses, oil seeds and chillies, however, either fell or stagnated. As population grew over the period at about 2.6% per annum the result had been a decline in their per capita availability.

2.39 Except for oilseeds, practically all the growth took place since the since the sixties. Before that one observes at best a stagnation. The sixties saw the most vibrant growth.The rate of growth of rice production shot up to nearly 10 times its earlier level. All other crops including even pulses showed a healthy growth. During the seventies, the pace of growth slackened for all crops except wheat which more than doubled the rate for the sixties. Pulses backslided again, so did chillies.

2.40 So far we have talked about rice in general. There are, however, three rice crops distinguished by growing season. These are aus grown during March-May to July-August, Broadcast aman paddy sown in March-April and harvested in November-December, transplanted aman whose growing period stretches from July-September to November-January and boro (local) which is grown during November-December to April-May. The high-yielding boro paddy is, however, sown/transplanted in January-February and harvested in May-June.

Table 2.15

Trend Rates of Growth in Production of Selected Crops, 1949/50-1983/84

Crop	1949/50 to 1983/84	1949/49 to 1957/58	1957/58 to 1970/71	1970/71 to 1983/84
1. Rice	2.32	0.34	3.21	2.26
(i) Aus	2.36	4.23	3.58	0.87
(ii) Aman	1.26	-0.89	1.48	2.08
(iii) Boro	8.83	-1.09	13.90	4.34
2. Wheat	13.42	0.38	11.50	25.70
3. Pulses	-0.51	-2.62	2.64	-0.56
4. Oilseeds	1.82	3.97	5.04	1.12
5. Potato	8.17	-	11.86	3.53
6. Chillies	0.66	0.75	3.45	-0.96
7. Sugarcane	2.71	1.83	7.00	0.41
8. Tobacco	0.50	-2.49	1.45	2.02
9. Jute	-0.36	-2.22	1.45	-0.70

Source: (Hossain, 1984[b]).

2.41 Generally speaking the level of land in an area determines the cropping pattern. Thus aus is grown on medium high to high land, broadcast aman on low land, transplanted aman on medium high land and boro on low land. The level specificity is determined by either to take advantage of moisture (as in case of boro) or to void deep flooding (as in case of aus). However, the existence of water management through dams and irrigation may substantially alter the choices of crops bringing into play the complex factors of risk, profit, subsistence considerations and the like. Generally speaking, boro, t. aman and broadcast aman and aus consume fertilizer in that order. Furthermore, boro requires irrigation often with the help of modern equipments. The changing pattern of importance of individual rice crops thus have important bearins on the modern input requirements such as chemical fertilizer and irrigated water.

2.42 Coming back to Table 2.15, we find that the production of aman has grown at the slowest pace while that of boro has increased pretty fast. Aus occupies a middle position. The average general picture is quite misleading as the growth rates during the sub periods show that aus growth rate in fact has slided down to less than 1% while that of aman has increased steadily starting from a negative rate during the fitties. Boro production increased very fast during the sixties particularly its latter part but has increased at a much slower pace during the more recent decade.

2.43 Agricultural production can grow as a combination of three factors, viz; expansion of acreage, increase in yield and substitution of low value crop by a high value one. It has been estimated that acreage expansion contributed most to crop output growth during the sixties while rising yield was the prime factor during the next dacade (Table 2.16). The rising yield was possible mainly due to the introduction of the "seed-fertilizer-water technology" in rice production. As rice area and production contributes most to total production and area, the general picture must also be reflected clearly in rice production i.e., while increase in area predominated as the major factor behind output growth during the sixties, that in yield became the most dominant factor later on. More recently, however, the situation has changed further as may be seen from Table 2.17. During the latter half of the seventies' crop mix has contributed most to increase in output. What has happened is that land under local varieties of rice have been put under HYVs resulting in an overall increase in yield.

2.44 The pace with which HYVs spread may be seen from Table 2.18. It is clear from the table that the expansion to HYVs have been quite fast for the last five years. It grew by nearly 11% per annum between the second half of seventies and first half of the eighties. During the earlier such interval, it grew at a rate just about half of that (5.6%). As a result HYV area undr rice stands at just about a quarter of total rice area. The expansion in area came about in boro and aman. In case of aman there has been a switch from local to HYVs while in case of boro, much of the shift has been from either fallow land or land under other crops. Both are possible due to increase in the area under irrigation.

.45 The other important food crops for which production has risen pretty fast during the seventies has been wheat and potato. In both cases, particularly wheat, HYVs are dominant as may clearly be seen from Table - 2.19.

.46 Therefore, it is clear that in the absence of any possibility of extending cultivable area, further increase in food production to meet domestic requirements in Bangladesh will depend primarily on expanding 'seed-water-fertilizer technology' to its full potential.

Food Policy:

.47 Self sufficiency in food production is a major objective of the government of Bangladesh. In general output price support and withdrawal of subsidy on inputs have recenly been adopted as the policy instruments to realize the objective of attaining self sufficiency in foodgrain production[1]. The policy regime may in fact be defined by the following features: i) withdrawal of input subsidies, ii) initiating a compensating price support programmes, iii) a relatively free market for determining both input price and the consumer price of foodgrains, iv) distribution of fertilizer through the private sector and v) private ownership of minor irrigation equipment, with large scale irrigation systems being financed and executed by the public sector.

1
See for details (Osmani and Quasem, 1985)

2.48 Chemical fertilizer was introduced in the country in late fifties. Its procurement and distribution was completely controlled by the government and it was highly subsidised to induce farmers to use it for raising productivity. But since independence a policy of withdrawing subsidy on chemical fertilizers has been pursued. It is estimated[1] that successive reductions of subsidy have brought about a 15-fold increase in the price of fertilizer during period between 1971/2 and 1983/4. During the sme period the grower's price of paddy has risen at a much slower pace, so that the fertilizer/paddy price ratio has gone up from 0.74 to 2.03. It is further shown that the domestic price of fertilizer has risen much faster than its world price, the ratio of domestic to world price went up from 0.32 in 1973/4 to 0.78 in 1983/4. Thus it is clear that subsidy was being reduced during this period.

2.49 Similarly, for irrigation equipment also reduction of subsidy and encouragement of private ownership have been the government policy in recent years. Both the rental charges and the sales price have been increased, rental charges increased at a much faster rate than the sales price in order to encourage private ownership of irrigation equipment.

2.50 It has been estimated that the rate of subsidy for DTW (diesel operated) in the rental programme came down from 97 per cent in 1980/1 to 93 per cent in 1982/3. For LLP the decline has been more dramatic coming down from 83 percent to about 58 percent within the three years.

Food Prices:

2.51 It is now clear that the prices of inputs, i.e., fertilizer and water, primarily responsible for the recent growth in foodgrain productivity of the country has been rising steeply as a result of dramatic reduction in the rate of subsidy on them. Obviously this escalation in the cost of production will have implications for output and prices of foodgrains.

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1 See (Osmani and Quasem, 1985)

2.52 It is estimated[1] that one unit of nutrient of chemical fertilizer produces about 2.87 units of rice under actual farm conditions. Further, a crude but estimate using parameters of production function for various rice crops estimated by IFDC for the period 1979-82 based on a country wide farm survey data show that the contribution of HYV amounted to 6.85 maunds per acre of land, and that for irrigation at 5.85 maunds per acre[2]. The modern inputs accounted for only 25 per cent of the crop output during the sixties, but may have contributed to about two-thirds of the growth during the post-independent period - about one-fourth due to fertilizer and two-fifths due to HYV and irrigation.

2.53 It has further been estimated that only about one-third of the potential cultivated land that can be irrigated with ground water resources during the driest months are being exploited[3]. The main constraint to reaching the full potential is the availability and use of irrigation facilities[4]. The other input for the growth of production of foodgrain, i.e. fertilizer consumption in future would primarily be determined by the expansion of area under irrigation and HYVs. Ultimately the use of all the inputs will obviously be determined by the profitability of the use of input.

2.54 The cost of cereal[5] cultivation increased by absent 90 percent over the period 1977/8 to 1982/3, while the grower's price of rice increased by about 57 percent. The profit in the cultivation of high -yielding varieties which are water and fertilizer intensive, declined but the level of profit in 1982/3 still remained much higher than that in the cultivation of local varieties.

2.55 It is argued that since the current rice price in the country is close to world price, any further increase will be harmful both from equity and efficiency points of views. Farmers should be provided incentive through input price subsidy to grow more food. Withdrawal of input subsidy is going to further increase the cost of production and restrict output by hampering growth of food production through 'seed-fertilizer-water technology' and thereby further increase the price of food.

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1 See (Hossain, 1985).
2 See (Hossain, 1984)
3 See (Bottral, 1983)
4 (Hossain, 1984)
5 (Hossain, 1984)

Table 2.16

Relative Contribution of Factors Behind Growth of Crop Output

Factor	Percentage change in output		Share of factor in percentage change (%)	
	1960-70	1970-83	1960-70	1970-83
Acerage expansion	19.5	3.5	57.4	14.3
Yield increase	10.7	16.9	31.6	69.2
Crop-mix	-1.5	3.8	-4.3	15.5
Interaction	5.2	0.2	15.3	0.9
All	33.9	24.5	100.0	100.0

Source (Hossain 1984b p.38)

Table 2.17

Source of Growth of Cereal Output Over 1975/76-1980/81

Source	Percentage increase in output due to	Percentage contribution of source of
Acerage	4.01	26
Yield	2.07	14
Crop-mix	10.17	66
Interaction	-0.90	-6
All	15.4	100

Source (Hossain, 1984, p.7

Table 2.18

Acerage of Rice by Season and Variety
(million acres)

Variety		1971/72-1974/75	1975/76-1979/80	1980/81-1984/5
1.	Aman			
	(i) Local	12.4 (90)	13.2 (92)	12.2 (83)
	(ii) HYV	1.3 (10)	1.2 (8)	2.5 (17)
	(iii) Total	13.7 (58)	14.4 (58)	14.7 (57)
2.	Aus			
	(i) Local	7.2 (96)	7.0 (89)	6.5 (84)
	(ii) HYV	0.3 (4)	0.9 (11)	1.2 (16)
	(iii) Total	7.5 (32)	7.9 (32)	7.7 (30)
3.	All rice			
	(i) Local	20.9 (88)	21.3 (85)	19.6 (76)
	(ii) HYV	2.8 (12)	3.6 (15)	6.2 (24)
	(iii) Total	23.7	24.9	25.8

Source: Computed from data reported in BBS, Statistical Year Books, various year.

Note: The figures are averages for the years cited. Figures in parentheses are percentages of total area under particular rice. These under "total" rows refer the total for all rice.

Table 2.19

Area under Wheat and Potato
(000 acres)

Crop	1972/73	1983/84	1984/85
Wheat			
Local	52	47	49
	(4)	(4)	(3)
HYV	1231	1253	1622
	(96)	(96)	(97)
Potato			
Local	117	110	105
	(44)	(42)	(38)
HYV	150	163	170
	(56)	(58)	(62)

Source: BBS, Monthly Statistical Bulletin of Bangladesh, September 1985, pp. 50-54

Notes: Figures in parentheses are to percentages of total area under each crop.

CHAPTER 3

INTERRELATIONSHIPS IN THE PUBLIC FOODGRAIN DISTRIBUTION SYSTEM IN BANGLADESH - AN ECONOMETRIC ANALYSIS

3.A Introduction

3.1 Domestic production of foodgrains in Bangladesh has not only lagged behind growth in demand, it has been highly variable as well. Prices, therefore, fluctuate sharply and policy makers face the challenge of stabilising both prices and consumption in the face of highly variable supplies. In so far as the role of PFDS in market price formation and stabilization are concerned, this study will centre around the following areas:

(a) The establishment and measurement of the relationship between market prices on one hand, and the the total production of foodgrains, level of ration offtake, import and the extent of domestic procurement on the other.

(b) The formation of price expectations, including speculative ones by private grain traders and assessment of their perceptions about the potential influence of PFDS variables on their stocking decision making.

(c) To assess quantitatively the impact of open market sale in offsetting the rising trend in foodgrain prices in lean period.

In this chapter, however, we shall confine our discussion to (a) i.e. to analyse the interaction of various elements in the foodgrain distribution system on an aggregate level, so as to understand the manner in which market prices are formed and in what way offtake from PFDS influence such price formation process. In Section B of the paper, the structure of aggregate model is presented. Section C discusses the sources of data and estimation of various equations in the model. In Section D, the basic interrelationships in the system under alternative scenarios are analysed and some interesting policy implications are derived. In particular, this would explore the impact on market price of rice and foodgrain consumption of a policy designed to reduce the distribution of foodgrains through rationing system. Also, the implications of reducing the share of rice in foodgrain distribution through rationing are analysed.

3.B Framework of Analysis: The Structure of Aggregate Model

3.2 Our framework of analysis based on Raisuddin (1979) study is so designed as to enable us to explore the interrelationships among domestic production, imports, procurement, ration offtake, income, open market sale, consumption and market prices[1]. It is recognised that the forces that influence the demand for and supply of foodgrains in Bangladesh are essentially resolved through the interaction of public and market distribution variables. An aggregate model of supply and demand incorporating rationing has, therefore, been developed to analyse such interrelationships in the system. The structure of the model is outlined below:

$$Q^S = (mQ^* - Q^F) \quad (1)$$

$$Q^D = a_0 + a_1 P^N + a_2 Y + a_3 Q^R; \quad a_1 < 0, a_2 > 0, a_3 < 0 \quad (2)$$

$$Y = Y^* + Q^R (\alpha P^N - P^F) \quad (3)$$

$$Q^R = b_0 + b_1 (Q^M + Q^F) + b_2 (P^N - P^F); \; b_1 > 0, b_2 > 0 \quad (4)$$

$$Q^F = c_0 + c_1 Q^* + c_2 (P^N - P^F); \; c_1 > 0, c_2 < 0 \quad (5)$$

$$Q^M = d_0 + d_1 (Q^* - DD) + d_2 FA; \; d_1 < 0, d_2 > 0 \quad (6)$$

$$D = (Q^D + Q^R) \quad (7)$$

$$Q^S = Q^D \quad (8)$$

---

1 Since the relationships are based on annual averages, they are not relevant for seasonal and disaggregated problems.

Where Q^{m} = Foodgrains available for sale in the open market including that part of production consumed at home.

m = Proportion of gross production available for consumption.

Q^{*} = Domestic gross foodgrains production

Q^{r} = Internal Procurement.

Q^{D} = Consumption from market and home.

P^{R} = Real market price of rice (wholesale, coarse variety).

Y = Real disposable income adjusted for rationing.

Q^{R} = Foodgrain ration distribution

a_0, a_1, a_2, a_3 = Parameters of demand function to be estimated.

Y^{*} = Real disposable income without rationing.

α = Marginal rate of substitution of ration foodgrains (rice and wheat) for local rice.

P^{F} = Weighted average foodgrain ration prices in real terms.

P^{R} = Procurement price of rice in real term.

Q^{M} = Import of foodgrains

b_0, b_1, b_2 = Parameters of ration function to be estimated.

c_0, c_1, c_2 = Parameters of procurement function to be estimated.

d_0, d_1, d_2 = Parameters of import function to be estimated.

DD = Consumption requirements used as a basis for import planning.

D = Total consumption of foodgrains.

FA = Food aid utilized

3.3 Equation (1) shows the net availability of foodgrains in the market and is a price invariant supply function. The invariance of supply to market prices reflects the short run nature of the analysis, and also the dominance of weather factors in the supply of foodgrains from domestic sources. Equation (2) is a market demand function in which rationing has been incorporated as a shift variable[1]. Equation (3) provides the mechanism for adjustment of income due to rationing. The "income effect" of rationing is captured through the second term, $Q^R (P^M_R - P^R_R)$ in the equation. Equation (4) represents ration quantity function in which ration offtake is assumed to depend on supply of foodgrains through both internal and external procurement and the difference in ration and market price. Equation (5) represents the domestic foodgrains procurement function where it is postulated that the amount procured depends both on domestic production and the procurement price relative to market price. Equation (6) represents the foodgrain import function where the amount of import is assumed to depend on net domestic foodgrain requirements (net of domestic production), and the amount of food aid utilised during the period.

3.4 Substituting equation (1) and (2) for equation (8), the system of eight equations can be reduced to a system of six equations where Q^D, Q^R, Q^P, Q^M, P^M_R and Y are endogeneous variables, and Q^*, Y^*, P^P_R and P^R_R are exeogeneous. It may be noted here that a negative Q^P is equivalent to as open market sales operation (OMS) by the govt. which would enables us to evaluate the consequences of such an operation though at an aggregate level. The system will be solved simultaneously (values of endogeneous variables solved for specified values of exogeneous variables) to trace out relevant policy implications. These are discussed in Section IV.

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1. The linear specification of the market demand function represents a linear approximation of the underlying consumption demand function for foodgrains, which is non-linear in character.

3.C Data and Estimation of Equations

3.5 The model presented in Section B was estimated using annual time series data for the eleven year period, 1972/73-1983/84[1]. To this end, relevant data from secondary sources were collected earlier. These included domestic production of foodgrains, import, internal procurement, PFDS offtake, population, GNP at market prices, market price of rice, ration price, procurement price and general wholesale price index. Time series of these variables for the said period are appended in Annex-A. A few words of explanation is in order.

3.6 Since a direct measure of the quantity consumed from the free market and at home (Q^D) is not available, an indirect estimate of the same has been made assuming that Q^D equals gross domestic production minus the quantity for seed, feed and wastage (which account for 10% of gross production) and the quantity domestically procured by the government during the period[2]. Per capita disposable income (Y) was based on estimate of GNP at current market prices less direct taxes. All nominal prices were converted into real prices by deflating them by a general price index. All quantity variables were expressed in per capita terms by dividing them by population in the respective periods.

3.7 Estimation of equation (2) would require a prior estimate of marginal rate of substitution (MRS) of ration foodgrains for market rice, since the MRS is needed to calculate adjusted disposable income (Y). In this study, the estimate derived by Raisuddin (1979) has been used. His exercise involving an

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1. 1974-75 was dropped from the sample as it represented an 'abnormal' year.

2. This measure of Q^D will differ from actual values by a quantity equal to changes in stock held by producers and traders. Failure to incorporate private stocks in the measurement of Q^D is likely to result in overestimation in good years, and underestimation in bad years (Raisuddin, 1979).

iterative econometric procedure generated a value of .7 as the best estimate for the MRS with the coefficients that are highly significant, and income and price elasticities that are considered realistic in the context of Bangladesh[1]. The estimated demand function is specified below:

$$Q^D = 297.22 + .3359Y - 150.15\,P_R - .70\,Q^R$$
$$(7.54) \quad (3.15)^{***} \quad (2.66)^{**}$$

$\bar{R}^2 = .69$

DW =2.01

All coefficients are significant at 95% level of confidence. Estimated income and price elasticities are calculated to be .37 and -.23 respectively.

3.8 Ration quantity function (equation 4) yielded the following estimating equation:

$$Q^R = 19.39 + .263\,(Q^M + Q^F) + 76.95\,(P_R - P_F)$$
$$(2.49)^{**} \quad (1.37)^{*} \quad (2.47)^{**}$$

$\bar{R}^2 = .66$

DW =2.49

Ration offtake appears to be determined by the availability of government stock of foodgrains through internal and external procurement, and the ration price relative to market price of rice[2].

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1. It may be noted here that the coefficient of Q^R represents the weighted average of marginal rate of substitution of ration rice and wheat for local market rice. The coefficient would quite accurately explain changes in the market price of rice due to changes in the ration offtake only when the proportion of wheat and rice in the ration offtake are similar to that obtained on an average in the sample. Evaluating policies require that separate effects of ration rice and wheat be known. The iterative process yielded the value of .92 as MRS of ration rice and .58 as MRS for ration wheat (Raisuddin (1979).
2. This result contrasted to that reported by Raisuddin (1979) where he failed to establish any significant relationship between ration offtake and relative price variable.

3.9 The domestic procurement function (equation 5) gave the following results:

$$Q^{F} = -27.51 + .120\ Q^{*} - 63.83\ (P^{M} - P^{F})$$
$$(.86)\quad (1.31)^{*} \qquad (2.22)^{**}$$

$\bar{R}^2 = .43$

DW = 1.51

Domestic procurement of foodgrains was found to be significantly related to both domestic production of foodgrains and the difference between market and procurement prices.

3.10 The estimated equation for the import function (equation 6) is noted below:

$$Q^{M} = 5.61 - .639\ (Q^{*} - DD) + .463\ FAD$$
$$(.45)\quad (2.06)^{**} \qquad (1.57^{*}$$

$\bar{R}^2 = .19$

DW = 2.11

Although the equation did not provide a good fit, the coefficients of both the explanatory variables, namely net domestic requirements of foodgrains and food aid utilised came out to be statistically significant.

3.11 Once the set of equations in the model were estimated, the estimated parameters were used to solve the system, for various values of variable exogenously specified, which traced out the interrelationships in the public food distribution system. This paved the way for carrying out some interesting policy analysis in this exercise as discussed in the next Section.

3.D Interrelationships Under Alternative Scenarios

3.12 Once the model is solved, policy implications can be derived by suitable varying and/or properly combining the set of policy variables exogenously specified. In our exercise, this would essentially involve the following:

a) To analyse the impact of different production scenario on market price of rice and other macro variables such as imports, ration offtake, internal procurement and total consumption in the economy.This would enable us to predict the behaviour of market prices of rice in "bad", "normal" and "good" years in the absence of specific intervention by the government in fixing the levels of foodgrain import,ration offtake,internal procurement and open market sale.

b) To trace our the impact on consumption and prices of various levels of ration offtake and its composition. This would essentially explore how the market prices of rice can be influenced by policies relating to ration prices and the share of rice in ration distribution. In particular, this would explore to what extent the market prices of rice are influenced at given levels of production, and income; by changing the levels of ration offtake through variation in ration prices and ration quota and also by changing the composition of ration offtake.

3.D(a) Interrelationship Under Alternative Production Scenarios

3.13 Three Alternative production scenarios are conceived for 1985-86. Case I represents a "bad" crop year, Case II a "normal" crop year while Case III represents a "good" crop year. Foodgrain production is assumed to be 14.85 million tons, 16.50 million tons and 18.15 million tons for these three alternative cases respectively. The high and low figures represent a variation of about 10 percent from the "normal" crop production figure projected for 1985-86. Population is projected to be 100.2 million, per capita disposable income to be Tk. 888.00 (at 72/73 prices) and food aid utilised to be 250 million dollars respectively. The ration price of foodgrains is fixed at Tk. 190/md (weighted average of Tk. 268/md. for rice and Tk. 173/md for wheat) and procurement price of rice at Tk.255/md. for 1985-86. The opening stock for foodgrain is estimated to be 1.08 million tons. Based on the relationships postulated in the model, and using the estimated parameters, the model was solved for imports, domestic procurement, ration offtake, and for consumption and market prices of rice.[1] The results are presented below in Table 3-1A.

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1. It may be mentioned here that before solving the model for 1985-86, the model was tested for its predictive performance by comparing the actual 1984/85 figures for market price of rice, ration offtake and other macrovariables with the model solution for these variables. It was observed that the ex-post forecasting errors were confined to within 10% for ration offtake and within 20% for market price of rice.

3.14 It is really observed from the figures in Table 3-1A that the impact of a production shortfall in a "bad" crop year is quite severe as a 10% decline in production of foodgrains leads to about 16% increase in market price of rice (wholesale price of coarse variety) in the absence of specific intervention by the Government in fixing the levels of imports, ration offtake, domestic procurement and open market sale[1]. Consumption of foodgrains, however, declines by only 4% as the potential decrease in consumption is partially offset through increased offtake from the rationing system (by about 5 lakh tons) made possible by an increase in import. Such a massive increase in imports (by about 1.0 million tons) is needed, in the absence of any internal procurement of foodgrains to ensure adequate availability of foodgrains for distribution through the Public Food Distribution System[2]. The impact of a production increase in a "good" crop year is almost symmetrical. Market price of rice declines by 18%, import goes down by 1.1 million tons and volume of foodgrains internally procured goes up by about 5 lakh tons.

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1. Similar price increase was reported by Raisuddin (1979) for a comparable production shortfall in 1980.

2. In fact, to contain the price increase within 16% as shown due to 10% production shortfall, it calls for an open market sale of foodgrains to the tune of about 2.3 lakh tons.

Table 3-1A

Scenario of Foodgrain supply, Demand and Prices, 1985-86

[Case A]

		(Million tons) I	II	III
(1)	Total Production (Q^*):	14.85	16.50	18.15
(2)	Total Consumption (D):	16.40	16.95	17.45
			(-3.2%)	(+2.9%)
(3)	Per Capita Consumption (lb):	360.08	372.16	383.13
			(-3.2%)	(+2.9%)
(4)	Market Price of Rice (P_R): (Tk/Md. at 83/84 Prices)	389.53	336.90	275.67
			(+15.6%)	(-18.2%)
(5)	Imports (Q^M) :	2.86	1.82	.75
			(+57.1%)	(-58.8%)
(6)	Internal Procurement (Q^P):	-.23	.23	.72
			(-200.0%)	(+213.0%)
(7)	Ration Offtake (Q^R) :	2.80	2.33	1.83
			(+20.2%)	(-21.5%)
(8)	Closing Stock (Q^{CS}) :	.91	.80	.72
			(+13.8%)	(-10.0%)

Notes: (1) Scenarios I, II and III represent respectively "bad", "normal" and "good" crop years with 10% deviations from the normal year production levels in either directions.

(2) Total consumption (D) equals Q^D plus Q^R where Q^D = (mQ^*-Q^P).

(3) Closing Stock (Q^{CS}) equals opening stock (Q^{OS}) plus quantity procured internally (Q^P) and externally (Q^M) minus ration offtake (Q^R).

Figures in parenthesis indicate percentage changes of the variables in Scenario I and III over II.

3.15 Table 3-1B presents the scenario when the production deviations in either directions are confined to 5% of the level attained in the "normal" crop year. The impact on the system is scaled down considerably now-the range of price fluctuations being limited to about + 9% as compared to + 17% recorded earlier.

Table 3-1B

Scenario of Foodgrain Supply, Demand and Prices, 1985-86

(Case B)

	(Million tons) I	II	III
(1) Total Production (Q*):	15.68	16.50	17.33
(2) Total Consumption (D):	16.64	16.95 (-1.8%)	17.21 (+1.5%)
(3) Per Capita Consumption (lb):	365.39	372.16 (-1.8%)	377.80 (+1.5%)
(4) Market Price of Rice (PN): (Tk/Md. at 83/84 Prices)	363.98	336.90 (+ 8.0%)	306.27 (-10.0%)
(5) Imports (QM) :	2.33	1.82 (+28.0%)	1.28 (-29.6%)
(6) Internal Procurement (QP):	.02	.23 (-91.3%)	.48 (+108.7%)
(7) Ration Offtake (QR) :	2.55	2.33 (+9.4%)	2.09 (-10.3%)
(8) Closing Stock (QCS) :	.88	.80 (+10.0%)	.75 (- 6.3%)

Notes:(1) Scenarios I, II and III represent respectively "bad", "normal" and "good" crop years with 5% percent deviations from the "normal" crop year production levels in either directions.

3.16 It may be worthwhile to discuss the implications for Government stock of foodgrains under alternative production scenario. The information contained in Tables 3.1A and 3.1B would enable us to do so. Starting with an opening stock of 1.08 million tons, the resulting closing stock figures would indicate that there has been depletion of stocks under all three production scenarios, and that the amount of this stock depletion is lesser in bad years as compared to good years. This must be attributed to the behaviour of imports and domestic procurement relative to ration offtake in alternative production scenario. Stock of foodgrains declines because the amount of foodgrains procured through imports and domestic procurement is less than the amount of ration offtake in each scenario. And this gap between procurement and release widens with the improvement in production conditions because imports declines more than either the increase in internal procurement or the decrease in ration offtake. This is partly attributed to greater weight of imports in total procurement of foodgrains, and also to the rigidity of the ration system which fails to respond appreciably to the changes in production conditions[1].

3.17 It has already been mentioned that the coefficients of demand function, particularly the MRS coefficients used in this exercise are those estimated by Raisuddin (1979) earlier based on the data covering the period, 1960-61 to 1975-76. There are, however, good reasons to believe that some changes in preference pattern with respect to food consumption, particularly in favour of wheat consumption has taken place since then. This should be reflected in higher MRS values of ration foodgrains (rice and wheat) for local rice. Sensitivity analysis was, therefore, carried out using alternative values of MRS to examine the implications of changes in the preference pattern for market price of rice and other macro variables in the system. The results are presented in Table 3-2.

3.18 It is readily observed that an increase of an aggregate MRS values from .70 to .85 leads to a decrease in market price of rice from Tk. 336.90/md. to Tk.318.52/md. i.e. by about 5.5 percent. This price decline should be attributed to the greater deflection of market demand curve for rice due to stronger substitution effect of rationing.

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1. In fact, the changes in ration offtake will be smaller if the price difference between market and ration price is maintained at the same level by changing the ration price proportionately with the market price.

Table 3-2

Effect of Changes in MRS on Market Price of Rice and Consumption of Foodgrains

(million tons)

		Alternative values of MRS			
		.70	.75	.80	.85
(1)	Total Consumption	16.95	16.90	16.84	16.78
(2)	Per Capita Consumption (lb)	372.16	371.06	369.74	368.42
(3)	Market Price of Rice (Tk/md. at 83/84 Prices)	336.90	330.77	323.68	318.52
(4)	Import	1.82	1.82	1.82	1.82
(5)	Internal Procurement	.23	.26	.29	.32
(6)	Ration Offtake	2.33	2.31	2.28	2.25
(7)	Closing Stock	.80	.85	.91	.97

Note: Alternative values of MRS of ration foodgrains for market rice were derived as weighted average of MRS of ration rice for market rice (.92) and alternative MRS values of ration wheat for market rice (.70, .75 and .80) and using 25% of rice and 75% wheat in total ration offtake as weights.

3.D(b) Interrelationships Under Alternative Policy Variables.

3.19 The basic interrelationships established under alternative production scenario set the stage for a more interesting analysis that explores the impact of alternative set of policy variables in the system. We shall consider first the effects of a policy of reducing ration distribution on foodgrain consumption and market price of rice. Reduction in ration offtake can be achieved either through an increase in ration price or through a decrease in ration quota or a suitable combination of both these policy instruments.

3.20 Table 3-3A presents the results under case A when foodgrain distribution through rationing is reduced through successive increase in ration prices starting from the base level of Tk.190.00 per maund. It is readily observed that a 7.7 percent reduction in ration distribution brought about through an increase in ration price by Tk.40/md. results in about 2.0 percent increase in market price of rice in a "normal" crop year. A reduction of foodgrain distribution by .18 million ton results in a market price increase of about Tk.6.5 per maund. This relationship varies with the level of ration offtake but not by much. It is also observed that a 38 percent reduction in ration distribution through almost doubling the ration price leads to a market price increase of about 11 percent.

3.21 The impact on foodgrain consumption of such a reduction in ration distribution results in a less than 1 percent decline in per capita consumption of foodgrains. If the desirable consumption level of foodgrains is accepted to be an average of 15.5 ounces per capita per day (or 354 pounds per year) then it would seem that such an objective is attainable in a "normal" crop year for 1985-86, even with a reduction of ration distribution by 9.0 lakh tons. Such conclusion, however, needs to be qualified at least in one essential way.

3.22 The per capita consumption figure, like all averages, conceals some gross disparity in foodgrain consumption for the low-income, disadvantaged groups in the society. A policy of reduction in ration distribution of the magnitude suggested above would need to protect these groups by ensuring that the cut in ration offtake are confined to those channels which benefits more the relatively better-off people. Even some redirection of existing ration distribution may be necessary to insulate the disadvantaged groups from the resulting price increases to which such groups become very vulnerable[1].

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1. More specific recommendations in this respect are made in Chapter 13.

3.23 Table 3-3B also shows the results of a policy of reduction in ration distribution of foodgrains but this time brought about presumably through a reduction in ration quota instead of an increase in ration price. This represents our case B. It is observed that the impact of a reduction in ration distribution in terms of market price increase and per capita consumption decline is similar to that obtained under case A shown in Table 3-3A. However, the impact of a larger reduction in ration distribution can be analysed now[1]. To reduce the ration distribution to almost half from its base level of 2.33 million tons would lead to market price increase of about 15%. This is as much as one could go if one would like to protect the per capita foodgrain consumption target of 15.5 Oz (daily per capita). The results also indicate that complete abolition of the ration distribution would result in a 30% increase in market price of rice for a "normal" crop year in 1985-86.

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1 No definite statement, however, can be made regarding the fixation of ration quota and the amount of ration offtake- in particular, how much decrease in ration quota is needed to achieve a given reduction in ration offtake. This would require the incorporation of ration quota as an additional explanatory variable in the ration quantity function.

Table 3-3A

Foodgrain Consumption and Market Price of Rice with a Policy of Reducing Distribution of Foodgrains Through Rationing System.

Normal Crop Year: 1985-86

(a) Gross Production of Foodgrains : 16.50 Million tons

(b) Per Capita Disposable Income : Tk.888 (at 72/73 Prices)

(c) Population : 100.2 million

(d) Procurement Price of Rice : Tk.255/md.

Ration Price (Tk/md.)	Ration Offtake (Million tons)	Market Price of Rice (Tk/md at 83/84 Price)	Foodgrain Consumption Total (million ton)	Per Capita (lb)
190.00	2.33	336.90	16.95	372.16
230.00	2.15 (-7.7%)	343.36 (+1.9%)	16.80	368.86
270.00	1.97 (-15.5%)	351.08 (+4.2%)	16.65	365.57
310.00	1.81 (-22.3%)	361.40 (+7.3%)	16.54	363.15
350.00	1.66 (-28.9%)	367.52 (+9.1%)	16.42	360.52
390.00	1.45 (-37.8%)	373.65 (+10.9%)	16.24	356.57

Notes: Ration offtake and market price of rice were solved simultaneously using the estimated equations through successive variations in ration prices exogenously as shown in the Table.

Table 3-3B

Foodgrain Consumption and Market Price of Rice with a Policy of Reducing Distribution of Foodgrains Through Rationing System

Normal Crop Year : 1985-86

(a) Gross Production of Foodgrains : 16.50 million tons

(b) Per Capita Disposable Income : Tk.888 (at 72/73 Prices

(c) Population : 100.2 million

(d) Procurement Price of Rice : Tk.255/md.

(e) Ration Price of Foodgrains : Tk.190/md.

Ration Offtake (million tons)	Market Price of Rice (Tk/md at 83/84 Price)	Foodgrain Consumption Total (million ton)	Per Capita (lb)
2.33	336.90	16.95	372.16
1.98 (-15.0%)	349.15 (+3.6%)	16.66	365.79
1.59 (-31.8%)	368.09 (+9.3%)	16.35	358.98
1.20 (-48.5%)	385.90 (+14.5%)	16.05	352.40
.82 (-64.8%)	404.28 (+20.0%)	15.76	346.03
.42 (-82.0%)	416.53 (+23.6%)	15.42	338.56
.05 (-97.9%)	434.90 (+29.1%)	15.13	332.20

Note: Market Price of rice was solved simultaneously with the ration offtake through variations in the intercept term of the ration quantity function in order to capture the impact of decreased ration quota in the system.

3.24 Table 3-4 shows the impact on market price of rice and foodgrain consumption of a policy of reducing the share of rice in ration distribution. It is readily observed that changes in the share of rice in total ration offtake has only a very modest effect on both market price and foodgrain consumption. A reduction of the share from 35% to 20% results in a price increase of only 2.2%. Also, if rice is completely substituted by wheat in the ration distribution, this would lead to a price increase of 4.5%. On the other hand, this policy would result in some marginal increase in per capita consumption[1]. This happens because of an induced decrease in internal procurement and increase in ration offtake due to an increase in market price of rice, brought about by changes in the share of rice[2].

3.25 Table 3-5 shows the impact on market price of rice and foodgrain consumption of a policy aimed at both reducing the ration offtake through an increase in ration price, and also reducing the share of rice in foodgrain distribution through rationing system. The combined impact of such a dual policy is obviously greater on market price of rice than either of the policies if pursued alone (Table 3-3 and 3-4). A reduction in ration offtake from 2.33 to 1.84 million tons (brought about through an increase in ration price from Tk. 190/md. to Tk. 310/md.), and a reduction in the share of rice in ration distribution from 35% to 20% leads to a price increase of 9.1%. Per capita consumption of foodgrains declines from 373.5 lb to 364.5 lb. due mainly to reduced ration distribution. A further reduction in ration offtake to 1.47 million tons (induced by a still greater increase in ration price to Tk. 390/md) combined with a policy of reducing the share of rice to only 10% of foodgrain distribution results in a 12.7% increase in market price of rice. Per capita consumption of foodgrain declines further, but still remains above the target consumption level of 354 lb.

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1. It may be noted here that total consumption equals Q^D plus Q^R where $Q^D = (mQ^* - Q^R)$.

2. A reduction in the share of rice in ration distribution, given the separate MRS values of ration rice for market rice (.92) and ration wheat for market rice (.58), lowers the aggregate MRS values of ration foodgrains for market rice, which in turn results in a lesser deflection of market demand curve for rice, hereby leading to higher price of rice, in the open market.

Table 3-4

Market Price of Rice with a Policy of Reducing the Share of Rice in Foodgrain Distribution Through Rationing.

Normal Crop Year : 1985-86

(a) Gross Production of Foodgrains : 16.50 Million tons

(b) Per Capita Disposable Income : Tk.888 (at 72/73 Prices)

(c) Population : 100.2 million

(d) Procurement Price of Rice : Tk.255/md.

(e) Ration Price of Foodgrains : Tk.190/md.

Proportion of Rice and Wheat in Ration Offtake		Market Price of Rice	Foodgrain Consumption	
Rice	Wheat	(Tk/md at 83/83 Price)	Total (million ton)	Per Capita (lb.)
35%	65%	335.63	16.94	371.94
30%	70%	336.85	16.95	372.16
25%	65%	339.29	16.97	372.59
20%	80%	343.05 (+2.2%)	17.01	373.43
15%	85%	344.29	17.02	373.69
10%	90%	346.91 (+3.4%)	17.05	374.35
5%	95%	349.37	17.07	374.79
0%	100%	350.68 (+4.5%)	17.08	375.01

Notes: Market Price of rice was solved simultaneously along with other variables using the estimated demand function, $Q^D = 297.22 + .3359Y - 150.15 P_R - .92 Q_R - .58 Q_W$ for given values of Q^*, Y, P_R, P_W and the share of rice and wheat in total ration offtake.

Table 3-5

Foodgrain Consumption and Market Price of Rice with a Policy of Both Reducing Ration Offtake and Reducing the Share of Rice in Ration Distribution

Normal Crop Year : 1985-86

(a) Gross Production of Foodgrains : 16.50 Million tons

(b) Per Capita Disposable Income : Tk.888 (at 72/73 Prices)

(c) Population : 100.2 million

(d) Procurement Price of Rice : Tk.255/md.

Ration Price (Tk/md.)	Share of Rice and Wheat in Ration Offtake: Rice	Wheat	Ration Offtake (Million Ton)	Market Price of Rice (Tk/md) at 83/84	Foodgrain Consumption: Total (million ton)	Per Capita (lb)
190.00	35%	65%	2.33	336.36	17.01	373.47
230.00	30%	70%	2.15	343.36 (+1.9%)	16.80	368.86
270.00	25%	75%	2.00	355.27 (+5.5%)	16.71	366.89
310.00	20%	80%	1.84	367.52 (+9.1%)	16.60	364.47
350.00	15%	85%	1.66	373.64 (+10.9%)	16.45	361.18
390.00	10%	90%	1.47	379.77 (+12.7%)	16.29	357.66

Note: Market price of rice was solved simultaneously with ration offtake using the estimated demand function, $Q^D = 297.22 + .3359Y - 150.15\ PR - .920\ QR - .580\ QB$ and through successive variation in both ration price and the share of rice in ration distribution of foodgrains.

CHAPTER — 4

PFDS Versus Price Stabilisation in Bangladesh

4.A Seasonality of Rice and Wheat Prices in Bangladesh, 1972/3-1984/5

4.1 Table A4.1 in the appendix to this chapter shows seasonal pattern of coarse rice prices in Bangladesh. Average monthly prices have been expressed as percentages of 12-monthly moving average prices. Such moving averages represent what prices could be expected to be due to relatively longer run factors than a year, e.g. trend and cyclical factors. When the effects of trends and cyclical factors on prices are thus isolated, the remaining variations may be attributed to pure seasonal and random variations. Coarse rice is selected as representing the overall rice market because this variety has typically been the single most important of the three qualitative varieties, viz. coarse, medium and fine, at about 45-50% during the last couple of years. When ratios between monthly observed prices are worked out against 12-month moving averages, a ratio higher than unity represents a firming up of prices on a seasonal basis, while a ratio lower than unity represents a softening up of the prices. A succession of increases in this ratio for a number of months represents a continuous tendency for prices to firm, and conversely for successive decreases in this ratio.

4.2 Likewise, Table A4.2 in the appendix to this chapter shows seasonality in wholesale wheat prices in Bangladesh 1973/4 through 1984/5. Bangladesh remains above all a rice economy, but wheat's share in availability has grown rapidly. From 5%-7% in the second half of the 1960's, the share of wheat in per capita availability has risen to between 16-19% in the first of 1980's. This is one reason why we have to look at the evolution of seasonality in wheat prices in their own right. Besides, not only is the relative importance of wheat in the national cereal basket increasing. There is the further belief that wheat enjoys a greater average budget share within poorer households in the population than in richer ones. What happens to market wheat prices, especially in conditions of overall food scarcity, may of greater importance from the viewpoint of food security of groups at risk.

4.3 Several descriptive services have been extracted from these two tables. For one thing, the monthly pattern of the incidence of the peak and trough of the seasonality of the prices of rice and wheat is depicted in Tables 4.1 and 4.2. The former shows that a change has distanced the period upto 1977/8 off from the subsequent six years. In the former, June and July represented the seasonal peak prices in 4 out of five cases, while in the latter, the matched frequency is 2 out of 6. September and April, which were not involved in seasonal peaking of prices in the first sub-period, are involved in such peaking in the second. The period preceding the harvest of boro now appear as new and important peaking points in the seasonal rice price calender[1].

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1 There is little in this evidence to suggest that the peaking of prices before the aman harvest, usually in September or October, is, of course, common throughout the 12-year period under review -- only 1975 and 1979 were clear exceptions. This suggestion was made by one of the commentators of an earlier version of this report. The continued importance of October to seasonal peaking is not here disputed. The change at issue relates to the emergence of pre-boro-harvest peak, perhaps at the expense of June/July, both of which appear to be unambiguously shown.

The incidence pattern of trend-adjusted seasonal troughs has remained basically unchanged as between these two sub-periods. In the main, aman harvest is what brings this trough about[1].

4.4 As for the seasonal peak and trough patterns of wheat, the major change, if any, between the two sub-period in Table 4.2 involves the trough points: while November and December were the seasonal price troughs in the first sub-period, this is no longer the case in the second. The pre-monsoon months now occasion the seasonal wheat price lows[2]. In contrast, the months when seasonal peaks are observed, in both sub-periods, are randomly distributed within the year.

1 A recent work, that examined changing seasonal price pattern between the 1960's. 1970s and early 1980's i.e. upto 1982/3 came to the conclusion that "the bottoms of price drops have lengthened to cover a number of months. In the past, low prices were limited to the November-January period: recently the bottom line has extended to the period July-August" (Ahmed, 1985). Ahmed was making this observation looking at de-trended monthly prices for 1977/8 through 1982/3. We have confirmed that the seasonal rice price trough against July in col.3 indeed belongs to 1977/8. A re-arrangement of the sub-period by including 1977/8 in the second sub-period would produce quite a similar result, in that both July and August would then, by representing troughs, indicate an extension of the bottom line. The expansion of Boro crop through HYV may have contributed to this change in rice price seasonality.

2 Note once again April, May, June and August have each occasioned seasonal wheat price lows in the period 1978/9 through 1983/4, while they were not in evidence in this role in the first sub-period. This change is deemed as mostly being due to the fact that FFWP, mostly mediating in wheat supplies to rural consumption particularly, becomes an important activity during February and after, thus having a depressive effect on wheat prices. In addition, wheat is harvested from April onwards.

Table 4.1

Monthly Incidence of Seasonal Price Peaks and Troughs, Coarse Rice, Bangladesh, 1973/4 through 1983/4

(Nos.)

Name of month	1973/4---1977/8 absolute frequency		1978/9---1983/4 absolute frequency		1973/4---1983/4 absolute frequency	
	Month is at seasonal price peak	Month is at seasonal price trough	Month is at seasonal price peak	Month is at seasonal price trough	Month is at seasonal price peak	Month is at seasonal price trough
(1)	(2)	(3)	(4)	(5)	(6)	(7)
July	3	1	1		4	1
Aug.				1		1
Sept.			1		1	1
Oct.	1		1		1	1
Nov.		1		1		2
Dec.		2		3		5
Jan.		1				1
Feb.				1		1
Mar.	1				1	
Apr.			2		2	
May						
June	1		1		2	
No. of yrs	5	5	6	6	11	13

Note: Each figure in a column indicates the number of times the month in question occasions the seasonal peak or trough, as the case may be in the ratio between observed price in that month to the corresponding centred 12-month moving average. The reason 1972/3 and 1984/5 had to be omitted due to nonavailability of the required monthly price data. This footnote applies, mutatis mutandis, to the following table also.

Source: Table A4.1

Table 4.2

Monthly Incidence of Seasonal Price Peaks and Troughs, Wheat, Bangladesh
1974/5 through 1983/4

(Nos.)

Name of month	1974/5 - 1977/8 absolute frequency		1978/9 - 1983/4 absolute frequency		1974/5 - 1983/4 absolute frequency	
	Month is at seasonal price peak	Month is at seasonal price trough	Month is at seasonal price peak	Month is at seasonal price trough	Month is at seasonal price peak	Month is at seasonal price trough
(1)	(2)	(3)	(4)	(5)	(6)	(7)
July	1		1		2	
Aug.				1		1
Sept.			1		1	
Oct.	1		1		2	
Nov.		2				2
Dec.		2		1		3
Jan.			1		1	
Feb.	1		1		2	
Mar.			1		1	
Apr.				2		2
May				1		1
June	1			1	1	1
No. of yrs	4	4	6	6	10	10

Source : Table A4.2

4.5 The results of Tables 4.1 and 4.2 have one peculiarity viz. that by taking individual months of individual years into account, they have not isolated the influence of random effects, for example, specific to one month in a given year. Isolation of random effects calls for averaging of the ratio-to-moving-averages for each month over a desired sample period. Pure seasonality, unaffected by random as well as trend/cyclical effects, of rice and wheat wholesale prices are shown by Tables 4.3 and 4.4. The panel al the bottom of each table shows the percentage points that separate the highest and lowest ratios. These are the percentage seasonal spreads. Tables A4.1 and A4.2 in the appendix shows these spreads for every individual year of the time series. It is found, for example, that for both rice and wheat, seasonal spreads have declined during the 1970s. For wheat, in addition, such decline has continued in the 1980s.

4.6 A further descriptive use that we can, with insight, make of the results of Tables 4.3 and 4.4 relates to the stability of the seasonal pattern over time. To this end, simple correlation coefficients, r, have been computed between separate pairs of cols. 2 through 5, in Table 4.5 (This exercise is attempted only for rice prices). A significantly positive 'r' between any two subperiod would imply that there is a significant degree of stability in the seasonal pattern between them. On this criterion, all the three possible 'r's in the three sub-periods ending with 1978/9-1980/1 are positive and significant. A claim for significant stability may thus be entertained for the period upto 1980/1. However, two of the three r's involving 1981/2-1983/4, though still positive, are rather small. The upshot may be that the correspondence between seasonality of rice prices in 1981/2 - 1983/4 and the two preceding sub-periods at hand is visibly weaker.

Table 4.3

Seasonality in Coarse Rice Wholesale Prices, Bangladesh, 1972/3 - 1984/5

Name of month	Ratio between actual monthly price to corresponding centred moving average				
	1972/3 - 1974/5	1975/6 - 1977/8	1978/9 - 1980/1	1981/2 - 1983/4	1984/5
(1)	(2)	(3)	(4)	(5)	(6)
July	91.2	108.5	103.4	93.6	103.5
Aug.	95.4	100.8	100.3	91.8	100.4
Sept.	102.3	102.2	1[illegible] 5	100.0	105.5
Oct.	112.9	99.6	98.03	103.6	102.3
Nov.	96.3	89.8	94.5	96.2	97.6
Dec.	84.5	87.4	90.0	92.9	100.1
Jan.	90.73	93.4	93.7	98.5	103.1
Feb.	100.3	97.1	96.4	102.9	103.5
Mar.	107.20	100.2	100.2	106.5	106.4
Apr.	109.33	103.1	105.9	108.9	107.5
May	101.6	100.1	101.8	97.6	96.1
June	98.3	99.6	102.7	95.7	90.4
Lowest	84.5	87.4	90.0	91.8	90.4
Highest	112.9	108.5	105.9	108.9	107.5
Highest-Lowest -	28.4	21.1	15.9	17.1	17.1

Note: Averaging is done involving three successive years in each case, in order to eliminate the effects of random forces peculiar to any given month in a year. This footnote applies to the following table, too.

Source : Table A4.1

Table 4.4

Seasonality in Wheat Wholesale Prices, Bangladesh, 1973/4 - 1983/4

Name of month	Ratio between actual monthly price to corresponding centred moving average				
	1973/4 - 1974/5	1975/6 - 1977/8	1978/9 - 1980/1	1981/2 - 1983/4	1984/5
(1)	(2)	(3)	(4)	(5)	(6)
July	81.7	118.7	112.8	94.8	103.3
Aug.	99.3	106.5	106.7	97.6	97.3
Sept.	123.6	95.6	107.1	107.5	111.2
Oct.	154.4	96.7	105.1	106.5	110.9
Nov.	91.9	86.4	98.5	97.2	106.3
Dec.	67.6	83.9	93.4	99.3	104.1
Jan.	99.9	96.8	96.8	107.6	106.8
Feb.	111.3	107.2	101.8	105.3	104.6
Mar.	115.2	93.2	92.3	95.9	90.6
Apr.	117.4	92.1	90.6	92.2	91.5
May	113.9	98.4	93.7	94.0	87.9
June	113.8	103.4	98.9	91.7	85.9
Lowest	67.6	83.9	90.6	91.7	85.9
Highest	154.4	118.7	112.8	107.5	111.2
Highest-Lowest -	86.8	34.8	22.2	15.8	25.3

Source : Table A4.2

4.7 It appears that seasonal spreads for coarse rice have more often than not been less than 20%, which has been widely considered as defining reasonable provision for normal trading profits via intra-year storage and for costs of carriage. A case can, therefore, be made that output price support programme of the government, in combination with fairly systematic monitoring of the food situation by the Ministry of Food (followed up whenever necessary by rapid action) have made for a relatively successful handling of intra-year price stabilisation. The procurement programme has helped raise the level of floor wholesale prices within the year is shown in the following. For December and January, which, according to Table 4.3, represent the seasonal troughs in three out of the four periods, the ratios-to-moving-average gain about 8 percentage points between the early 1970's and early 1980's. This can, to a large degree, be attributed to the procurement programme and, in part, to the rapid build-up of paddy-processing capacity within mechanised rice mills. Now this assessment of the effectiveness of procurement programme, at any rate in terms of its ability in raising growers' price relative to procurement prices is at variance with the position taken in a recent and seminal BIDS contribution on the subject (Osmani and Quasem, 1985). It is therefore, absolutely necessary to posit a fullblown defence for it. Given the importance of the conclusion just stated, its further vindication is best submitted here in the text itself and not relegated to an appendix.

4.8 It has to be noted that the numbers in Table 4.3 relate to seasonality in wholesale coarse rice prices. If one has to assess the effectiveness of procurement programme from the viewpoint of price support, then the appropriate basis is the growers' price relative to procurement price. Osmani and Quasem correctly point out that the proper touchstone is whether procurement programme succeeds in raising growers' price close to or to the level of procurement in years with favourable rice crop[1]. In order to see whether this has been the case since 1975/6, they examine the ratio between annual growers' to procurement prices. Out of nine years, crop and procurement levels were found to be favourable in only three years. They however, find that in all these three years, the growers' price has, annually, been considerably lower than procurement prices Table 4.6.

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1 The ability of a voluntary procurement programme to raise growers' prices depends upon the availability of financial and organisational resources at the disposal of the government. It also must depend on the size of the crop relative to historical standards, as also how widely the crop is distributed. If there were no financial or organisational constraints, it would be a relatively simple matter to buy enough foodgrains so that prices are forced upward to the degree desired. Again, the higher is the crop size relative to the relevant trend and/or the more geographically scattered is the incremental crop, the greater is the financial resource required to raise prevailing prices by one unit.

Table 4.5

Correlation Coefficient Matrix of Seasonality of Monthly Coarse Rice Wholesale Prices, 1972/3-1983/4

	1972/3-1974/5	1975/6-1977/8	1978/9-1980/1	1981/2-1983/4
(1)	(2)	(3)	(4)	(5)
1972/3-1974/5	1.0	0.439**	0.589*	0.810*
1975/6-1977/8		1.0	0.902*	0.227
1978/9-1980/1			1.0	0.302
1981/2-1983/4				1.0

Note : * denotes significant at 5% level

** denotes significant at 10% level

On that evidence, they suggest that procurement programme had not been successful.

4.9 Procurement of rice and paddy is of course a highly seasonal activity. Between 1975/6 through 1983/4, 71.5% all rice and paddy procured was aman, the bulk of which is concentrated within the period December through February. Procurement out of boro harvest has further been an important category in more recent years, and this too, tends to be localised within May and June. Table 4.7 shows the seasonality of the rice/paddy procurement programme. There is sufficient intra-year variation in the scope of the procurement drive shown in this table to raise doubt as to the adequate of an annual comparison between growers' and procurement prices. Perhaps, the ratio between growers' price to procurement price ought to be weighted by monthly procurement shares. It can be argued that a disaggregation of the performance of the procurement programme helps generate a different view about the ratio between growers'-to-procurement prices. This is shown in detail below. But first we would like to make certain conceptual observations regarding some of the methodological requirements of assessing the effectiveness of procurement programme.

Table 4.6

Food procurement programme
(Rice and Rice - equivalent of paddy)

Sl. No.	Year	Procurement price (Tk./md)	Grower's price (Tk./md)	Procurement (ml. ton)	Production (ml. ton)
(1)	(2)	(3)	(4)	(5)	(6)
1.	1975/76	122	109	0.35	12.56
2.	1976/77	123	109	0.31	11.57
3.	1977/78	133	130	0.55	12.76
4.	1978/79	134	137	0.31	12.65
5.	1979/80	170	194	0.14	12.54
6.	1980/81	175	156	0.86	13.66
7.	1981/82	190	194	0.29	13.41
8.	1982/83	210	228	0.17	13.99
9.	1983/84	225	251	0.15	14.28

Source : Monthly Statistical Bulletin (various issues)

Table 4.7

Seasonality of Rice/Paddy Procurement Activities, 1979/80 through 1984/5

Months	Monthly procurement of rice/paddy (long tons)						Average monthly procurement as % of average annual	
	1979/80	1980/1	1981/2	1982/83	1983/4	1984/5	1979/80 1981/2	1982/3 1984/5
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
July	27530	50877	41415	731	30123	7644	7.9	7.6
Aug.	33907	70105	43506	1338	18511	39	9.7	4.5
Sept.	36311	65354	45311	176	5050	411	10.4	1.3
Oct.	29377	71346	27086	18	530	340	8.4	.2
Nov.	15925	44277	9041	11595	10015	1931	4.6	5.3
Dec.	56070	141554	46279	62002	44566	10622	16.1	26.4
Jan.	72623	180781	62502	18200	20398	12182	20.8	11.4
Feb.	37914	121083	5910	1771	6945	17632	10.9	5.9
Mar.	17737	59163	280	-	1783	18011	5.1	4.5
Apr.	6203	20826	5	360	16	3997	1.8	.9
May	17	6309	-	12039	964	25201	.5	8.6
June	12998	40844	2722	60176	4219	39162	3.7	23.3
Total	348477	883519	284057	168406	143120	132372	99.9	99.9

Source : Data collected from the files maintained with Food Division.

4.10 The crux of the Osmani-Quasem (O-Q) argument is that procurement programme as an incentive price aid is redundant in years with firm and high prices in the harvest season. The real test of the success of the procurement program 'qua incentive price scheme is whether in years of good crops, it succeeds in raising growers' prices to the vicinity of procurement prices. In fairness to O-Q, one must say that they believe that the provision of an incentive price is the more relevant yardstick for assessing the effectiveness of the procurement programme. It can be argued that, in pronouncing upon the effectiveness of the procurement programme in Bangladesh, their tendency to single out years with good crop and procurement levels and the ratio of growers' prices to procurement prices in them arises quite logically, from their judgement that this programme is better geared toward providing an incentaive price. When one is assessing a policy of price target procurement, such a policy would quite evidently lead to procurement only in good harvest years. Whether such a policy is successful or not is, under those circumstances, a matter specific to good crop years. The problem with this argument, however, is that the "present policy of procurement is oriented more to quantity target rather than price target: (Ahmed, 1985, P.123). We shall see later in chapter 7 that the essential priority and, to a lesser degree, other priority category of recipients in public rationing are a major claimant of the rice so distributed. Ensuring rice supplies of reasonably predictable quantity, quality and prices is therefore a political-cum-bureaucratic desideratum. This forms one of the compulsions for a quantity target procurement[1]. The second compulsion presumably rises from the mani-facetedness of price target procurement which , for effective operation, has to be based upon "the considerations for general economic activity, prices and production of jute, and production of rice" (Ahmed, 1985, P.123). Such a policy would naturally become a candidate for cumbersome inter-ministerial deliberations between Food, Agricultural and Jute ministries. Uncertainties may prevail as to the desirability of taking important decisions like what quantity to procure on the basis of inter-ministerial consultation.

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1. Osmani and Quasem, too, has been careful to stress this point.

4.11 That procurement policy is oriented towards target quantity results in procurement in both good and bad years. Hence one needs a criterion of assessment which is applicable to both good and bad years. The problem, however, is that any sensible criterion for judging quantity target procurement also relies on a certain price. Surely, the government can achieve any quantity procurement target if there were no limits to the price the government could pay. Again, unless the government were prepared to pitch its procurement price at a high enough level, it would fail to procure any quantity at all. Hence one ought, ideally speaking, employ a synthetic index the combines extent of quantity target actually procured and the ratio of growers' to procurement prices[1].

4.12 One of the real questions is what would have happened to the growers' price if there were not procurement drive at all. It is possible to show, diagrammatically, that procurement programme has a potential for exerting upward presurre on the growers' prices. The following graph seeks to illustrate this proposition.

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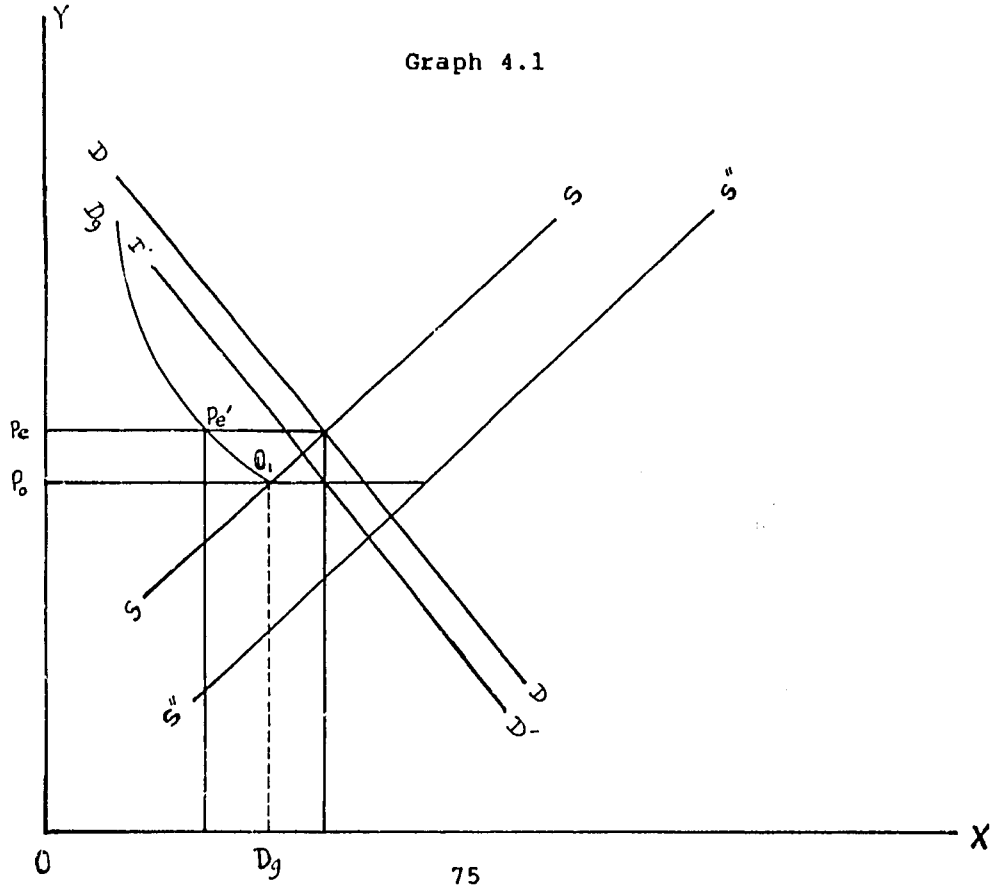
1 It is not proposed to go into the details of such a measure here. We shall content ourselved by only noting that the following formula could be a possible candidate:

$$i = [\{(Q_P/Q_T) + (P_G/P_P)\}/2] \times 100$$

= index of success of procurement programme, Qp is quantity procured, Qt is quantity procurement target, P_G is growers' price, Pp is procurement price. It is recognised that an alternative index could be built with the ratios within round brackets by casting them in a multiplicative mould and by losing the denominator 2. The additive version is intuitively better in that in its case the index retains a nonnegative value even if one of the constituent ratios were to assume zero value as for example, when, in a year of very high prices relative to procurement price (i.e. high value within the second round bracket), actual procurement is nil. In the multiplicative version, the index would have a zero value.

4.13 Let Ox and Oy represent quantity and price, respectively. SO_1S represents total supply function for rice in the absence of any procurement programme. When procurement programme exists, the rice supply curve is SO_1P_g. --- the segment O,S really becoming eleminated by $O_1 P_g$ .The logic for this is that, if procurement programme succeeds in paying the declared price with zero transaction costs, then no supplier of rice would sell below such a price. $D_gO_1D_g$ defines the government procurement demand curve. The government target is to spend money represented by $OD_gO_1P_g$ on procuring OD_g quantity of rice at Op_g price. D_gO_1 segment of this government demand curve is by way of a rectangular hyperbola which incidentally, has the property that each and every point on it represents the same total expenditure on rice procurement. The hyperbola is however truncated by the vertical segment O_1D_g, since the government is committed towards a guaranteed price. When growers' price is autonomously higher than procurement price, the government has to follow the hyperbola in determining the quantity to procure and at what price. Let DD be the total demand curve, giving the equilibrium price of Pe, at which the government only procures PePe' quantity of rice.

Graph 4.1



4.14 The potential of the procurement programme can be vividly seen when, for some particular reason, the supply curve shifts. An unexpected bumper crop may cause such a shift. Rice prices, in early part of the season, will be O_{pe}. The demand curve DD may shift too: leftward if the negative income effect of rice producers who market their product in the early part of the season is stronger than the positive income effect implied by lower rice prices; rightward, if it otherwise happens. Now suppose the demand curve shifts leftward to D'D'. The existence of the procurement programme has imparted the supply function a horizontal segment. (What this horizontal segment really represents is the fact that, unless the government were to declare for all to hear that it has procured its targeted quantum of rice, no farmer, potentially within the reach of the procurement centre, would like to sell below the guaranteed minimum price.) It is this horizontal segment that is critical to the upward pressure that procurement programme gives to prices, for certainly were no such concerted procurement to occur, the price suggested by the inter section by DD' and S"S" would in fact be lower than O_{pe}. Procurement programme thus certainly provides to those farmers which deal with it a benefit in terms of higher prices than would prevail in its absence. This is the simple point that Fig 4.1 has brought out.

4.15 Let us now return to the empirical question of whether the procurement programme has succeeded in exercising an increasingly upward effect on growers' prices or not. We have already made the point in para 4.9 that procurement is a highly seasonal activity. What is more, procurement activity in paddy/rice tended to be concentrated in a small number of districts (Table A4.3). The fact concerning both temporal seasonality and geographical localisation would strongly argue against use of annual data in examining what effects procurement drive was having on growers' prices. For, given seasonality of procurement implies that the annual ratio between growers' to procurement prices may be significantly different from the ratio during the small months of critical importance of procurement. Again, given the fact that only a handful of districts predominate procurement activity, the country-wide ratio may be quite inaccurately representing what effect procurement programme was having on growers' prices in the few districts that really matter in this context.

4.16 We have calculated the ratio of growers' - to - procurement prices on a monthly basis for 1976/7 through 1984/5[1]. To eliminate random factors, we take three-yearly averages of these ratios, we then take two kind of averages: I) simple averages over the monthly-averages; II) weighted averages of the monthly averages, weights being monthly share of country-wide procurement. The results are shown in Table 4. Several factors are worthy of note here.

4.17 What procurement programme does to the growers' prices during the four months of aman harvest is of critical importance to its price support objective. Table 4.8 shows that the ratio of growers'-to-procurement price for the four crucial months, November through February has invariably tended to increase from one period to the next. This finding is confirmed when we look at the monthly ratio of trend growers-to-procurement prices, in Table 4.9. The increases in the ratios between 1979/80 - 1981/2 and 1982/3 - 1984/5 in these four months are quite spectacular, and we have to add here that we ourselves do not fully understand what is causing such large relative increases in these harvest months. These findings, coupled with the discussion surrounding graph 4.1, suggest (a) that procurement programme has resulted in higher level of growers' prices than would prevail in its absence even in a year of outward shifts in supply (even though the ratio was less than unity), and (b) that the ratio during the crucial aman harvest months has invariably risen from period to period.

4.18 So also, in addition, has the annual average ratio of growers'-to-procurement prices in this period, whether we look at simple or weighted averages.

4.19 This long discussion about what we view as the success of the procurement programme in favourably affecting growers' prices during the aman harvest was necessary if we wanted to correctly appreciate the significance of the numbers in Table 4.3 about a narrowing of the seasonal price spreads. What that spread suggests that one aspect of PFDS, namely the procurement programme has, to a significant degree, resulted in raising the bottom of the seasonal price trough. How another arm of the PFDS, the OMS, has dealt with the price stabilisation objective is the subject matter of the rest of this chapter.

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1 Later on, we calculate the ratio between trend growers'-to-procurement prices on a monthly basis for the same period by employing 12-month moving averages. This method is analytically superior in that it recognises that grower prices may be influenced by longer-run forces, and that procurement prices, too, may be based on some calculation, within the price-fixing authority, as to the extent of this trend factor which influences growers' prices.

Table 4.8

Ratio of Growers-to-procurement Prices of Rice, Bangladesh, 1976/7 - 1984/5

(%)

Name of month	1976-7 -1978/9	1979/80 - 1981/2	1982/3 - 1984/5	1976/7 - 1984/5
(1)	(2)	(3)	(4)	(5)
July	78.26	96.32	107.43	94.00
August	80.88	91.92	105.68	92.83
September	92.82	99.60	115.43	102.62
October	97.04	101.27	127.90	108.74
November	82.47	93.52	105.67	93.89
December	89.85	94.91	109.69	98.15
January	92.53	103.67	117.54	104.58
February	97.39	117.37	119.64	111.47
March	109.39	126.21	123.27	119.62
April	101.45	97.71	103.37	100.84
May	96.12	80.97	98.87	91.99
June	106.49	81.57	100.56	96.21
Annual av.	93.7	98.8	111.2	101.2
Weighted av.	n.a	100.9	108.1	n.a

Note: Growers' price data were carefully compiled from BBS, Monthly Statistical Bulletin, various issues. Grower prices were taken on the basis of harvest seasons for the three main rice crops. Aman harvest season was treated as from November through March; boro from April through June; Aus, from July through August.

Source: The same as those for Table A4.4

Table 4.9

Ratio of Trend Grower-to-Procurement Prices of Rice, Bangladesh, 1976/7 - 1984/5

(%)

Sl. No.	Name of Month	Periods		
		1976/7 - 1978/9	1979/80- 1981/2	1982/3 - 1984/5
(1)	(2)	(3)	(4)	(5)
1.	July	94.5	99.2	111.7
2.	August	95.6	99.9	111.0
3.	September	97.2	101.2	109.0
4.	October	98.5	101.3	108.7
5.	November	99.3	100.3	108.7
6.	December	94.2	98.7	108.7
7.	January	95.6	98.2	109.0
8.	February	97.0	97.6	109.5
9.	March	98.5	96.5	109.5
10.	April	99.5	97.7	110.0
11.	May	99.9	97.5	111.0
12.	June	100.6	97.3	111.5

Source: The same as that for Table A4.4

4.B Open Market Sale (OMS) as a Tool for Seasonal Price Stabilization

4.20 Prices of foodgrains are characterised by seasonal fluctuations. This occurs because of the uneven nature of agricultural production in the face of relative even flow of foodgrain consumption. Public policy instruments, therefore, need to be employed to contain such price fluctuations within reasonable limits. Two policy tools that have been used in Bangladesh to squeeze the lower and upper limits of seasonal prices are those of domestic procurement program and open market sales program. An evaluation of the former (domestic procurement program) which attempt to construct a floor below which prices would not fall has been carried out in the previous Section. Here we seek to evaluate the performance of the other policy instrument, namely open market sale (OMS) which has been recently put in operation in Bangladesh.

4.21 Open market sale is certainly not a new concept in food policy management. However, the price setting mechanism under OMS contains certain features which distinguishes it from similar other programs the exist elsewhere. Open market sale, it may be emphasized, is primarily designed to combat the price rise due to apprehension of foodgrain shortfall. This must be distinguished from other causes of seasonal price increases, namely real storage cost and opportunity cost of storage. This aspect of OMS operation must be borne in mind while evaluating its effectiveness in arresting the price hike during the lean season. But first let us have a look at how the program actually operates in Bangladesh.

How OMS Works

4.22 OMS provides for price-interaction between market and PFDS since OMS price is set in response to movement in market prices. Under present operating procedures, OMS are initiated through grain dealers when retail market rise 15% above procurement price of rice, and 20% for wheat. The grain is usually sold at a price approximately halfway between the current market price and OMS trigger price. Initially, it was designed to have unlimited quantities available for sale with an open-ended commitment to continue selling until prices come down. However, official resistance to open-ended commitment was great and it was subsequently modified to impose quantity restriction on sale of foodgrains.

4.23 The novelty of this approach lies in the fact that OMS program does not make use of an inflexible ceiling price, which leads to huge budgetary losses by the Government if the difference between market price and ceiling price happens to be large. OMS by selling grain at a price closely following market price recoup some of the losses incurred by ceiling price program. Also, the quantities of grain involved would be less. This is because the price difference between current market price and OMS sale price is always small. As market prices come down, the difference gradually disappears, and the consumers become uninterested more quickly with OMS grain than with a ceiling price program. They more quickly approach the threshold where the inconvenience of distance, queuing up in line and inferior quality of government grain become equal to the price difference (Montgomery, 1983).

4.24 Rationing has its primary goal of quantity grain allocation for selected group of consumers with the achievement of price stabilization relegated to a secondary role. OMS, on the other hand, represents the pioneering effort in Bangladesh which have price management as the primary goal. Rising prices signal the onset of OMS and falling price marks the end of it. It is seasonal in nature and is intended to operate only during periods of price rise which occur shortly before the harvest of Aman and Boro/Aus crops. Most of foodgrains sold through OMS consists of wheat, although the objective of price management is the moderation of rice price. By moderation is meant seasonal price swings within approximately 20% band suggested by the World Bank (1979 Report).

4.25 Although historically seasonal price fluctuations in Bangladesh have been mostly confined to 20% limit, there were times in which seasonal rice prices displayed considerable variations. These were the years characterized by shortfall in either aman or boro/aus production. A monthly price rise by as much as 10% during the period reflect information reaching the traders that permits them to predict that the ensuing harvest will be short of expectation. And the degree to which price rise by more than storage costs is directly related to the degree of <u>expectation of shortfall</u>[1].

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1 The actual shortfall may, however, turn out to be quite defferent from the expected shortfall. 1982 provides a very good example. The expectation of a serious shortfall was quite high by early October; only very late rains in late October and early November saved Bangladesh from what could have been a disastrous drop in Aman rice production. Nevertheless, for most of the growing season the expectation was for a much worse crop and price behaved accordingly (Montgomery, 1983).

4.C An Evaluation of OMS Program - Application of A Disaggregated Price Model

4.26 As mentioned earlier, it is important to know how large the expected shortfall is in order to ascertain the level of OMS offtake for price stabilization purposes. The disaggregated price model developed by Montgomery (1983) attempts to deduce the degree of anticipated grain shortfall from price behaviour. The expected shortfall is indelibly connected with the degree of price increases through the following linkages:

(a) The greater the shortfall expected of the crop in the ground, the less it will be able to satisfy demand during the year following its harvest, hence the higher the future market clearing price will be when it is harvested. As a consequence, the greater will be the difference between current prices and expected future prices.

(b) The higher the future market clearing price at the next harvest time, the more traders and farmers allocate to future sales and less to current sales.

(c) The greater the difficulty of moving grain from region with no expected shortfall to those with large expected shortfalls (the greater the "friction" in the transport and marketing system) or the shorter the time period under consideration, the more it will appear that individual markets are not integrated and therefore, the greater will be interregional price differences.

(d) The less the market surplus (even in times of no expected shortfall) the larger the impact of an expected shortfall upon the thin market and hence the higher the price rise.

(e) The closer it is to harvest time (and the less the time available for favourable news regarding weather) the more certain the expectation of a shortfall and therefore, the more uniform the behaviour of traders to allocate to future consumption.

4.27 Using price elasticity and a number of assumptions about normal price increases, one can derive an estimate of perceived shortfall in a particular period. The magnitudes thus estimated for shortfall can then be compared with the magnitude of offtake on sale under OMS and other forms of offtake of PFDS in order to make the following observations:

(i) If the level of offtake during the period is far below the estimated level of shortfall predicted by price behaviour then the low level of offtake should not be effective in bringing down prices.

(ii) Even if the aggregate level of offtake during the period of concern approaches the estimated level of shortfall there still remains a question of regional distribution of the offtake; can the PFDS accurately know where the greatest shortfall is and supply more foodgrains there compared to areas of less severe shortfall?

(iii) In almost any year, good or bad, there are deficit regions and surplus regions of foodgrains. In any surplus region, a "shortfall" would in fact only mean a reduced surplus. In such a location offtake from the PFDS should naturally be less than in other regions with similar sized shortfall but which on balance historically had deficit.

4.28 The working hypothesis underlying the approach may, therefore, be postulated below:
"If and only if the level of grain offtake reaches the order of magnitude of the estimated or perceived shortfall, will it be effective in dampening prices. It is not just government's intentions which are important but also the actual quantity of grain it places on the market."

4.29 Therefore, it becomes necessary to examine in order to judge the effectiveness of OMS program whether the quantity of OMS (or OMS plus MR grain) are sufficient to overcome the anticipated shortfall which develops in a certain period of the year. This hypothesis was tested by Montgomery (1983) using statistical technique and cross sectional subdivisional information on offtake, prices and expectations for the July 1982- December 1982 period. The source of data and the results of his empirical work are summarised below:

Sources of Data

4.30 Although 68 subdivisions report prices daily to the Ministry of Food, a number of subdivisions lie in urban areas where statutory rationing (SR) is undertaken. To reduce the problem of assigning true responsibility on method of foodgrain offtake, it was decided to eliminate subdivisions where SR was currently being undertaken; these were subdivisions within Dhaka city, Narayanganj, Chittagong city, Rajshahi city, Khulna city and Rangamati. Also, a number of very minor grain producing subdivision in the Chittagong Hill Tracts were excluded because of incomplete data series for all variables concerned. The omission of the SR subdivisions and the Hill Tracts subdivisions left 53 subdivisions in the data set.

4.31 A base year for comparisons had to be chosen for which "normal" subdivisional aman production, population and basic surplus or deficit status could be ascertained. The latest year for which all these types of information were available (when Montgomery undertook the study in 1982) was 1978. The published information for this base-year was found in the BBS Thana Statistics, Basic Information Volume published in December 1981. It also contains an estimate of whether on balance the subdivision was surplus or deficit in foodgrain production in 1978 by comparing total cereal grain production with the standard foodgrain consumption target (15.5 oz. per capita per day).

4.32 The mathematical expression which links the excess price increase to the shortfall is, for each subdivision (stars represent expected values):

$$\frac{(Q_{aman\,'82} - Q^{*}_{aman\,'82})}{Q^{*}_{aman\,'82}} = E.\ \frac{(P_{October\,7} - P^{*}_{October\,7})}{P^{*}_{October\,7}}$$

which can be rearranged as follows to estimate the anticipated shortfall in aman production in each subdivision:

$$(Q_{aman\,'82} - Q^{*}_{aman\,'82}) = E.\ Q^{*}_{aman\,'82}\ \frac{(P_{October\,7} - P^{*}_{October\,7})}{P^{*}_{October\,7}}$$

4.33 The estimates are, therefore, negative number. The decision was to allow the base-year aman production of 1978/79 to represent what might have been obtained or expected in a good aman crop year and hence it is used as a proxy for $Q^*_{aman\ '82}$.

4.34 To estimate the expected price on October 7 ($P^*_{October\ 7}$) two different methods were employed. The first was to take bi-weekly prices, find the actual low price during the July-August period and increase it by 5% every 28 days forward to October 7. This was called Expected price A. The second method was to assume that the July 29 price in each subdivision was sufficiently close to the seasonal low to represent that low. Then the July 29 price was increased by 5% for every four weeks up to October 7 (a total increase of 12.5% for the 10 week period). This is shown as Expected price B in Appendix Table 4A.

4.35 Estimates of the anticipated shortfall for each subdivision also appear in Appendix Table 4A. Shortfall A adopts the method of using actual lowest price during July-August period, and shortfall B adopts the July 29 price as a base price. Shortfall A gives slightly higher estimates of anticipated shortfall with very few exceptions. The total anticipated shortfall in the 53 subdivisions surveyed (and they represent more than 90% of the rice production area in the country) amounts to between 2,08,000 tons and 2,80,000 tons according to the choice of method applied.

Results of Regression Analysis

4.36 Following specific questions were asked to ascertain the effectiveness of OMS program.

(1) Was the quantity of OMS sufficient to bring down prices? Which months sales were important?

(2) Was the OMS grain sold in the correct subdivisions where the price increase was the most severe?

(3) Was the OMS grain sold in the subdivisions with the greatest deficit (as compared to less important areas experiencing only a reduced surplus)?

(4) Was it OMS rice plus wheat which turned prices down? How effective was wheat in bringing down prices?

(5) Or was it only combined effect of OMS plus increased offtake of modified rationing (MR) which supplied the additional grain needed to reassure the traders and consumers that the anticipated shortfall would not affect them?

4.37 To answer these questions, a series of regressions were run which could test the relationships implied in these questions. The first model is a cross sectional statistical test of the relationship implied in questions (3) and (5).

(1) Offtake = a + b (Shortfall) +c(SurDef)

where Shortfall is represented by the two defined shortfall variables discussed earlier. SurDef is the 1978 defination of whether the subdivisions were on balance surplus or deficit in cereal grain production, in thousand long tons. A number of offtake variables were constructed for testing with this model. The variables involving only OMS grain were as follows:

Offtake 1 = OMS rice sold during July-September period

Offtake 2 = OMS rice sold during July-October period

Offtake 3 = OMS rice and wheat sold during July-September period

Offtake 4 = OMS rice and wheat sold during July-October period.

Offtake 5 = OMS rice sold during July-September period plus .58 times OMS wheat sold during July-September period.

Offtake 6 = OMS rice sold during July-October period plus .58 times OMS wheat sold during July-October period.

The variables which combined the offtake of OMS and MR grain were as follows:

All offtake 1 =Sum of all OMS and MR rice and wheat during July-September period.

All offtake 2 =Sum of all OMS and MR rice and wheat during July-October period.

All offtake 3 =Sum of all OMS and MR rice during July-September plus .58 times sum of all OMS and MR wheat during July-September period.

All offtake 4 =Sum of all OMS and MR rice during July-October period plus .58 times sum of all OMS and MR wheat during July-September period.

4.38 There constructed variables are mostly self-explanatory except for the "seemingly misterious number" (.58) which appear in Offtake 5, Offtake 6 and All Offtake 3 and All Offtake 4. This represents the marginal rate of substitution of ration wheat for market rice and is a result of an iterative econometric estimation carried out by Raisuddin (1979). It indicates that wheat is only 58% as effective in satisfying demand as market rice; alternatively stated it means that 1.72 maunds of wheat must be sold to have the same demand effect as one maund of rice.

4.39 These ten possible offtake variables were tested against the two possible shortfall variables - a total of twenty combinations. The seven regressions which gave relatively good fit are presented in Table 4.10 below:

Table 4.10

Regression Results - Offtake Regressed Against Estimated Shortfall A and B and Surplus/Deficit Position

Dependant Variables	Constant	Shortfall A	Shortfall B	SurDef	R^2
Offtake 6	15835.15	-1578.68** (434.4)		-23.80 (30.88)	.21
Offtake 6	19680.74		-1268.10 (493.07)*	10.40 (30.10)	.12
All Offtake 1	62687.11	-10609.71** (2411.77)		-413.49 (171.46)*	.28
All Offtake 1	74669.54		11927.7** (2542.57)	-215.73 (155.20)	.31
All Offtake 2	111495.00	18738.00** (3821.74)		-586.04* (271.70)	.32
All Offtake 3	43545.15	-7948.00** (1726.39)		-310.76* (122.73)	.30
All Offtake 4	76826.23	-13691.88** (2716.30)		-446.04* (193.11)	.34

Notes: (1) Standard errors are in parenthesis. ** and * indicate that the co-efficient is statistically significant at 1% and 5% level.

(2) The sign for either Shortfall A or B should be negative (Shortfall itself is a negative number). And the sign for the variable SurDef should be negative. The latter should be negative because subdivision with a normal surplus should receive less offtake; conversely, subdivision with large basic deficits should be expected to have larger offtake.

The following observations can be made based on regression results presented in Table 4.10

4.40 Firstly, of the six Offtake variables (which included OMS but excluded MR), only Offtake 6 gave a reasonable fit when tested against the two computed shortfall variables. Offtake 6 was the sum of all OMS rice (July-October) plus .58 times all wheat Offtake for the same period. Offtake variables 1 to 5 did not achieve significant statistical fits. One can thus conclude that the first five possible OMS variables were not significantly related to the estimated shortfall per subdivision. Both rice and wheat were important and October Offtake were especially important.

4.41 Secondly, was OMS alone more or less significantly related to the estimated shortfall than the combination of OMS and MR as represented by the All Offtake variables? Inspection of the results presented in Table 4.10 shows that the All Offtake variables gave somewhat better fit as measured by R^2. The closest fit of all the regressions was between All Offtake 4 and Shortfall A. This was a relationship between (a) the sum of OMS and MR rice for the entire four months added to .58 times the sum of all OMS and MR wheat for the four months and (b) the anticipated shortfall in grain production as estimated by starting with the seasonal low price and using the price elasticity of demand (-.23).

4.42 Thirdly, was the grain sold in the correct subdivision? By this is meant, was the grain sold not just in subdivision which had a currently anticipated shortfall but instead in deficit subdivisions which had a shortfall (rather than surplus subdivisions which only expected a decreased surplus)? The regression results in Table 4.10 sort this question out rather nicely. The OMS variable included (offtake 6) did not give a good regression fit with both Shortfall and SurDef and one can conclude that the OMS rice and wheat (July through October) sales, while linked with size of current shortfall, were not closely linked with the basic surplus/deficit nature of the subdivisions.

4.43 However, when MR grain was added to the OMS grain, the simultaneous association with the two variables becomes much stronger. Again, it appears that the last regression in the test (All Offtake 4 with Shortfall A, SurDef) gives a marginally better fit than any other. This would indicate that it was the sum of OMS and MR rice plus .58 times the quantity of wheat which became the best targetted at dispensing grain in deficit areas with a large shortfall.

4.44 Of the original five questions posed at the beginning of this Section, two of them were basically quantity relationship questions (3 and 5), asking whether the offtake of publicly controlled grain was correctly targetted to areas where the anticipated deficit was greatest and in quantities sufficient to do the necessary job. The remaining question (1,2 and 4) dealt with price management. Was the OMS grain (or OMS plus MR) sufficient to bring down prices?

4.45 To answer these questions a set of new per capita offtake variables were constructed by dividing the ten previous offtake variables by subdivision population. This step was necessary because of the need to "normalize" and to put on a per capita basis the different quantities of offtake on a subdivisional basis. To measure the degree to which prices fell after October 7 (and they fell very quickly), there was a need for the construction of price-decrease variables. Two were created. P Fall 1 was the drop in coarse rice price from October 7 to October 21. P Fall 2 was the drop from October 7 to November 4. The first tested a two week period, and the second tested a four week period.

4.46 The ten per capita variables were then statistically tested against the two price-decrease variables (a total of twenty regressions). Results are shown in Table 4.11 giving the best fits only, and discarding those for which no significant statistical relation could be established.

Table 4.11

Regression Results - Offtake Per Capita Regressed Against Degree of Price Fall

Dependant Variable	Constant	Independant Variable	R^2
P Fall 1	-13.66	-1.098** (OffCap 3) (.28)	.23
P Fall 2	-24.09	-1.077** (OffCap 3) (.33)	.18
P Fall 1	-13.15	-1.71** (OffCap 5) (.46)	.22

Note: Figure in parenthesis represent standard error of the respective co-efficient.

4.47 Of the twenty possible regressions, these are the only ones successful at establishing the relationship. No variable of the type All Offtake per capita (which combined OMS grain with MR grain sales) was found to be significantly related to the degree of price decreases. However, several of the OMS variables were very positively associated with price management. For example, offtake per capita 3 (which was the sum of OMS rice and wheat for the months of July, August and September) was significantly related; the negative sign is correct and the co-efficient is significant at 1% probability level. Also, offtake per capita 5 (which was sum of OMS rice plus .58 times the quantity of wheat for July, August and September) was also significantly related to the resulting price fall. The price decrease variable which appeared more often was the two week price fall (P Fall 1) from October 7 to October 21.

4.48 Thus, of the seventeen regression attempts which were no successful, one can infer that the per capita offtak variables were not as directly linked with price decrease This implies that the additional OMS grain sold in Octobe (which was a substantial increase over July, August an September levels) and appear only in variables offtake 2 offtake 4, offtake 6, All Offtake 2 and All Offtake 4 wa not as important as the grain sold up through the end o September, in causing prices to fall from October 7 throug October 21. Also, the fact that any of the All Offtake pe capita variables (which include MR) do not appear in th final acceptable regressions indicates that the addition o MR to OMS was not more powerful than OMS alone in moderatin prices.

4.49 Following conclusions were drawn by Montgomery based upo his empirical work:

(a) A program such as OMS does not need to make up 100 anticipated shortfalls in grain production. By providing approximately 40% to 50% of the anticipated shortfall and demonstrating a commitment to continue to sell grain, government can adequately change the direction of price change. And once change in direction is established it encourages other traders to sell grain and take advantage of high prices already established.

(b) Prices cannot remain flat throughout the year; indeed they should not because private traders who perform the function of storing grain must be rewarded for their economic activity. With rural interest rates at the levels present at Bangladesh, foodgrain prices must rise by about 5% per month. This can be considered a normal price rise and does not signal the apprehension of future shortfall.

(c) However, price increase of 10% per month or more are a clear warning of a potential shortfall in grain production. They must be used to initiate government grain sales program which can add significant quantities of grain to the market at such a critical time. Compared to modified rationing (MR), open market sales (OMS) have shown considerable ability to influence prices and keep them within a chosen band.

(d) The period of concern about grain prices is now well established; such period occur twice a year during the approximately four months of price rise. If prices rise by about 5% per month for the four month period (upto April and upto October) they will rise a total of 20% each time and stay within the band suggested by the World Bank.

4.50 Empirical Extension of Montgomery's Work

The disaggregated price model developed by Montgomery was used to evaluate the effectiveness of OMS program during 1982/83 period. Attempts have been made in this study to examine whether the conclusions derived by Montgomery retains its validity in the subsequent years as well. Following the same analytical framework, the regression equations were reestimated using data covering 1983/84 and 1984/85 period. The findings of this empirical exercise are summarised below.

4.51 Regression Results for 1983/84

The regression model tested remains the same as before:

Offtake = a + b (Anticipated Shortfall) + c (SurDef)

The variables, however, have been defined in a slightly different way. Anticipated shortfall is represented by shortfall A as defined in Montgomery's work using Expected Price A; i.e. to find the actual lowest weekly price during July-August '83 period and increase it by 5% for every 28 days forward to the period when weekly price peaked. SurDef is the 1981 definition of whether the subdivision was on balance surplus or deficit in foodgrain production. This has been documented in Upazila Statistics (1980/81 to 1982/83), Vol. I, Bangladesh Bureau of Statistics. Following offtake variables were considered for testing the regression model using monthly offtake data covering July '83 - November '83 period.

OMS Offtake 1 = OMS rice sold during July-September period

" 2 = " " July-October period

" 3 = " " July-November period

" 4 = OMS rice and Wheat sold during July-Sept period

" 5 = " " " July-Oct period

" 6 = " " " July-Nov. period

" 7 = OMS rice sold during July-Sept. period plus .58 times wheat sold during the same period.

" 8 = OMS rice sold during July-Oct period plus .58 times wheat sold during the same period

" 9 = OMS rice sold during July-Nov period plus .58 times wheat sold during the same period.

" 10 = OMS rice sold during the July-Sept. period plus .74 times wheat sold during the same period

" 11 = OMS rice sold during the July-Oct period plus .74 times wheat sold during the same period

" 12 = OMS rice sold during the July-Nov period plus .74 times wheat sold during the same period

MR Offtake 1 = MR rice sold during July-Sept. period plus .58 times wheat sold during the same period

" 2 = MR rice sold during July-Oct period plus .58 times wheat sold during the same period

" 3 = MR rice sold during July-Nov period plus .58 times wheat sold during the same period

All Offtake 1 = Sum of OMS and MR rice and wheat sold during July-September period

" 2 = Sum of OMS and MR rice and wheat sold during July-October period

" 3 = Sum of OMS and MR rice and wheat sold during July-November period.

4.52 The complete set of estimated regressions are presented in Appendix 4D. It is readily observed that none of the equation gave statistically good fit as measured by R^2. OMS offtake during July '83 - November '83 period either separately or combined with MR offtake failed to establish any significant relationship with anticipated shortfall in Aman harvest and/or surplus/deficit position of subdivision. One can possibly offer several explanations for this poor performance.

(1) The total amount of OMS offtake during the period was too insufficient to cover the anticipated shortfall in Aman production deduced from the behaviour of weekly rice prices. OMS offtake during July '83 - November '83 period was 38,378 tons which accounted for only 28% of the grain shortfall (134,810 ton) anticipated during the period.

(2) Twenty seven out of fifty eight subdivisions studied here recorded OMS offtake which was less than 40% of the anticipated shortfall estimated for these subdivisions. Of these, OMS offtake of twenty subdivisions were even less than 20% of the anticipated grain shortfall. On the other hand, OMS offtake for twelve subdivisions were observed to be greater than their anticipated shortfall[1]. They may have disturbed the greater shortfall - higher offtake relationship postulated in the model.

(3) Aman harvest in 1983/84 was much more satisfactory as compared to that in 1982/83. Therefore, the rice market was relatively soft during this period in 1983/84, which is reflected in our estimate of anticipated shortfall in Aman production, (which is about half of that estimated by Montgomery for Aman harvest in 1982/83). On the other hand, 1983/84 was marked by poor harvest of Boro crop, which must have put considerable pressure on the market during the months preceding the Boro/Aus harvest. OMS offtake during this period was much greater in 1983/84 as compared to any other year[2]. Attempts to establish a meaningful relationship between OMS offtake and anticipated shortfall in grain harvest perhaps could have been more successful during the February '84 - May '84 period.

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1 OMS offtake and anticipated shortfall in Aman harvest for each subdivision are shown in Appendix 4F.

2 OMS Offtake during February-June period was 38% in 1983/84 as compared to only 3% and 5% in 1982/83 and 1984/85 respectively.

4.53 Regression Results for 1984/85

Following offtake variables were considered for testing the model with data covering 1984-85 period.

Oms Offtake 1 = OMS rice sold during July-September period

2 = " " " " July-October "

3 = " " " " July-November "

4 = OMS rice and wheat sold during July-September period

5 = OMS " " " " " July-October period

6 = OMS " " " " " July-November period

7 = OMS rice sold during July-September period plus .58 times wheat sold during the same period.

8 = OMS rice sold during July-October period plus .58 times wheat sold during the same period.

9 = OMS rice sold during July-November period plus .58 times wheat sold during the same period.

10 = OMS rice sold during July-September period plus .74 times wheat sold during the same period.

11 = OMS rice sold during July-October period plus .74 times wheat sold during the same period.

12 = OMS rice sold during July-November period plus .74 times wheat sold during the same period.

13 = OMS wheat sold during July-Septmeber period.

14 = " " " " July-October period.

15 = " " " " July-November period.

MR Offtake 1 = MR rice sold during July-September period.

2 = " " " " July-October period.

3 = " " " " July-November period.

4 = MR wheat sold during July-September period.

5 = MR wheat sold during July-October period.

6 = MR wheat sold during July-November period.

7 = MR rice and wheat sold during July-September period.

8 = MR rice and wheat sold during July-October period.

9 = MR rice and wheat sold during July-November period.

All Offtake 1 = Sum of all OMS and MR rice and wheat sold during the July-Septmeber period.

2 = Sum of all OMS and MR rice and wheat sold during the July-October period.

3 = Sum of all OMS and MR rice and wheat sold during the July-November period.

4 = Sum of all OMS and MR rice plus .58 times all OMS and MR wheat sold during July-September period.

5 = Sum of all OMS and MR rice plus .58 times all OMS and MR wheat sold during July-October period.

6 = Sum of all OMS and MR rice plus .58 times all OMS and MR wheat sold during July-November period.

7 = Sum of all OMS and MR rice plus .74 times all OMS and MR wheat sold during July-September period.

8 = Sum of all OMS and MR rice plus .74 times all OMS and MR wheat sold during July-October period.

9 = Sum of all OMS and MR rice plus .74 times all OMS and MR wheat sold during July-November period.

4.54 The complete set of regressions are presented in Appendix 4E. The performance of OMS program evaluated in terms of estimated regression model is observed to be rather poor. However, a subset of regressions which gave relatively better fit are presented in Table 4.12.

Table 4.12

Regression Results - Offtake Regressed Against Anticipated Shortfall and Surplus/Deficit Position

Dependant Variable	Constant	Anticipated Shortfall	SurDef	R^2
OMS Offtake 1	235.20	27.2 (2.36)*	-.20 (.55)	.14
OMS Offtake 2	396.60	38.00 (2.17)*	-.18 (.30)	.11
OMS Offtake 3	437.24	44.07 (2.24)*	-.45 (.66)	.13
MR Offtake 1	850.19	-78.33 (2.44)*	.19 (.18)	.13
MR Offtake 2	984.24	-88.31 (2.41)*	.31 (.25)	.13
MR Offtake 3	1160.01	-105.64 (2.44)*	.33 (.22)	.13
MR Offtake 4	2194.80	-199.51 (2.14)*	-.92 (.29)	.09
MR Offtake 5	3054.11	-304.00 (2.40)*	-.67 (.15)	.11
MR Offtake 6	3463.72	-341.30 (2.38)*	-.64 (.13)	.11
MR Offtake 7	3044.99	-277.84 (2.29)*	-.73 (.17)	.10
MR Offtake 8	4038.35	-392.3 (2.40)*	-.36 (.06)	.12
MR Offtake 9	4623.73	-446.94 (2.43)*	-.30 (.50)	.12

Of the twelve regression results presented, three relate to OMS offtake and the remaining nine relate to MR offtake. None representing combined OMS and MR offtake is included in the subset[1]. Thus only three out of fifteen regressions representing only OMS offtake, all nine representing only MR offtake and none involving combined OMS and MR offtake gave relatively better results, as measured by R^2.

4.55 Also, it is observed that the three OMS regressions come out with wrong signs for the ASF variable (though with correct signs for the SurDef variable) while all MR regressions gave correct (negative) signs for ASF variable and six of them gave correct sign for both ASF and SurDef variables, although the estimated coefficients of the latter was hardly statistically significant. How can one explain such regression results? In particular, how one can appraise the performance of OMS program in 1984/85 as compared to that in 1982/83 which has witnessed, as we observed earlier, effective OMS operations?

4.56 In 1982/83, OMS was initiated in September when market prices rose rapidly-the retail prices of coarse rice and wheat rose about 27% and 37% over procurement prices. Substantial amount of grains totalling about 1.36 lakh tons (of which .60 lakh tons was rice and .77 lakh tons was wheat) was released through OMS, which accounted for about 27% of total PFDS distribution during the September-November period. This had an immediate and noticeable impact on market prices of foodgrains. Rice and wheat prices were brought down to about 22% above procurement prices by November 1982 and following the aman harvest in December, market prices of both rice and wheat were reduced to about 16% above procurement price of rice and 19% for wheat. Thus OMS operations in 1982/83 was quite successful in containing seasonal price increases within reasonable limits.

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1 This contrasts with the results derived by Montgomery (1983) using 1982/83 data, wherein combined OMS and MR offtakes gave better results.

4.57 In 1984/85, on the other hand, market prices were already well above trigger prices for initiating OMS as early as in July 1984 due to bad boro and aus harvest in 1984. Although OMS were initiated in July 1984, they accounted for only about 12% of total PFDS distribution during the period. Even when relief distribution is excluded, OMS in 1984/85 accounted for only about 15% of total PFDS distribution during the lean season period. Thus the effect of OMS on market prices was much less marked than in 1982/83 (World Bank Annual Report, 1985). This is also reflected in our estimated regressions (Appendix-4G) linking the OMS offtake with the degree of price decline following the peak period. An additional reason for the relatively modest impact of OMS on foodgrain prices in 1984/85 was a limited amount of rice sold under OMS. Proportion of rice sold under OMS was reduced from about 44% in 1982/83 to about 22% in 1984/85. Since the cross elasticity of wheat to rice is estimated to be only .58, it takes almost twice as much wheat sales as rice in order to achieve the same effect on rice prices.

4.58 Before concluding this section, a few points seem to be in order. OMS is not a regular channel of PFDS in the sense of maintaining an even flow of foodgrain distribution throughout the year. It represents a special channel designed to be activated during the lean season when there is presumably greater pressure in the grain market. Timely release of foodgrains as dictated by the OMS trigger prices in adequate quantities to meet the anticipated shortfall should contribute towards arresting the seasonal upswing of prices, particularly in a bad crop year, and thereby serve as an effective tool for moderating seasonal price fluctuations in Bangladesh.

4.59 However, if the grain market in any year is not characterised by shortfall due to good prospects of ensuing harvest, then the seasonal price increase may remain confined within the limits set by economic costs of storage (say, within 20% as suggested by the World Bank). The role of OMS will necessarily be limited in such a situation. Volume of OMS offtake will be smaller because the sales operation will be initiated for a shorter period and also in a limited number of areas. Moreover, in a normal crop year, the price differential between OMS and current market price may not be sufficient to compensate for the quality difference, inconvenience of distance and queuing costs involved. There will thus be little incentive on the part of the consumers to participate in such a programme. The experience with OMS offtake in recent years could be an indicative of this phenomenon. Under these circumstances, a larger price differential through fixation of OMS price at a lower level would help in boosting the OMS offtake,if it is needed to do so.

CHAPTER 5

ROLE OF PFDS IN REDUCING SPECULATIVE BEHAVIOUR OF RICE TRADERS IN BANGLADESH

5A Introduction

5.1 This Chapter is devoted to studying the speculative behaviour of rice traders in Bangladesh. Excessive hoarding during the lean months between harvest arising out of speculative behaviour is generally identified to be an important contributing factor to Bengal Famine of 1943, 1974 famine in Bangladesh as well as numerous other famines in the subcontinent during the nineteenth century. Apart from famines, that such speculative hoarding by private traders contribute greatly towards aggravating the food crisis in a bad crop year is now widely accepted. Thus, it becomes very important to identify the main determinants of such speculative behaviour on the part of the rice traders in Bangladesh. Also, it is necessary to develop insights into the perceptions of grain dealers particularly the wholesalers as to the actual and potential role PFDS offtake can play in dampening such behaviour. To this end, a field survey was conducted among a sample of rice traders to generate relevant information which form the basis of much of the analysis carried out in this Chapter. Before doing that, however, we would like to draw on the findings of two recently completed studies (Ravallion, 1985 and Ravallion and Van der Walle, 1983) in this field as pertaining to traders' price expectations in Bangladesh rice market and the allocative performance of food institutions during famine in Bangladesh, These are discussed below in Sections 5.2(a) and 5.2(b).

5B Traders Price Expectations in Bangladesh Rice Market

5.2 Ravallion's (1985) work offers some evidence on the price forecasting performance of a group of prominent Bangladeshi rice traders, surveyed for the purpose. Total storage at any time will depend on stock holders expectations about future scarcity. Thus the concern with private storage raises the question of how well stock holders forecast future prices. His paper particularly deals with the question of whether or not traders price expectation satisfy the condition of informational efficiency; in other words, could their price forecasting precision have been increased using readily available information? For the purpose of the study, twenty

eight (28) traders in the main wholesale rice market at Badamtali were interviewed at about the same time on each day in the market was open for three months. The survey was conducted about two weeks before the main winter (aman) harvest of 1983-84. The sample constituted twenty (20) "aratdars", four (4) "beparis" and four (4) "retailers". The following comments give an overview of the results:

5.3 (a) Expectations track the prices fairly well; the standard deviation of the forecasting error is about 2% of the mean price. But the variance is quite high; the coefficient of variation is about 1.9. And a tendency to underestimate is apparent, particularly in December and early January, the period when the new harvest arrives. Of course, it is not hard to achieve quite precise forecasting of the day-to-day movements of a highly autocorrelated variable; static expectation will often do the trick. But they will rarely be informationally efficient and could yield substantial biases in storage decisions (relative to a rational expectation storage rule) if prices become highly unstable.

5.4 (b) Overall there was a very high level of agreement amongst the traders concerning their price expectations, although, some of this may be due to the interviewing process itself. Of the 231 distinct correlation coefficients between the first differences of the (log) price expectations of the 22 regularly interviewed traders, 164 exceed .7 and all except one are significant at an 1% level.

5.5 Ravallion conducted a number of econometric tests to examine whether there is any forecasting bias in the sample and the nature of such forecasting bias, if there is any. Forecasting bias can be tested by regressing realizations against their forecasts, and then testing the appropriate unbiasedness restrictions using calculated regression coefficients and residuals. The results of these tests are summarised below:

5.6 Forecasting errors (expected minus actuals) are found to be positively correlated with expectations. Thus at any point in time, there is a critical value of each trader's price expectation, above which future price can be overestimated and below which it will be underestimated. The turning point in the direction of bias varies quite a lot amongst the traders. For most traders, these figures are contained within (or are reasonably close to) the range of the data, although underestimation is more common than overestimation for all traders. This seems most marked during the harvest period. At the same time, there is a universal tendency to overestimate the absolute magnitude of price changes, and in this sense, expectations tend to be more volatile than realizations.

5.7 Ravallion also used a composite model embodying both bias and efficiency tests of forecasting and observed that when the two sources of forecasting bias were nested within one model, forecasting errors were more consistently correlated with forecasts than with past realizations.

5.8 A future implication of informationally unbiased forecasting is that changes in the expectations in the price to prevail at a fixed future date should be unpredictable on the basis of current information. Therefore, terminal price expectations as a martingale was also investigated by Ravallion. The results of this test can be summarised as in the following:

5.9 The terminal price forecasts for a majority (but not all) of the traders turn out to be inconsistent with informationally efficient forecasting. The martingale property can be reasonably rejected for either first or second differences for 14 traders. It may be noted that the finding seems to be in marked contrast to the results of numerous tests of the efficiency market hypothesis for future and other speculative price in developed countries. While this comparison suggests greater informational inefficiency in Bangladesh rice markets, one should note that it is probably a good deal easier to find such inefficiency at the individual level than in futures market prices; since the latter will improve forecasting performance by aggregation. Thus, the present results do not imply that, if an organized futures market for rice existed in Bangladesh, it would be inefficient. Rather, the results suggest that relevant allocative decisions made in the existing spot market will depart significantly from those based on informationally efficient price expectations.

5.10 The overall conclusions that emerge from Ravallion's study investigating into the price forecasting performance of Bangladesh rice traders may be briefly summarised below:

5.11 (a) The restrictions implied by the unbiasedness of one-day-ahead price forecasts are convincingly rejected on the basis of residual variance tests at the individual level. The martingale model of price forecasts for a terminal date is also rejected as a generalizations of traders' forecasting behaviour. Overall, "informational efficiency" seem to be a poor characterization of expectations formation in this market.

5.12 (b) A striking results of the bias tests is the universal tendency of the traders to overestimate price changes: forecasting errors (expected minus actual) are positively correlated with forecasts. There exists a critical level of expectations below which future prices are underestimated and above which they tend to be overestimated.

5.13 However, these results, as the author himself admits, beg a number of questions. The behavioural reasons for the revealed pattern of forecasting bias remain unclear. This is also true of the potentially very important implications for storage and price formation.

5C The Allocative Performance of Food Institutions During a Famine

5.14 Revallion and Van der Walle (1983) has examined the allocative performance of food institution in Bangladesh during the famine of 1974[1]. Their work was primarily designed to develop applicable methods for assessing the performance of markets and governments in allocating food consumption over time when food production is discontinuous and uncertain. Applications have been made to Bangladesh during the post-independence period, including the 1974 famine.

5.15 The issue is particularly important in an economy such as Bangladesh which has suffered repeated food crisis in recent times, many of which have been blamed on the poor allocative performance of food institutions. In the case of the 1974 famine, this view gained credibility from the knowledge that despite heavy flooding during the year, current aggregate production reached a local peak. If the famine was not due to decline in aggregate food availability then there must be a strong presumption that the intertemporal and/or interpersonal allocation of consumption was at fault. In Sen's terminology, the famine was one of "trade entitlement failure" rather than "food availability decline". The following sections summarise the methods used in this study in examining the allocative performance of foodgrains market, and some aspects of the government activities, as well as the preliminary findings in applying these methods to the Bangladesh famine of 1974.

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1. Although the analysis has been carried out in the context of the famine of 1974,the implications have much relevance for other period with varying degrees of food crisis in Bangladesh

The Intertemporal Performance of Foodgrain Market

5.16 During the last half of 1974 in Bangladesh many observers, including the government, blamed the hoarders for the famine condition. Recent discussion have further emphasized the role of speculation in foodgrain as a possible cause of famine. By this reasoning, famine is attributed to the expectations on the part of the stock holders of a substantial future price increases. The validity of this explanation is far from obvious. If a famine is prolonged, then "hoarding" at the early stage will improve foodgrain availability later on. Thus "hoarding" can be desirable response by markets to discontinuous and uncertain production. It remains to clarify the precise meaning of "exessive hoarding" and to determine if this is a cause of famine.

5.17 Revallion and Van der Walle's research on this topic has concerned the development and application of a quantitative method for evaluating private storage in this setting. The method deems competitive hoarding to be excessive if it is not justified by a rational expectation of future scarcity. In other words, the private sector stock level is considered to be excessive if stock holders overestimate future prices and could have reduced their forecasting errors using available information. The criterion for informational efficiency can be developed into a test for market performance using data on realised market prices. Clearly, it is desirable that private storage should respond to future scarcity and then, so should the spot price of a storable good. But it is not so clear that such a relationship should exist independently of future prices. If there is convincing evidence that readily available information on likely future scarcity affected current price independently of realised future prices then it is reasonable to conclude either that market prices do not adjust to reflect [illegible] or that the information on future scarcity is leading [illegible] biased price forecasts. In either case, markets are not performing well.

5.18 The proposed methodology require a careful econometric modelling of foodgrain price determination. When production is discontinuous, current price will depend in part on the expectation held by storage agents about future prices. But price expectations cannot usually be observed. If expectations are rational in the Muthian sense then one can treat actual future prices as a measure of expected future prices with a measurement error which is uncorrelated with existing information. This can be dealt with by an appropriate instrumental variable estimator. The resulting procedure is the "error in variable" method for econometric models incorporating rational expectations.

5.19 However, one can visualise a situation where the errors made in forming price expectations do not satisfy the muthian condition in that the forecasting errors are correlated with information which are available at the time expectations were formed. If one has a prior belief about the nature of that information then this can be incorporated explicitly into a modified error in variable method of estimation. In particular, one can suppose that current price is a stochastic function of future price and the variables which are thought to bias expectations. Thus provided there are no identification problem (e.g. that the relevant information is not also a determinant of current production), one can set up the price determination model in a form which has the rational expectation hypothesis nested within a general model and testable as a parameter restriction.

5.20 Two important measurement problems are posed by the choice of these variables which are hypothesized to be correlated with price forecasting errors.
First, it should be highly plausible that the chosen variables were information available at reasonable cost to stock holders at the time they formed their expectations.
Second, to avoid identification problems, the chosen variables should not also be determinants of current production or consumption.

5.21 In dealing with the first problem, the authors used information contained in past newspaper reports of crop damage and government activities. Daily Bangladesh newspaper have been used to make a count of the number of reports of crop damage each month during the period. All reports of damage likely to affect current rice output or time profile of future output have been counted. In dealing with the second problem, the information contained in the rice crop calender has been combined with the reports on crop damage to construct an index of recent damage to future output. Then, the index ignores reports of crop damage likely to affect production in the current month.

Government Activities in Foodgrain Market.

5.22 Many governments purchase foodgrains at the time of harvest and sell in the lean months, usually by rationing at low prices. One often finds, particularly in a food crisis, that this form of direct market intervention is accompanied by (or even abandoned in favour of) government promises or threats to take further action in the near future. Examples include promises to increase food imports and threats to take coercive action against stockholders.

5.23 The effects on markets of this form of government activity do not seem to be well understood, partiqularly when private food storage is possible but traders face uncertain future prices. The authors have examined the causes and effects of promises as a distinct form of government activity. Promises are viewed as a political response to unstable market conditions. As well as influencing the price expectations of individual traders, government promises and announcements are seen to alter the distribution of information amongst traders. Thus, promises may destabilise markets. The quantitative analysis of the government's promises in post-independence Bangladesh have been based on detailed monitoring of daily newspaper reports of the government's intentions to take an action aimed at effecting conditions in rice markets.

Main Findings of the Study.

5.24 (a) The econometric method of modelling rice price determination outlined above has performed well in reproducing a monthly time series of rice prices in post-independence Bangladesh, including the dramatic changes in the latter half of 1974. The results indicate that newspaper reports of future crop damage had a highly significant positive effect on current rice prices during the period, and that this effect existed independently of future prices.

5.25 The main interpretation offered for this empirical finding assumes that rice prices adjust competitively to clear markets. Although the adjustment needs not be instantaneous, it is assumed that traders believe that future prices adequately reflect the future scarcities on which their storage decisions depend. This interpretation supports the conclusion that traders' price forecasting errors were correlated with readily available information on damage to the future harvest. Thus private sector storage was excessive during the famine when compared to the likely outcome under competitive conditions with well informed and rational price expectations.

5.26 (b) Preliminary results support the view that the Bangladesh government's numerous promises to take action in rice markets during 1972-75 were motivated by high rice prices and food shortage. In making its promises, the government was constrained by its foodgrain stocks and also aimed for a reasonable balance between its recorded actions and its past promises. However,their results do not support the view that the government's promises as opposed to the actions themselves, had the effect of lowering traders' price expectations. They conclude that traders did not reduce their rice stocks in response to the

government's promises; if anything, their effect on expectations was price de-stabilising. On the other hand, a potential remained for limited stabilisation using immediate intervention on the supply side, although this possibility was severely constrained by the low level of public food grain stocks at critical times during 1974.

5D Behaviour of Rice Traders in Bangladesh-Findings of a Sample Survey

5.27 As mentioned earlier, attempts were made to collect information through field survey from a sample of rice traders in Bangladesh. The survey was so designed as to elicit information pertaining to rice traders behaviour particularly with respect to their stocking decisions, and how these decisions are affected by various PFDS operations in Bangladesh[1]. We first discuss the size and composition of the sample and some aspects of rice markets in Bangladesh. This will be followed by an analysis of the factors influencing stocking decisions of rice traders, and also what significance they attach to the operation of PFDS in Bangladesh.

Size, Composition and Some Data Characteristics in the Sample.

5.28 Table 5-1 shows what categories of traders were interviewed, their size and the location in which the survey was carried out.

Table 5-1

Size and Composition of the Sample in Traders Survey.

Category	Location	Sample Size
I Wholesalers		42
(a) Bepari		11
(b) Aratdar	Badamtali (9), Babubazar (4)	13
(c) General	Mirpur (7), Kowranbazar (2)	9
(d) Miller	Mirkadim (4), Ferangibazar (3) Others (3)	9
II Retailers	Malibaghbazar (3), Thataribazar (3) Kowranbazar (4), Fakirapulbazar (2)	12

1. A translated version of the Questionnaire used in the survey is appended with this report in Annex-

5.29 It is quite evident from Table 5-1 that in total fiftyfour (54) traders were interviewed, of which fortytwo (42) were wholesalers and the rest, twelve (12) were retailers. Four categories of wholesalers were identified for the survey, namely bepari, aratdar, general wholesaler and miller wholesaler[1]. The field survey was carried out in various markets in Dhaka City and its surrounding areas during the third and fourth week of November (Nov.16-Nov.24), 1985.

5.30 Tables 5.2A through 5.2D present information with respect to some socio-demographic and functional characteristics of various categories of rice traders in the sample.

Table 5.2A

Age and Educational Level of Different Categories of Traders.

Category	Age		Education	
	Mean (Years)	Coefficient of Variation (Percentage)	Mean (School Years)	Coefficient of Variation (Percentage)
I. Wholesalers	38.3	31.2	6.9	45.7
(a) Bepari	34.4	26.9	6.8	49.7
(b) Aratdar	42.2	27.7	8.9	29.7
(c) General	34.0	10.5	4.2	71.3
(d) Miller	42.9	36.9	7.4	50.5
II. Retailers	37.8	32.4	5.6	45.3

Source: Traders' Survey, 1985.

Note: Generally, the bepari wholesalers buy rice or paddy from the primary markets and sell them to retailers either directly or through agents. The aratdar wholesalers procure rice from the primary markets through farias and salaried agents and sell them direct to the retailers. The general wholesalers buy either from the primary markets or from the millers or even the growers through farias and sell them to the retailers. The miller wholesalers purchase paddy through intermediaries and mill themselves into rice before selling it to the retail traders.

Table 5.2B

Variety of Rice Traded by Different Categories of Traders

Category	Coarse		Medium		Fine	
	Mean	C.V.	Mean	C.V.	Mean	C.V.
I. Wholesalers	43.3	29.4	38.2	30.5	18.5	85.9
(a) Bepari	28.8	53.5	38.7	35.1	32.5	90.4
(b) Aratdar	53.8	21.0	32.7	26.7	13.5	58.5
(c) General	43.3	28.8	40.0	22.8	16.7	46.9
(d) Miller	46.7	26.4	42.9	32.1	10.4	40.2
II. Retailers	33.5	24.3	49.2	13.3	17.3	44.4

Table 5.2C

Type of Market Information Needed by Different Categories of Traders.

Category	Crop Condition	Rice Price	Market Arrival	Market Stock
I. Wholesalers	47.6	88.8	95.2	-
(a) Bepari	45.4	100.0	100.0	-
(b) Aratdar	46.2	69.2	100.0	-
(c) General	-	100.0	100.0	-
(d) Miller	100.0	88.8	77.8	-
II. Retailers	-	91.7	100.0	8.3

Note: The figure indicate the percentage of respondents with positive responses in total sample in that category.

Source: Traders' Survey 1985.

Table 5.2D

Means Through which Market Information Collected By Different Categories of Traders

Category	Radio	Telephone	Newspaper	Market Visit	Other Dealers	Transport Agents
I. Wholesalers	-	68.0	-	78.6	88.1	4.8
(a) Bepari	-	72.7	-	54.5	72.7	9.1
(b) Aratdar	-	100.0	-	23.1	46.2	7.7
(c) General	-	33.3	-	100.0	66.7	-
(d) Miller	-	22.2	-	77.8	88.9	-
II. Retailers	-	-	-	66.7	75.0	16.7

Note: Same as in Table 5-2C
Source: Traders' Survey, 1985

5.31 Average age and education level of different categories of traders in the sample are presented in Table 5.2A. It is observed that there is virtually no difference in the average age (and also its variability) between the two major group of traders, wholesalers and retailers - with an average age of about 38 years showing about 38% variability in the sample. The level of education as measured by the number of school years attained by the wholesalers is somewhat higher than that of the retailers - 6.9 school years among the former as compared to 5.6 school years among the latter. Both the groups display similar variability in the sample. Within the wholesalers group, however, one observes considerable differences in the level of education, with aratdar attaining the highest level (8.9 school years) and general wholesalers the lowest level (4.2 school year). It is also observed that the traders with the highest education level show lowest variability in the sample and vice versa.

5.32 Table 5.2B shows the relative importance of different variety of rice traded by various category of traders in the sample. The wholesalers as a group traded more in coarse variety of rice than in medium variety. This is particularly observed in case of aratdars. Retailers, on the other hand, seem to be trade more in the medium quality rice. For both the groups, fine variety of rice featured rather insignificantly, accounting for about 1/5th of their total volume of transactions. Bepari would appear to be the sole exception - fine rice claiming about 1/3 of the share in their total trade as recorded in the sample survey.

5.33 Regarding the type of market information required by the traders, it is observed (Table 5.2C) that price of rice feature rather prominently in the sample. This remains true for the respondents engaged in both wholesale and retail trade. About half of the respondents in the wholesalers group (but none among the retailers) also indicated crop condition as an additional factor entering their information package.

5.34 Among the means through which information are collected (Table 5.2D),the exchange of information with other dealers, market visits and telephone, in that order, were cited more frequently in the sample particularly for the wholesalers, though some variation were observed within themselves. Telephone as a means through which information collected did not feature at all among the retailers while neither radio nor newspaper were cited as an important means through which market information collected by either of the two groups.

Factors Affecting Stocking Decisions of Rice Traders in Bangladesh

5.35 As mentioned earlier, an important objective of trader's survey was to generate information that would facilitate our understanding of the decision-making process of rice traders particularly with respect to their stocking of foodgrains. In particular, attempts were made to identify the factors-both general factors as well as factors specific to the operation of PFDS that affect their stocking decisions. The results of the field survey pertaining to such behaviour are presented in Tables 5.3A through 5.3E.

Table 5.3A

Average Period and Amount of Stock by Different Category of Traders

Category	Buy More and Sell Less Now (Percentage)	Average Period of Stock		Average Amount of Stock	
		Mean (days)	C.V. (%)	Mean (maund)	C.V. (%)
I. Wholesalers	86.7	4.9	43.9	202.8	76.2.
(a) Bepari	90.9	3.6	22.2	69.2	77.2
(b) Aratdar	76.9	4.0	33.5	315.0	81.5
(c) General	100.0	6.0	60.0	168.0	75.8
(d) Miller	77.8	6.6	28.9	258.6	67.2
II. Retailers	66.7	6.5	15.4	12.5	134.6

Table 5.3B

Impact of Future Price on Stocking Decisions of Different category of Traders

Category	Tomorrow's Price	Price Expected After 3 days	Price Expected Next Week	Price Expected Next Month
I. Wholesalers	40.5	21.4	28.6	-
(a) Bepari	45.4	45.4	9.1	-
(b) Aratdar	61.5	-	15.4	-
(c) General	44.4	22.2	33.3	-
(d) Miller	11.1	22.2	66.7	-
II. Retailers	25.0	66.7	8.33	-

Table 5.3C

General Factors Affecting Stocking Decisions of Different Category of Traders

Category	Present Market Condition	Rice Harvest	Other Traders' Behaviour	Future Scarcity
I. Wholesalers	69.0	30.9	47.6	-
(a) Bepari	54.5	18.2	63.6	-
(b) Aratdar	61.6	23.1	46.1	-
(c) General	100.0	33.3	11.1	-
(d) Miller	66.7	44.4	66.7	-
II. Retailers	66.7	8.3	75.0	-

Notes: The Figures indicate the percentage of respondents with positive responses in that category.

Source: Traders' Survey, 1985

Table 5.3D

PPDS Factors Affecting Stocking Decisions of Different Category of Traders

Category	Ration Price	Ration Quota	Ration Offtake	Open Market Sale	Import of Foodgrains	Govt. Stock of Foodgrains
I. Wholesaler	-	-	-	95.2	90.4	4.8
(a) Bepari	-	-	-	100.0	100.0	-
(b) Aratdar	-	-	-	84.6	69.2	7.7
(c) General	-	-	-	100.0	100.0	11.1
(d) Miller	-	-	-	100.0	100.0	-
II. Retailers	-	-	-	91.7	58.3	16.7

Table 5.3E

Impact of Open Market Sale (OMS) on Stocking Decisions of Different Category of Traders.

Category	Awareness of OMS		Effectiveness in Checking Price Rise		Affecting Stocking Decisions		Amount of Stock Likely to be Affected
	Yes	No	Yes	No	Yes	No	
I. Wholesaler	100.0	-	100.0	-	95.2	4.8	92.4 (11.1)
(a) Bepari	100.0	-	100.0	-	84.6	15.4	100.0 (14.0)
(b) Aratdar	100.0	-	100.0	-	100.0	-	76.9 (9.5)
(c) General	100.0	-	100.0	-	100.0	-	100.0 (11.1)
(d) Miller	100.0	-	100.0	-	100.0	-	100.0 (9.4)
II. Retailers	83.3	16.7	100.0	-	91.7	8.3	75.0 (18.3)

Notes: Figures in parenthesis indicate the quantitative impact of OMS on traders stocking decisions, in particular, what proportion of traders' total amount of stock likely to be affected by OMS.

Source: Traders' Survey, 1985.

5.36 Table 5.3A shows that there is an overwhelming tendency on the part of the traders, particularly among the wholesalers to resort to stocking of foodgrains in the event of an expected production shortfall. Within the wholesaler group, this tendency is observed to be more pronounced among beparis and general wholesalers. Surprisingly though, the average period of stocking is observed to be greater for the retail traders (6.5 days) as compared to the wholesalers (4.9) days.The difference, however, may not be statistically significant, particularly for general wholesalers and millers. As expected, the average amount of stock as recorded in the sample, is considerably greater (about fifteen times) for the wholesalers as compared to the retail traders. There are noticeable variations within the wholesalers group, with aratdar recording the largest (315 maunds) and bepari the smallest (69 mds).

5.37 The impact of future price on stocking decisions of different category of traders are shown in Table 5.3B. It is readily observed that the traders; both wholesalers and retailers, stocking decisions are influenced by prices expected in the future but that the time frame of such price expectations is confined to only seven days[1]. Within this one-week time frame, however, there are considerable variations in price expectations affecting stocking decisions between the wholesalers and retailers and among the four category of wholesalers. About two-fifth of the wholesale traders are observed to be influenced in their stocking decisions by one-day-ahead (tommorow's price) price expectation, about one-third by one-week ahead price expectation and only about one-fifth by three-day-ahead price expectations. More retail traders, on the other hand, are motivated in their stocking decisions, by three-day-ahead price expectations (about two-third of them) than by one-day-ahead (about one-fourth) or by one-week-ahead (only 8%) price expectations. Among the wholesalers, aratdars are influenced by tomorrow's price most (about 60% of them) and the miller wholesalers least (only 11% of them), while the miller wholesalers are motivated in their stocking decisions by one-week-ahead price expectations most (about two-third of them) and the beparis least (only about one-tenth of them).

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1. This is also confirmed by responses to "others" category (referring to future prices for the periods not specified) which represented only 5% of total sample among the wholesalers and none among the retailers.

5.38 Table 5.3C shows the relative importance of different factors affecting stocking decisions of various category of rice traders in Bangladesh. It is observed that for most of the wholesalers, present market condition seems to an important factor affecting their stocking decisions. Also, about half of the wholesalers take into consideration other traders' behaviour and one-third of them the condition of rice harvest in making their stocking decisions. Retailers, on the other hand, cite both present market condition and other traders' behaviour as almost equally frequently as factors affecting their stocking decisions. A very few consider the condition of rice harvest as a relevant factor. It is significant to note that none in the sample consider future scarcity as a factor influencing his stocking decision.In our context this makes sense only when the future refers to a time period not exceeding one week as we observed earlier while discussing the role of price expectations in traders' stocking decisions.

5.39 Next, we attempt to analyse the set of factors specifically related to the operation of PFDS that affect traders' stocking decisions. This is done on the basis of results shown in Table 5.3D. It is readily observed that none of ration variables, such as ration price, ration quota and/or ration offtake entered into the stocking decisions of rice traders in our sample. This is true for both wholesale and retail traders. On the other hand, more than 90% of traders in both the wholesale and retail groups consider open market sales (OMS) of foodgrains by the Government as a factor affecting their rice stocking decisions. This remains true for almost every category of traders among the wholesalers as well. Import of foodgrains by the government also feature rather prominently as a factor affecting traders' stocking decisions. This is more pronounced among the wholesalers (almost each category) as compared to the retailers in the sample. Very few in the sample, however, consider government stock as a factor affecting their stocking decisions. Thus traders' stocking decisions would seem to be influenced by the expected build up of government stock through import of foodgrains rather than by its existing stock.

5.40 We have already observed that government OMS operation seem to play an important role in traders' stocking decisions. This happens because most of the traders (all wholesalers and more than 80% of retailers) are aware of such an operation and also believe that it is effective in arresting the price hike during the lean period[1].

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1. It is also observed that the impact of OMS on traders' stocking is confined to the period in which such operation is actually carried out.

Such conclusions emerge from the results shown in Table 5.3E. It is also observed that more than 90% of wholesalers and 75% of retailers consider the OMS operation as an important factor influencing the amount of rice they decide to stock but that the impact is likely to be quantitatively insignificant-only 11% for wholesalers and 18% for retailers in the sample. Also, not much variation is observed among different categories of wholesalers in this respect. Our survey findings with respect to OMS, therefore, underscore the need to devise appropriate measures for greater involvement of private rice traders in the public food distribution system.

5.41 Attempts were also made to ascertain whether the existing restrictions on foodgrain storage adversely affect the traders in their business transactions, in particular whether such restrictions forces them to incur losses. The results are shown in Table 5.4. It is readily observed that most of the respondents replied negatively to such a querry, both among the wholesalers and retailers. Similar responses were obtained when asked whether various govt. regulations in rice trade increased their cost of operating business. Again, most of the traders in different category replied negatively excepting beparis, most of whom felt that their cost increased due to the existence of various rules regulating rice trade in Bangladesh. The amount of such cost increase, however, is not significant-only 6% of their total cost of operation.

Table 5.4

Impact of Government Regulationson Rice Trade

Category	Does restrictions on storage of food-grains forces you to sell at a loss?		Does existing govt. regulations on rice trade increase your cost of operation?		Amount of such increased cost of operation
	Yes	No	Yes	No	(Mean) (%)
I. Wholesalers	4.8	69.0	21.4	61.9	6.0
(a) Bepari	9.1	63.6	63.6	27.3	6.0
(b) Aratdar	7.7	46.2	-	61.5	-
(c) General	-	100.0	22.2	66.7	6.0
(d) Miller	-	77.8	-	100.0	-
II. Retailers	-	66.7	8.3	58.3	5.0

Notes: The figures indicate the percentage of respondents in total sample in that category.

Source: Traders' survey, 1985.

CHAPTER 6

PRINCIPLE OF SETTING RATION PRICES OF FOODGRAINS OVER TIME

6.A Introduction

6.1 Setting of ration prices over time constitute an important aspect of policy making in Public Foodgrain Distribution System. A host of considerations come into play in fixing these prices at an appropriate level. What is considered appropriate in turn depends largely on what policy objective ration prices are designed to achieve in the first place. Moreover, the factors considered relevant in determining prices of foodgrains distributed through rationing display considerable variations over time and hence they need to be revised periodically. A framework is, therefore, needed to serve as a guide as to how the ration prices of foodgrains should be set over time. Such a framework incorporating factors such as consumers' income, prices of foodgrains in the open market,procurement prices etc. has been developed in Section B. In Section C attempts have been made to apply the suggested principle empirically in the context of PFDS in Bangladesh. The nature of trade off involved are also brought out clearly in this Section.

6.B Setting of Ration Prices over Time—Analytical Framework

6.2 Ration prices of foodgrains over time may be set keeping the following objective in view:

6.3 To protect consumer welfare in the face of changes in his money income and prices while maintaining fiscal burden (due to budgetary subsidy on foodgrains) of the government within reasonable limit.

6.4 Consumer welfare in our context will be somewhat narrowly interpreted in terms of maintaining his foodgrain consumption at the current or at some desired level. This is perhaps justified because ration price represents just one of the many policy instruments at the disposal of the government and hence its use may be restricted to achieve a particular aspect (and not overall) of consumer welfare. The framework of analysis incorporating such an idea is outlined below.

Framework of Analysis

6.5 Let the consumers' income at the base year be Y_o and let the proportion of his income spent on rice and wheat be a_r and a_w respectively. Let the market prices of rice and wheat be PM_o and PW_o and ration prices of rice and wheat be P_{Rro} and PW_o Also, let the ration quota of rice and wheat be represented by Q_r and Q_w, and let b_r and b_w be the proportion of rice and wheat quota actually drawn during the period. We can then define his base-year consumption level of rice and wheat as

$$R_o = b_r Q_r + \frac{(a_r Y_o - PM_o \; b_r Q_r)}{PM_o} \qquad \ldots\ldots\ldots\ldots(1)$$

$$W_o = b_w Q_w + \frac{(a_w Y_o - PW_o \; b_w Q_w)}{PW_o} \qquad \ldots\ldots\ldots\ldots(2)$$

$$b_r Q_R \lesseqgtr \frac{a_r Y_o}{PM_o}, \quad b_w Q_w \lesseqgtr \frac{a_w Y_o}{RW_o}$$

6.6 Using equations (1) and (2), it may be easily ascertained how much changes in ration prices is needed to offset the impact of any given changes in his money income and market prices in order to maintain his base-year consumption of foodgrains. This would assist in setting the ration prices at appropriate levels in the event of some specific changes in consumers' money income and market prices of foodgrains. This is demonstrated below.

6.7 Let consumer's money income change from Y_o to Y_1 and market prices of rice and wheat change from PM_o to PM_1 and PW_o to PW_1 respectively. Using equations (1) and (2) one can easily compute the level of ration prices required to maintain his base-year consumption of foodgrains (R_o and W_o), as shown below.

$$PM_1 = \frac{a_r Y_1 - PM_1 \; (R_o - b_r Q_r)}{b_r Q_r} \qquad \ldots\ldots\ldots\ldots\ldots (3)$$

$$PW_1 = \frac{a_w Y_1 - PW_1 \; (W_o - b_w Q_w)}{b_w Q_w} \qquad \ldots\ldots\ldots\ldots\ldots (4)$$

It can also be shown that

$PM_1 \gtreqless PM_{ro}$ as $a_r \; (Y_1 - Y_o) \gtreqless (PM_1 - PM_o) \; (R_o - b_r Q_r)$..(5)

and

$PW_1 \gtreqless PW_o$ as $a_w \; (Y_1 - Y_o) \gtreqless (PW_1 - PW_o) \; (W_o - b_w Q_w)$...(6)

6.8 In other words, an increase in consumer's money income accompanied by an increase in market prices of foodgrains may lead to an upward or downward revision of ration prices depending on the relative magnitudes of such income and price changes appropriately weighted as shown in equations (5) and (6).

6.9 To maintain foodgrains consumption in the face of rising prices in the open market through appropriate adjustments in ration prices is an important objective of PFDS which the government would like to persue. However, it is necessary to ensure that the persuance of such an objective does not impose an excessive fiscal burden on the government. The level of budgetary subsidy on foodgrains should not exceed a reasonable limit. This may be examined in the following way.

6.10 Budgetary subsidy on foodgrains (BS) is usually calculated as the difference between expenditure on food account (E) and receipts from public sale of foodgrains (S). In other words,

$$BS = (E - S) \qquad \text{.....(7)}$$

$$\text{Where } E = (P_R^D Q_R^D + P_W^D Q_W^D) + P_R^I Q_R^I + P_W^I Q_W^I) + H \qquad \text{.....(8)}$$

$$S = (P_R^D Q_R^D + P_W^D Q_W^D) + J + K \qquad \text{.....(9)}$$

P_R^D = Domestic procurement price of rice

P_W^D = Domestic procurement price of wheat

Q_R^D = Amount of domestic rice procurement

Q_W^D = Amount of domestic wheat procurement

P_R^I = Import price of rice under cash purchase

P_W^I = Import price of wheat under cash purchase

Q_R^I = Amount of rice import under cash purchase

Q_W^I = Amount of wheat import under cash purchase

Q_R^D = Amount of ration offtake of rice

Q_W^D = Amount of ration offtake of wheat

H = Cost of import of foodgrains under aid (grant and loan) including incidental/distribution cost.

J = Receipts from public sale of foodgrains other than ration offtake

K = Value of changes in stock of foodgrains during the period.

We have already shown earlier that the ration prices consistent with base year foodgrains consumption for income level Y_1 and market prices, PM_1 and PW_1 are PS_1 and PS_1. Corresponding to this new set of ration prices the level of budgetary subsidy may be calculated using equation (7), (8) and (9) given the procurement prices of rice and wheat, amount of domestic procurement, imports under cash purchase, import prices, and ration offtake of foodgrains. If the calculated level of budgetary subsidy does not exceed the limit considered acceptable, then the exercise stops here. We can then say that the level of ration prices have been set in such a way that they are consistent with the objective of maintaining consumer welfare (in the sense we have defined here) without imposing excessive fiscal burden on the government. The latter may be judged in terms of some given criterion such as proportion of budgetary subsidy in total food expenditure or in public development expenditure or in total tax revenue.

6.11 If, on the other hand, the calculated budgetary subsidy exceeds the acceptable limit, then this would call for an upward revision of ration prices. Any upward adjustment in ration prices, however, will mean that the base-year consumption of foodgrains cannot be maintained. There is then clearly a trade off here between supporting foodgrain consumption at a given level and maintaining budgetary subsidy within an acceptable limit. The magnitude of such tradeoff, however, can be established only through an empirical exercise. This is attempted in the next section.

6.C Setting of Ration Over Time: Empirical Results

6.12 The analytical framework presented in Section II was tested for the base-year data in 1984-85. Information regarding some household parameters such as annual per capita expenditure, proportion of expenditure made on rice and wheat etc. were obtained from the SR and MR survey conducted earlier for analysing distributional impact of urban and rural rationing in Bangladesh. Different values of ration prices were derived corresponding to alternative assumptions with respect to changes in money income and market prices during the period. The steps actually involved in such calculations and some of the important implications of our findings are briefly duscussed below:

6.13 The base-year per capita consumption of foodgrains (both for rice, R_o and wheat, W_o) was calculated using the 1984-85 data for ration prices, ration quota and market prices for rice and wheat. This was first done for the MR household covered under rural rationing. On the basis of average annual per capita expenditure of such households of Tk. 2,735.00, of which 45.4% spent on rice and 6.3% on wheat, per capita consumption of rice and wheat for 1984-85 was calculated to be 3.95 md. and 1.08 md. respectively[1]. Using equation (1), calculation of base-year consumption of rice (R_o) was pretty straightforward. Calculation of base-year consumption of wheat, however, needed some adjustments. It was observed that per capita expenditure on wheat ($a_w Y_o$=.063 X Tk. 2,735.00 = Tk. 172.3) was much smaller than the ration expenditure on wheat, if full quota is drawn ($P_{wo} Q_w$ = Tk.158.95/md X 1.93 md = Tk.306.8). Therefore, either a portion of ration quota fully drawn was subsequently resold in the open market for profit or the full ration quota for wheat was not drawn at all. We incorporated the later possibility in this exercise. In either case, however, no wheat purchase from the open market was involved. The base-year wheat consumption was derived by simply scaling down the full quota in proportion to the amount of per capita expenditure on wheat as recorded in the MR survey. In other words, W_o was computed as $b_w Q_w$ where $b_w = (a_w y_o/P^R_{Wo} Q_w)$. Thus $W_o = (a_w Y_o/P^R_{Wo} Q^w) Q^w$ =(172.3/306.8)X 1.93 md. = .56 X 1.93 md. = 1.08 md.

6.14 Once the base-year consumption of rice and wheat was computed, the stage was set for calculating the set of ration prices consistent with increased levels of money income and market prices in the next period[2]. In the absence of any reliable indicators of future income and price increases, the set of ration prices required to maintain base-level consumption of foodgrains was calculated for a wide range (between 5% to 15%) of increase of these two variables. The results are presented in Table 6.1A for ration price of rice, and in Table 6.1B for ration price of wheat. Following observations may be made based on the results presented in Table 6.1A.

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1. Calculations are made in terms of proportion of total expenditure and not income because household consumption data are classified by expenditure levels.

2. It is assumed that an increase in money income leads to a proportional increase in total household expenditure thereby implying as unitary elasticity of expenditure with respect to income.

6.15 (a) Ration price of rice seems to be quite sensitive to changes in money income and market price of rice. It is observed that an increase in money income by 1% leads to an increase in ration rice price by Tk.19.2. This remains true irrespective of the level of money income and at each level of market price of rice. An increase in market price of rice by 1%, on the other hand, leads to a decrease in ration price of rice by Tk.16.5. This again remains true irrespective of the price level and at each level of money income. Thus, changes in money income would seem to have relatively greater impact on ration price of rice. This is also demonstrated by the results across the diagonal in Table 6.1A, which shows the ration prices of rice for proportional changes in both money income and market price of rice.

6.16 (b) Among the set of calculated ration prices, those associated with an increase in money income and market prices confined to (2% -- 3%) differential may be considered as relatively more feasible. Within this subset, the ration price associated with larger increase in money income relative to price increase. (e.g. 7% or 10% increase in money incomes combined with 5% or 7% increase in market price of rice) would appear to be more acceptable in the light of increased domestic procurement price of rice and recent changes in ration price. A disproportionate change in money income relative to market price of rice would impose a rather heavy burden of adjustments on ration price (in the sense of having drastic changes in ration prices needed to maintain base-year level of rice consumption) which may not be considered feasible in practice, particularly from budgetary point of view.

Table - 6.1A

Variation in Ration Prices of Rice Due to Changes in Money Income and Market Price of Rice

Base-Year (1984-85)

(a)	Per Capita Yearly Expenditure	:	Tk. 2,735.0
(b)	Proportion of Expenditure made on Rice	:	45.4%
(c)	Ration Price of Rice	:	Tk. 241.50/md.
(d)	Ration Quota for Rice	:	.65 md.
(e)	Market Price of Rice (Retail, Coarse Variety)	:	Tk. 329.70/md.
(f)	Per Capita Consumption of Rice	:	3.95 md.

Increase in Market Price of Rice	Increase in Money Income				
	5%	7%	10%	12%	15%
5%	246.2	284.6	343.1	381.5	438.5
7%	213.6	251.4	309.9	348.3	405.3
10%	163.1	202.0	260.0	298.5	355.0
12%	129.9	168.3	226.8	265.2	322.2
15%	80.0	118.5	176.9	215.4	272.3

6.17 The method of computation of ration prices for wheat was somewhat different from that followed in case of rice. Since the entire consumption of wheat was supplied from rationing, no purchase of wheat from the open market was presumably involved and hence it was logical to assume that changes in market price of wheat could not have any impact on consumption and therefore, in the calculation of ration price of wheat. Thus, equation (4) could not be applied in this case. What was done to incorporate any probable changes in money income was through variation in ration wheat prices in such a way as to maintain base-year consumption of wheat (1.08 mds). In other words. $P^R_{W_1} = a_w Y_1 / 1.08$. The results are shown in Table 6.1B

Table - 6.1B

Variation in Ration Prices of Wheat Due to Changes in Money Income

Base-Year (1984-85)

(a) Per Capita Yearly Expenditure : Tk. 2,735.0

(b) Proportion of Expenditure made on Wheat : 6.3%

(c) Ration Price of Wheat : Tk. 158.95/md.

(d) Ration Quota for Wheat : 1.93 md.

(e) Market Price of Wheat : Tk. 189.0/md.

(f) Per Capita Consumption of Wheat : 1.08 md.

Increase in Market Price of Wheat	Increase in Money Income				
	5%	7%	10%	12%	15%
5%	167.4	170.7	175.5	178.7	183.5
7%	167.4	170.7	175.5	178.7	183.5
10%	167.4	170.7	175.5	178.7	183.5
12%	167.4	170.7	175.5	178.7	183.5
15%	167.4	170.7	175.5	178.7	183.5

6.18 It is readily evident that changes in money income has a rather modest impact on ration prices of wheat. Ration price of wheat increases from Tk.158.95/md. to Tk.167.4/md. for a 5% increase in money income, and to Tk.183.5/md for a 15% increase. This should be attributed to very low share of wheat (6.3%) in per capita expenditure for the MR household, so that a given increase in total expenditure resulted only in a very small increase in the absolute level of expenditure on wheat.

6.19 The exercise was repeated in our sample of SR household representing urban rationing in Bangladesh. Per capita yearly expenditure was observed to be considerably higher for the SR household - Tk.7762.0 as compared to Tk.2735.0 for MR household. Proportion of expenditure incurred on rice and wheat also varied between these two category of households in our sample - 13.3% on rice and 3.9% on wheat for the SR households as compared to 43.4% and 6.3% respectively for the MR household, as mentioned earlier. Base-year data with respect to other variables such as ration prices, ration quota, and market prices of rice and wheat, however, remained the same.

6.20 Using equation (1), base-year per capita annual consumption of rice was calculated as 3.30 md.[1]. Calculation of base-year consumption of wheat needed some adjustment as before, since the household expenditure on wheat fell short (though marginally) of the ration expenditure on wheat if full quota is drawn. Base-year consumption of wheat (Wo), was, therefore, computed as $(a_w Y_o / P_{w_o} Q_w) Q_w$=(Tk.302.7/Tk.306.8) 1.93 md. = .987 X 1.93 md. = 1.90 md. Per capita annual consumption of foodgrains thus amounted to 5.20 md. (or 1.17 lb per day) for the SR household as compared to 5.03 md. (or 1.13 lb per day) for the MR household.

6.21 As before, a set of ration prices for rice and wheat were computed corresponding to different assumptions with respect to increase (ranging between 5% and 15%) in money income and price of rice in the open market. The results are presented, for ration rice in Table 6.2A and for ration wheat in Table 6.2B. Following observations may be made based on the information contained in Table 6.2A.

6.22 (a) Ration price of rice seems to be quite sensitive to money income and market price of rice, though not quite as much as in case of MR household. An increase in money income by 1% leads to an <u>increase</u> in ration price by Tk.15.8/md. as compared to Tk.19.2/md. for the MR household. An increase in market price of rice by 1% leads to a <u>decrease</u> in ration price by Tk. 13.5/md., as compared to Tk.16.6/md. for the MR household. Thus changes in money income would appear to have, as before, relatively greater.

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1. This may be contrasted with the per capita consumption of rice (3.85 md.) for the MR household. Per capita consumption of foodgrains, however, was observed to be greater for the SR household because of much greater consumption of wheat (1.90 md.) as compare to only 1.08 md. for the MR household).

6.23 (b) Calculated ration prices are generally observed to be greater, (particularly in higher market price and lower income range) for the SR household as compared to the MR household. This happens because although the level of total expenditure differ widely between two categories of households, the amount of expenditure on rice does not; at least not by as much[1].

Table - 6.2A

Variation in Ration Prices of Rice Due to Changes in Money Income and Market Price of Rice

Base-Year (1984-85)

(a)	Per Capita Yearly Expenditure	:	Tk. 7762.0
(b)	Proportion of Expenditure made on Rice	:	13.3%
(c)	Ration Price of Rice	:	Tk. 241.50/md.
(d)	Ration Quota for Rice	:	.65 md.
(e)	Market Price of Rice (Retail, Coarse Variety)	:	Tk. 329.70/md.
(f)	Per Capita Consumption of Rice	:	3.30 md.

Increase in Market Price of Rice	Increase in Money Income				
	5%	7%	10%	12%	15%
5%	259.9	288.5	335.9	367.5	415.0
7%	229.8	261.4	308.8	340.4	387.9
10%	189.2	220.8	268.2	299.8	347.3
12%	162.1	193.7	241.1	272.7	320.2
15%	121.5	153.1	200.5	232.1	280.0

1. In fact, the amount of per capita yearly expenditure on rice of the SR household is less-Tk.1032.3 as compared to Tk.1241.7 for the MR household.

6.24 Ration prices of wheat also computed as before for the SR household corresponding to different assumptions with respect to increase in money income, ranging between 5% and 15%. Since no purchase of wheat from the open market was involved, market price of wheat did not have any impact on the consumption of wheat and hence its ration price. Ration price of wheat was computed as $P^{R}_{w1} = a_w Y_1/1.90$. The results are shown in Table 6.2B.

Table - 6.2B

Variation in Ration Prices of Wheat Due to Changes in Money Income

Base-Year (1984-85)

(a)	Per Capita Yearly Expenditure	:	Tk. 7762.0
(b)	Proportion of Expenditure made on Wheat	:	3.9%
(c)	Ration Price of Wheat	:	Tk. 158.95/md.
(d)	Ration Quota for Wheat	:	1.93/md.
(e)	Market Price of Wheat	:	Tk. 189.00/md.
(f)	Per Capita Consumption of Wheat	:	1.90/md.

Increase in Market Price of Wheat	Increase in Money Income				
	5%	7%	10%	12%	15%
5%	167.3	170.5	175.3	178.4	183.3
7%	167.3	170.5	175.3	178.4	183.3
10%	167.3	170.5	175.3	178.4	183.3
12%	167.3	170.5	175.3	178.4	183.3
15%	167.3	170.5	175.3	178.4	183.3

6.25 It is readily observed that the set of ration prices remained exactly the same as before (in case of MR household). This is not surprising in view of the fact that for a given percentage increase in money income, the ratio of expenditure on wheat between the two categories of households remained unchanged over time (relative to base-year). And this is a sufficient condition for wheat ration prices to remain same in the two sample characterised by wide divergence in household expenditure (See Appendix 6A).

6.26 As mentioned earlier in Section II, the set of ration prices that purport to maintain foodgrain consumption in the face of increase in money income and/or market prices need to be checked against what budgetary burden they impose on the government. If the resulting budgetary subsidy on foodgrains calculated using equation (7),(8) and (9) happens to be within the limit considered acceptable (judged by some definite criterion) then the set of ration prices are those conforming to the principle enunciated earlier. No attempt has been made in this study to demonstrate this empirically in the absence of readily available information needed to calculate the budgetary subsidy on foodgrains. However, some observation are made below in the light of the calculated set of ration prices presented in this Section, which will bring out the nature (if not magnitude) of trade-off involved more clearly.

6.27 (a) An increase in money income relative to market price of rice calls for an upward revision of ration prices of both rice and wheat. In the face of increased procurement cost of foodgrains, this may or may not lead to greater budgetary subsidy, for a given level of PFDS offtake, depending on the rate of increase in procurement price relative to ration prices of foodgrains. If the increase in procurement costs exceed the increase in ration prices, the budgetary subsidy, ceteris paribus, will increase as compared to the base-year. In this case, it is necessary to check whether the amount of budgetary subsidy corresponding to the increased procurement costs and proposed set of ration prices, exceed the limit set by the government. If it does, then this calls for further upward revision in ration prices until the resulting budgetary subsidy conform to the level considered acceptable. These increased ration prices, however, will fail to maintain, given the level of per capita expenditure and market price of rice, the consumption of foodgrains at a base-year level. This means that some sacrifice in consumer welfare (in the sense that we have defined here) is required in order to keep the fiscal burden

within tolerable limit, given, of course, consumers' income, price of rice in the open market, procurement cost of foodgrains under different categories, and the volume of PFDS offtake. How much sacrifice in foodgrain consumption is actually needed under these circumstances, can be ascertained, however, only through a more comprehensive empirical exercise.

6.28 (b) An increase in market price of rice relative to consumers' income will call for a downward revision of ration price of rice in order to maintain foodgrains consumption at the base-year level[1]. A lowering of ration prices will result in larger budgetary subsidy for a given level of PFDS offtake even if procurement costs remain the same as before. In real word, however, procurement costs of foodgrains increase over time and this will result in even larger amount of budgetary subsidy and hence impose even greater fiscal burden on the government, if, of course, the volume of PFDS offtake remains the same or increases (or even decreases but less than proportionately)[2]. The degree of trade-off between maintaining foodgrain consumption at a given/desired level and keeping the budgetary burden on foodgrain subsidy within tolerable limit become even sharper in this case. Again, only a detailed empirical exercise can highlight the magnitudes of trade-off involved here.

6.29 It may, however, be mentioned here that given the need to keep the fiscal burden within some acceptable limit while at the same time maintaining foodgrain consumption at some desirable level, some burden of adjustments will have to be borne, given the historical trend in consumers' income, market price of rice and procurement price of foodgrains, by the volume of PFDS offtake in different channels. Total budgetary subsidy is a function of both unit budgetary subsidy and the level of PFDS offtake. If unit subsidy increases due to a lowering of ration price of rice and/or increased procurement costs of foodgrains, then the volume of PFDS offtake need to be reduced by targeting them to a smaller but more needy and vulnerable groups in the society. The issue, however, has wider implications which involves the restructuring of PFDS itself.

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1. Ration price of wheat, as we have observed, increases with an increase in money income irrespective of any changes in the market price of wheat.
2. To the extent that wheat ration price is revised upward with an increase in money income, and the fact that wheat accounts for more than two-third of total PFDS offtake, the unfavourable impact on budgetary subsidy will be considerably minimised.

CHAPTER - 7

PFDS IN BANGLADESH IN STATISTICAL PROFILE 1972/3 - 1984/5

7.1 The objective of this chapter is to summarise, in mainly statistical terms, the evolution of the PFDS in Bangladesh in the post-liberation period. In the main, it will embrace changes in (i) the relative shares of the various channels of the PFDS, particularly those other than SR and MR; (ii) weekly quota in SR, MR and OP channels; (iii) unit subsidy on rice and wheat when the subsidy is measured by the difference between the ration price and the matched market price[1], and (iv) the relative shares of estimated urban and rural population that is covered by PFDS. We do not deny that there are certain commonality of overall flavour between what is to follow, and the contents of Ch. 2.B. Nevertheless, this chapter is posited here in that its empirics have a certain direct relevance for the discussion of chs. 8 through 10.

7A Relative Shares of Components of PFDS

7.2 Table A7.1 presents 3 yearly moving average of the offtakes within various monitised and relief channels of the PFDS. The resulting numbers isolate random fluctuations, and depict some kind of trend values of various categories of offtakes. Table A7.1 leads, after some calculations, to Table A7.2 which gives the relative shares of various PFDS categories. Table 7.1 below then encapsulates the structural changes of PFDS in Bangladesh.

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1 It will be readily admitted that this defination is simply one among many possible definitions of subsidy. It will be maintained here, however, that this definition is the one most directly involved in the problem of estimation of the income effect of rationing. This is the version of food subsidy of relevance at calculating the income effect of urban ration .. In 1984/5 on certain assumptions, later in chapter-8.

7.3 It may be helpful to categorise the individual channels according as whether their relative shares have declined, risen or stagnated. First, the shares of SR, MR and LE can be unequivocally treated as having declined from one sub-period to another. Second, the shares of OP, FFW and the (controversial) amalgam of OMS + MO have risen consistently through this period. Third, the relative share of EP has stayed pretty much the same throughout this entire period. Fourth, the shares of FM and VGF have fluctuated with no predictable pattern. The percentage in the column headed "others" represent quantity distributed under Free Sale in 1981/2.

7.4 Having thus introduced Table 7.1, it may not be amiss to enter the following pertinent observations. The decline of the shares of SR, especially rapid in the early 1980's, suggests a decline in what may be called urban-proneness of the PFDS, a tendency which we confirm further below. The sharp decline in the share of MR must be qualified in that a part of that decline in fact shows up as the seven percentage-point increase in the share of OP. It is, however, clear that the share of MR has fallen far more -- by nearly sixteen percentage points -- than the share of OP has risen. There has, unmistakeably, been a considerable decline in the net share of MR. We would like to stress again that among all the monetised channels of PFDS, MR is the only one with the rural poor as its defined constituency. It is this component that has taken the largest proportionate cut of all in its relative share between the first two periods. This is doubtless one of the major causes of the decline in the rural proneness of the PFDS in the quinquennium after 1975/6.

Table 7.1

Structure of Offtake in Bangladesh PFDS, 1973/4 - 1983/4

Year	EP	OP	LE	FM	OMS/MO	SR	MR	FFW/CD	VGF/GR/R	Others
1973/4-1975/6	5.3	12.7	5.1	8.2	.5	24.5	34.5	2.6	6.5	-
1976/7-1979/80	5.5	19.5	4.3	10.0	2.6	23.1	18.4	13.[illegible]	2.7	4
1980/1-1983/4	5.0	19.6	3.1	6.6	5.1	15.5	18.7	20.0	4.9	-

Note: For the purposes of this table, offtake under OMS and MO have been aggregated. We are aware of course, that there are certain differences between OMS and MO in terms of their modus operandi.

7B Periodic Quota of SR, MR, OP, LE

7.5 Table A7.3 presents the changing levels of weekly quota by food grain type in the period in three channels. These channels have attached to them a notion, whether explicit or not, of a weekly quota[1]. Table A7.4 expresses the same information in terms of relative shares of rice and wheat in total weekly quota. Before we take up the findings of these two tables specifically, a small point of clarification may be noted here. In some years, slight differences between the weekly overall quotas of SR and MR can be seen. This is the case, for instance, with 1976/7. The reason was that during 1976/7, rice and wheat quotas, as also overall quotas, within SR and MR were changed three times. The degree of changes between SR and MR were disparate for rice and wheat[2]. These averages have been weighted ones, the weights being the (rounded) number of months representing the continuity of a particular quota.

7.6 From Table A7.3 we see that weekly quotas were pretty much stable during 1972/3 through 1980/1, at about 3 seers or so. This meant 156 seers per year for SR and OP. That quantity amounted to about 87% of the officially declared minimum cereal intake level of 1 lb/day/person. The year 1981/2 through 1984/5 have witnessed a fall of about between 26 to 28% in the weekly quota in these channels from the average level of the earlier nine years. Table A7.4 basically shows that, as far as SR and MR are concerned, the wheat-to-total quota ratio has been U-shaped, the years 1976/7 through 1978/9 representing the belly of the U-curve (Graph 7.1).

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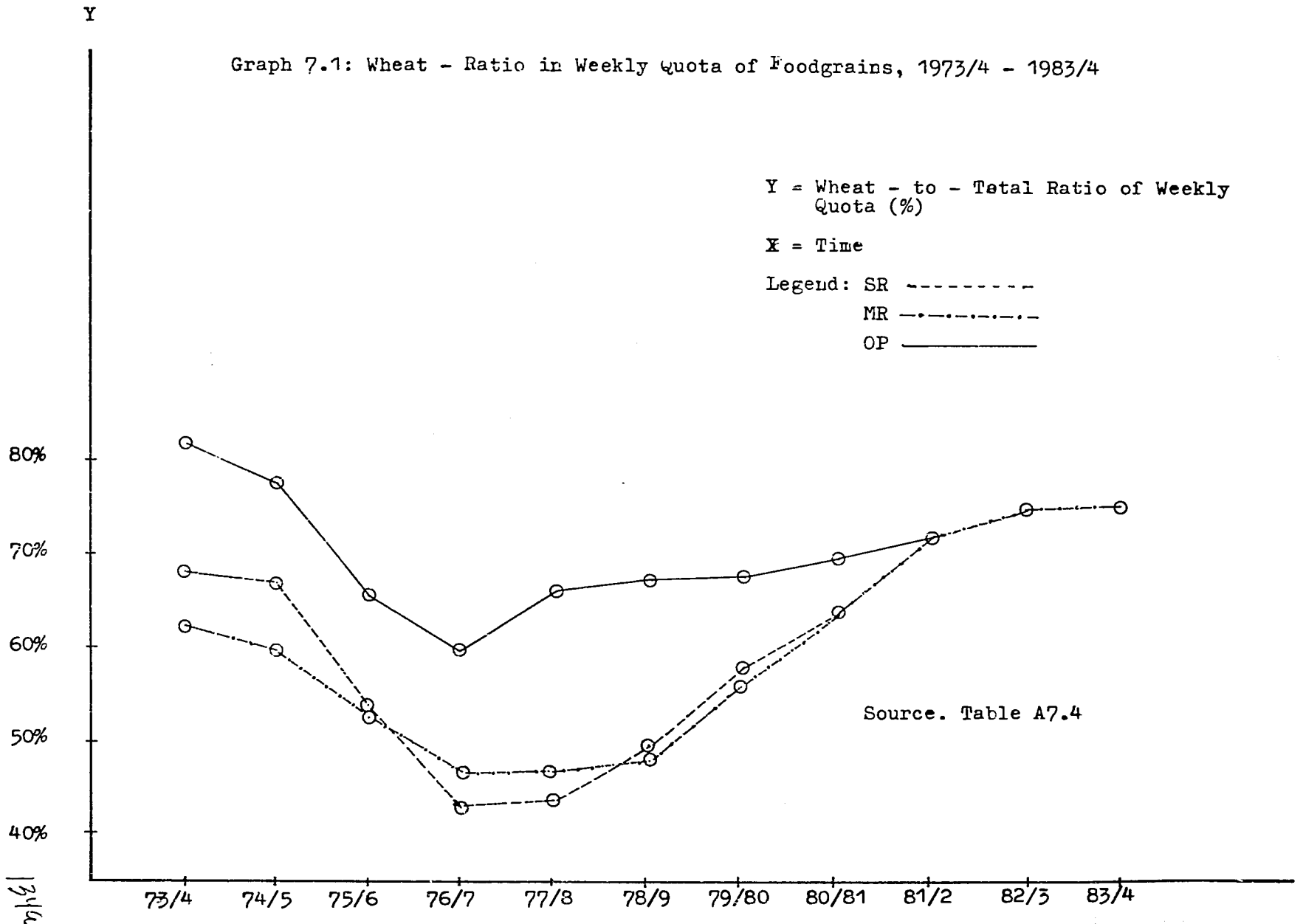
1 This may give rise to some confusion in the case of MR. However, our understanding in the matter is that the SR quotas usually define a maximal weekly quota for MR card holders. The quota in EP is not usually notified outside relevant parts of the departments so involved. Our understanding is that even the Food Directorate is not notified about the quota that is in fact applied in EP. The quota in LE is specified monthly. Since 1975, it has been 35 seer/family/month, raised to 35 kg/family/month since July 18, 1983.

2 We have further cross-checked these numbers with (Wennergren, 1983, Table 4.2)

Graph 7.1: Wheat - Ratio in Weekly Quota of Foodgrains, 1973/4 - 1983/4



The curve for the OP quota is also U-shaped, with the difference that its wheat ratio has mostly been higher than in SR and MR, until 1981/2, when quotas were equalised in these channels (Graph 7.1). The implication of this is that as between SR and OP beneficiaries, the former category is attached greater priority if a greater proportion of rice is any indication of such a priority. Since the relative extent of subsidy has invariably been greater on rice than on wheat, the attribution of greater priority would perhaps be warranted.

7.7 As regards LE, this channel really became prominent in July, 1975. Upto that time, workers in large enterprises frequently used to be covered within MR. As such, upto that period workers' quota would, as in MR, include both rice and wheat. From July, 1975 the quota began to be specified as 35 seer/family/month. In July 1983, the quota was denominated in kgs. Noting that the quota in all the other channels shown in Table A7.3 have fallen in 1981/2 while the monthly quota of LE has remained the same (even increased as a result of re-denomination in July, 1983), any given industrial worker is hereby seen as witnessing a potential improvement in their treatment by the PFDS relative to these other beneficiaries[1].

7C <u>Unit Subsidy Levels</u>:

7.8 Table A7.5 presents unit subsidies on ration wheat and rice in various years. SR and OP are the rationing channels of the greatest relevance in this regard although MR, too, is involved. Cols. 7 and 13 show the rate of unit subsidy on rice and wheat. Note again that this definition of subsidy focuses on the ratio between the unit price in rationing outlets, and in the open markets. Table 7.2 presents 5-yearly moving averages of the ratios of cols 7 and 13 of Table A7.5. Cols 2 and 3 of Table 7.2 shed important light on the relativity between the unit subsidy on ration rice and wheat. One may note the following. First, the rate of subsidy (in this limited sense) has always been lower on wheat than rice; the values in Col. 3 are always higher than in Col. 2. Second, and more interesting, the differential rate of subsidy in favour of rice has, however, inexorably declined through time; while there was a differential of about 15 percentage points to the advantage of rice in 1976/7, this has declined to 9 in 1982/3.

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1 This need not be true for all industrial workers in actual fact in that the issue for LE has been pitched higher than for SR, for example, thus taking away, in principle, a part of the preferential treatment noted in the relevant text.

Table - 7.2

Unit Subsidy Rates, 1974/5 through 1982/3

Year	Ration-to-market price ratio, rice (1%)	Ration-to-market price ratio, Wheat (1%)	Average Rate of Subsidy
1974/5	45.6	55.6	49.8
1975/6	50.6	60.9	55.1
1976/7	55.0	70.3	61.8
1977/8	60.5	77.6	67.5
1978/9	64.8	82.5	72.7
1979/80	63.9	80.4	71.9
1980/1	67.0	79.9	73.4
1981/2	69.8	79.7	75.2
1982/3	73.6	82.5	79.1

Source : Table - A7.3 Table- A8.3

7.9 The evidence yielded by Cols. (2) and (3) of Table 7.2 remains incomplete, however, in that they lack any reference to the quota per week or (per year) per card prevailing during each period of interest. When these unit rates are applied to the periodic quotas, we get (weighted) average rate of subsidy. This is the ratio of the ration-price cost of foodgrain quantum specified in the quota to the market-price cost of the same. The unit refers to the quota per card. The average rates of subsidy are presented in Table A8.3 in Chapter 8. Table 7.2 presents 5 yearly moving average of these rates. Col. 4, Table 7.2 shows us that, between 1974/5 and 1982/3, the rate of subsidy declined by 30 percentage points.

7D Relative Coverage of PFDS in Rural and Urban Areas.

7.10 An important statistical aspect of the character of the PFDS of Bangladesh may be judged to embrace the estimated number of beneficiaries and its distribution in rural and urban areas. Efforts have been made in the past to arrive at the number of beneficiaries by area of residence (World Bank, 1979). Those estimates need to be made current, both in terms of time coverage and of the availability of new information. Such an exercise must necessarily still rest on somewhat shaky foundations, for example, the use of certain approximations, which may derive from subjective perceptions of admittedly knowledgeably practitioners in the area of food management, in matters of isolation the rural-urban division of the incidence of a particular category of offtake. Hence, considerable degrees of error must be seen as associated with the resulting estimates. A firm case can, nonetheless, be made for such an exercise, for in the absence of an awareness of the trend of the percentage of urban and rural population that derives a degree of benefit from the PFDS, one must be missing a crucial element in seeking to understanding possible changes in its distributional character. It is this that has motivated us in undertaking these hazardous exercise.

7.11 Before proceeding any further, the assumptions made in the course of this exercise may be stated.

7.12 First, SR is seen as a channel wholly urban in its incidence and the FFWP/CD wholly rural.

7.13 Second, it is assumed in this exercise that it is better to ignore foodgrain distributed with the gratitutious relief (GR) or Relief component of PFDS. This is because great uncertainty must attach to any estimate, howsoever knowledgeably attributed, as to its rural-to-urban division. There would undoubtedly be a bias in attributing to the rural area a fair share of this quantity. Since GR was disproportionally important in one or two years in the first half of the 1970's, the above bias is likely to overstate the true rural benefit out of the PFDS in that period. This would appear to needlessly introduce uncertainties into the estimation of the degree of rural-proneness of the PFDS in the later years. As an offset, the VGFP, which raise rural incidence of benefits and was introduced later on, is also ignored in this calculation.

- Third, it is assumed, following World Bank (1979), that the rural-to-urban ratio in benefits from EP, OP and LE are respectively 40:60, 40:60 and 25:75.

- Fourth, we depart very radically from the World Bank (1979) in matters of rural ratio in MR. The Bank document had assumed a rural-to MR ratio of 92.5% for 1975/6 and 90%. For reasons discussed more elaborately in Ch. 9, we used a ratio of 50:50 in the years 1972/3 through 1974/5, and 70:30 in the other years.

- Fifth, it is assumed that 1.3 members per FFW household can participate in FFWP for 33 days each for 3.25 seer/day. On the assumption that four members comprise a household, this gives us a number for food-users benefitted. This number is comparably denominated to the other PFDS categories by converting it such that the resultant corresponds to an annual, as opposed to 33-day long, process of access to food distribution[1].

- Sixth, rural and urban population growth rate between 1974 and 1981 was estimated. For intervening, prior and posterior, calender years, inter and extra-polation was used. Derivative values for succeeding calender years were seen to approximate fiscal year population[2].

The ratio of 0.09 (33+363) was used in converting the number of users obtained in the earlier step into number of year-round beneficiaries comparable to the other estimates.

1974 Census of Bangladesh is widely known to have been revised upward from its original level of 71.48 million. Even very recent BBS publications have continued to provide rural and urban breakdown on the basis of the unrevised total population figure. In order to estimate rate of growth of rural and urban population separately, we have used unrevised BBS-provided rural and urban population. This procedure no doubt leads to rural and urban beneficiary ratios that are different than if the true rural and urban population were known. But since such data are not available, we shall only state here that the relativity among the ratios that we have presented essentially capture the true relativity. This would require that the degree of understatement in the original census estimate was symmetric to urban and rural population. Even if one were revising the original rural and urban population in the light of the magnitude of the undercount, this is the assumption one would have to make.

7.14 We are now ready to introduce the evidence in Table A7.6 and A7.7. Table 7.3 present 5-yearly moving averages of col. 10 from both tables. One thing emerges very strongly from the table, namely that the urban beneficiary ratio of PFDS has quite rapidly and unambiguously fallen through the 1970's and beyond. Between 1974/5 and 1981/2 -- a span of 8 years -- the ratio has declined by as much as one half or more. The rate of the decline was more rapid upto the year 1978/9 .. the year of the much publicised drought as also an election year .. than in the years since. In contrast, the rural ratio does suggest a pattern of a crawling improvement in the rural ratio, although the pattern is hardly spectacular. Here again, the drought year 1978/9 seems to represent the watershed, in that in the period in its wake the rural ratio has made relatively rapid gains.

Table - 7.3

Rural and Urban PFDS Beneficiary Ratio, 1974/5 through 1981/2

(Five yearly moving Average)

Year	% of population covered by PFDS	
	Rural	Urban
(1)	(2)	(3)
1974/5	6.7	108.2
1975/6	6.0	88.2
1976/7	6.1	72.9
1977/8	6.4	65.0
1978/9	5.9	56.0
1979/80	7.0	54.9
1980/1	7.7	52.6
1981/2	8.2	49.7

Note: As explained at the foot of Table A7.6, urban beneficiary ratio greater than 100% represents the existence of false cards which result in greater offtake than can be accounted for by total urban population.

Source: Table A7.6 and A7.7

CHAPTER 8

8.A URBAN RATIONING IN 1984/5: DISTRIBUTIONAL AND NUTRITIONAL EFFECTS

Distributional Effects of Urban Rationing, 1973/4, 1984/5

8.1 The TOR for this study required an examination of the effects of the rationing system on the distribution of income and nutritional availability in rural and urban areas. Ahmed (1979) has examined the first of these dimensions in his IFPRI study. He presented estimated quantities of rationed foodgrains as percentages of total foodgrain consumption for various income groups as measured by 1973/4 HES in urban and rural areas. This study first detailed evidence of the urban bias of rationing in Bangladesh during the years immediately after liberation of the country. Table 8.1 below presents the highlight of the distributional part of Ahmed's important finding. While urban population in 1973/4 was no more than 9.2% of the total, the fact that about 55% of the annual ration offtake in that year went to urban population testifies to the view, frequently expressed thus far without the under-pinnings of such detailed evidence, that the one of the basic thrusts of public foodgrain rationing is to cushion off certain favoured segments of the urban population from fluctuations in foodgrain prices and availability. Such a food distribution strategy may have a compulsive explanation from an administrative-political viewpoint, int that it puts first the food needs of people on whose unhampered material well-being the machinery of government and national security crucially depends. Such categories of beneficiaries include the members of the armed forces, members of law-enforcing agencies, paramilitary groups, employees of the government and all semi-government agencies, men working in the railways, ports, etc.

8.2 What Ahmed did not specifically investigate was the changes in distribution of income and nutritional intake arising from the rationing activity in urban areas in 1973/4. We have made an attempt to examine this. Our method involves the following: (a) express in terms of deciles total per capita incomes in the with and without-rationing situation; (b) calculate Gini coefficient of per capita incomes between the with and without-rationing situation; (c)calculate levels of foodgrain intake in the with and without-rationing situation; (d) calculate Gini coefficient of calorie intake per person per day in those two situations. Under circumstances of 1973/4, it is meaningful to do this exercise only for the urban areas, as the incidence of food subsidies in the rural areas in that year was really very

small (Ahmed, 1979, Table 12). The resultant decile specific values of the four relevant variables for 1973/74 are shown in Table 8.1 below, as also the Gini coefficients.

8.3 It is clear that rationing activities made for a slightly more equal distribution of incomes per capita in the urban areas in 1973/4 than would otherwise prevail. The distributional effects of rural rationing in 1973/4 was doubtless much less favourable. Similarly, rationing in 1973/4 resulted in a more equal distribution of caloric intake in urban areas than would otherwise prevail. Rationing in 1973/4 thus promoted, howsoever feebly economic equality within urban areas of Bangladesh. Besides, rationing had the added virtue in 1973/4 of cementing the political and administrative loyalty of the crucial constituencies of the State.

Table 8.1

Distributional and Nutritional Effects of Urban Rationing in Bangladesh, 1973/4

(Tk./Capita/yr.)

Income deciles	per capita annual total expenditure, 1973/4		per capita calorie intake per day, 1973/4	
	including income effect of rationing	excluding income effect of rationing	including income effect of rationing	excluding income effect of rationing
(1)	(2)	(3)	(4)	(5)
1st	669	533	1593	1397
2nd	742	633	1704	1539
3rd	803	714	1766	1626
4th	881	813	1795	1688
5th	978	922	1864	1776
6th	1075	1032	1938	1867
7th	1219	1185	2030	1974
8th	1398	1371	2105	2066
9th	1595	1576	2148	2131
10th	3413	3406	2266	2243
Gini coeff	0.274	0.304	0.06	0.08

Source : (Ahmed, 1979), (BBS, 1980).

8.4 We envisaged attempting to carry out a repeat of Ahmed's above exercise for a recent year, e.g. 1981, for which a HES has been conducted, its data being in advanced stage of dissemination. But all attempts to the contrary, it has not been possible to obtain access to the tables giving basic distribution of expenditures and food intakes for rural and urban areas as a whole. Were it feasible for the Bangladesh Bureau of Statistics to supply the consultants with the requisite tables, it would have been possible and quite insightful to update Ahmed's exercise. We did, at one stage, consider using the body of published tables from the 1976/7 HES, all of whom provided the required disaggregation by commodity classification of expenditure. However, the quality of the 1976/7 HES has been shown by members of this research team, as also other, to involve significant degree of bias (Chowdhury, 1985; Muqtada, 1985).

8.5 What one could of course do would be to calculate the magnitude of the income effect of rationing in 1984/5 on the assumption that, between 1973/4 and the latter, the only changes to have occurred involving urban consumers of foodgrain have been relating to (i) the ratio between ration retail issue retail to open market retail price of comparable rice; and (ii) the quota per week per capita. By assumption, everything else governing consumers' choice behaviour in the market for foodgrain (rationed and marketed) and non foodgrains is assumed to have remained unchanged. Obviously, (i) and (ii) in combination determine the extent of the income transfer due to rationing. The latter in combination with marginal propensity to consume foodgrains would determine what additional quantum of foodgrain would be implied by the income effect of rationing. Assuming that marginal propensities to consume foodgrains and all other commodities have remained the same, one could determine the additional quantity of foodgrain a lower or higher income transfer effect would entail. This simple exercise boils down to the question of what income distribution effects would have taken place in 1984/5 if the values of parameters at (i) and (ii) in 1973/4 were the same as in 1984/5. Table A8.3 shows the rate of income transfer (calculated against without-rationing foodgrain expenditure levels) in various years relative to 1973/4. The number in col.12 can range from 0.1 to 1. An increase in this ration implies a fall in the rate of subsidy. Hence the index in col.13 ranges between 100 to 272. As such, an increase from 100 in the index also implies a decline in the rate of income transfer relative to 1973/4.

8.6 Using the fact that the rate of income transfer (calculated against without-rationing expenditure levels) in 1984/5 is estimated to be 118% lower than that in 1973/4, everything else remaining the same, gives a basis for adjusting downward the income transfers originally estimated for 1973/4 in Table A8.1. While expenditure per capita in the with-rationing situation originally estimated for 1973/4 would, by assumption, remain the same, the expenditure levels excluding the income effect of rationing in 1984/5 would then have to be recalculated. Table A8.2 presents the relevant calculations. While the Gini coefficient in the without-rationing 1973/4 situation remains the same at 0.27, the corresponding figure in after-rationing situation incorporating 1984/5 "income effect" magnitudes is 0.286. For the urban areas in Bangladesh as a whole, income due to rationing works out according to this methodology at 3.21% of with-rationing income per capita. (The corresponding figure was 7.05% in 1973/4). In other words, we have found that at the weighted average rate of subsidy of 1984/5, household's income in the after-rationing situation would increase by 3.21% per capita due to rationing. This is somewhat higher than has been estimated in a recent paper by A. Abudllah (1985). Abdullah estimates rationing benefit-to-income-ratio to be 0.3% or less for three SR cities. Data from our own SR sample surveys in Dhaka and Khulna sugest that income per household in the same static sense as that used by Abdullah works out at about 0.7% of average household expenditure in 1984/5. Benefit per household on our sample is found to be Tk.38.6 per month, as against Tk.13.5 or so on Abdullah's sample.

8.7 We are quite aware that the estimates contained in para 8.6 are not definitive as they are not based on nationally-representative HES for urban areas. Nevertheless, we feel that the estimates especially of Table 8.1 and in para 8.6, shed much important light on the distributional implications, whether measured in terms of average expenditures or calorie intake, of urban rationing in 1973/4 - a year when participation in it by the eligible population must have been at one of its highest ever in the post liberation period. Thus, to find that urban rationing in that year lowered Gini coefficient by 3 percentage points is of interest. our own reaction is that the redistributive impact of urban rationing even in the highly favourable circumstances of 1973/4 is not all that impressive. The nutritional redistribution due to rationing is even less (table 8.1). We have further seen that the redistribution arising from urban rationing in 1984/5 is only to the tune

of an improvement of the Gini coefficient by slightly more than 1 percentage point. Besides, both our estimates, as also Abdullah's ones, of the size of the income transfer (in a static sense) relative to expenditure (in our case) and income (in Abdullah's case) in SR areas in 1984/5 (September 1985 in Abdullah's case) ranges from 0.7% to slightly less than 0.3% (para 8.6). For urban beneficiaries as a whole, we estimate that rationing benefits-to-expenditure ratio in 1984/5 is much higher, at 3.21%. We shall now turn to present some interesting insights into rationing and food consumption behaviour of SR household in Bangladesh. It has been our belief that the evidence really hard to gather in evaluating rationing programmes are about the rationing and food consumption behaviour of particular priority groups of households. In this study, we have attempted to quantify these and some other relevant variables for a randomly chosen set of households in two SR areas, Dhaka and Khulna.

8.B Food Consumption Characteristics of Average SR Household, 1984/5

8.8 A knowledge of the food consumption characteristics of the sample household is obviously of great importance in the present context. In particular, we must know (a) how budget shares allotted to food and (b) how, within allotment to food, the budget shares of cereals behave within this sample. It has been argued that smaller budget shares allotted to food can be considered an indicator of a higher standard of living (Deaton, 1983). A comparison between food and (intra-food) cereals budget shares obtaining for the sample, and the corresponding shares based on nationally representative data can shed some useful light on the standard of living of the SR households in general. The second use of food consumption data is in permitting an estimation of the income effect of rationing, and an evaluation of its distributional effects. The third use lies in establishing the impact upon the food and nutritional intake of rationing. Food consumption characteristics thus constitute an obvious starting point for this chapter.

8.9 Expenditure per standardised consumption units was chosen as the measure dividing households into income groups. As already argued above, the practice of using expenditures as representing permanent incomes has a respectable pedigree (see for example Hazell and Ailsa 1983, P.44, in addition to references cited above). If further conviction is wanted, an examination of the information in Table 8.2 may help.

Table 8.2

Income characteristics of SR Households on the Sample, 1985

(Weighted average)

Expenditure quartile groups	Av. No. of earners per household	Total income per year Tk. per earner	Total income per year Tk. per capita	Total income per earner per month Tk.	Total expenditure per year per capita Tk.
(1)	(2)	(3)	(4)	(5)	(6)
1st	1.98	19888	4396	1651	4387
2nd	1.76	33688	6845	2807	6120
3rd	1.61	38977	7603	3248	7860
4th	1.77	48818	9827	4068	13169
All	1.77	34324	7058	2860	7762

Source: SR sample survey

3.10 Table 8.2 shows quite starkly the problem of using reported income for classifying households. A comparison between cols. (4) and (6) shows that, while for the first two quartiles, per capita income is higher than the matched expenditure as one would expect, the opposite appears to be the case with the two following quartiles. The difference is not particularly noteable for the 3rd quartile, remembering that expenditures on our measurement include imputed value of consumption out of own production or of draw down of last year's stocks. It is commonplace to recognise that whenever consumption out of own-account production or stock draw-down becomes important, expenditures, including imputations tend to be increased, while reported incomes are not, at least to the same degree. Such an explanation could possibly do as far as the light discrepancy in the 3rd quartile is concerned. However, the difference is very much noticeable in the case of the 4th quartile. A large part of this difference is likely to consist of conscious understatement of income[1], although a small part may well reflect consumption of own account production and draw-down. In contrast, expenditures are unlikely to be understated, even at the upper ends of the distribution, because we detailed out a long list of possible types of expenditure, which is supposed to facilitate the process of accurate recall.

8.11 Though expenditures are identified in this study as reflecting permanent income, we may, in passing, note the following characteristics of the measured income of the sample households. More than one earner per household is the norm. The average number of earner per household is 1.77. The highest number of earner per household is found for the first quartile where annual income per earner is the lowest in the table. In all the income variables i.e. in cols. (3) - (5) one finds a smooth progression of values from the 1st to the 4th quartile. Also average incomes on this SR households is significantly higher than estimated average income for urban areas as a whole in 1984/5, whose distribution is shown in Table 8.3 below[2]. It has often been said before, usually on a priori grounds, that urban rationing benefits households with above - average income more frequently than is desirable (Clay, 1981). Such assessments are hereby given a firmer basis of fact. We shall return below to this issue of inequitable distribution of SR offtake.

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1. Understatement of income, especially in the upper reaches of the income distribution, is a fact of life. Well-trained investigators such as our own, may frequently be aware as it happens but unable to do much about it.

2. Income per capita in terms of quartiles were calculated for 1978/9 on the basis of HES data for that year. They were then expressed in terms of 1984/5 prices by applying an appropriate cost of living index.

Table 8.3

Relative Standard of Living on Our Sample to Representative Urban Households in Various Quartiles, 1984/5

(Tk./capita/yr.)

Quartiles	per capita expenditure per year, urban areas in Bangladesh, 1984/5			Per capita total expenditure per yr.,on our sample	Ratio of Col. (4) to col. (5)
	Food items	Nonfood items	Total		
(1)	(2)	(3)	(4)	(5)	(6)
1st	2222.5	936.1	3158.6	4387	72.0
2nd	2489.0	1017.6	3506.6	6120	57.3
3rd	2744.2	1256.9	4001.1	7860	50.9
4th	6274.8	4735.4	11010.2	13169	83.6

Note:Food and nonfood annual expenditures per capita were first estimated for various quartiles for the year 1978/9 using HBS 1978/9 data. Using consumer price index for middle income families in Dhaka obtained from BBS, these averages were adjusted upwards. Separate indices for food and nonfood items were used. The food index in 1984/5 was estimated at 365, as against 185 in 1978/9 (both with 1973/4 = 100). This suggested that food prices in Dhaka for middle-income families had risen by about 196.8% between 1978/9 and 1984/5. On that basis, the values in col.2 were obtained. Likewise, values in col.3 was obtained by applying an appropriate nonfood price index for Dhaka middle-income families. The other two series on consumer price index published by BBS were deemed to be more specialised in nature, and therefore not used

Source: (HBS, 1978; our own sample survey results).

Table 8.4

Quartile Distribution of Family size, Food and Nonfood Expenditures, and No. of Earners, SR Households' Survey, Bangladesh, 1985

Quartiles	Household Size (Nos.)	Male adult equivalent consumption unit (Nos.)	Per capita expenditure			Average number of earners	% share in total per capita expenditure	
			Food	Nonfood	Total		Food	Nonfood
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1st	8.91	6.65	3080	1307	4387	1.98	70.2 (70.3)	29.8 (29.6)
2nd	8.65	6.38	4017	2103	6120	1.76	65.6 (71.0)	34.4 (29.0)
3rd	8.26	6.0	5045	2815	7860	1.61	64.2 (68.6)	35.8 (32.4)
4th	8.8	5.97	7015	6154	13169	1.77	53.3 (57.0)	46.7 (43.0)
All	8.63	6.23	4745	3017	7762	1.77	61.1 (68.0)	38.9 (32.0)

Note : 1) Quartile distribution is based on expenditure per standardised consumer unit. However, per capita expenditure in this table and elsewhere is derived by dividing household expenditure by the number of household members.

Source: Our own SR sample survey.

8.C Analysis of Sample Food Consumption

8.12 Table 8.4 shows the size of household, the levels and composition of average expenditure as between food and nonfood categories, on our SR sample households. The percentages within parentheses in cols. 8 and 9 show the quartile-specific budget shares of food and nonfood items for all urban areas in 1978/9, as far as possible on a comparable basis. Several observations are in order here. First, average family size on sample households is larger than the national urban average[1]. Second, inspite of larger household sizes, per capita expenditure on the sample on food and nonfood items is significantly larger than the estimated corresponding figure for all urban areas in 1984/5. Per capita incomes on our sample are higher by anything between 96% and 20% - depending on the quartiles - than what is estimated on rather generous bases, to be the average income of representative urban households in various quartiles. Third, the overall share of food in household budget of the sample, at 61%, compares with the 68% estimated for urban areas as a whole. In both cases, the percentage of food declines with higher quartiles, but the rate decline is slower in the case of the estimated 1984/85 percentages. Again, in both cases, the fall is visibly more rapid in the last quartile.

8.13 We should perhaps at this stage point out that there is probably a significant difference, as regards the capacity of households to earn and spend money, between the urban areas as a whole which underpin the basic HES estimate used in Tables 8.3 and 8.4 and the cities of Dhaka and Khulna that our own survey have covered. One should only remember that for the purpose of the HES 1978/9, an area with a population in excess of 25000 persons was treated as urban. Such a definition perhaps brought within its purview the small un-industrialised mofussil town as well as major cities, boasting wealthy industrial and commercial concentrations. The urban sample of the HES must have been more inclusive than our own. This is important to bear in mind when comparing expenditure per capita on our Dhaka-Khulna SR samples with an updating of the 1978/9 estimates.

8.14 The substantial differences between the two averages, certainly not surprising, highlight that the average recipient of SR in Dhaka and Khulna is significantly better off in life in 1984/5 than the representative urban household in Bangladesh.

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1. This is borne out be comparing sample average family size with the corresponding urban average for 1978/9, obtained from 1978/9 HES.

Table 8.5

Quartile Distribution of Expenditure on Cereals and Cereal Derivatives, SR Households Survey, Bangladesh, 1985

Quartiles	Per capita expenditure on						As % of all cereals expenditure			
	Rice	Wheat	Flour, flour-based products	Atta	All cereals except flour	All cereals	Wheat	All food-grains	Flour	Atta
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1st	995	186	69	46	1288	1357	13.7	87.0	5.1	3.4
2nd	1028	229	194	24	1359	1553	14.7	80.9	12.5	1.5
3rd	958	239	252	29	1325	1577	15.1	75.9	16.0	1.8
4th	1196	433	426	34	1616	2042	20.5	77.3	20.9	1.6
All	1036	266	229	34	1387	1616	16.3	79.8	14.2	2.1

Note : a) Percentages below only include expenditure on rice and wheat, whether or nor bought through rationing. Difference between cols 9 and 8 equals proportion of rice in cereal budget. Percentages in col. 9 through 11 need not add up to 100, because share of some cereal derivatives are not included.

Source: Our SR sample surveys

8.15 Table 8.5 shows the levels and composition of expenditures on cereals for the SR household sample. It is somewhat odd is that as a percent of expenditure on all cereals, expenditure on wheat increases, at first very steadily but finally at a rapid rate, from one quartile to the next. We would like to offer three explanations for this. First, wealthier households tend to have a higher ratio of domestic help and non-kin dependants in the size of the household.

Wheat may contribute by far the greater part of the foodgrains fed to these members. Second, there is evidence to believe that educational levels in wealthier households are higher. These households will likely have a higher proportion of their members who choose between rice and wheat on the dietary and health value considerations. Obviously, higher educational levels of wealthier households facilitate such choices. Such dietary choice process favours wheat. Besides, households with members with high blood sugar levels, or with a family history of diabetes or cardiac problems tend now-a-days to lean towards a wheat-based diet, especially in breakfast and supper. Certain religious festivities, e.g. the celebration of the Laila-tul-Barat among Muslims and of the Durga Puja among Hindus, ceremonially involves distribution of charities of cooked meal among the poor. "Ruti-halua" is an item pervasively used for this purpose by both types of people. (Incidentally, Laila-tul-Barat preceded the commencement of this survey by only about 40 days). Quite likely, such expenditures are positively correlated with per capita expenditure. Another way of saying this would be that "charity" is a normal "consumption good". These three explanations would appear to us to largely account for the observation regarding wheat expenditure per capita.

8.16 We note next that the expenditure on all foodgrains as percentage of expenditure on cereals declines from 87% for households in the first quartile to about 80% in the top quartile. This is to be expected. We obviously have an interest in our next finding, namely, that the expenditure on flour and flour derivatives (bakery products and fried flour-products) as a proportion of cereals-expenditure rises quite systematically through the quartiles. Flour consumed in Bangladesh is largely produced out of the wheat distributed to the flour mills at subsidised prices for onward distribution at similarly subsidised prices. Our data suggest that the richest 25% of our households account for 42% of the expenditures on flour, while households in the 3rd quartile account for 33%. The top half of the distribution thus account for three quarters of the expenditures on flour and flour products[1].

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1 We should add a qualification here that, especially for the wealthiest 25% of the households, the relatively higher proportion of expenditures on flour and flour-products could well in part result from higher prices of product associated either with higher quality or with its prestige value, when bought from an exclusive outlet. e.g. the cake bought from French Bakery, or some such place.

Table 8.6

Food Consumption Pattern by Expenditure Quartiles, SR Households Survey, Bangladesh, 1985

(Unless shown otherwise, Tk./Yr.)

Quartiles	Cereals, cereal derivative	Fish, Meat, dairy Product	Pulses, Vegetables	Oils	Sugar sugar product	Spices, Other edibles	All Cereals	Fish, Meat dairy items	Pulses and all veg.	Oils	Others
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1st	1357	778	646	127	139	22	44.0	25.6	20.9	4.1	5.2
2nd	1553	1208	863	177	172	44	38.7	30.1	21.5	4.4	5.4
3rd	1577	1839	1079	222	282	45	31.2	36.4	21.4	4.4	6.7
4th	2042	2888	1365	360	305	53	29.1	41.2	19.4	5.1	5.1
All	1616	1663	981	218	226	40	34.0	35.0	20.7	4.6	5.6

Source : SR sample surveys

8.17 We next turn, in Table 8.6, to the composition of per capita food expenditure as between various groups of edible items, like cereals, fish-meat-dairy products, pulses and vegetables, edible oils and fats, and others[1]. The percentages presented in cols. 8 through 12 capture the highlights of this table. In overall terms, only 34% of food expenditures is allocated to cereals. A significantly large share 35% and 20.7%, respectively are allocated to protein-rich categories of products shown in col. 9 and 10. Even households in the first quartile devote, on average, about 46% their average food expenditures to commodities more noted for their protein than for their caloric intake. In fact, the sample in overall terms, has a strong preference for protein-rich food. Proteins in food in urban Bangladesh are evidently expensive. The unmistakeable preference for protein-rich food suggested by this table points to the fact that SR beneficiaries in general are well-off households.

8.18 Table 8.7 shows daily calorie intake from various groups of food items. Three aspects of the information in this table are worthy of note. First, overall calorie intake on the sample is high indeed, at 2297 k.cal per day. Representative urban average on all Bangladesh basis, estimated from quite firm HES data in 1973/4, is found to be 1920 k.cal and from somewhat less firm data of HES 1976/7, is found to be 1897. Second, the values of each of the quartiles exceed those derived from earlier HES. Finally, the daily calorie intake of only the first quartile on this sample, at 1865 k.cal, appears lower than what is frequently pur forward as the poverty level intake for Bangladesh, namely 2100 k.cal. But we should remember that even this class of households were found to be devoting a large part of their incomes favouring protein-rich food. Obviously, their measured low intake represents not so much their proverty as perhaps a peculiar preference for protain. We would like to assert, therefore, that poverty appears to be conspicuously removed from the food consumption characteristics of our randomly selected SR households.

.. Dairy products include chicken, eggs, butter and cheese. Ghee and vanaspati are included in oils. Unfortunately, the earliest year for which representative urban data providing similar disaggregation by comodity exist is 1976/7. It would, however, not be very appropriate to compare the relative shares in Table 8.6 with the corresponding percentages relating to 1976/7.

Table 8.7

Caloric Intake by Broad commodity Groups, SR Survey Households, 1985, and All Urban Population 1973/4, 1976/7

(K.cal/per day)

Quartile groups	Caloric intake per capita per day							caloric intake, all urban population	
	Cereal and derivative	Fish and meat	Milk, dairy products	Pulses, all veg.	Oils	Other fruit	Total	1973/4	1976/7
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1st	1331	43	29	242	207	13	1865	1735	1514
2nd	1600	84	73	284	276	24	2346	1864	1710
3rd	1504	127	101	314	370	31	2447	2067	1976
4th	1411	144	129	410	434	69	2597	2266	3330
All	1451	99	83	310	321	33	2297	1920	1897

Note: Note that the average daily calorie intake in urban Bangladesh in 1976/7 appears to have been both lower and more unequally distributed than in 1973/4. Muqtada (1985, Table 3.3), too, has reported a drastic increase in the Gini coefficient of urban incomes between 1973/4 and 1976/7 - an increase of 13 percent points.

Source: Cols. 2 through 8 are from our own sample. Col.9 is calculated from BBS, 1980, vol. II, Table 4.19, col. 10 is calculated from BBS, 1982, Table 15.16

8.19 There findings confirm what earlier assessments, usually done on a priori reasoning, of SR had alleged to be its tendency to reach mainly the nonpoor in urban areas. Thus, it has been argued, "the poorest consumers, excluding low-paid public sector employees, are therefore left to depend on the residual commercial market for foodgrains and will bear the brunt of adjustments to fluctuations in domestic supply" (Clay, 1981, p.60)[1]. Clay was referring to all priority channels of PFDS. He saw inequity, howsoever justified in the context of the organisational imperatives of what he called a military-bureaucratic-political complex, as the most distinctive feature of the priority channel of the PFDS. We can now see that the operations of the SR provides perhaps the most unambiguous documentation of the inequitable nature of the supplies within PFDS favouring urban areas.

8.20 We must now seek to provide some plausible explanations for why SR rarely, if at all, reaches the really poor segment of the urban population. For one thing, two aspects of the administration of SR results in that the poor find themselves cut out from it. First, new issue of SR cards has been stopped since 1974 except to persons belonging to the priority categories, like government servants on transfer, etc. Between 1974 and 1981, Dhaka's population more than doubled. Dhaka is the only city out of the four SR areas in Table 8.8 where growth rate of population 1974 through 1981 was higher than during 1961 through 1974. Urbanisation in Bangladesh has typically represented relocation in urban areas of previously rural, invariably land-poor, farm workers. There is evidence above that Dhaka has been over-urbanised than other SR areas. There has thus been a relocation of existing poverty in favour of urban areas in general, and of Dhaka in particular. And yet vast numbers of poor relocating themselves in Dhaka and in preference to rural or other urban locations found themselves counted out of the SR system.

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1 There is nor contradiction between Clay's reference to the poorest consumers only being left out of the rationing system and our finding that SR predominantly benefits the nonpoor. The point is that he was speaking about the coverage of all the priority channels of PFDS, including the SR. It is of course quite plausible that a percentage of offtake by channels such as Other Priorities, or Large Employers may indeed reach relatively or even absolutely poor households living in non-SR areas. In contrast, our findings are specific to the households in Dhaka and Khulna covered by SR.

Table 8.8

Urbanisation of Four Major Statutory Rationing Areas, 1961- 1981

(Compound growth rates)

Name of the city	Population			Rate of growth per year		
	1961	1974	1981	1961-1974	1974-1981	1961-1981
Dhaka	521	1679	3458	9.41	10.9	9.9
Chittagong	364	890	1383	7.11	6.6	6.9
Khulna	128	437	623	9.9	5.2	8.2
Rajshahi	57	133	172	6.7	3.7	5.7

Note: Natural logs have been used.

Source: Population figures for 1961 and 1974 are from BBS, 1975. 1981 figures are from BBS, 1982.

8.21 Secondly, between 1974 and 1985, households that were already in residence before 1974 and had been issued ration cards may be supposed to have through time improved their economic situation. The reasoning at this stage of our argumentation may appear a little conjectural, for the necessary empiricism is hard to come by. Between 1974 and 1985, the cities of Dhaka and Khulna have witnessed an unprecedented boom in subsidised, long-term residential investment. Families with some owned land have, with a bit of administrative connections, frequently become owners of sizeable and previously improbable, annuities in the form of rental incomes. Many categories of households have mainly benefitted from the dramatic improvement of earnings implied by the boom: (1) senior and mid-level government servants, and senior officers of public sector agencies who were in possession of land on long-term lease; (2) officers in the armed force with the rank of Lt. Col. and equivalent or above; (3) private-sector people who owned land in and around the city; (4) dealers or importers of building materials and men in construction consulting firms; (5) re-rolling businessmen, makers of residential implements from steel, etc. Ownership of a small piece of land in the city of Dhaka, Chittagong, Khulna and other SR areas frequently transformed incomes possibilities of numerous households

theretofore quite modest of means. Those already rich went into luxury housing riding on the crest of long-term loans at only 4% interest, and multiplied wealth at a speed not theretofore customary. Residential incomes, thus brought into being largely at public expense, frequently provided the basis on which many opulent households succeeded in securing worthwhile shares of the massive expansion of industrial credit, beginning about 1977/8. It is common knowledge that a preponderant part of credit-led growth in private incomes has been largely a major-city phemomenon, in the sense that industrial belts around the cities of Dhaka, Chittagong and Khulna have supposedly absorbed the massive expansion of industrial credit. There can be no question that the entrepreneurial agents in the centre of this unprecedented splurge of publicly underwritten cheap industrial credit were mostly resident in Dhaka and Chittagong. Privatisation in inustry and commerce was accompanied by a massive expansion of trade credit, particularly to jute trade (Chowdhury, 1984), the major centres for which, incidentally, are Dhaka, Narayanganj and Khulna. Such credit was occasionally diverted on a large scale as in 1980/1 (World Bank, 1981). It is in Dhaka and Chittagong that most of the major entrepreneurial groups reside.

8.22 The above serves to show that households in Dhaka of upper class or even upper-middle class position secured, in a decade or so, what were unbelievable riches. Other middle-class households were thrusted forward on the crest of the manpower export to the Middle East, whether in the capacity of actual immigrants or due to any spawned (e.g. recruiting agency, travel agency, photocopying, foreign exchange brokerage, trafficing in "short-circuited passports:, private vocational schools etc.) As average incomes have risen, and as female labour force participation has risen too, parental demand for early schooling has risen also, thus spawning numerous private sector nurseries, high-schools, 'pre-cadet' training schools. There are hundreds of cases of men and women securing formidable economic security via this route, having begun their working lives in stark austerity. Facilities for private health care, numerous Chinese restaurants, shopping arcades have been opened. Indenting of foreign products, techno-economic-engineering consultancy have experienced very considerable expansion. In short, members of middle and lower middle class have also found reasonably widespread access to raise average income considerably.

8.23 The point being made is the upper and middle classes in cities of Dhaka, Chittagong and Khulna have enjoyed sharp acceleration of industrial and infrastructural investment and presumably private incomes, too. The irony is that perhaps most, if not all, of these households are treated as priority recipients of subsidised ration simply because, in SR, cards, upto 1974, were issued on residential basis and because renewal of those cards was virtually automatic.

8.24 The SR cities in general, and Dhaka in particular, have been areas of relative opportunity even for households who came into residence before 1974, were issued with SR cards and have stayed on eversince. Many master weavers, especially those with a flair for mechanical systems, who earned relatively low real wages in public sector mills in pre-1974 days, quit to set up on their own or with a partner eventually to achieve control of one or two powerlooms a couple of years later, when expansion in powerloom loomage began. Many rickshaw-pullers have, when accosted by the writer of these lines, related the story of their accumulation of small but self-effacing bits of savings, leading eventually to their rising to the rank of a proprietor rickshawalla. No doubt, food subsidies undoubtedly played a note, though not a very important one, in improving their food security in the years since their first coming to Dhaka. It continues to do that to this day, although they may be much less deserving of these subsidies than the more helpless migrants who came after 1974, that is after ration cards were stopped being issued to new-comers.

8.25 The really paradoxical aspect of the situation is that rural migrants who streamed into the SR cities in the wake of the famine of 1974, not least because they were re-assured by the continued guaranteed access to cheap rationed food to the poor people, at times their own kinsfolk, in these cities, as they themselves starved in the countryside, were turned down by the rationing system. These relatively luckless people constitute a very large body; no less than three quarters of a million person may be involved in this category in Dhaka itself. These are the poorest of the poor in the SR cities. An yet, these households are unlikely to find themselves on any sample of SR covered households. The conclusion that the above analysis suggests is that SR, at least in Dhaka and Khulna, as a norm reaches nonpoor households. It is not being said that poor households never are covered within the SR, still less that no poor households benefit, at any rate indirectly, from the SR. (We shall shortly present some idea about the extent of leakage of SR foodgrains, presumably benefitting the poor). The point being made is that the chief, if not the only, beneficiaries of the system are the nonpoor.

8.26 At this point, we may do well to anticipate two types of comments which may seek to call into question the validity of these results. First, it may be argued that ours is a small sample in view of the total number of SR-covered households in the cities of Dhaka and Khulna. Hence the findings from such a survey cannot be accepted as depicting representative truths pertaining to SR households. Such a view would appear to us to denigrade the value of our selecting the ration shops at random, and then of randomly selecting the address of our ultimate respondents from a

long list of addresses of persons who were actually lifting ration. This procedure would serve to significantly increase the randomness of the actual selection. Secondly, it would be nearly impossible to design a statistical frame for conducting a representative SR survey that would stand up to every reasonable nuance of representativeness. For expample, in order to estimate the size of a desired sample that yields suitable confidence intervals, one needs estimates of the mean and standard deviation of a basic variable, frequently called an indicator variable, for the universe involved. Now per capita consumption of rice and wheat could have been used as the indicator variables. But the last HES for which data are available in published form in the commodity disaggregation desired was 1976/7 and as has already been noted, was of dubious quality. Furthermore as the BBS publishes these household data in panel form,access to individual values of the vairables which as needed if standard deviation was to be computed would have very difficult to manage. There is not much in these two comments therefore that flaws our results.

8.D Rationing Behaviour of the Sample Household:

8.27 We would like now to present the analyses of relevant antecedents and rationing behaviour of the sample households in terms of the following: (a) residential characteristics; (b) average number of minor and adult cards per household; (c) average number of minor and adult persons within households; (d) average number of weeks ration is lifted in a year; (e) average quantities of rice and wheat lifted in 1984/5; (f) average quantities of rice and wheat in entitlement; (g) the decomposition of the quantity entitled but not lifted due to irregular lifting, lifting at less than quota and an interaction term; (h) the possible extent of leakage of ration foodgrains from household consumption ; (i) households' own perceptions of what proportion of their foodgrain requirements were met by ration offtake; (j) the nature of consumer preference for ration "boiled" versus atap rice.

8.E Residential Charcteristics of Sample Households:

8.28 Table 8.9 shows quartile distribution of households by the stage of their lives when they came into residence in these two cities. In overall terms, only two of the categories shown in the table appear materially involved. The heads of 72% of the households were born outside these SR areas but came into permanent residence in these areas subsequently.

Another 24%, overall, have been resident in these SR cities since birth, while only 3% reported having moved into these SR areas due to transfers on duty. An important characteristic of the sample is that a distinctly lower proportion (14%) of the households in the lowest quartile have been resident in these cities since birth than those in the higher three quartiles (ranging between 26% to 29%).

Table 8.9

Residential Pattern of SR Households on the sample, 1985

Quartile groups	Resident in this SR area since birth	Moved into this SR area after birth of head of household	Came into residence due to transfer in my job	I live alone here, though my family lives in village/ smaller towns
(1)	(2)	(3)	(4)	(5)
1st	14.0	86.0	-	-
2nd	28.0	69.0	3	-
3rd	29.0	65.0	4	2
4th	26.0	69.0	5	-
All	24.0	72.0	3	1

Source: SR sample surveys.

8.29 Table 8.10 is concerned with yet another residential facet of the households, namely length of residence by quartiles. On an overall basis, the average length of residence of households whose heads were not born in these two cities is quite high, namely about 20 years. As we have noted at the bottom of that table, the actual average length of residence has to be deemed as even higher than 20 years because we looked only at the length of residence of households who at some point re-settled in these SR areas. The upshot is that

a clear majority of sample households, previously having lived outside Dhaka and Khulna, decided to permanently settle in these two cities.Note at this stage that, overall, only 3% of the households reported that their movement into these cities was occasioned by transfers on duty. The category of those who settled down in Dhaka and Khulna, in preference to the places of their birth, reflects, by virtue of its sheer dominance, a fact well-known to many, namely that especially Dhaka has attracted many families on account of its being the country's capital. We can perhaps even surmise that a process of conscious choice was exercised by these households in selecting Dhaka and Khulna, not the least important of the reasons for which may have been that these have for long been covered by statutory rationing. The "average" household in these category moved into SR area about 20 years age, or in 1965. It is apt to remember that in 1962/3, erstwhile East Pakistan had a crop failure (See Ch.2, Table 2.6), which sent market prices upwards. SR offtake during 1962/3, at 292 thousand tons, has been the highest ever in the entire decade ending in 1969/70. The protection that coverage in SR provided in that year from sudden spurts in rice prices must have been considerable. It is not to be ruled out, therefore, that the presence of SR in Dhaka and Khulna added to the attractiveness and promise that these two cities were already possessing for quite other reasons. The timing of our "average" household moving into Dhaka and Khulna may, therefore, well be more than coincidental[1].

8.30 Table 8.10 also presents two additional sets of averages of some importance, namely the average number of years since the household has been issued with ration cards, and the average number of years spent by households without the benefits of SR. This last set of averages is relatively more interesting. We find that the length of the period which households had to spend in these SR areas before being issued cards is the highest for the lowest quartile, and lowest for the highest quartile. A t-test showed that the mean of the lowest quatile was significantly higher than that for the other three quartiles. This is intuitively acceptable. The 'average' household was issued ration card 15.7 years ago, i.e. in 1969 or so. The ratio of ration to

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We should note, in passing, that the coefficient of variation attached to this overall average is large, 49.6%. This high order of variability is mostly a result of the relatively small sample size, and is unavoidable. This should, however, in no case completely nullify that the central tendency of this sample has been one of moving into SR area for permanent residence somewhere during the mid 1960's

market price in that year was a paltry 30%, and the quota per adult card was about 50% higher than it is today. There was very sizeable incentive to ensure the issue of cards in favour of oneself. Ensuring coverage within SR required (a) suitable employment status (e.g. government service) (b) social or political equation, or (c) capacity to resort to graft. Poor people outside government service would frequently lack both (b) or (c). It is to be expected, therefore, waiting time would be related to economic status of households.

Table 8.10

Length of Residence in SR Areas, 1985, by Quartiles

Quartile groups	No.of years since household moved into SR area	No.of years since households has been issued SR cards	No.of years since moving into SR area spent without, the benefit of ration cards
(1)	(2)	(3)	(4)
1st	23.9 (49.4)	14.7 (46.1)	9.2
2nd	19.6 (41.0)	18.3 (53.7)	1.3
3rd	18.4 (48.9)	14.2 (57.3)	4.2
4th	17.9 (50.9)	16.9 (61.8)	1.0
All	20.2 (49.6)	15.7 (52.1)	4.5

Note: The averages in Col. 3 do not include households whose heads were born and brought up in these two SR areas. Inclusion of such cases would have raised further these averages.

Source: SR sample surveys.

8.F Occupational Pattern of Heads of Households:

8.31 Tale 8.11 shows the distribution of the heads of 3026 SR households covered during an interview carried out in April 1985[1]. We find that about 82.5% of the heads of households involved had some defined employment status, while 8.5% of the cases returned obscure returns about the occupations of their households[2]. Also, 8.4% of the households are headed by retired men, or by women, presumably widows or wives with their husband abroad, both types not working to earn and hence properly treated as outside the labour force.

8.32 Government servants constitute the single most important segment of the group having some defined employment characteristic, with men in profession, trade, industry and other services being the next important category. Semi-government employees come next followed by salaried employees in private firms. Representatives of occupations with low socio-economic rating, e.g. artisans, rickshawala, maid servants are not much in evidence in this lot.

8.33 Table 8.12 presents occupational details of the heads of households on our SR sample. There are several noteable similarities between the proportions in these two tables. The proportions of semi-government and private sector employees are strikingly close. The proportion of those in government service on our sample is reasonably close, if somewhat lower. The overall proportion of the self-employed, including in it both occupations of high and low sociao-economic rating, in the two tables are almost identical, 31.9% in the ration shop sample and 32% in SR sample. The proportions of households whose heads do not themselves work to earn are also very close indeed. In essence, therefore, we would like to think that our samples have been drawn from the same structural universe as the much larger ration shop survey sample. This is a recognition of some considerable comfort to us.

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1 These interviews formed the basis of a survey of 10 ration shops carried out by us at the time. Interview were conducted with randomly selected persons that were actually lifting the ration of their own households, or on behalf thereof. Interviews were conducted at or around the ration shop premises. Ration shops only in Dhaka SR were covered.

2. Frequently, these were cases where ration was being lifted by proxies who were ill at ease during interviews. It is well known that many thousand false cards were still at work and it is not to be ruled out that what we are seeing in this particular case is hindrend to that problem.

Table 8.11

Occupational Distribution of Heads of Households Interviewed during Dhaka Ration Shop Survey, 1985

Nature of income of household head/other characteristics	Nature of Employer	No. of household	%
(1)	(2)	(3)	(4)
Salary	Government	820	27.1
Salary	Semi-Government firm	390	13.2
Salary	Private	246	8.1
Wages/profit	Business, profession	782	25.8
Salary	other types of organisation	65	2.1
Wages	Artisan, richshawpuller maids	185	6.1
Household heads with some defined employment status		2497	82.5
Occupation of household head miscellaneous, or unknown to ration lifters		256	8.4
Household heads outside the labour force[b]		256	8.4
Household heads deceased[c]		16	.5
Grand total		3026	

Note: a) Percentages in col. 4 may not add up to 100 due to rounding error.
b) This relates to housewives or retired persons heading households
c) The person in whose name the cards were issued have since died.

Table 8.12

Occupational Distribution of Heads of Households in Dhaka and Khulna SR Areas, 1985

Nature of income from primary occupation	Nature of Employer	All Quartiles
(1)	(2)	(3)
Salary	Government	20.5
Salary	Semi-government	12.2
Salary	Private sector	8.3
Wages/profit	High-level business profession	10.2
Wages/profit	Other self employment	21.8
Salary	NGO, embassies, international organisations, etc.	17.9
Household heads in labour force		90.9
Household heads outside labour force		9.0

Source : Sample survey results

8.34 Table 8.13 shows the average number of members and ration cards in the sample households. Both members and cards are categorised as adult and minor by using 8 year as the cut-off point. This definition is due to the practice whereby a household member upto 8 years is accorded half the quota of adult cardholders. While the averages in col. (2) through (5) are easily noted, the highlight of the table is contained in cols. (6) and (7), in that households have more

minors cards then they have minors, and that they have less adult cards than they need. Note that this need not be true for every conceivable household, but that this is true on the average, for each of the quartiles. The reason for such a pattern may lie in the fact that the status of ration cards has not been changed in the light of changing ages of the members. Minors of yester years have grown up into "adult-hood" on the definition at hand, without the family changing the status of the cards involved.

8.35 This may be seen as an indirect evidence of an attitude by households of the lack of acute concern with getting the maximum benefit possible under the SR rules prevailing. Minor cards have a quota half that for adult cards, and if ration subsidies are deemed very important, households will consciously seek to change the status of cards whenever possible if doing so will raise food entitlements. The rations in the last columns of Table 8.13 do not suggest that this is the case with the sample households.

Table 8.13

Number of Member and Ration Cards per Household, SR Survey Households, Bangladesh, 1985

Quartile groups	No.of member per household		No.of ration cards at issue for household		No.of cards as a ratio to no. of family members	
	Upto 8 years	8 years & above	Minor card	Adult card	Upto 8 years	8 years & above
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1st	1.54	7.37	1.63	5.19	1.058	0.704
2nd	1.0	7.64	1.45	6.83	1.450	0.894
3rd	1.20	7.08	1.57	4.98	1.308	0.703
4th	1.06	7.73	1.71	5.51	1.613	0.713
All	1.21	7.40	1.60	5.5	1.322	0.74

Source : SR sample surveys

8.G Frequency, Extent, and Commodity-mix of Lifting

8.36 Table 8.14 shows several things. First, it shows that the number of times in a year that ration is lifted falls steadily from the 1st to the 4th quartile. Average number of weeks when ration is lifted is found to be 42.5 during 1984/5. This incidentally is very close, if not identical, to the corresponding average estimated for a much larger number of ration-lifters interviewed throughout Dhaka rationing area. The latter average was estimated at 45.4. Second, while the weekly lifting per household of rice also falls with quartiles, the same is not necessarily true of wheat. Third, the overall quantity of ration foodgrain lifted per capita for the sample is found to be 98.5 lb. Unfortunately, the only estimate of urban lifting of ration foodgrain per capita available for comparative purposes is due to Ahmed, 1979, Table 14. He estimated that urban ration per capita received on average in 1973/4 was as high as 275 lb. The ration lifted per capita even in the highest expenditure size-group was estimated by Ahmed to be 240 lb.

Table 8.14

Frequency, Commodity-mix and Annual Quantity of Lifting, SR Survey Households, Bangladesh, 1985

Quartile groups	No. of Weeks per year	Quantity lifted per week (kg)		Quantity entitled per week (kg)		Quantity lifted 1984-85 (kg)			Percentage shares in total qty. lifted	
	ration lifted	Rice	Wheat	Rice	Wheat	Rice	Wheat	Total	Rice	Wheat
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1st	45.1	2.60	6.77	3.0	9.00	116.7	320.3	436.9	26.7	73.3
2nd	44.8	2.76	9.14	3.77	11.33	119.1	378.3	497.4	23.9	76.0
3rd	41.9	2.02	5.51	2.88	8.65	87.2	233.2	320.4	27.2	72.8
4th	38.4	1.71	5.83	3.18	9.56	71.2	251.1	322.3	22.1	77.9
All	42.5	2.26	6.60	3.15	9.45	97.7	288.2	385.8	25.3	74.7

Note:a) Quantity entitled per week has been calculated on the basis that quota per adult card is 1.5 kg. for wheat and 0.5 Kg. for rice, and that the quota per minor card is half that much.
b) These are per household averages.

8.37 The quantity of ration foodgrain lifted per capita by SR households is therefore much lower in 1984/5 than in 1973/4[1]. The reasons for this are not relevant at this stage. Suffice it to say that, while the ration rice and wheat were at least 62% and 62.4% cheaper than comparable market prices in 1973/4, they were only 18% and 10.5% cheaper in 1984/5. There are other contributory forces at work, too, which are best omitted here. Lastly, the proportions of rice and wheat in the quantities lifted are, on overall basis, the same as in the allotment per card per unit of time, namely 25% and 75%. There are, however, some variations to this among the households of different quartiles groups. It is interesting to note that for households of the highest quartile group, the proportion of wheat in total foodgrain lifted is the highest for the sample, at 77.9%

8.38 What is the extent of lifting of one's entitlement on this sample. Table 8.15 seeks to answer this question. One point of procedure may be noted at the outset. Quantity of lifting has here been standardised with respect to the number of adult-equivalent cards since it is only possible to speak of allotment per adult (or minor) card, as the case may be. Several findings are of interest here. First, the same proportion of the rice and wheat quota per card per year appears to be lifted overall, although there are interesting similarities and contrasts in the proportion for the quartile groups. The similarity is that the proportion predictably declines with ascending quartiles for both rice and wheat. The dissimilarity, however, lies in that the rate of decline is appreciably faster in the case of rice than in the case of wheat. Wheat is, therefore, seen as the preferred commodity by this well-off sample. Also note however, that the highest proportion of entitlement that is lifted is returned for the 1st quartile in the case of rice.

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1. True, Ahmed's estimates pertained to urban lifting out of SR as well as other priority categories, while our data are specific to two SR areas. The point, however, is that in 1973/4, the quota per card was the same on SR as for other priority ration receivers, as well as beneficiaries under the Large Employer (LE) category. For the most part, an urban card-holding consumption unit in 1973/4 would quite accurately be represented by an SR card-holding unit. Hence the conclusion made in the text would appear to hold.

Table 8.15

Percentage Lifted out of Quota on SR Sample

(Weighted average, 1984/5 annual)

Quartile groups	Quantity of ration lifted per adult-equivalent card (kg[a])			Percentage lifted of allotment per adult card[b]		
	Rice	Wheat	Total	Rice	Wheat	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)a
1st	19.4	53.4	72.8	74.6	68.5	70.0
2nd	15.8	50.1	65.9	60.8	64.2	63.4
3rd	15.1	40.4	55.6	58.1	51.8	53.4
4th	11.7	39.4	50.6	45.0	50.5	48.6
All	15.5	45.8	61.3	59.6	58.7	58.6

Note: a) Minor cards have been treated as one-half of adult card for the purpose of arriving at the number of adult-equivalent cards.
b) An adult is supposed to receive 26 Kg. of rice and 78 Kg. of wheat per year under the rules prevailing in 1984/5.

Source: Sample survey results

8.39 Our data permit us to decompose the quantum of allotment not lifted into (i) irregular lifting; (ii) lifting at less than full quota; (iii) and an interaction between the two. The logic of this exercise has to be understood first. A card-holder will likely lift his full quota per year if he lifts his ration regularly, i.e. on each of the 52 permissible weekly occasions and if he lifts the full quota per card per week. His actual lifitng may be lower than his total entitlement if (a) he lifts irregularly but fully, or (b) if he lifts partially, even if regularly; or (c) if he lifts both irregularly and partially. The effects at (a), (b) and (c) in this above sentence correspond to the three noted in (i), (ii) and (iii) in the above. Yet another preliminary that should be noted is that all the figures presented in Table 8.16 are per household averages. We would have obtained the same results were we to use per-adult-card figures, and it is not the natural thing in this present context to express everything in per capita terms.

Table 8.16

Under-utilisation of Ration Quota per Household per year, SR Households Survey, Bangladesh, 1985

Quartile groups	Quantity entitled per year per household, at full lifting (Kg)		Decomposition of unutilised entitlement						Total quantity entitled but not lifted	
			Irregular lifting		Lifting at less than the quota		Interaction between irregular lifting & less than full lifting			
	Rice	Wheat	Rice	Wheat	Rice	Wheat	Rice	Wheat	Rice	Wheat
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1st	156 (624)	469	18.7 (47.6)	31.7 (21.5)	18.0 (45.8)	83.7 (56.6)	2.6 (5.6)	32.3 (21.8)	39.3	147.7
2nd	196 (785)	589	24.3 (31.4)	96.9 (45.9)	34.7 (44.9)	83.2 (39.5)	18.2 (23.5)	30.7 (14.5)	77.2	210.8
3rd	150 (600)	450	17.9 (28.5)	53.3 (24.6)	33.9 (54.1)	130 (60.0)	10.9 (17.4)	33.2 (15.3)	62.7	216.5
4th	166 (663)	497	17.9 (19.0)	52.0 (21.1)	52.3 (55.4)	119.4 (48.6)	24.2 (25.6)	74.5 (30.3)	94.4	245.9
All	164 (655)	491	20.1 (30.4)	55.21 (27.2)	33.8 (51.1)	106.2 (52.3)	12.0 (18.1)	41.6 (20.5)	66.1	203

Note: Figures within the parentheses show, for each of the two commodities, the proportion of total underutilisation of yearly ration quota per household as between irregular lifting, lifting at less than the quota, and interaction between the two. These same percentages would also be obtained if underutilisation of quota per card holder were to be examined. Figures in parenthesis intermediate to cols 2 and 3 show total entitlement per household of rice and wheat.

8.40 The following findings may be highlighted. First, a significant portion of quota under the SR system is not lifted. The quantity of foodgrain per adult card that is not lifted is found to be 42.75 kg[1]. Total quantity entitled per adult card per year came to 104 kg. The proportion entitled but not lifted thus came to 41%. Since under SR arrangement, the dealers routinely are allotted the full de jure quota of all their card-holders, (unless they themselves go for carry-over) the non-utilisation of the quota by households at once means that 41% of the SR offtake represents the maximum limit of potential leakage from the PFDS presumably into the market -- involving diverting function performed by the SR dealers[2].

8.41 Second, the table shows in parentheses appearing below each row in cols 4 through 9 the results of our decomposition of the balance between household total entitlement and the quantity they lifted. In overall terms, the proportions shown in any of the category against rice and wheat are not very different. Again, in overall terms, partial lifting, rather than irregular lifting, is found to account for over half of the total un-utilisation of ration entitlement, and this appears to hold good for both rice and wheat. This appears to be a sensible finding. What this perhaps means is that the card-holder or his proxies attend the ration outlet relatively regularly. Whether, however, he lifts fully or partially depends on the quality of the rice or wheat being distributed on a particular day and on the relative price of that specific variety at the ration outlet versus the market place. As shown further below, there is a clear preference for boiled versus atap rice (table 8.17 below). The problem of lack of utilisation of the quota is not so much one of cardholders who rarely visit the ration shop as one of discriminating customers who base their rationing quantity decisions on considerations of quality, relative price and so forth. Regular attendance at ration outlets could also be due to the fact that commodities other than foodgrains too, are available for rationing.

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1 Total quantum entitled but not lifted is 41.98 metric ton on this sample, while the total number of adult cards is 982

2 We do not imply here ofcourse that this was also the extent of actual leakage by SR dealers into the market, for as long as it is profitable for the dealer to divert deliveries to the open market due to differential prices for the same variety, it must also be profitable for households to choose rationing as against the market. Hence it may be quite wrong to equate the unlifted part of households entitlement to actual leakage. However, the potential most certainly exists and is evidenced by casual empiricism in which retail outlets in major city bazars frequently sell ex-rationing rice. We have ourselves noticed this during SR field surveys.

8.42 This may be an appropriate stage to present a clear evidence as to consumers' preference for one particular type of rationed rice to another. Table 8.17 shows, for both the categories of rice, the distribution of households as between various degrees to which they utilised their quotas. The relative frequencies presented in this table can be used to yield averages relating to the extent of lifting. The average extent of lifting, suggested by this table are found to be somewhat lower, especially for atap rice, than has been shown before in connection with Table 8.15. The measurement in Table 8.15 was quantitative and not, as in the present case, based on subjective perceptions. This suggests that the figures in Table 8.17 are not useful for pointing at the extent of lifting of rice. Of course, that is not its purpose, either. Its purpose is instead to see whether the perceived percentage of the quota that is lifted varies as between the two major qualities of rice rationed : it is comparison across two qualities. The biases, if any, of responses to the relevant question asked, reproduced at the foot of Table 8.17, are likely to symmetrically affect both types of rice.

8.43 The table suggests that a certain degree of preference is accorded to boiled rice : on an overall basis, while about 39% of households reported they lifted 60% or more of their rice quota when boiled rice is being rationed, only 21% did so when atap rice was being distributed, Conversely, while as much 64% of the households stated that they lifted less than 40% of their quota when atap rice is rationed, the matched percentage was 48% only when boiled rice is. The point, therefore, is that the absence of preferred ration foodgrain variety influences the extent of lifting. (There is similarly an evidence, not presented here, as to preference accorded to the "red" wheat versus the "whitish" wheat). It is not surprising, therefore, that lifting at less than the full quota is the more important source of underutilisation of the quota.

Table 8.17

Percentage of Rice Quota lifted (when lifting is partial), for preferred and less preferred Types of Rice, SR Survey Households, 1985

(Percentages)

Quartile groups	Boiled rice					Atap rice				
	0-19	20-39	40-59	60-79	80-99	0-19	20-39	40-59	60-79	80-99
1st	51	-	3	14	33	62	3	14	21	-
2nd	35	1	15	22	23	59	4	19	4	15
3rd	39	2	22	11	26	59	2	15	11	13
4th	52	9	12	3	24	67	18	6	9	-
All	45	3	13	12	27	62	2	16	7	14

Note: The question asked in the survey instrument was : when lifting is partial, what proportion of your total quota do you normally lift in the case of (a) boiled rice, (b) atap rice

Source : SR sample surveys.

8.44 Ration foodgrains may leak out, presumably into the open market, at the stage of the SR dealers. Further, leakage may take place at the stage of SR households. The following procedure was adopted to capture its possible extent. The respondents were asked if their households had been a party to the divertion into or out of their consumption flows, as the case may be, of ration foodgrain received by others. It has thus been possible to calculate the net quantum of ration foodgrain that is leaked into or out of households consumption stream as the case may be. On an overall net basis, the sample households have leaked ration foodgrains out of their own consumption stream, to the extent of 0.71 kg. per adult card. (Table 8.18). We are not, however, inclined to take this at face value. We feel some serious understatement is involved in the evidence just noted. The probable extent of leakage is shown in Table 8.18 by rice and wheat, col. 9 and 10. But let us first outline our procedure for arriving at this sensitive conclusion.

8.45 Households were asked to state how they met their foodgrain consumption during 1984/5 : from own-account production, ration offtake and market purchase. They were then, in a separate part of the questionnaire, asked about the quantity of ration foodgrain actually offtaken by them during 1984/5. Finally, they were asked about the net extent of their leakage of ration foodgrain into consumption by others. Normally, ration quantity offtake net of the quantity leaked should equal the ration quantity that households consume. The figures in Table 8.18 show that this, more frequently than not, is not the case.

Table 8.19

Accounting for Ration foodgrain lifted between Household consumption and possible Leakage, SR Household survey, 1985

Quartile groups	No.of adult equivalent cards at issue per household	Quantity of ration foodgrains consumed within household, per adult equivalent card (kg.)		Quantity of ration lifted 1984-85 per adult equivalent card (kg.)		Quantity of ration foodgrains lifted by household but consumed outside, per adult equivalent card. (kg.)		Quantity of lifted ration that cannot be accounted for (per adult equivalent card) (kg.)	
		Rice	Wheat	Rice	Wheat	Rice	Wheat	Rice	Wheat
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1st	6.0	15.3	36.1	19.4	53.4	0.30	1.00	3.8	16.3
2nd	7.56	13.3	33.5	15.8	50.1	0.95	1.07	1.6	15.5
3rd	5.76	12.4	36.9	15.1	40.4	0.37	nil	2.3	3.5
4th	6.37	5.4	40.3	11.2	39.4	0.54	0.93	5.26	-1.83
All	6.30	11.8	36.7	15.5	45.7	0.54	0.71	3.2	8.29

Note: Col. 9 equals col. 5 -(col.3+col.7). Col. 10 equals Col. 6 - (col. 4 + col. 8)

Source SR household sample surveys.

8.46 Table 8.18 in cols. 9 and 10, shows what quantities of lifted ration cannot be accounted for. On a overall basis, 8.3 kg. out of 45.7 kg. of ration offtake per adult card by SR households in wheat cannot be account for. Is it not plausible to suppose that this represents the probable extent of leakage of wheat? If true, this suggests a percentage of about 20%. In the case of rice, the percentage is at 24%.

8.47 What, then, is the total extent of potential leakage in 1984/5 from rationing foodgrain stream? 41% of what is allotted to SR dealers potentially leaks out due to households not lifting their full entitlement. Another 20% of what lifted -- or another 12% of the total quota -- is perhaps leaked by households themselves. In all, about 53%, or say, about half of entitlement of ration foodgrain on this sample had a potential of leakage out of household consumption in 1984/5.

8.48 Certain conditions peculiar to 1984/5 have promoted an uncharacteristically high order of potential leakage. In particular, we have noted the softening of the market prices versus ration prices, especially in the second half of the fiscal year which reduces the incentives to lift one's quota. A good deal of rice that has been imported during 1984/5 has been of a variety that is not rated highly by the consumers. The need for the government to import uncharacteristically high levels of wheat using deferred payments may also have resulted in the selection of a variety of wheat that consumers tend to discount. What we may be witnissing, therefore, is peculiarly high levels of leakage in SR in this particular year.

8.49 Table 8.19 shows who, among the members of the households or their proxies, usually lift the ration. In a relatively large proportion of households, the head of the household himself or his son or brother attends to lifting. In overall terms, in two-third of the cases the lifting is done by the head himself, or his son. The sum of these two proportions is uniformly about 77% for the households in the first and second quartiles. For the third and fourth quartiles, they are 55% and 65% respectively. The other major finding of the Table is that better-off households utilise the service of male servants much more frequently than other households in lifting the ration.

Table 8.19

Family Status of Person who Usually Lifts Ration on Behalf of the Household.

(Percentage)

Relationship with household head	Quartile groups 1st	2nd	3rd	4th	All
(1)	(2)	(3)	(4)	(5)	(6)
Head of HH	32.5	40.7	34.7	35.3	35.3
Wife	2.5	-	2.0	-	1.3
Son	45.0	37.0	20.4	29.4	32.0
Daughter	2.5	3.7	-	5.9	2.7
Brother	5.0	3.7	10.2	2.9	6.0
Sister	-	-	-	-	-
Nephew, niece	-	-	4.8	-	1.3
Daughter-in-law	-	3.7	2.0	-	1.3
Son-in-law	-	-	-	-	-
House tutor	-	-	2.0	2.9	1.3
Father	2.5	-	-	-	.7
Male servant	7.5	11.1	20.4	20.5	15.3
Others	1	-	4.8	2.9	2.7

HH stands for household

Source : SR sample survey

8.50 The finding that household heads are personally involved in the act of lifting suggests, to our review, an aspect of the households' perception about the role of rationing in influencing food availability. We have already noted that under-utilisation of ration quota in SR is more often due to partial lifting than to irregular lifting. We have also made the point that the quantity, especially rice, lifted is discriminatingly dicided after quality and price of ration foodgrain are compared with perceived market alternatives. The exercise of option and discrimination is known to require experience. Presumably, the heads of the household are likely to bring the greatest degree of discretionary experience in the household to bear on this task. Furthermore, in three fourths of the cases where sons and brothers were found to perform the act of lifting, they were found to be in their late teens or beyond and presumably able to make intelligent decisions[1].

8.51 Is there any contradiction between the fact that households appear to take seriously the quality of the decisions relating to the quantity lifted, and the fact, noted earlier on, that about 20% or so of what was lifted is not brought into family consumption? What is the point of taking all that trouble if a not inconsiderable part of what is lifted is going to benefit others? The answer is that households take all the trouble because they consume a lion's share of what they lift. In other words, households are primarily concerned with improving quality and reduce costs of their own consumption flow when they are investing their time in lifting. The possibility of a leakage is quite incidental to this decision about attention to lifting.

8.52 A second explanation may lie in the fact that the diverted grain may involve re-trading at a price intermediate between ration issue price, and the market price[2]. If households to retrade a minor portion of what they lift, the need to ensure sound discretion in lifting decisions is even greater than when only maintenance of the quality of family consumption is the desideratum. When retrading for gain, howsoever small, is another object in view, then failure to apply sound discretion may result in losses

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1 In SR, ration shops are kept open on Fridays so as to increase the convenience households face in lifting their quota. School and college going teenagers, therefore, have no difficulty in matters of lifting the ration. That, presumably, also may explain why a relatively large proportion of the heads of housenolds is found to lift the ration.

2 In our survey, respondents were predictably suspicious of questions concerning the possible incidence of divertion of lifted foodgrains away from family consumption.

8.H Other Priority (OP) Versus Statutory Rationning(SR).

8.53 In the Inception Report, we undertook to survey average incomes and expenditures of only selected SR households. We consciously did not also undertake to survey living standards of selected households benefiting from OP. Additional surveys that could do justice to the heterogenous constitutions of OP as a channel were deemed to be far beyond the time available for the study: We had already had a pretty packed schedule for collecting primary data about the PFDS. (Nor did the Functional Committee require it). It was our intention to form an intelligible judgment as to average living standards of households in OP through its disaggrgation using occupational categories. Of course, the categories in OP were mainly of government and public sector empolyees. Once this occupational categories were specified, we had of course fairly good notion of broad economic situations of these households.It is thus that we planned to go about the task of making some suggestions regarding rationing policy for OP beneficiaries.

8.54 It is at times maintained the households in OP and SR have similar incomes and jobs. Now that we know from our own SR surveys occupational composition of SR, the foregoing proposition appears to be a debatable one.

8.55 Only about one third of SR households work for the government and public sector, while the matched proportion is bound to be greater in the OP, perhaps three-fifths if account is taken of the numerous teachers of primary schools. Except for Chittagong Hill Tracts, the other SR areas are major cities, of great administrative and political significance. Naturally, these areas feature a concentration of relatively senior officials, both in the government and public sector, not found in the mofussil district head quarters. Average salaries thus tend to be significantly higher in SR areas than for the OP as a whole. Besides, as we have argued, some SR areas have seen a veritable explosion in providing access to non-salary income, e.g. residential property, consultancies, part-time industrial projects etc. in favour of public employees. Such opportuinities have been rarer for public emplyees in the OP. On these two grounds (and others not noted here), OP salaried households have to be rated as of lower average incomes than corresponding SR ones. It is to be noted that ch. 8 has shown that a portion of salaried households in SR areas have jobs with international ogranisations and enterprises, as also with private corporate sector. Average salaries of persons from these households are surely higher than other public employees in SR and much higher than salaries in the OP.

8.56 OP is also different from SR in terms of the employment status in another sense. Rich private industrialists and businessmen in SR areas are clearly in evidence in SR, while the OP does not accommodate any private businessmen, whether large or small. Again average incomes must be much higher in SR areas than for the OP beneficiaries.

8.57 In view of these above considerations, we have treated SR and OP differently in our recommendations: while we have advocated an abolition of SR, we argue that the OP had better be gradually phased out of the system. This distinction is based on what appears to be a clear priority favouring the average OP recipent in terms of greater need for food subsidy, relative, that is, to SR. We would further more argue that the average beneficiary household in OP may not be very dissimilar to that in LE in terms of average incomes but that the latter must be much worse off than an average SR household.

8.58 There is of course, the view point that the OP recipients, however great their relative need to SR households, can not be as mired in poverty as the millions of land less agricultural households. It would, therefore, be a gross violation of the principle of equity that an attempt is not made to eliminate food subsidies to the OP households and channelise themselves instead towards the villages. This is a valid considaration, and we had ourselves not overlooked this. The point, however, is that this applies more fittingly to the EP, and we could not have wanted an end to OP and LE as channels without at the same time wanting EP ended, too. However, since the relevant information about EP was, as already explaned in cahpter 1, not made available the necessary research was not possible. It would have been unfair to make such a profound recommendation without the benefits of considarable and dispassionate research.

CHAPTER 9

MODIFIED RATIONING IN BANGLADESH

9.1 Modified Rationing (MR) was first introduced as a separate conduit of the PFDS in 1949. Its stated objective has always been to bring a degree of benefits of food subsidies to the population outside of the SR areas and not belonging to any of the groups of having priority in rationing. DPLs are prepared on the basis of taxes household pay to municipalities and Union Parishads(UPs). Subsidised rice and wheat within the overall allotment to MR are distributed to households belonging to the two bottom tax-paying categories (see below). In 1975/6, it was estimated that about 30% of MR foodgrains were distributed in the pourashavas in Mymensingh, the then largest district in Bangladesh (Ahmed, 1979). The remaining 70% was distributed through the medium of UPs. This part of the MR offtake is the core of the rural MR. Unions are the territorial unit relevant here. All households within a union are classified by the amount of Chowkidari tax paid per year, into four categories. In 1984/5, households paying no chowkidari taxes were in 'A' category; those paying less than Tk.10 were in 'B' category; those paying between Tk.11 and Tk.20 annually were in 'C' category; those paying in excess of Tk.20 were in category D. While households in 'A' and 'B' were eligible to receive rice and wheat ration, those in C and D categories were eligible to receive sugar, edible oil and other non-cereal items when stock levels permitted.

9.2 The commodity issue prices are the same for MR as for SR. The maximum quota per card for MR is the same as that in SR. Since the MR quantities are predicated on availability the DG, Food is required to make such distribution commensurate with the stocks remaining with the government after the requirements of priority categories are met. As it happens, the distribution in the MR frequently does not take place on the basis of maximum allowable rates. Besides, the frequency of distribution, too, is lower than the stipulated forthnightly interval. These are the main reasons why many beneficiaries once categorised as within the preserve of MR had themselves reclassified as beneficiaries of the other priority groups.

9.3 The following questions are posited below so as to structure the ensuing presentation of our evidence regarding MR :

(a) How does MR operate in terms of eligibility, stability of offtake, the modalities of the district level MR allotment among constituent upazillas and of the upazilla allotment among the constituent unions?

(b) What has been the relative importance in MR between pourashava and UP rationing?

(c) How often do rural MR activities reach the intended beneficiaries and when they do, how large, quantitatively, are their effects on the food intake of the households so reached? To what extent do FFWP, and relief activities supplement the food availability arising from MR?

9.A Stability of MR Offtake

9.4 By stability, we must mean stability of MR offtake comparative to other priority channels of PFDS, e.g. SR, OP, and LE. Stability can be described in terms of variability. We have used CV as the statistical measure showing relative variability. Quarterly offtakes are used, 1972/3 through 1984/5 is the period of interest. Table 9.1 presents the results.

Table 9.1

Relative Variability of Offtake under Different Monetised Channels of PFDS, Bangladesh, 1972/3 - 1984/5

'000 long tons'(CVs,%)

Period	Channels					
	SR	OP	EP	MR	LE	FM
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1972/3-74/5						
Mean	119	51	22	234	24	33
CV	(12)	(19)	(15)	(56)	(11)	(14)
1975/6-1979/80						
Mean	104	86	25	91	21	45
CV	(18)	(36)	(16)	(54)	(26)	(16)
1980/1-1984/5						
Mean	75	94	28	94	14	32
CV	(13)	(31)	(9)	(55)	(45)	(26)

Note : Combined quarterly offtake of rice and wheat in thousand long ton were used to generate these figures.

Source: Offtake data obtained from Food Division

9.5 MR is shown in the table as the least stable channel of Bangladesh PFDS. Besides, we also find quarterly MR offtake to have fallen, too, by about three-fifths between the early 1970s, and thereafter. Between 1975/6 and 1982/3, roughly about 70% of MR were distributed through the UP, and about 30% distributed in pourashavas. It is, therefore, largely correct to say that MR is alone among the monetised foodgrain distribution channels to have the rural poor as its de jure constituency[1]. It is revealing to note the paradox that this is precisely the channel the relative share of which has been slashed to the greatest degree in this entire period. SR, LE and FM, too, have experienced a decline in absolute size of their operations, but the degree of their diminution has nowhere been of the degree of the MR. In addition, the offtake in MR has experienced the same degree of volatility in all the three periods: the degree of this volatility did not, for example, decline at all when the scale of MR had taken a very considerable cut. These numbers only serve to make rather stark what, to all intent and purposes, is one of the objectives of rural food policy in Bangladesh, viz. that MR should be treated as a residual category within the monetised channels. The uncomfortable fact, however, is that ipso facto, this dispensation sounds as though that the problem of food availability for the rural poor, who may well comprise the majority of Bangladeshi population, can be treated as a residual one.

9.6 How residual is MR in the context of dealing with the rural poor in Bangladesh? We need to know, of course, if the residual is one of 15%, or one of 30%? The following paras seek to anwer this question in quantitative terms.

9B Proportion of Rural Poor Covered by MR in Bangladesh

9.7 Table 9.2 presents some interesting information as to residual nature of MR. Before presenting the major findings of this table, it is perhaps necessary to elaborate on some of the assumptions and sources of data.

9.8 (i) Quantity of foodgrain offtake in MR : This has been compiled from various sources. For 1963/4 and 1966/7, they come from computations done on the basis of offtake data in Berlage (1972). For other years, we have used unpublished data collected from Food Directorate. No sys tematic time series data are available relating to the

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1. FFWP and VGFP are targeted food interventions, and may be set apart form monetised distribution channels.

quantity of MR foodgrain that is distributed in genuinely rural areas. The World Bank estimated that the rural proportion of MR foodgrain distribution for 1975/6 through 1978/9 was anything between 92.5% to 90% (World Bank,1979, Table 10.3). Writing at about the same time, Ahmed used primary data for the district of Mymensingh (the then largest district of the country), in reaching the conclusion that the rural proportion in MR was as low as 70%. We have collected some primary data on this subject. We sent pro-forma to the District Controllers (DCs) of all the 64 new districts of the country about the quantum of rice and wheat distributed on the basis of the DPL for the pourashavas and the unions of their respective district. Out of the 64, 31 DCs have responded in time.

Their returns have been tabulated in Table A9.1. These returns relate to 1983/4. We find from them that in 1983/4, a reasonably normal year, 68% of the quantum of rice and wheat distributed through MR were through the union parishads, the rest being in pourashavas.

9.9 Hence, out of the two estimates of the proportion of MR foodgrains distributed in rural areas for the period beginning with 1975/6, the one due to Ahmed (1979) is perhaps more close to the truth. This would imply that since 1975/6, about 70% of MR distribution has reached rural households. Under Assumption 1 in Table 9.2 we have used 70:30 as the rural: urban ratio. For 1972/3 through 1974/5, as already said, the balance of urban areas in MR distribution must have been more favourable, as several categories of urban beneficiaries were taken out of MR and put into priority status in 1974/5 and thereafter. These urban beneficiaries were covered by MR in these earlier years. Hence in the first three years of this table, 50:50 is deemed to be the rural: urban offtake ratio. In assumption 2, the position is taken that all MR foodgrains only reaches rural households. This assumption is made use of in the calculations done later in the table.

9.10 (ii) Estimated number of rural poor: Om Nijhwan (1981) and Muqtada (1985) have both estimated the number of the rural poor in Bangladesh in some selected years.

The caloric criteria they use as the poverty cut-off are, between them, sufficiently close : 2122 calorie/day/person in the case of Om Nijhawan and 2150 in the case of Muqtada. Despite the closeness of these cutoffs, Om's estimates are invariably and significantly higher than Muqtada's.

Presumably, these differences arise from certain methodological differences between the two studies. What is relevant for present purposes is that we may perhaps treat these widely differing estimates as representing upper and lower bounds of the number of the rural poor in Bangladesh[1].

9.11 (iii) Number of adult-equivalent ration cards: We assume, quite conservatively, that a rural MR household has only four persons in it: two adults and two children below 8 years of age. This implies that a rural household has only 3 ration units in adult equivalents. This conservative assumption is made so as to understate, if at all, the quantity of foodgrain that would be required if full permissible MR quota were actually allotted.

9.12 (iv) Quantity that would be required at full MR quota: This uses the actual MR quota per adult card per week multiplied by 52. The annual quota, thus derived, is multiplied by the total number of adult equivalent MR cards to arrive at annual MR quota.

9.13 In the light of all these assumptions and methodological steps, we may now review the major findings of table. 9.2 Cols.11 and 12 present the ratio of the (generously) assumed rural MR distribution to alternative estimate of the total quantity that would have been required, where maximum quotas typically distributed. The percentage varies from a low of 2.6% in 1976/7 to a high of 11.5% in 1963/4. Some care has to be exercised before this finding is interpretted. It does not imply, for example, that only about 11.5% of the rural population are, at best benefitted by the MR. It implies that if anyone who was reasonably deemed to be poor was inviolably entitled to the full MR quota, then no more than 11.5% of rural population were, on very generous assumption, likely to receive such an accommodation. One of the immediate implications of such a finding is about the proportion of the maximum allowable weekly MR quota per capita <u>in fact</u> distributed. We may say that at best 11.5% only of the maximum allowable MR quota was distributed per fortnight, for example. In view of the clearly generous assumptions, the proportion of the maximum allowable quota actually distributed per unit of time may well have been a good deal less than shown above.

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1. It is admitted quite freely that estimating the number of the poor can be very sensitive to the specifics of the methodology adopted in a particular case. It is not for us to rate the comparative merits of this pair of estimates. It may be mentioned, however, that Om Nijhawan has been slightly more elaborate in outlining his methodology, than has Muqtada. At any rate, it is convenient from our viewpoint that such a duality of estimates actually exists, in that they provide us with a possible range to the actual extent of rural poverty in Bangladesh.

Table 5.2

Some Liberal Estimates of the Proportion of the Rural Poor Population Reached by Modified Rationing, 1963/4-1978/9, Bangladesh

(All food grain in 000 long tons)

Year	Qty.off take in MR	Of which, distributed in rural area		Estimated no. of rural poor		No. of MR. ration cards in adult eqv.		Qty that would have been required		Col. 4 as % of	
		Assumption (1)	Assumption (2)	OM Nijhawan	Muqtada	OM Nijharan	Muqtada	OM Nijhawan	Muqtada	col.9	col.10
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1963/4	396	198	396	36.7	24.1	12.2	8.0	5243	3438	7.6	11.5
1966/7	628	314	628	50.8	n.a	16.9	n.a	7263	n.a	8.6	n.a
1973/4	663	332	663	57.4	42.6	19.1	14.2	8209	6102	8.0	10.9
1975/6	497	348	497	62.2	n.a	20.7	n.a	7413	n.a	6.8	n.a
1976/7	273	191	273	64.8	55.5	21.6	18.5	11108	9514	2.6	3.0
1978/9	310	217	310	n.a	59.5	n.a	19.8	n.a	8510	n.a	3.6

Notes : 'n.a' means not available. Col 9 and 10 are quantities that would be required were maximal MR quotas to be allotted in MR

Source: see text.

9.14 A second feature of the table shows that MR activities have been conspicuously pared down in the years after 1975/6. The lowest ratios of the table are evidenced in this sub-period. Of course, this implies either that a smaller portion of maximum allowable MR quota is actually distributed, or that rural poverty has risen at a higher rate than in the earlier, pre-liberation years. The lower ratios in 1976/7 and 1978/9 are also in part due to the relocation of rationing categories out of MR in 1975/6 and beyond.

9.15 We have looked at the variability of the overall MR foodgrain distribution, and we have seen the residual nature of MR in the context of the massiveness of the problem of rural poverty. It may of course be useful to disaggregate the instability of MR distribution, using districts as the territorial unit. But coming to that, a question that may arise is how is the overall quantity to be distributed in MR determined and how are district-level allocations made.

9.16 The decision relating to the overall quantum of MR foodgrain ought, to our view, to be taken in the light of (i) prevailing public stock, in particular the quantity at the ports waiting for movement in-shore or up-country; (ii) the quantity of foodgrain that is likely to arrive over the next quarter or so; (iii) the quantity to be added to public stocks via internal procurement; and (iv) the quantity to be earmarked for channels other than the MR. We assume here that MR offtake ought perhaps to be stabilised on a quarterly basis. If this be the basis for policy, these four variables will determine what MR quarterly offtake is to be. This relies on an accounting relation like the following

$$O_m = [(S_t + \sum_{i=1}^{3} A_{t+i} - \sum_{i=1}^{3} O_{t+i}) - \bar{S}]$$

Where O_m = is quarterly MR offtake;

S_t = public foodgrain stocks, including port arrivals waiting movements inshore or up-country, at end of period t

$\bar{S}$ = Some critical minimum level of stock

A = Fresh arrival

O = Fresh offtake in channels other than MR

i = 1 to 3, months in a quarter

9.17 What this relation suggests is that if the A's and O's are known in advance with sufficient accuracy, it is possible to predict quarterly offtake for MR with reasonable certainty. Of course, neither A's nor O's are very accurately predictable. Besides, S and the O's, e.g. offtake in SR or OP, are not independent, since a high stock level may keep market prices low relative to the ration price, thus cutting back on offtake. Hence it has to be conceded that this procedure of arriving at the overall MR quantity to be allotted country-wide cannot be used in practice, without substantial improvement, for example, in the programming of food aid shipments.

9.18 Its place is taken by a more practical approach in which these same elements still remain active but are intermixed not so much in an accounting as a judgmental framework. Discretion, conventional standards and proportions have greater roles to play in this modus operandi. The overall MR allotment being thus made monthly in this practical manner, the DG, Food, hands down MR allotment in favour of the districts. The district quota is largely a matter of the number of MR cards, in the pourashavas and the unions, the districts have. District MR quotas are, however, not simply pro rated on the basis of the number of eligible units enumerated by the DPL. We have been able to generate some primary information about the comapartive extent of accommodation enjoyed by an average card-holder in the pourashavas and union. Table A9.1 presents quantity of foodgrain distributed per MR card in the pourashavas and the unions within 31 districts in 4 divisions of the country in 1983/4 and 1984/5. These numbers suggest that there is a noticeable "urban bias" in the distribution of MR foodgrains between pourashavas, and the villages.

9.19 We need for present purposes only highlight one important aspect of the evidence in Table A9.1. In all the four divisions of the country and in both years, MR foodgrain distribution has been much more inadequate on a per-card basis in our villages than in our pourashavas. This is shown very vividly by Table 9.3 below. In 1983/4, the ratio between rural-to-pourashava MR distribution per card ranges from 14.7% in the case of Chittagong division to about 31.4% in the case of Khulna division. For that year, the overall ratios are found to be 18.4%. For 1984/5, the overall ratios are estimated to be somewhat different 22.2%. These findings suggest an asymmetry in unit foodgrain distribution within MR that is highly preferential towards the urban poor. The rural poor are accorded far less importance in the actual modalities of MR distribution.

Table 9.3

MR Foodgrain Distribution per card, 1983/4, 1984/5, Bangladesh

(seers)

Name of Division	1983/4		1984/5	
	Union Parishad	Poura shavas	Union Parishad	Poura shavas
(1)	(2)	(3)	(4)	(5)
Dhaka	28.5	110.3	25.2	79.1
Rajshahi	19.0	129.9	16.2	98.0
Khulna	33.7	107.3	31.1	120.6
Chittagong	19.2	130.6	37.0	130.0
Bangladesh	22.8	124.1	25.8	116.3

Note: The drastic increase in the table observed for Chittagong Division may be due to a suspiciously precipitate fall in the number of MR cards with UPs in 1984/5, in Chittagong district. For details, see Table A9.1, Chittagong district figure.

Source : Table A9.1

9.20 In reaching the above pessimistic conclusion, we must refrain from identifying who is it that accords "far less importance" to the rural poor. Is it the DC, Food, who is charged with issuing the allotment in favour of both pourashavas, and the UPs? Or does this owe itself to the fact that, for instance, the differential offtake reflects different degrees of attractiveness for MR dealers within rural as opposed to urban areas in dealing in MR foodgrains. As regards the latter, it may be conceivable that average returns from being an MR dealer have more recently been lower in rural areas than in urban areas. If offtake of what was allotted did not appear worthwhile in the more recent past, this would encourage non-lifting of allotment. Allotment in the current period may well depend on the offtake-to-allotment ratio in some previous period or periods, Hence the lower unit allotment in rural MR in 1983/4 and 1984/5 may have been triggered by a fall over the recent past (immediately preceding these two years) in the

offtake-to-allotment ratio. We have argued that such an outcome may be due to a decline in the relative profitability of being MR dealers in rural areas, relative, that is, to urban areas. If this be the case, the conclusion would have to be modified. We could then say that market forces have accorded less importance to the carrying of subsidised foodgrains for poor people in pursuit of relatively unattractive rates of profit. This would imply that the inadequate accommodation of the rural poor in accessing MR is ultimately reducible to their poverty which prevents them from making it worth the while of their MR dealers to lift subsidised foodgrains which are meant for their benefit. For, this hypothesis would mean that if only the rural poor pay somewhat higher for MR foodgrains than the specified ration retail prices, it would be in the interest of MR dealers to report enough of offtake relative to allotment. The point therefore is that we must not attribute the evidence of Table A9.1 to anyone rightaway: we need to know a lot more than was possible in the course of this study.

9.C Instability in MR Distribution by Districts, 1983/4, 1984/5

9.21 We have already examined overallinstability in MR distribution during 1972/3 through 1984/5 (Tble 9.1). We had concluded there tnat the CV of quarterly MR offtake had remained about the same in the three periods examined. We are now presenting evidence that when MR offtake is disaggregated by districts, important variations emerge. We shall now look at the CV of monthly MR distribution of rice and wheat in 1983/4 and 1984/5. (Table 9.4)

Table 9.4

Inter-district Variability in MR Distribution by Divisions, 1983/4, 1984/5

(%)

Division	1983/4	1984/5
Chittagong	28.4	43.3
Dhaka	40.3	46.6
Khulna	33.3	54.7
Rajshahi	36.6	54.1
All division	34.6	49.7

Source : Table A9.2

9.22 Two things emerge from the table. First, there is a considerable range within which the average CV of monthly MR foodgrain distribution in the four divisions vary in any one year. For instance, in 1983/4, about 12 percentage points set the lowest divisional CV from the highest. That proportionate range is a good 35% of the overall CV for the country. In 1984/5, this range is 11.4% and as a percentage of the overall CV, it is 22.9%. The volatility of the MR distribution is, therefore, seen to have a territorial dimension in that districts in some division have unforeseen changes in its MR distribution while those in others remain relatively unaffected. A second point to emerge from the table is the sudden increase in the variability of MR offtake in 1984/5. All divisions experienced such an increase. A clue as to the reason for this is provided in Table 9.5 below, which examines, by Division, quarterly relative shares of annual MR offtake in 1983/4 and 1984/5. The sharp increase in variability in 1984/5 is essentially due to a major increase in the share of the 1st quarter in 1984/5 and the corresponding fall in the shares of the 3rd and 4th quarter. In sum, both due to administrative procedures and public perceptions as to the unpredictability of foodgrain availability at MR dealer's outlets (which may militate against stable offtake), MR offtake has considerable volatility territorially, and across time. This we think has had important influence on popular behaviour about MR. Data obtained from MR households indicate that MR per se contributed next to nothing to their food intake in 1984/5. An important cause of this has been that the rural households have reservations about the MR in terms of (a) predictability; (b) adequacy and (c) convenience of actual offtake. We now turn to an examination of the evidence generated by our MR household survey.

Table 9.5

Quarterly Relative Shares of Annual Foodgrain Distribution in MR by Division

Division	1983/4				1984/5			
	1st quarter	2nd quarter	3rd quarter	4th quarter	1st quarter	2nd quarter	3rd quarter	4th quarter
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Chittagong	17.7	25.2	26.2	30.8	34.7	25.1	13.7	16.5
Dhaka	30.1	24.6	20.0	25.2	38.9	26.8	17.5	16.8
Rajshahi	23.7	24.7	22.7	28.9	39.7	31.6	15.3	13.3
Khulna	17.8	26.3	25.0	30.9	43.1	27.4	15.0	14.5

Source : Data obtained from 31 DCs, Food.

Table 9.6

Some Salient Aspects of MR Household Sample in Five Districts of Bangladesh, 1984/5

District	No. of household (Nos)	No. of Members (Nos)	Income per capita from market work (Tk)	Expenditure per capita (Tk)	Family size (Nos)	No. of earners per household (Nos)
Comilla	50	303	1971	2943	6.06	1.74
Average	25	165	2044	3029	6.60	1.84
Famine-prone	25	138	1884	2840	5.52	1.64
Jamalpur	50	268	1814	2240	5.36	1.81
Average	25	114	1785	2334	4.56	1.40
Famine-prone	25	154	1836	2170	6.16	2.12
Gaibandha	49	318	3819	3422	6.49	2.34
Average	25	204	3970	3530	8.16	2.40
Famine-prone	24	114	3520	3230	4.75	2.25
Madaripur	50	239	1853	2252	4.78	1.48
Average	25	109	1943	2499	4.36	1.44
Famine-prone	25	130	1778	2045	5.20	1.52
Jessore	50	337	2773	2635	6.74	1.49
Average	25	177	3826	2938	7.08	1.76
Famine-prone	25	160	1609	2299	6.40	1.20
All Districts	249	1465	2509	2735	5.88	1.78

Source : MR sample survey

9D Modified Rationing in Eligible Households

9.23 Table 9.6 presents some pertinent information regarding the 249 MR-covered households surveyed in ten villages from five districts in Bangladesh. The methodology of MR household survey and other surveys is described in an appendix to this chapter). We note, first of all, that the findings of MR household survey will be presented in terms of the territorial units, i.e. village-samples[1]. We note next that the average family-size in the overall sample is 5.88. According to the latest available HES (1978/9), average rural family in that year was found to be 5.7. The average number of earners on our sample, overall, was 1.78. The corresponding average for rural areas as a whole in Bangladesh in 1978/9 was 1.5.A higher family size would, in generating greater need for consumption resources, induce greater participation in the labour market. Income per earner, overall, works out at Tk.8293 per year, or Tk. 691 per month. Rough calculation suggests that monthly income per earner in rural areas of Bangladesh in 1984/5 may be in the range of Tk. 900 to Tk. 1100. In any case, market incomes on our sample is lower than national rural average would appear to be.

9.24 The most important findings of Table 9.6 relate, of course, to expenditure per capita, since that, to us, corresponds to permanent income of household. In this connection, note that average measured incomes from market production is frequently lower than average expenditure. In rural areas, mesured incomes from market production frequently understate

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1. An alternative course would have used expenditure quartiles as the basis of presentation. We rejected such a course for present purposes because it was likely to have concealed more than illuminated, as compared with the chosen course. For instance, while the overall averages yielded by both approaches remained the same, the alternative course would have glossed over the geography of economic vulnerability in the country that we sought to address in our survey methodology. Besides, quartile distribution (for example, of average expenditures on rice) would not be very revealing in the present case, as they would relate to a relatively sectional category of people, as distinct from a cross sectional one.

household's access to consumption; both due to the importance of home-based production and incomes derived from collection activities, etc. Again, the dependence of farming on weather must result in the transitory component in household incomes in rural areas being relatively large. As it turns out, in 1984-85, many farmers in several part of the country reported poor yields or outright crop losses. The transitory components of income in that year may thus have been negative and large. For all these reasons, it is more accurate to use average expenditures as the basis of discussion. We find that in most cases, average expenditure for the sub-sample from the famine-prone upazilla is lower than the corresponding average for the average upazila of the district. These differences are not always statistically significant and this is what one might expect. This is because location in a famine-prone as opposed to an average upazilla is perhaps likely to make some, but not all the possible, difference between the economic situation of two villages. These difference are nevertheless reassuring in the sense that there really is such a thing as the importance of location in determining economic stress. Expenditure per capita, overall, is found to be Tk. 2735 per year.

.25 In 1978/9, average annual expenditure was Tk. 1642. Between that year and 1984/5, the rural cost of living in the country is estimated here to have risen by about 95%. On that basis, average rural expenditure in Bangladesh may be estimated at about Tk. 3200 per year. One important implication, therefore, is that our five-district sample should be treated as below-average in the national context of rural average well-being. This establishes two things. First, the rural DPL in the offices of the UPs in the ten unions, whence our samples came, have properly recorded households in the A and B categories. Second, in speaking of this overall sample, we are essentially speaking of households that are on the whole poor. (This derives further and direct empirical support further below).

.26 Table 9.7 basically shows that the sample of MR covered households, in overall terms, is in poverty measured by calorie level derived from food consumption. Om Nijhwan of the World Bank has identified 2.122 k.cal to represent poverty level. In our sample, Gaibandha is the only district where the sample households are above the poverty line. The

average daily calorie intake in all other upazilas represent conditions of poverty to by typical. This picture is particularly gloomy for the famine-prone upazila in Madaripur, where the calorie level suggests the existence of even what may be called 'hard-core' poverty - a level that has been associated with daily intake of 1850 k.cal. Table 9.7 shows again that there is a geography of incidence of poverty in that in every case, the calorie intake of the famine-prone sub-sample is lower than the corresponding intake in the non-famine upazila.

9.27 Table 9.7 also shows, basically, that, whatever else may have been to blame, the low caloric intake observed on our sample is apparently not due to low availability of cereal and cereal derivatives. In overall terms, 1754 k.cal, out of 2039 k.cal, (86%) is contributed by cereal and cereal products. In contrast, about 72% of the calorie of the households in the 1st quartile of our urban sample were derived from cereal/and allied sources (Table 8.3). Domination of food-mix by cereals and cereal-derivatives may be seen as simply another facet of the problem of poverty.

9.28 Table 9.8 presents us, first of all, with a paradox. This lies in that, while the overall sample shows itself to be afflicted by poverty, its average daily intake of cereals, at 1.07 lb per capita is 7% higher than the official minimum cereal-intake level of 1 lb. The implication is that the ability to exceed the official minimum cereal-intake level, however laudable it may be from the viewpoint of administrative calculations about the number or proportion of people not supposedly at risk, does not amount to any guarantee against the persistence of poverty when measured in terms of overall food intake. The paradox seems only to underline the necessarily conservative flavour of the public food policy on its consumption side, arising perhaps from acute shortage of resources.

9.29 Table 9.8 also serves to show that PFDS, through its several conducts, makes an important contribution to the maintenance by these rural households of the cereal consumption at an above-average level. In overall terms, 82.2% of average annual cereal intake arises in terms of rice. The remainder is almost solely contributed by various categories within the PFDS. It is significant that of this residual category, atta is the single most important item -- 11% of cereal intake. In contrast, 6.2% of the cereal intake is procured <u>qua</u> wheat. In all, about 17.5% of annual cereal intake is contributed form wheat and atta. In this residual category, the dominance of direct purchase of atta, relative to that of wheat, is noteable. This would appear to us to be higher than has been the case, historically.

Table 9.7

Daily Calorie Intake of the NR Households, 1984/5

District	Caloric intake per person per day						
	Cereal, and cereal derivative	Fish & Meat	Milk, egg, dairy products	Pulses, vegetables spinach	Oil, fats, sugar, gur, spices	Fruits, & other	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Comilla	1822	21.6	10.7	88.9	131	9.3	2083
Average	1872	23	13	118	127	7	2160
Famine-prone	1762	20	8	54	135	12	1991
Jamalpur	1764	6	12	80.3	87.8	7	1958
Average	1781	7	11	82	93	6	1980
Famine-prone	1752	5	13	79	84	8	1941
Gaibandha	1844	26.2	21.6	147.8	144.5	12.5	2197
Average	1867	28	23	165	151	-	2234
Famine-prone	1804	23	19	117	133	35	2131
Madaripur	1538	14	8.4	122.2	93.2	29.5	1805
Average	1572	14	10	151	146	54	1947
Famine-prone	1509	14	7	98	49	9	1686
Jessore	1752	16.6	8.3	136.7	153.5	15.5	2082
Average	1718	18	13	160	193	16	2118
Famine-prone	1789	15	3	111	109	15	2042
All districts	1754	17.4	12.4	117	125	14.3	2039

Source : NR household survey.

Table 9.8

Per capita cereal Intake per year by Sources, HH - covered households, 1984/5

District	Per capita cereal intake per year by sources of procurement							
	Rice		Wheat			Atta	Flour	Total
	Market purchase, own output	Rationing	Market Purchase, own output	Rationing	FFWP			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Comilla	145.6	-	0.6	-	6.9	48.3	.5	201.9
Average	145.6	-	-	-	7.8	52.2	0.2	205.8
Famine-prone	145.6	-	1.3	-	5.8	43.6	0.9	197.2
Jamalpur	153.7	.		.5	7.5	37.0		198.8
Average	171.0	-		0.4	5.8	23.6		200.8
Famine-prone	141.0	. .	.	0.6	8.8	47.0		197.4
Gaibandha	170.0	-		8.7	.3	12.3	0.8	193.0
Average	172.0	.	..	11.7	0.2	10.2	1.2	195.3
Famine-prone	169.0	.	.	3.4	0.4	16.2	-	189.0
Madaripur	126.2	.3	15.6	1.1	10.7	9.4		173.3
Average	146.0	0.7	15.1	2.5	11.2	1.0		176.5
Famine-prone	123.0		16.0		10.2	16.5		170.7
Jessore	169.3	1.3	1.2	7.5	2.2	1.6		183.1
Average	167.7			8.3	3.8	2.1		181.9
Famine-prone	171.0	2.8	2.5	6.6	8.5	1.1		184.5
All districts	156.3	.3	2.9	3.9	5.1	21.3	.3	190.4

Note : Intake of wheat does ultimately involved conversion to atta. The focus in this table is to distinguish among forms of primary procurement.

Source: HH sample surveys

9.30 An aspect of the evidence in Table 9.8 perhaps needs a clarification. This relates to the relative share of rice, perponderantly obtained from non-ration sources in the table, which, overall, would strike the knowledgeable reader as being on the high side, especially for a sample of households in obvious poverty. The judegment just mentioned would appear to be sustained by a reference to the 1973/4 HES (BBS, 1978). In 1973/4, the ratio between wheat plus wheat flour and total cereal consumption for the entire rural sample was found to be 19%. The ratio was found to be 23% for the 1973/4 expenditure categories which appeared to correspond to overall average expenditure of our sample. Is there any inconsistency between this observation, and saying that our sample is largely composed of people in poverty?

9.31 We would seek to answer the question in the negative, on two grounds, Table 9.9 shows the rice-cereals ratio for the average and famine prone upazilas separately, as also the price per seer of rice paid by MR households. Note that the famine-prone upazilas on the whole return a lower rice price than average upazilas. And yet they return a lower rice-cereals ratio. A substitution toward wheat and atta is still seen as operative within the sample, due to the pressures generated by poverty in the famine-prone upazilas, to the acuteness of which the lower price does not make enough of a difference. If this substitution away from rice is a symptom of poverty of people at hand, this sample then has a fair degree of poverty in evidence. Second, the poor and the nonpoor may have differential access to the (mostly relatively cheaper) sources of non-rice cereals. Paucity of rationing infrastructure within defined micro regions may well hamper availability of cheaper wheat for poor people which may raise the relative share of rice in cereals budget. This would be a variation on the theme that relatively high transactions costs are attached to the option of raising the share of the nominally-cheaper foodgrain, cost of which prohibitively raise the effective relative price of the latter. Such circumstances would result in a higher ratio of the nominally-dearer alternative. The point, therefore, is that poor people can still return higher rice-to-cereals ratio than others without becoming any the less poor. The explanation may lie in institutional failures, which differentially constrain price formation in the segments of the foodgrains market where the poor have to operate.

9.32 From Table 9.8 we get, in addition, a picture of the relative share of various PFDS channels in the intake of wheat, atta and white flour1. We find that FFWP is more important than MR in its relative share. The Comilla sample returns no incidence of MR in 1984/5, while the Jamalpur and Madaripur samples return very limited incidence of MR. All these three district samples return above-average (relative to the overall sample) contribution from participation in FFWP. In contrast, while the Gaibandha and Jessore samples return above-average benefit from MR, and, interestingly enough, return comparatively small benefits from FFWP participation. Market purchase or own-account consumption of wheat is important only in Jessore, an important wheat growing district, and neighbouring Madaripur.

Table 9.9

Comparative Cereal Prices, and Rice-to-Cereal Ratio, MR Households, 1984/5

Sub-sample	Price/seer of rice	Rice-to-cereal ratio (%)	Price/Seer Atta
Five average upazilas	7.87	84.1	6.03
Five famine upazilas	7.65	80.3	6.26
All sample	7.76	82.2	6.14

Source : MR sample survey

1 Ration contribution of rice can be ignored for present purpose, due to its paltry magnitude.

9E Modified Rationing Evaluated by Other Primary Data

9.33 The discussion in the following is organised to include the following: (i) the existence of the DPL in the UP office; (ii) the state of the currency of the last issue of MR cards; (iii) quantity of foodgrain distributed per member in 'A' and 'B' category; (iv) some evidence by way of relevant socio-economic background of MR dealers and chakkiwalas; (v) length of period since which the MR dealers have been in the business and the nature of change in the number of MR dealers per union in the recent years; (vi) the modality of allocation of upazilla MR allocation among unions, and its adequacy relative to total requirement as determined by the size of the DPL; (vii) perception of UP functionaries, MR dealers and chakkiwalas as to whether MR does reach the intended beneficiaries; (viii) perceptions of MR dealers about the desirability of the practice of issuing wheat to the approved chakkiwalas; (ix) identification of the reasons why even beneficiaries within the system -- as well as eligible people not within it -- do not participate in the MR system. We shall seek to present the information listed above in the same order against the serial nos. used, viz. in terms of lower case Roman alphabets.

9.34 i) A preponderant majority of UP interviewees (97%) stated that DPLs were present at the UP office at the time the interview was taking place. Names, address and number of members in the households enlisted on the DPL were in fact available.

9.35 ii) The last issue of MR cards to eligible households was found, however, to be quite dated. Table 9.10 shows that, according to a clear majority of UP interviewees (57%), the last issue of MR cards was 6 years ago or more. The average duration is found in Table 9.10 to be 4.7 years. This may be seen to suggest considerable datedness of the last issue of MR card which itself may safely be assumed to lag the preparation of the DPL by anything upto two years. During our pretests and field visits, it was mentioned to use that typical union level DPLs were between five to seven years dated. This above information is pretty consistent with that sort of view. Now dated DPL may be a real handicap when the pace of pauperisation and marginalisation is as rapid as it is in rural Bangladesh. It makes it impossible to gear the MR system, in theory at any rate, towards the food security problems of those households who were in

C and D categories last time the DPL was prepared but may now be among the A and B categories, due to land fragmentation, loss of land due to erosion, etc. It is estimated that between 1963/4 and 1976/7, the size of the rural population poverty grew at a compound annual rate of 4.47% -- much faster than rural population. Hence a dated DPL can really be a blunt type of aid when dealing with poverty of such a high growth rate. That the DPL should be so dated does not quite surprise us because we have already seen that one of the main uses of DPL involves the running of the MR regime, and that this is treated as of residual attention

Table 9.10

UP Interviewees' Information as to Period since Last Issue of MR Cards

Years	%
1 - 2	29
2 - 3	10
3 - 4	-
4 - 5	2
5 - 6	2
6 - 7	17
7 +	40
Average (years)	4.7

Note: It may appear a bit strange that we have presented here various interviewee's possible conflicting information about the timing of the last issue of MR cards. Should not that timing, it may be asked, be an uncontroversial part of the records maintained at the UP office. True, it should, but more often than not, this was not found to be the case. There is not enough of continuity in office of the union-level functionaires, and hence it is not surprising that documents in their comprehensive state were frequently not available. Hence this manner of asking the question.

9.36 iii) We have already seen from Table 9.3 that in 1984/5, distribution of foodgrain in MR per card was 26 seers. Information received from union level interviews strongly suggests that the total number of MR cards of all UPs taken together (which forms the basis of upazilla-wise and union allocation of the MR foodgrain quota of a district) may be lower than the total number of persons listed in A and B categories on the DPL. In other words, not everyone on the A and B category on the DPL have been issued with MR cards. As a result, MR foodgrain received per member of A and B category at the union level works out at much smaller levels than would be suggested by Table 9.3. This is shown in Table 9.11, where MR distribution per A and B category member in 1984/5 in six sample unions is found to be only 6.5 seers. This is far closer to the MR-contribution per capita that has been found on average from MR household sample, than to the estimate of Table 9.3. This serves to increase our confidence in the reliability of the data generated by the MR household data.

Table 9.11

Quantity of Foodgrain Distribution in MR per person in A and B Categories, 1984/5

District/ Union	No.of members in A and B category	Quantity of foodgrain allotted in MR (Seer)	Distribution-/ capita (Seer)
(1)	(2)	(3)	(4)
'A'	12658	72135	5.7
'B'	28133	111147	3.9
'C'	12243	192975	15.8
'D'	29565	196931	6.66
'E'	19190	58765	3.06
'F'	8345	84890	10.17
All unions	110134	716838	6.5

Note : The names of the unions could not be disclosed for reasons of confidentiality.

Source: Data collected from UP interviews

9.37 iv) Table 9.12 looks at the age distribution of four types of interviewees surveyed for this study. Table 9.13 looks at their educational levels. Table 9.14 than looks at the secondary occupation of the MR dealers and chakkiwalas, while Table 9.15 presents the distribution of the MR dealers by duration for which they have been in MR dealership.These tables appear to us to shed some valuable insights into the socio-economic background especially of the traders now involved in PFDS. Let us now take up the findings of these tables in that order. First, the thing that strikes one is that although the mean age as between the four samples is about the same - one might say that these economic agents represent on the whole the same human generation - there is quite a difference as between the average educational level of the MR dealers and chakkiwalas on the one hand, and the heads of the non-covered households. Even the MR households that are covered appear to be at a slight disadvantage on the score of educational attainments. For a trader, knowledge of profit opportunities, of how they are affected by government policies for example, are crucial for traders, such as MR dealers and chakkiwalas. In turn, education is crucial to the gathering of such knowledge. The improved educational rating of the traders already suggests one of the possible bases whereby the rural poor - the intended beneficiaries of rural rationing - may be shrewdly side-stepped by a more sophisticated, more educated and market-knowledgeable class of actors in allocating "subsidised" food resources[1].

9.38 Table 9.14 shows that the all dealers and chakkiwalas have a secondary occupation. Farming via ownership of farm land is conspicuous as an economic vocation of greater significance is the fact that commodity trade is of major concern to both groups. The MR dealers appear to be more diverse in their

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1. We put subsidesed within quotes because at least in 1984/5, market prices in rural areas were widely reported to be soft relative to ration prices. Hence the degree of conflict between the dealers and the consumers that normally characterises their roles within the rural food distribution system was attenuated during this year. The potential for a short changing of relatively ignorant rural population by this educated bunch of traders is seen to exist. We do not imply that dealers are the only actors that may succeed in exploiting rural eligible beneficiaries of the system.

Table 9.12

Age Distribution of Four Types of Interviewees

(%)

Age categories (yrs)	Distribution			
	MR	Chakki-owners	MR households	Non-covered households in MR
(1)	(2)	(3)	(4)	(5)
Upto 19			10	
20-29	7	23	9	20
30-39	43	31	16	29
40-49	32	27	27	27
50-59	18	8	18	13
60 +	-	12	20	11
Average (yr)	39	39	41	40
N	28	26	249	250

Source: Various surveys conducted for this study.

Table 9.13

Educational Levels of Four Types of Interviewees

(%)

No. of years of Schooling groups	Distribution			
	MR	Chakki owners	MR households	Non-covered households in MR
(1)	(2)	(3)	(4)	(5)
Nil		-	58	79
1-3	7	-	18	5
4-6		-	7	4
7-10	14	67	9	2
11-12	50	33	8	8
13-16	14	-	-	1
17 +	.		-	..
Average (yrs)	8.4	9.5	6.7	1.2
N	28	26	249	250

Source: Various surveys conducted for this study

secondary trading interests. Fertilizer dealership, jute brokerage, whole-saling rice/paddy are among the most remunerative businesses in the country-side. This extensive and diversified involvement of the traders in some of the most basic trades serves to underscore the fact of a considerble asymmetry in access to information and market power to the advantage of the traders involved[1]. Table 9.15 shows that the average duration for which an MR dealer has been in this trade is about 7.9 years. A full 53% of the MR dealers have made their entry into this business in the relatively recent past, i.e. since 1981 or later. This would appear to put to doubt the suggestion that being in MR dealership in rural areas has become less lucrative in absolute terms, in more recent years than in the relatively distant past[2]. Table 9.16, which shows the number of MR dealers operating per union, confirms that the MR dealership is far from unattractive in more recent years, the number of dealers per union in fact having increased.

9.39 vi) 69% of the UP interviewees stated that union-wise allocation of upazilla level quota of foodgrain in MR is made pretty much unilaterally and without regrd to the union's requirements. Only 15% of the union level interviewees reported that allocation reflected their requirements. Unit allocation thus tended to be very much lower than the maximal rates applicable to MR which, incidentally, is the same as the SR quota. It is useful at this stage to refer back to Tabke 9.11. MR quantity allotted to UP per member of A and B category in 1984/5 was only found to be 6.5 seers which works out at only 5.8% of annual SR quota per card.

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1. It is well to stress at this stge that we are not reading into this evidence of asymmetry in access to information and market power the conclusion that these traders are, therefore, necessary evils, even less that government food policy ought not to rely upon them to achieve distributional objectives, on the ground that they are bent on seeking unearned incomes by cheating on public duty entrusted. All we are saying is that the traders have a set of socio-business characteristics that give them a potential market leverage over rural households of concern to rural rationing - a fact worth keeping in mind while assessing prevailing policies or thinking up new ones.

2. The rate of returns from MR dealership in rural relative to urban areas can still have fallen in recent years, the argument in the text notwithstanding. Hence there is no contradiction between this logic and the offered earlier in the chapter.

Table 9.14

Secondary Occupations of Dealers and Chakkiwalas

(%)

Other occupation of respondents	Distribution	
	MR	Atta Chakkis
Farming	39	23
Fertilizer dealership	7	8
Rice/paddy wholesale	11	-
Jute brokerage	11	69
Wholesale, Other items	7	-
Retailers, Other products	21	-
Contractor	4	-

Source : Field Surveys.

Table 9.15

Duration for which MR Dealers have been in the MR Dealership

No. of years for which respondent has been in MR business	Relatives frequency
1-2	32
3-4	21
5-6	4
7-8	7
9-10	4
11-14	19
15 +	18
Average (year)	7.9

Source : MR dealers survey.

Table 9.16

Number of MR dealers per Union in 1985, in 1980

Number of MR dealers	1985	1980
1-3	23	17
4-5	15	23
6-8	48	38
9-12	-	-
13 +	15	23
Average (no.)	7.27	6.42

Source : Union Parishad Interviews.

Table 9.17 presents the frequency distribution of the number of months in a year when monthly allocation was found to be grossly below unions requirements. On average, quantity allotted in 5 out of 12 months is judged by UP interviewees to be grossly inadequate relative to the need of the union[1].

Table 9.17

No. of Months during a Year when MR allotment is Grossly Inadequate

No. of Months	Relative frequency (%)
1-2	2.4
3-4	41.5
5-6	43.9
7-8	7.3
9-10	2.4
11-12	2.4
Average	4.97

Source : UP functionary survey.

1. The average MR quantity shown in Table 9.11 is so low (only 6.5 seers per person) that we are led, by Table 9.17, to presume that the quantities received in seven out of twelve months must be much lower than maximal MR quota, while they may not, according to the subjective judgement of the UP functionaries, yet not be grossly inadequate. There is, to our mind, no contradiction between Tables 9.11 and 9.17.

9.40 vii) When asked about whether households that were beneficiaries of MR in the union were invariably among the poorest of people, 80% of eligible responses were in the affirmative. Only three out of 48 interviewees replied in the negative. When asked about what percentage of the MR beneficiaries did not deserve to so benefit, these three respondents suggested an average figure of 10% or so. The impression that MR did reach the intended beneficiaries most of the time was also suggested by the MR dealers: 79% of them stated that they thought in the light of their experience during last two or three years that MR wheat had mostly reached A and B category households.The chakkiwalas concurred too: 69% of them said that they thought it untrue that intended beneficiaries did not receive MR foodgrains via cards. Between a dominant to an overwhelming majority of these three classes of interviewees thus regard MR system to have reached the poor.

9.41 viii)When asked about their views on the effects of the new MR arrangement involving chakkiwalas on their own businesses, 96% of MR dealers did predictably disapprove of the scheme. 79% in addition thought that the scheme did not benefit the MR card holding families either. We were able to generate some quantitative information about the performance of the chakki scheme. First, price per seer of atta on our sample of MR households has already been shown to be Tk. 6.14 during 1984/5. Considering that wheat to chakkiwalas was available at MR wholesale at MR wholesale price and adding reasonable milling and handling charges, this price may be seen an involving a scarcity premium of no less than Tk.0.75 per seer. Second, Table 7.18 shows that while only 77% of the chakkiwalas duly report that they sell milled MR wheat to MR card holders (which they should), 36% say that they sell, certainly in part, to bazar retailers[1]. The problem is, however, that despite repeated proddings they would simply not come clean with what the relevant quantities were like involving the latter. The relatively high price of atta, together with an important attraction of buying atta to the exclusion of MR-wheat noted below, would incline us to the view that the quantities involved were considerable.

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1 Of course, selling to bazar retailers is not irregular

Table 9.18

Nature of Operations and Milling-mix of Chakkiwalas, 1984/5

Nature of involvement of atta-chakki owners in respect of milling and marketing activities	% of atta-chakki owners	Milling-mix between different modes (%)
(1)	(2)	(3)
1. Mills wheat to order for consumers	100	48
2. Buys wheat in market and sell atta to consumers	42	15
3. Buys wheat in market and sells atta to retailers	50	1
4. Sells MR wheat atta to MR card holders	77	20
5. Sells MR wheat atta to retailers	36	Not available

Note: Note that while 36% of the chakkiwalas admit to selling MR-derived atta to retailers, they were not reporting any quantities for this category, when asked. This is surprising, because these transactions are supposedly not illegitimate. Despite our best efforts, the chakkiwalas simply would say that although they would possibly sell MR-wheat atta to retailers, there was no profitable opportunity of doing that during 1984/5 ... our reference year.

Source: Survey of chakkiwalas

9.42 ix) 241 out of 250 households sampled as non MR beneficiary stated that they had not received any MR foodgrain at any time during the past. Of these, 180, or 75%, thought they deserved benefit under MR. All of these 180 had tried in the past to effect issue of MR cards in their favour, but without success. The most frequently cited result that our respondents quoted was that they were assured accommodation next time there was a fresh issue of cards. Interestingly however, about one-fifth of this sample never tried to ensure issuance of MR cards. Their reasons for non participation are shown in Table 9.19. Two responses stand out, namely that open market price frequently equals issue price of MR, and that buying atta in day-to-day quantities is much more convenient. Uncertainties about whether lifting will at all occur or about quantities that will be available for lifting, too, are important reasons of nonparticipation. Some further observations as to the interpretation of this evidence are made in para 9.44.

Table 9.19

Reasons for Non-participation in MR by non-covered Households

Reason	%
1. Open market price often equal to MR	28
2. MR dealer's shop too far, trip costly	2
3. Uncertainty about whether lifting will occur even after reaching MR outlet	13
4. Uncertainty about what quantity will be allowed, after reaching MR outlet	15
5. Too poor to buy MR	4
6. Buying atta in small quantities is much more convenient	27
7. Others	11

Source: Non-covered household survey

9.43 Our account will be incomplete if we do not report that the noncovered households were almost always in the A and B category of households: 70.4% were A category, and 25.6% were B category. This was established with regard to the Chowkidari Tax paid by these households. 4% were not eligible to MR, as they belonged to C and D categories. We would like to say here that our procedure to sample non covered households has, despite the drawback of lacking a well-defined frame, been able to zero in on the desired households in about 96% of the cases. These noncovered households are poorer on average than even the generally poor households covered under MR: income per capita is found to be Tk. 2195 per year, which is about 87% of the corresponding average for the MR covered households. It is not surprising therefore that three-quarters of them tried to secure place within MR and failed: they are after all poor families,and small families (average family size being only 3.15). What is more surprising that not inconsiderable proportion of them never even sought to secure a place within the coverage of MR, for the reasons adduced in Table 9.19.

9.44 We do find surprising that a small proportion of the rural poor seems to have rejected MR permanently as a source of food supplements. What is surprising, in addition, is that of these households, a clear majority think that the circumstances of the wheat market, as also of their own access to cash, are such that they can go by without accommodation by the MR. The fact that market prices frequently equal issue prices may be a little exaggerated, and directly reflect the households' experience, at any rate in the second half of the fiscal year 1984/5, that monthly MR offtake has been lower than in the corresponding month during the three years 1981/2-1983/4. Almost invariably, these non-MR households had not reported any purchase of wheat as such. Yet they were saying something which we knew not to be strictly true. The average price per kg. of wheat in 1984/5 suggested by a very small price of households that bought wheat from the market was at least 10% higher than the MR retail issue rate of Tk. 4.28. Hence we cannot take this response at face value: What the quantitative importance of such a response may mean nevertheless is that some people may not participate in MR because of the mistaken notion that prices in the two outlets do not differ much. It is altogether possible however that people are in fact saying that ration prices, though still lower than market prices, are not low enough to compensate for the costs and inconveniences of the trip to the MR dealers' outlet, especially since uncertainties are involved.

9.45 The other response involving the fact that buying atta in small batches is much more convenient is altogether more understandable. We have seen that both MR-covered and non-covered households are basically very poor people. At prevailing MR issue prices, even 10 kgs. of wheat will take Tk. 42.8 to lift. It is quite conceivable that many poor rural households would much rather buy atta at Tk. 6 to a seer in a nearby retailers' outlet than be able to collect Tk. 43 so as to go to a MR dealers' to lift 10 kg. of wheat. Three forces may be at work here: first, the household saves expenses and productive time trekking down to the dealers' outlet; second, many household may only rarely be able to collect 43 takas at one time. Thirdly, the retailer may be selling atta on credit on the condition that male members of household work as labourer on his land as a quid pro quo - a facility that MR dealers cannot possibly offer.

9.46 One may get the impression that this chapter has not anywhere specified the amount of food grain that should be directed through MR to meeet a desired level of calories intake by the rural poor in Bangladesh. We have sought to address the nexus between the prevailing MR offtake and problem of poverty in an indirect way, early in ch. 9. We have shown that on the most geneous assumptions MR offtake has, in several years,amounted to a very small effort relative to the extent of massive poverty involved. That calculation was based on the assumption of individual intake of MR foodgrains being equivalent to SR quota --- a reasonably high level of calorie intake --- and of some "normal" family size. The implication is clear: if a desired calorie intake be identified, then the desired MR offtake level must increase six-fold or ten-fold, depending on the impact level. We consciously refrained from making any direct specification of the sort noted at the start of this chapter plainly because the case for expansion - of such a large magintude- for just one outlet may widely be construed as of only academic interest.

9.47 As regards MR malpractices, we found the situation a mixed one. We found on the one hand that beneficiary households were properly screened for economic status and that the sample housholds (of MR beneficiaries) conceded receiving on average some level of foodgrains. Hence there is no evidence of an obvious malpractice in the sense of improper selection, or wholesale leakage. On the other hand, there is the more subtle malpractice involving leakage: in this study, however, we have not undertaken to identify its magnitude exactly and the modalities. A study of the problem of leakage from MR was simply deemed as a proper subject of an independent exereise. Nonetheless, our evidence helps suggest that some potential for leakage: may exist. MR foodgrain distribution per MR card in 1984/5 in all Bangladesh of 25.8 seers (table 9.3) and per capita ration cereal intake on sample house holds, of only 4.2 seers (table 9.8) suggest that a large discrepancy exists between what is lifted off PFDS inthe name of MR on a per card basis and what reaches the beneficiary households. About 60% of the members of the households ought to actually have received some thing of the order of 15.5 seers per capita. In fact, however, only 4.2 seer do reach these households. The question is one of what this large discrepancy reflects. We belive that a part of this reflects actual leakage from PFDS into the open market <u>ab initio</u>. The other part may reflect leakage by default, as beneficiary households do not lift their quota, and as MR dealers have no option but to channel to the market what is not lifted.

9.48 It is not clear that the conditions prevailing in 1984/5 were ideal for isolaling leakage amounting to an "abuse" and leakage by default. We belive that a reform in MR has principally to premise itself on evidence of abuse. Such evidence was hard to come by, as the officals and dealers involved could, as they in fact did, pass the buck on to the fact of the households not lifting. Be that as it amay, one of the cornerstones of an efficient MR is a reasonable spread between market prices and issue prices, the other, it seems to us, is intervention by selection of form in which cereals are made avaiable in MR, e.g. distribute atta in MR and not wheat. To some details of this proposition, let us now turn.

9.49 It is our opinion that the potential for some leakage will exist in any public distribution system but its extent can perhaps be minimised by selecting appropriate modalities. We belive that MR is likely to work better in terms of reaching beneficaries if all of the MR allocation both in pourashavas and the unions, is routed through approved millers in urban and rural atta chakkis. The latter would in turn market the atta. (We are coming to pricing in a moment). This would appear to have the following advantages. First, leakage frequently involves inter-district movement of foodgrains issued at another district. However movement of atta acorss districts is logistically more difficult than that of wheat. Second, allotment of wheat favouring approved millers will more likely be crushed in their facilities than be shipped interdistrict qua wheat. This is so because having people in their employ puts pressures for utilisation of their facilities. The more this happens, the greater are the chances of food assistance reachimg people where the foodgrains involved are in fact issued. Thirdly, creating pressure leading to use of rural manufacturing capacities is an advantage in a country with a serious problem of rural-urban imbalance. Fourth, our survey results show that consumption of wheat-derived cereals procured <u>qua</u> atta is at a predictably high level of over 10%. That being the case, a system featuring distribution of atta in MR would be also consonant with the preferences of the poor people.

9.50 Critics have at times pointed out that at any rate the rural <u>chakkis</u> are located in clusters within rural towns, and that a scheme of utilising these facilities to mill wheat and then distribute atta among residents of villages, themselves scattered all over the place, will raise unit transport costs. The fact ofthe chakkis being located in clusters is not disputed. But it is at these same facilities that wheat distributed in conventional MR would be milled also. It is not the case that if wheat distributed in conventional MR can be milled in facilities that are less clustered than if the wheat were to be distributed first to the millers. Households who receive wheat have to use these chakkis in any case. Hence it is not really the case that unit transport costs would be any higher if MR is modified in its modality.

9.51 As regards pricing of wheat to be issued to approved chakkis within MR, the existing pricing principle can be continued. We have no reason to recommend otherwise. Under the current practice, approved chakkis are issued wheat at the prices that aply to MR dealers. The same unit transportation costs and a certain milling charge is then piled up on that price. A normal profit is allowed to the millers. This pricing formula can well continue.

CHAPTER 10

ASSESSMENT OF DIRECT TARGETTING EFFORTS IN PFDS IN BANGLADESH

10.1 Food distribution programs can be categorised according to the degree of targetting of the benefits that is built into them (a) untargetted food subsidy schemes (e.g. comprehensive coverage to essentially entire population irrespective of income or nutritional status); (b) subsidy schemes targetted by area of residence and/or present or past employment status (e.g. in SR, OP, EP, LE and MR in Bangladesh), (c) subsidy schemes targetted primarily by a rationale derived from poverty objectives (e.g. schemes which feature fair price shops located in particularly poor neighbourhoods, or which are heavily weighted toward commodities that only the poor are interested in (e.g. the FFWP in Bangladesh); and (d) highly targetted special intervention nutrition programs (e.g. VGFP and Institutional Feeding Programs in Bangladesh). Specimens of schemes of categories (b), (c) and (d) can be found among the components of PFDS in Bangladesh. The objective of this chapter is to enter some pertinent observations so as to evaluate the schemes entered in categories (c) and (d), now that we have treated, quite exhaustively, the distribution of benefits, as between rural and urban areas, of the operation of the subsidy components in category (b).

10.A - An Evaluation of Food-for-Works Program in Bangladesh.

10.2 World Food Program began its assistance to Bangladesh FFWP in 1974. To quote from a recent document of the WFP, the current objectives of FFWP in Bangladesh are as follows :

- to improve rural infrastructure (e.g. through upgrading of village feeder roads);
- to increase the agricultural productivity of land through a variety of water development works (e.g. the construction and re-construction of coastal and river embankments, drainage canals, irrigation canals and field channels;
- to generate lean season employment opportunities for the rural poor;

- to assist in the stabilisation of the Bangladesh foodgrain market (WFP, October, 1985). These four objectives can also be synoptically be seen as corresponding to imperatives of (a) generating employment in the short run for the very poor and and the poor, (b) of utilising such employment to create rural capital assets which disproportionally benefit marginal and small farmers by improving their access to markets, and (c) of utilising such employment to raise land productivity and lower uncertainties to return to investment in farm modernisation. In principle, these objectives are of paramount importance in view of possible antidotes to poverty in rural Bangladesh. It will readily be agreed that significant scope of improvement exists on all three counts, and even that FFWP is virtually alone among policy options that serve all these goals at the same time that it does not run afoul of the problem of political economy of distributive change. FFWP is potentially able of improving the income distribution and poverty situation in both the short and the long run. Given this, it will, of course, be desirable to have a brief but coherent evaluation of its effects in the light of these desiderata of policy[1].

10.3 It may be useful to recapitulate the basis of allocating FFWP wheat here. Upazillas are the territorial units. Regular programme resources were in 1984/5, allocated using the following steps. First, the base rate remained 107 maunds per thousand population or 4.28 seers per person. Second, this base rate was modified by incorporating :

- upazila distress factor:

  base rate for average or better distress situation;

  base rate + 10% for slightly distressed situation;

  base rate + 25% for moderately distressed situation;

  base rate + 50% for several distressed situation

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1. As stated in the Inception Report, we shall rely entirely on the findings of BIDS - IFPRI joint evaluation of FFWP for this end.

- upazila 1983/4 performance factor:

  20% extra for best performing upazilas;

  10% extra for next best performing upazila;

  no change for upazila with average performance;

  20% cut for worst performing upazila;

  10% cut for next worst performing upazila[1].

What is particularly relevant in the above description of modalities is the explicit recognition of upazila-level stress and the conscious use of implementation performance in one year as a basis for altering entitlement in the next.

10.4 Selection of FFWP Workers: BIDS - IFPRI evaluation concluded that there is a very large degree of self-selection of the poor into the scope of FFWP in Bangladesh. 51.3% of FFW workers were landless, 70% had only upto half an acre of land and only 7% had 2 acres or more (Chowdhury, 1983, P.132). Chowdhury concluded that "both in terms of human and material capital FFW workers are worse off than the rural population of Bangladsh. Incidence of multiple occupations, each with very low productivity is very high among FFW workers. Chowdhury concluded emphatically that FFW workers doubtless recruit themselves from the poorest section of the community (P.133)

10.5 The mode and rate of payment : The normal or basic rate of payment to FFW labourers is 42.86 seers of wheat per 1000 cft. of earthwork done. Allied factors, e.g. lead, lift, which raise difficulty of earthwork, fetch premia. From 1982, base and allied rates have been merged for all MRR executed FFW projects to result in that, while 1000 cft of earthwork on roads and embankments would fetch 50 seers, excavation of canals would fetch 55 seers. The rates of payments on WDB executed projects still feature the duality of base and the allied rates. The minimum still remained at 42.86 seers per 1000 cft. We shall see below that a major part of the poor FFW workers surveyed by BIDS - IFPRI received less than this minimum in the FFW season 1981/2

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1 In 1984/5, there were considerable supplementary wheat donations. WFP has determined supplementary FFW allocation criteria on the basis of upzilla-level extent of flood damage

10.6 Project authorities are required to put up sign-board prominently about the site showing the stipulated wage rate. The BIDS survey found, however, that 85% of the workers were illiterate and, not surprisingly 56% of them just did not know their entitled wage rate. 61% of the workers are recruited by gang leaders - usually village roughs who often command possessive loyalty - and 20% of workers who knew about stipulated wage rate knew it from gang leaders. 47% of the workers reported that what they were paid was less than the stipulated rate. Project authorities are required to maintain a Master Roll where the names of workers their daily attendance and payments made to them are to be registered against their signature or thumb impressions. But the workers commonly put their thumb impressions - if at all - on a chit of paper against payments made to them. Fictitious names are entered on the Master Roll and usually paper work on it are done after the project is over. Since the workers are generally ignorant about the terms and conditions of working in a FFWP, what they are paid are closer to the prevailing market wage rate (in the lean season when labour demand is slack) than the rate stipulated for working at the project. Chowdhury concluded that the workers at WDB - executed projects received 33.7% less in wages, and at MRR - executed projects 9.83% less, than their entitlements (P.29). On an average (WDP and MRR taken together) wage payments were 42.16 seers/1000 cft. for the entire BIDS - IFFRI sample, the weighted average rate of underpayment for the WFP - aided FFWP in 1981/2 season was estimated at 26%.

10.7 There was a discernible degree of variation in the rate of underpayment territorially. The rate of underpayment for WDB projects varied from a high of around of 60% (at Mirersarai) to a low of around 10% (at Natore). The corresponding figures for MRR were around 30% (at Madhabpur) and around 3% (at Ulipur). The study suggests that inter-regional variation in the rate of underpayment could, in large part, derive from the rate of workers' wages being modelled on prevailing market wage rates. The more depressed an area is, the lower would the prevailing farm wages in the lean season likely be - hence the higher rate of underpayment. This further suggests that a part of the additional wheat allocation due to distress factor may result in additional "unearned incomes" for non-worker actors involved in the project.

10.8 In FFW season 1981/2, the extent of leakage of wheat from FFW channels was, therefore, at-least 26%. This estimate of under-payment has been officially accepted in that WFP noted this as a statement of fact in its report quoted earlier. That disturbing finding has put pressures on the beefing up of field monitoring on FFW projects. The main objectives of field monitoring has been to ensure that workers receive their correct FFW entitlement according to work accomplished. The Bangladesh executing agencies have taken step to strengthen this monitoring. WFP has adduced evidence that intensified field monitoring has yielded desired results, in that the 1983/4 season WFP monitoring reports indicated that under-payment to workers had been reduced to about 13%. For the major part of 1984/5 FFW season, rate of underpayment was in the range 2-5% (WFP, 1985).

10.9 We have already noted that FFWP in Bangladesh shows a predictable tendency towards its self-selection by the target group, viz. the poorest of the rural community. This happens because earthwork is the archetypal manual work and in rural setting mannual work for a living can be adjudged to be a reliable indicator of poverty. Any one who can do away with mannual work will readily do so. Earthwork also happens to be very laborious. Besides, the fact that at the end of work-day people are paid, more frequently than not, wholly in kind and not in cash may well repel many people who, habitually, judge the status of a job by whether it generates <u>cash income</u>. The pressure of need has to be correspondingly greater if the physiological stigma (of ending a day of work with a basket-load of grains funded by international donations) has to be overcome[1]. For all these reasons, poverty acts as a very effective screening mechanism for regulating the distribution of benefits out of FFWP. FFWP does, therefore, not suffer from some of the limitations which afflict some of the other anti-poverty programmes for the landless. In the latter, sons belonging to well-to-do landed fathers in extended family can and do frequently masquerade as practically landless and thus qualify for coverage. Self-selection motivated by poverty makes FFWP a very potent vehicle for simultaneously subserving the goals of poverty alleviation via employment generation and fostering farm viability and productivity via improving market access and capital formation. A careful extension of the scope of FFWP would thus seem to be in order[2].

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1 In Bengali parlance, alms giving has typically been visualised to involve paying to a stretched arm some grain, mainly uncooked rice.

2 We would not like to venture beyond this as our TOR only requires us to come thus far and go no further. In particular, we should record that we have not examined what effect, if any, FFWP foodgrain releases likely have on market prices because our TOR did not necessitate it. Hence the adjective careful in the text.

10.B Evaluation of the VGFP and Institutional Feeding Programme in Bangladesh.

10.10 There are two main objectives of the VGFP in Bangladesh. First, to provide "temporary food assistance to the most economically distressed and, therefore, most nutritionally vulnerable mothers and children in order to help alleviate their critical nutritional situation ---- it is these very groups for whom food assistance is most vital, often providing that precarious balance between survival and catastrophe" (WFP, 1983, P.4). The other objective of VGFP is to use the respite from critical nutritional deficiency provided by the programme as a basis for their rehabilitation as a productive agent of the society. Food resources alone cannot remove poverty from the lives of the neediest groups on a permanent basis. Permanent respite form stark forms of malnutrition can only come if the VGFP beneficiaries as also the community realise the urgency and feasibility of, and innovatively seizes, the opportunities for productive self-reliance via combining health care, skills acquisition and functional literacy within the arrangement of receiving transitory food assistance. VGFP was begun in 1975 on a pilot basis, the scale of the programme was expanded twice since.

10.11 distribution of wheat is made qua dry take-home ration. Each mother receives a daily family ration of 104 grms of wheat (supposedly enough for herself and three pre-school children) for a year for a duration of two years. Within VGFP, an IF programme is also executed whereby cooked meal, including WFP wheat, pulses and oil for mothers and children at orphanage and training centre, is distributed. From the point of view administrative structure, the Ministry of Relief and Rehabilitation has the overall responsibility for the implementation of the project. There are three types of VGF centres, namely Union Parishad (UP) Centres, UP Health Centre and Women Training Centre (WTC). There were in 1983/4 1963 UP VGP Centres and 150 Health Centres.

10.12 VGFP has been shown by rigorous evaluation to have overwhelmingly reached the desired beneficiaries, namely women with dependants facing considerable poverty. 73% of the beneficiary households were headed by members who are either unemployed or employed as daily paid agricultural labourers (WFP, 1983, P.9) 73.3% of the 1446 women covered by the programme were employed either as domestic servants

or agricultural labourers. Another 14.4% were engaged in weaving, begging, earthwork. 90% of them were found to be illiterate. Average monthly income from all sources (including the value of the wheat ration received) was found to be about Tk. 273 or about 30% of the national average. The wheat ration was found to comprise about 22% of house-hold income. Average daily calorie intake per person was only 1029 - about 56% of what may be counted as denoting absolute poverty. VGFP contribution accounted for 35% of the calorie to these marginal diets. The implication is clear that on the whole, VGFP does embody for about 267 thousand poor families the delicate balance between outright starvation and a very meagre nutritional supplementation. There is common consensus, therefore, that VGFP is performing its nutritional intervention function well within the constraints of existing resources.

10.13 Of course, aside from the nutrition-intervention objective, VGFP has always had a developmental objective with regard to the human resource formation of the women involved. There was, until about 1984 widespread and genuine concern that VGFP was not as yet performing the developmental functions expected of it. The investment in human resources development in (a) betterment of health and nutritional education, (b) of the standards of functional literacy, (c) of the level of gainful skills had not as yet come about. However, some concerted attempts have been made by the Ministry of Relief and Rehabilitation to improve VGFP from this particular viewpoint. Several steps have been taken in the matter, namely the formation of a National Coordination Committee, the formation of a Working Committee in the Directorate of Relief & Rehabilitation (DRR) and, among other things, the creation of a VGF cell in DRR with WFP experts. The cell officials have started monitoring the developmental performance of VGF rather closely. The last quarter of 1985 appears to have been the beginning of a real activity in terms of a singificant expansion of the number of VGFP Centres where facilities of health, education, functional literacy and income generation have been created. Progress made so far is doubtless modest but the movement is surely in the right direction. Even so, despite some success a good deal of time and concerted action must take place before the ultimate developmental goal of VGFP can be realised. Admittedly, accomplishing such transformation toward economic self-sufficiency involving poor and mostly illiterate women is exceedingly difficult especially in a social setting where the pace of change has been and remains slow. All the more reason therefore that one must not make a case for expanding the present level of VGFP before an independent evaluation of the developmental endeavours noted above is undertaken.

10.14 Let this be noted that we have examined the VGFP only as programme for providing targeted nutritional intervention, and especially that we have not anywhere argued that VGF-type programs are the most efficient and least costly of all programs in Bangladesh to target food subsidies. We have simply argued that VGFP has performed its nutrition-intervention functions quite well, and that, from 1985 onward, some serious efforts have been made to improve its developmental performance. The latter ought to be evaluated first before a decision for the expansion of the VGFP is deliberated.

10.C - Disaster Relief and Ways to Improve its Efficiency.

10.15 Bangladesh is a country afflicated by a relatively high degree of susceptibility of natural disasters e.g. floods and cyclones - Droughts and part-attack have also had a certain degree of incidence more recently. Even in a year of bountiful crop, three-fifth of the rural people remain the victim of poverty. Small wonder, floods or cyclone can spell outright extinction to thousands of impovrished people, and a disastrous and irreversible loss of earning potential to many more thousands of people. And yet it is reasonable to say that timely succour in case of such calamities cannot only minimise the humanitarian dimension of the devastation caused thereby but, more importantly, can contain the economic disruptions as well. This is the rationale of disaster relief.

10.16 The implementation of disaster relief is within the jurisdiction of MRR. Such relief has frequently taken the form of give a-ways of grains, mainly wheat, re-allocated from what normally would have been distributed within MR. This is necessiatated in that advance allocation for disaster relief cannot, given the imponderable nature of the occurance of its raison d'cre, be made. It is of less importance for present purposes to speak about how the upazila or union level allocation of the quantum of foodgrains is made. It is far more important how whatever little is allocated in favour of a particular union actually gets distributed. This is where the local government institution enter the scene.

10.17 It is our considered opinion that relatively low levels of accountability characterise the manner in which elected representatives distribute foodgrain resources within their jurisdiction. Our MR household surveys returned less than half a seer per capita in contribution of disaster relief in 1984/5. And yet the scale of operation of disaster relief in 1984/5 was very considerable. When the typical benefits from relief operations are so small, it is not surprising to find that people lower guards in so far as whether their entitlements are possibly being infringed by their elected representatives. Nor is it surprising to find that only a relatively small part of disaster relief reached the real victims of disaster[1]. Low sense of accountability inherent in such ad-hoc situations, with little or no precedents or set guidelines for official conduct, coupled with the oft-noted weakness of administration at decentralised levels of responsibility naturally promote a degree of leakage of resources. This prognosis is deliberately pitched at a level of generality. It is neither warranted nor strictly within our mainly academic competence to be more specific as to how to deal with what we have mainly identified inadequate performance by democracy and administration.

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1 The Urir Char and other victims of 1985 tornado may have been an exception to this rule, due to apocalyptic proportions of the disaster and the public sympathy at so movingly aroused.

CHAPTER 11

PFDS AND FOOD SECURITY IN BANGLADESH

11A The Concept of Food security:

11.1 Food insecurity is a problem most often conceptualised as a macro phenomenon --- deviations from trends in aggegate consumption[1]. Deviation patterns from the trend doubtless constitute important signs about the behaviout of particular food systems. They raise important issues involving the existence of patterns of instability in aggregate food consumption, as also of their causation and the nature and costs/benefits of probable sources of their redressals or alleviations. This aggregative concept of food security is closely related with the task of macro management of supply. A sudden and drastic shortfall in market availability of staple cereals may trigger off a fateful cost-price spiral, which may undermine the long-run operational basis of the economy. Clearly, food insecurity in the sense of aggregative instability is the one of the aspects of a country's food system that is of direct concern to governments and donor agencies concerned with macro-economic policies. Some of the questions that have assumed focal consideration in this tradition are the following:

(a) How unstable, from one year to the next, can one expect domestic food supply and the landed cost of imports to be?

(b) What consequences can different sets of policies have in a particular environment in terms of stability of aggregate consumption?

(c) What are the long-run costs or gains of the different policies for the economy, the government, producers and consumers?

(d) What are the costs and benefits of operating some kind of buffer-stock arrangement?

(e) Under what circumstances is food insecurity a problem of national poverty and not of deficient world supply.

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1 It should be made clear that PFDS is just one among many different variables that influence food security of a people. They include employment opportunities, level of wages, market foodgrain prices, economic policy framework of the country, etc. The purpose of this chapter is really to focus on some of the relationships between the PFDS and the conditions of food security or lack of it. In particular, we seek to establish a defined aspect of the problem of food security, pertaining to the geography of vulnerability, and to see what PFDS can do about it.

11.2 Conceptualisation of food insecurity problems is at the same time becoming increasingly sensitive to the fact that the most compulsive aspects of food insecurity surface for attention surrounding the welfare vulnerabilities of distinct and definable categories of people within the population. Such a view is based on the perception that aggregation, however necessary it may be, has the potential demerit of detracting attention from the plight of the particularly vulnerable and handicapped. Even in years with normal food grain availability there may be any number of individuals in Bangladesh facing severe nutritional deficiency. The precipitate decline in the welfate of these presons that may result from a random shock, whether it be untimely and unexpectedly prolonged flooding that damages standing crops and destroys employment opportunities or an externally induced exchange rate fluctuation that makes imported food dearer, is the essence of dealing with food insecurity in the short run. Food insecurity in this disaggregated sense has close connection with the problem of poverty and malnutrition. We can think of at least three sets of forces that affect the problem of food insecurity in disaggregation in Bangladesh, namely <u>personal/occupational, ecological</u>, and <u>policy-induced</u>.

11.3 As for the first, disaggregation of the problem of malnutrition suggests that one of its locilies in the circumstances of people in certain age and reproductinve categories --- e.g. children upto 8 years or so, the very old, the pregnant and lactating women --- and certain socio-economic categories, e.g. the landless and land-poor farm households, the urban squatters, people whose staple sources of income are undermined by otherwise beneficial thrust of development activities, etc. Frequently, also the primarily socio-economic forces sustaining the deprivation indicated above is reinforced by a primarily ecoligical and climatic dimension that is more properly seen as <u>regional</u> than as personal or occupational. Regions within Bangladesh frequently differ in terms of ecological characteristics critical to regional food production, such as crop yields, disaster-proneness of farm ecology, remoteness, and population pressure. Ecological and climatic handicaps of particular regions may also be at times accentuated due to investment allocation according to a possible prevailing orthodoxy which relegates remote and poorer regions to subsidiary positions on the order of priorities. These handicaps are policy - induced and have the presently relevant effects of giving and additional and tragic twist in the predicament of these ecologically vulnerable micro regions.

11.4 We have isolated in the foregoing two perspectives from which to consider the problem of food insecurity. Central to both is the fact that insecurity is measured in terms of the level and, perhaps more importantly, the instability of consumption of food. A conscious distiction between the level and the stability of consumption of food has to be recognised, and, at times, the case for the greater importance of the stability as opposed to the level is arguable. Food security involves adequate and stable levels of food intake. A high but unstable food intake is likely to yield a lower level of utility than a slightly lower but equally stable intake level[1]. This in part implies that stability can be as important --- sometimes even more important --- than the level. The importance of stability becomes even greater when speaking of poor people. Low food intake, levels, undesirable as they are have at least one saving grace, thanks to the biological ability among human to adjust, upto a point, calorie requirements to intakes. The point here is that the body is able to adjust without any conspicuous functional impairment and for sustained time periods to food intake levels that may primafacie appear low. However, at low levels of food intake that have been "regularised" with the metabolism, instability in food intake can become a disruptive force of some importance, in that a departure from such delicate requirement - intake equilibrium may trigger off some new or previously dormant functional impairment including heightened susceptibility to diarrhoel and other diseases which both result from and cause malnutrition. Instability is therefore important in its own right.

11.5 Although several dimensions of the concept of instability in its aggregative sense have been touched upon in para 11.1, we need not deal with all of them in the following. We shall seek to speak quantitatively about the order of instability in three foodgrain variables, production, availability and import in our treatment of aggregative instability. The two other strands on which this chapter rests are about the geography of food insecurity and famine early warning system. We shall next look at aggregative instability in foodgrain production and consumption in Bangladesh over the long period.

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1 This point presupposes diminishing marginal utility of foodgrain consumption.

11B Aggregate Instability in Foodgrain Production and Consumption

11.6 Instability is here measured by coefficient of variation around the trend[1]. The variable of real interest of course is foodgrain availability. But one should perhaps look at foodgrain production and imports as well. Table A 11.1 presents average levels of production, imports and availability of foodgrain in the ten years ending in 1969/70 and the thirteen years ending in 1984/85. The table also presents CV of the actual values of the variables. The CV around estimated trend equations are, however, presented in Table 11.1 below. Let us first examine the instability for the overall period. What emerges quite clearly is that aggregate instability in foodgrain output overall has not been very substantial. For rice, it is found to be 0.9%, and for wheat 1%. This seems in absolute terms reasonably low. We have to state here that our estimate of the CV is found to be much lower than has been reported in a recent study (Murshid, 1985, PP.). It is our opinion that the use of a semi - log specification has to rest on the assumption that the process of growth in a variable involves elements of exponential expansion which, in turn, strictly necessaitates the use of natural logs. It can also be shown that use of common log will overstate CV around an estimated trend relative to natural log.

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1 The methodology followed was the following. Simi-logarithmic relation were estimated of the following form where Y denotes the variable of which the time trend is the object at hand, and X denotes time in years beginning with 1. Natural logs are used, in preference to common log. (It will be shown below that we arrive at much lower variation around the trend, for example for foodgrain output, than estimated by a recent doctoral thesis submitted to an English University)

CV = (SEE/ $\bar{Y}$ *) X 100 where Y* stand for log Y, and SEE is the standard error of estimate of trend line.

Table 11.1

Variability around Trend of Selected Foodgrain variables, 1960/1 through 1984/5

(%)

Variables	1960/1 - 1969/70	1972/3 - 1984/5	1960/1- 1969/70, 1972/3- 1984/5
(1)	(2)	(3)	(4)
Rice output	0.7	0.5	0.6
Wheat output	6.9	3.9	6.5
All foodgrain output	0.7	0.5	0.6
Rice import	8.5	15.9	12.6
Wheat import	6.7	5.7	7.9
Total grain import	4.8	5.6	5.8
Rice availability	0.5	0.4	0.5
Wheat availability	5.0	3.7	4.8
Total foodgrain availability	0.5	0.4	0.5

Note: The two years 1970/1 and 1971/2 have been omitted from this exercise on the ground of political turmoils of that period, which must be seen as originating from non-economic factors 1974/5 has in contrast, been included in that year's famine was caused by natural as well as policy-induced factors -- both being natural subjects of a study of food security. Availability of foodgrain, as before in this report, is defined as net production domestic procurement + offtake. Offtake is fed from procurement and imports.

Source: These ratios are computed from estimated trend equations presented in Table A11.2

11.7 It may be useful first of all to look at overall instability of foodgrain output and availability. While the CV of the former is found to be 0.6%, the corresponding ratio for availability is a percentage point lower. Strictly speaking, however, those two orders of things may be seen as substantially similar. This would suggest the conclusion that instability in availability has been of the same order of importance as that in production levels. The instability in nither production nor availablity appears great in overall terms in that both are less than 1%. The fact that instability both are roughly of the same order of magnitude suggests in both that the instability in production is an important cause of that in availablity, and that, in both periods, it has been possible to offset losses in net production by increases in ration offtake such that instability in food availability has been in keeping with that in food production. This conclusion suggests that PFDS has been an useful device in Bangladesh in that it has lent itself successfully to moderate what may well have been relatively higher instability levels in foodgrain availability.

11.8 A word of clarification appears to be warranted regarding the strangely high level of instability in foodgrain imports. Where levels of foodgrain imports are determined with a view to minimising the effects of changes in foodgrain production on availability, surely one expects an order of instability in import levels of roughly the same order as that of production level itself. It appears that, in Bangladesh that is not how import flow of foodgrains are determined. Perhaps, foodgrain import levels are more forcefully determined by factors not directly related to performance of the food poducing sectors. It may even be speculated that even when decisions to import are initially triggered by performance of the food economy (e.g. necessitated by crop losses due to floods), there have been tendencies towards "overkill", resulting in huge imports which end up doing much more than stabilise consumption[1].

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1 The developments succedin 1984 flood convincingly demonstrate the type of tendencies under reference here. It is true that different parts of the country suffered atleast four waves of flooding in May, June, July and September, 1984. These did no doubt cause sizeable damage to boro, aus and broadcast aman crop. The government acted quickly. It first sought to talk important food donors into up-grading shipping schedules of foodgrains already committed. When donors were less than forthcoming, the government embarked upon market purchase on cash and deferred payment terms. In addition, some of the donors, too, made available emergency contributions to Bangladesh's FFWP in 1984/5. The result is that foodgrain imports reached the staggering level of 25.8 million metric tons - one of the highest ever. The irony is that domestic production level was far higher than was thought.

Such modalities will aggravate instability in the import levels. A look at Table A11.2 shows that overall series from foodgrain (rice + wheat) imports during 1970's exhibit little trend growth, with a $\bar{R}^2$ that is next to nothing and a variability around trend of 5.6%. Clay has argued that imports have moved cyclically under the influence of a combination of factors including production, ration off take, demand, and stock levels (Clay, 1979, p.12). Such cyclical movements around an insignificant trend have reflected themselves in the high variability we have noted.

11C Food Security at the District Level in Bangladesh

11.9 The evidence showing that aggregate instability in foodgrain consumption has not been significantly high should suggest nothing about a very real problem in Bangladesh by way of regional variations in economic vulnerability. Sen's seminal work (1982) has popularised the paradoxical theme that occurance of major famines has frequently been in the midst of reasonably high levels of aggregate food availability. Famines are viewed as stark manifestations of the problems of food insecurity of certain types of people. These people have certain vulnerabilities specific to their status in the labour market or in the realm of production which are aggravated by what Sen calls failure in their entitlements to exchange. Such failures can happen, and have frequently happened, in the midst of adequate aggregate foodgrain availability. The point tha tis being driven home is that, as noted in 11.1, a researcher is still confronted with the need to probe for the geography of poverty even when all seems to be well in the aggregate.

11.10 Of course, Bangladesh has a reasonably well-defined geography of poverty. As noted earlier, this notion has proceeded from the work of Dr. Bruce Currey (see the appendix on the methodology to Ch.9). Dr. Currey in essence drew in his work a poverty map down to the upazilla level. WFP, too, uses a version of a map showing various degrees of distress level down to the upazilla level. It is recognised that the geography of poverty under discussion here is reflected, among other things, in differential average foodgrain intake to the disadvantage of upazilas characterised as either liable or very liable to famine conditions. Chowdhury (1984) compared calorie consumed per day per person in 1979/80 as between upazillas betraying a significant degrees of distress (according to the WFP poverty map) and between randomly sampled upazillas within

the same district. Since not all districts are represented on the list of upazillas betraying a significant exposure to famine, a comparison is afforded only for those districts that have representation from both exposed upazillas as well as non-exposed ones. The results are presented in Table 11.2. The evidence is clear that in every case, the famine upazillas fare worse in terms of production levels and, for the reason adduced in the footnote to that table, per capita availability as well. Hence we would like to say that the WFP sponsored famine map has correctly traced at least the broad gradations of significant exposure to food Insecurity , and an average level of such exposure.

11.11 If any further proof of the case for a geography of poverty is needed, we believe, Ch.9, in its paras relying on the findings of the MR household survey, gives quite persuasive support. We have, it will be remembered, based our exercise on the famine map associated with Currey's work. We have found that daily calorie intake per capita is in every case, lower in the sample households from the below-average union of the famine upazilla than is the case with the non-famine upazilla. And yet, as one would expect, the differences were not frequently statistically significant. There is a strong case that the geography of micro-regional economic distress exists.

11.12 This observation should not strike the knowledgeable reader as new; we have ourselves noted that the FFWP wheat allocation makes a conscious use of this concept. The reason for seeking to establish its empirical validity here has been to call attention to the importance of making the allocation of public food resources for rural areas more sensitive to this factual aspect of the distribution of food insecurity in rural areas of Bangladesh. For example, it is technically feasible and highly desirable that modalities of allocating quantities for MR among districts and upazilla be changed such that famine upazillas come to have a higher entitlement, in relative terms to non-famine upazillas, within the campus of MR. What this would mean is that the requirements of A and B categories of persons in the famine upazillas should have greater weight relative to those of A and B categories of people in nonfamine upazillas. If what, prevails to-day as an average MR card-holder's benefit, in physical terms, has to stay the same, this would necessitate an absolute expansion in the size of MR. Other things being the same, this would gear rural rationing to the problem of rural poverty to a greater extent than now is the case. Getting at worst pockets of rural poverty is an important way of dealing with lack of food security in its regional dimension.

Table 11.2

Comparative per capita calorie production as Between
Random Upazillas and Upazillas showing Exposure to famine, 1979/80PM
(K.Cal/day/Capita)

Sl. No.	Name of District	Randomly selected upazillas: No.	Randomly selected upazillas: Per capita calorie production	Upazillas with exposures: No.	Upazillas with exposures: Per capita calorie rice production	Col.4 as % of Col.6
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.	Faridpur	9	1280	13	1193	93.2
2.	Jamalpur	4	1923	4	1794	93.3
3.	Chittagong	7	2058	1	878	42.7
4.	Noakhali	5	1951	1	1329	68.1
5.	Dinajpur	8	3083	1	2978	99.1
6.	Rangpur	11	2310	5	2189	94.8
7.	Khulna	8	1799	3	1639	91.1
8.	Patiakhali	4	2005	3	1166	58.2

Note: Of course, unit calorie production of an upzila may be augmented by internal trade, or by ration off take. Despite that limitation, there are atleast two important reasons why production data still provide an insightful way if talking about poverty at micro regional level. First, relative production per capita among upazillas may be seen as roughly indicating, relative employment levels of agriculture in the upazilla economy. Secondly, it may be that prices of edible field crops may tend to be relatively low in upazillas which have higher incidence of distress and poverty, and may for that reason alone experience movement of foodgrain for example, to higher price area. If such were the case, there would be a presumption that differential availability in per capita foodgrain (after private trade effect has been accounted for) will be even more to the handicapped of the exposed upazillas than shown by the production data in the table above.

Source: (Chowdhyry, 1984, Table.2)

11.13 Table 11.3 presents the proportion of population of the (old) districts that resided in upazillas which were treated by Currey as very liable or liable famine. It is striking to note that the proportion is at its highest for the districts of Faridpur, Rangpur, Jamalpur. All of these districts have one thing in common in that they are part of the basin of the major river systems of the country. The upazillas involved in exposure to famine are frequently composed of low lying char regions, with one - crop farm cycles and high population pressure. Table 11.3 suggests a high degree of regional food insecurity observed in these dis tricts. This calls for an explicit consideration of the role that PFDS can play, or has played, in the context of ensuring food security whether in its regional or individual dimension.

11.14 Let us deal with the regional demension first. We have noted that FFWP has sought to explicitly take this dimension into account. It is an encouraging sign that FFWP has, in more recent years, accounted for as much as one-sixth of the total operations of the PFDS, in that the allocation, in space, of about one-sixth of the total quantity in public districution has addressed itself to the regional aspect of food insecurity. This is encouraging because only a few years ago, the share of FFWP was exceedingly low, no more than 6-8%. Further hope can be had from the fact that the problems of effective administration of FFWP are being tackled with generally salubrious result, and that the climate of opinion about the management of project food aid resources, especially among the donors that operate through the WFP has become generally favourable. It is genuinely possible that a reasonable and steady expansion in the scope and effectiveness of FFWP can be brought about, although it has not been possible within the confines of this study to come up with any really concrete suggestions additional to those that the MRR, with assistance from the donor agencies, has already identified to be promising. Nonetheless, FFWP does appear to offer a pretty firm basis from doing something for the rural poor in general, and the poor people in these famine-prone upazillas[1].

11.15 Similarly, we consider that the allocation of the MR food resources ought to be conditioned to a large degree by the geography of distress. As has been noted above, this can be achieved by assigning graduated premia to the entitlements of households in A and B categories resident in upazillas having varying degrees of famine exposure. In theory, this is what has to be done if the policy-maker would like MR to contribute to the alleviation of rural poverty at the same time that the territorial dimension of food security is to be addressed. One possible way of re-orienting the

allocation of MR in the direction just noted without, however, expanding the overall quantum of the MR would be to de-prioritise the beneficiaries living in the pourashavas (who also receive out of MR). Such de-prioritisation can be rationalised in that the degree of stress confronting A and B categories in pourashavas is perhaps lower than that facing A and B category people in villages in general and within villages of famine-prone upazillas in particular. It is reasonable to argue that employment opportunities are greater in pourashavas, and hence income per capita may be higher, too. Besides, the pourashavas are far more accessible than these famine upazillas, and accessibility is conducive to the arrival of fresh market supplies in the event of a natural disaster (which incidentally be trough of a price rise), while the famine-prone upazillas, which frequently are remote, may face a more inelastic market, supply function. Bullish traders' expectations about prices in the latter can, to a large degree, perhaps be "reformed" by expanding the scale of operations of public rationing in these upazillas during more normal months. Once traders receive that these famine-prone upazillas occupy important place within government's food distribution priorities, their speculative proclivities during disaster periods will be restrained because the government would be perceived, subjectively by the traders at any rate, not to let prices rise to unreasonably high levels. These expectations may exercise down-ward pressure on planned stock levels. The point, therefore, is that pourashava poor are less deserving of rationing than the poorest among the famine prone upazillas.

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1 It is not being suggested that FFWP alone can deal comprehensively with the problem of rural food insecurity, for that would be an absurd thing to say. For FFWP must, in the nature of things, remain a seasonal activity, open to participation only be able bodied men and women, a very large number of persons who may otherwise be quite needy being nonetheless kept outside the ambit of FFWP simply because they cannot cope with the work. What is, however, being suggested here is that an expansion of FFWP can make a real and much needed contribution toward the alleviation of the most compelling symptoms of rural poverty in which even otherwise able-bodied men and women were facing starvation just because there are no takers of their only asset, unskilled labour power. Besides, there always are spin of benefits that accrue even to non-participating people and arise from the participation by able-bodied members in FFWP.

Table 11.3

Proportion of Populaiton in Selected Old Districts Resident in Famine Prone Upazillas

Name of District	No. of upazillas in district	Population of district in 1981 census (000)	No. of upazilla: Liable to famine	No. of upazilla: Very Liable to famine	Population (000): Liable upazilla	Population (000): Very Liable upazilla	Col. 4 as % of Col.2	Col.5 as % of Col.3	Col.6 as % of Col.3	Col.7 as % of Col.3	% of District population in famine-prone upazillas (10) + (11)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Rangpur	35	6490.4	3	4	611.2	668.3	8.5	11.4	9.4	10.3	19.7
Pabna	17	3418.5	4	3	614.3	577.3	23.5	17.6	18.0	16.9	34.9
Barisal	30	4670.5	6	2	1067.7	306.2	20.0	6.7	22.9	6.5	29.4
Chittagong	27	5477.0	5	1	1063.0	238.0	18.5	3.7	19.4	4.3	23.7
Bogra	16	2727.8	3	-	528.8	-	18.8	-	19.4	-	19.4
Rajshahi	31	5262.7	5	-	827.9	-	16.1	-	15.7	-	15.7
Kushtia	12	2292.1	1	-	231.7	-	8.3	-	10.1	-	10.1
Khulna	27	4406.7	6	-	1025.7	-	22.2	-	23.3	-	23.3
Sylhet	36	5256.4	3	-	399.1	-	8.3	-	7.1	-	7.1

Source: Bruce Currey (1978)

11D Early-Warning System as a Device for Food Security

11.16 By an early warning system (EWS), we really have in mind a Famine Early Warning System (FEWS). There is of course, no FEWS in Bangladesh. The old "famine code" of the British administration is now defunct, and at present there is no office within the Food Ministry which is responsible for collating and disseminating information on potential food emergencies. Instead, the system that exists is an administrative structure which is cpable of communicating news of actual distress from the lowest levels of the administration to the highest level within the Ministry. The current system can offer little or no "lead time" to disaster, which has in the recent past occured rapidly and on a massive scale in Bangladesh. Even in performing the relatively limited task of altering Dhaka authorities, the existing administrative system in the district and below continue to need accurate assessment about the degree of distress on the whole, and the regions being afflicted. The needs for speedily collecting information is great. It may be pointed quite safely that the district authorities have frequently relied on the assessments of the Chairman of the UP in their own assessment of the disaster situation. This suggests that the process of famine relief has at its core a potentially political source of information, as distinct from an objective one, in that UP chairman may only report famine conditions if they feel that it is in their interest to do so (Cutler, 1984, p.6). But it is not to be implied that the government uses the UP chairman as the sole source of information. Now that each upazilla has a project implementation officer at the upazilla and an upazilla food oficer, both reporting to the UNO, it is likely that government resources at upazilla level is more plentiful than was the case before the decentralisation of the administration. Hence the possibility is real that the UNO in a position of getting an assessment that is alternative to, and possibly more objective than, that adduced by the UP Chairman. PIOs and the UFOs are frequently moved about on transfer. Not being involved in the "local politics" of the territory underliving their administrative jurisdiction, they are unlikely to be any privy to the vested interests which may colour the assessments that UP chairman may have of the disaster situation. The chances, therefore, are that the reporting of the actual disaster may have become slightly more accurate. Even so, the important fact remains that Bangladesh needs, but does not have, a FEWS.

11.17 It is not intended here to provide the blue print of such an EWS for Bangladesh, for such a thing would require the services of specialists, which the authors are not. What we would like to contribute here is the recognition that the problem of food security is, to a large degree, one of the ability of generating alertness as to a probable decline in the foodgrain consumption of the population in general, and as to the points of its most direct impacts. The attraction of such a prior alertness is that of course this provides a basis for mounting a preventive plan of action. One has a lead time in which to weigh various possible alternative action courses one against the other. Lead time also comes very handy in an economy where speedy but effective action is as difficult to ensure as is its necessity great. The remaining few paragraphs dwell on some of the major ingredients of just such an EWS. Before we take these up, it is well to consider the chief deficiencies of such a system, as also what we cannot expect from it.

11.18 One limitation of the FEWS outlined in the following is that it will be unable to create prior alertness as to sudden, genuinely unpredictable turn of the climatic condition, e.g. a flash flood. This is so because a flash flood can not be forecast even by advanced meteorological bailiwick. Similarly, it cannot offer much protection against typhoons on cyclones or some such thing. This limitation may be even more important in the post-farakka era when lower - reperian Bangladesh may be used at will by India as the unwilling, even hapless, reciipient of excess water of the Ganges. Similar descriptions may soon be apt in relating to Indian efforts to build dams upstream on the Indian portions of the Brahmaputra. The point is that if flash flood can occur not only because a sudden naturally-caused swelling of Bangladesh rivers (e.g. due to excessive rain) but also by a sudden change in the political climate between India and Bangladesh, it would be outside the competence of the FEWS to deal with such contingencies. If it turns out that unsavoury aspects of international diplomacy increasingly overpower impersonal working of climate as the primium mobile of flash floods, the recognition that FEWS is a blunt tool in that context is a depressing one.

11.19 Fortunately, flash floods or tornados are not the only causes of food insecurity in Bangladesh, even though they may well be far more visible and hence politically much more destabilising. The point of the matter is that food

insecurity is as extensive in Bangladesh as it is recurrent. The problem of lack of enough food is not specific to the years of flash flood. For tens of lakhs of persons, for the elderly, the female-headed households, the children -- particularly in the famine - prone upazillas -- lack of food is a nagging experience. The World Bank estimated the rural population with less than 1805 kcal/day/capita to be an appaling 45 million in 1976/7. The corresponding number was estimated at 3.3 million for the urban areas (World Bank, 1980, P. 174). These are large number of people, and it can safely be posited that a very large proportion of them are precariously poised between being nominally alive and starvation death. The case for FEWS arises out of the plight of these people. In this context, the logic on which FEWS rests is that several categories of crises that, if unchecked, can pose fatal dangers to this class of people, do in fact feature a build up -- and hence a lead time --- that reflec s itself in the conditions of markets and in human responses. The second logical strand is that many of these manifestations lend themselves to observation and even to measurement. The existence of a build-up, coupled with the feasibility of generting/using information by way of causes and effects of food shortage conditions, suggests the idea of the technical feasibility of famine monitoring. The idea of fmine monitoring is highly plausible, intuitively. Cutler argues, "... it seems that social and economic indicators could have an important role to play in food crisis prediction ... some degree of awareness in Dhaka of developing crisis conditions in the upazillas could allow local level stocks to be reviewed and updated and a general level of disaster preparedness to be established. The process could be likened to a traffic light going green to amber, and then to red if the crisis really does come about: (cutler, 1984, P.11).

11.20 Already, at least four blueprints, with varying elaborateness, of EWS to suit Bangladesh's conditions have been out forward (Newton, et al, 1980; Currey and Yousuf, 1979; Cutler 1984; Amin and Chafur, 1984). These have several common features. First, all emphasise that early warning forecasting of crops and agricultural employment require (a) that reasonably accurate post-sowing acreage by crop type (viz. Aus, etc.) and by varieties (viz. local or HYV) will be required; (b) that fertilizer prices and rates of application and availability of crop loan will have to be monitored. Second, foodcrop yield prospects at various points of crop cycles will have to be monitored; (c) that reliable post-harvest output estimate must speedily be trasnmitted to relevant agencies; (d) that continuous

monitoring be done of a set of at least four variables that capture the interrelationship between the food and labour market, viz. foodgrain prices, real wages, availability of employment, and land prices; (e) that, in addressing the issues noted at (a) through (c) sight must never be lost of the geography of economic dstress, which requires that special monitoring devices, additional to those noted in the above, for example special and quick surveys focussed on the famine prone upazillas, must, especially during a build up to a probable crisis, be resorted to so as to keep the vulnerable as a distinctive focus in its own right; and (f) finally that primary foodgrain market data, e.g. imports, offtake, procurement, public stocks etc. should be systematically utilised in order to contribute to the macro dimensions of an emerging food distress situation. We shall refrain from making any further observation by way of the tec' calities of a FEWS, or about how to proceed with the idea on an administrative plane. We believe that the design of a FEWR is outside the province of our TOR. Our main contribution appears to have been the confirmation of widespread notions about the lack of impact that direct rationing (e.g. in MR) has had on the welfare of poor rural households. The food security of the rural poor does not seem to have taken any improvement from the direct distribution of foodgrains. The lack of exposure to public rationing strengthens the need for a FEWS. The precise framework and modalitic; of such a system is best dealt with in a different exercise.

11E Fair Price Shops in SR Areas

11.21 In Ch.8, we have shown that SR succeeds principally in providing food subsidies to nonpoor households, and that the poorest households in SR areas are left outside the PFDS. The latter represents an aspect of the problem of food security in its disaggregated sense. In case SR is to be abolished, for which we have made a case later in this report, something is needed in order to deal with the food security problem of this handicapped mass of people. The poorest of households living in the SR areas would in the absence of SR, appear to call for the creation of perhaps a new instrument for targetting food assistance. In this regard, we propose that serious consideration be given to the establishment of Fair Price Shops (FPS) on a pilot basis within SR areas.

11.22 Two considerations motivate the suggestion that FPS is a feasible as well as an equitable idea. First, it is possible

to delineate within the SR ares poor neighbourhoods featuring a concentration of poor families. It may of course be necessary in order to bring within perview the slum areas in the suburbs. The idea would be to take advantage of locational self-selection of these poor neighbourhoods of the FPS in ensuring primary participation by the poor. Second, it is desirable to have an appropriate combination of cereals fed into the operation of these FPS. Wheat and atap rice only should be distributed in the FPS. The rate of subsidy on the foodgrain so distributed should be about two-thirds that on the foodgrains distributed in the MR. That establishment of FPS is feaseble, given such a policy decision, cannot be much in doubt. Once this is established, that it will be equitable also cannot be much in doubt. What is very important is to realise that their establishment will represent a novel departure from existing practice. Both in terms of the cultural values of the businessmen associtated with the working of existing SR, as also of the preference of the actors within the Food Directorate, the proposed system may appear to be too idealistic. The nonpoor is unlikely to spontaneously entertain the idea of coming all too close to poverty in order to carry out the mandate of the state. Hence one may need creative and dedicated leadership from the Food Ministry in the matters of the establishment of the FPS.

11.23 The FPS will have their best chances of success if they could somehow be operated by poor neighbourhood peoples themselves. This could be accomplished by forging some kind of a groups within these neighbourhood on the basis of self-help. The Food Ministry may be required, initially, to give these groups a seed capital through free supply of a certain quantity of foodgrains. The proceeds from the latter could pay for most of the cost of setting up the physical facilities of the FPS (e.g. a secure room with a small storage attached, scale, some furniture, etc.). Such proceeds should also be large enough to pay for two person's salaries for about six months' period. These two men will be in the employ of the group. The groups are envisaged to have members from the neighbourhoods, and to pay a nominal membership fee. It is assumed that even poor families would not be unwilling to pay these fees both because they ought to realise that starting their FPS has cost and because regular access to subsidised food is a benefit. The salaries of the two persons whose services may be needed for the operation of each FPS should be seen as a charge to the Food Budget: they, and some part of the other administrative costs not covered by the membership fee, may be financed explicitly by some additionality in terms of foodgrain movement to these FPS. Eventually, therefore, the rate of subsidy on supplies to the FPS may be the same as that on supplies through the MR.

11.24 We shall be rash if we gave the impression that it is easy to set up and operate successfully the FPS. Several problems may be encountered in the process. First and foremost, there is the problem of delineation of an urban territory that looks like a good candidate as a constituency for a FPS. Inside the city of Dhaka, there are stinking slums and multi-storied flats within the perimeter of the same (municipal) unit, called ward. Hence the idea of the FPS would be to serve those parts of the ward that on some reasonable basis appear to display significant levels of poverty. For example, houses in certain parts of a ward may be characterised by unusually low-cost materials, e.g. straw, jute-sticks, bamboo-mats etc, or by very primitive methods of sanitation. Although co-habitation of stinking slums and opulent homes is admitted, in reality the very poor find it necessary to cohere together, thus offering some promise to the FPS proposal. The second major difficulty relates to the financing of the services of the FPS, as already discussed. We believe however that these difficulties, though real enough, have to be dealt with by the Food Ministry in a dedicated manner.

11F OMS and Food Security

11.25 Open market sales program in its role of supply and market price stablization has considerable potential in contributing towards removal of food insecurity in Bangladesh. As an effective instrument to ensure a stable maximum price, the program assists in targetting of foodgrain operations to benefit a wide segment of the population. The welfare implications of a stable consumer price is well documented in the literature. In Bangladesh, which periodically suffers from aggregate food shortages, the welfare contribution of a distribution mechanism that is exclusively oriented towards stablizing foodgrain prices in the open market must be quite large. This is particularly so in an economy where a significant number of people live near or below the poverty line.

11.26 Of course direct targeting of increasing share of public foodgrain distribution through various programs designed to reach the very poor, who face serious handicaps in the absence of such programs, will alleviate this problem to a large extent. However, even when these programs make their contributions most, there still remains a vast number of people in Bangladesh outside the ambit of these targeted programs, who are quite vulnerable to the escalating price increses in times of foodgrain shortages. Effective OMS operations through exerting a significant stabilizing influence on country wide retail price of coarse rice and wheat can have wide beneficial impact in such a situation.

11.27 Also, the territorial dimensions of food security can be effectively handled through OMS operation by targeting the foodgrains more in those Upazilas which are traditionally deficit areas, ecologically more vulnerable and therefore, more famine-prone. This assumes greater significance in view of the lack of impact, as evidenced in this study, that direct rationing such as MR has had on the welfare of poor rural households[1].

11.28 OMS program by exerting a stabilizing influence on market price can also contribute towards mitigating the difficulties faced by the government in fixing procrument prices in periods of rising domestic foodfgrain prices. There are at least two reasons why a decision to raise procurement prices substantially in line with domestic market prices could have adverse implications for future food policy (World Bank,1985).

Firstly, procurement prices should be floor prices whose levels should be related to medium term trends in both domestic and external market prices for foodgrains, and to trends in production costs. Short term market prices being volatile, particularly for rice, do not necessarily provide an adequate basis for setting procurement prices.

Secondly, what is more significant, if there is a marked divergence between trends in domestic market prices and trends in world prices for foodgrains, then procurement pricing decisions would become very difficult. If procurement prices follow domestic market prices under these circumstances, wrong price signals could be provided to producers and unduly high prices charged to consumers.

11.29 To the extent, high domestic prices of foodgrains is attributed to market shortfall, OMS as we observed earlier, can play an effective role in stabilizing market prices through augmenting the supply and thereby help overcome such problem. However, part of the increase in foodgrain prices may be attributed to expansionary monetary policies which generate inflationary pressures in the economy. Therefore, improvements in this area of macroeconomic policy is essential if public pricing policies in the foodgrains sector are to be successful in stablizing both producer and consumer prices of foodgrains.

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1. Due to limited impact of OMS among rural population, however, the argument loses much of its force. A better suggestion to combat food insecurity would be to make MR program more effective, and also to undertake,in times of foodgrain shortages, free sales program in those remote rural areas which are observed to be more famine-prone.

CHAPTER - 12

INTERNATIONAL PERSPECTIVE OF FOOD DISTRIBUTION

12.1 There is a multitude of food distribution programmes ranging from untargeted food subsidies schemes to targeted systems like strategically located ration shops, self-targeting by commodity, food-stamp programmes and to the highly targeted special intervention nutrition programmes. In analyzing the impacts of various public food distribution systems, it is important to keep in mind the objectives of the programmes. The stated objectives also range from providing a minimum level of per capita consumption at a fair and stable price to self-sufficiency in food production. In general the ultimate objective of public food distribution system may be defined as food security or freedom from food deprivation for all i.e. to provide a target consumption level in the face of fluctuating production, prices and incomes.

12.2 One of the basic causes of food deprivation has repeatedly been identified as poverty. Short of eliminating poverty, countries have experimented with alternative systems of food distribution to tackle the problem of food insecurity. In this chapter we shall try to assess the implication of PFDS in the light of the contemporary experience of some of the countries in the region.

12.A Food Distribution System in Indonesia:

12.3 Indonesia is one of the largest countries of the world with around 150 million people. Rice is the staple food of the country and it occupies more than one-third of the cropped area. Yet the domestic production is not sufficient to meet the requirements and as such it is one of the largest rice-importing countries of the world with annual imports varying between 1 and 2 million tons.

12.4 One of the basic objectives of the Indonesian Governments' food distribution policies is the assurance of adequate food supply at stable prices for the country's large and growing population[1]. The achievement of this policy objective is pursued through the National Food Price Stabilisation Programme, the implementation of which is entrusted to the National Logistic Agency (BULOG). Its primary tasks is the maintenance of national stocks of basic food commodities and the management of buffer stock operations.

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1 See for details Soegeng Amat, ( ), Promoting National Food Security: The Indonesian Experience.

12.5 A minimum of floor price (for paddy and rice) and a maximum or ceiling price (for rice) are set every year and the market prices are allowed to fluctuate within this range. These price controls are implemented through the domestic procurement of rice at the floor price and release of rice from the national stock into the market to prevent prices from exceeding the ceiling. Rice from domestic procurement is combined with imports for maintaining the national stock.Imports of rice are exempt from import duties, levies, or tariffs. Rice exports are prohibited. Thus the policy of keeping food prices within a pre-determined range require both holding and maintenance of an adequate buffer stock which in its turn have both domestic and foreign exchange cost implications as well as influencing domestic production.

12.6 Both the ceiling and floor prices have substantially increased over the year. Consumer prices have been allowed to "float" temporarily when stocks were inadequate to meet the demand on the domestic market at the ceiling price. But in recent years the stocks have approached full capacity and the prices have been allowed to "float" downwards in order to equalise supply with demand.

12.7 There is only one floor price set each year for all varieties of rice, irrespective of locality. BULOG must continue to purchase rice, from the farmers as long as the market price is below it. Hence the quantity of rice purchased domestically by BULOG is independent of its decision regarding the level of stocks it chooses to maintain. The size of the market surplus, on the other hand, is the most important factor determining the quantity of rice BULOG is able to procure. It is estimated that the marketed surplus has increased from 25 to 30 percent of the total crop to about 40 percent by the late 1970's. Cash needs of the farmers and increased interseasonal stability in the rice prices encouraging farmers to sell more of their produce in the market with the assurance that they will be able to buy when needed later in the season at a comparably reasonable price are regarded as the primary causes of increase in marketed surplus in recent years.

12.8 Storage capacity needs to be expanded to cope with the growth in the national rice stock to implement the stabilization programme satisfactorily. BULOG has expanded its storage capacity considerably by constructing modern ware houses in strategic locations throughout the country. Thus the risk of disruptive supply shortfalls caused by either crop failures or inaccessibility of import are reduced. Availability of stocks distributed throughout the country is critical to meet the demand of ever increasing share of the population dependent on market for their food supply since yearly fluctuation of total production has more than proportionate impact on the fluctuation of marketed surplus.

12.9 BULOG controls about 10 percent of all rice consumed and 30 percent of the share marketed. It has been able to maintain a relatively stable domestic price of rice. Since a large share of the nation's disposable income is spent on rices, the stability of rice price has contributed to the relative economic stability in general and overall price stability in particular. Indonesia's economic growth and political stability have been facilitated by this economic stability largely due to supply of food at a relatively stable price to the urban people through the market. On the other hand, the operational cost of the system is also quite large requiring foreign exchange to import food during the bad crop years, building enough storage capacity to hold and maintain sufficient stock of food to supply the large and growing population at a stable price and procuring from domestic production at a minimum price set before the harvest.

12.B Public Food Distribution System in West Bengal

12.10 West Bengal with a population of more than 55 million is a major rice producing and consuming area in India. About 60 percent of the cropped area is sown in rice. Yet its production is far below the consumption requirements of the population. It is estimated that about more than fifth of its food requirements are met from supply from outside the state in recent years.

12.11 The system of public distribution of food in India has evolved over the years since the Second World War, when the supplies from Burma were cut off and India faced food shortage. In West Bengal in can be traced back to the Bengal famine of 1943. The partition of Bengal in 1947 reduced the food availability in West Bengal as the eastern part was the traditional supplier of agricultural commodities such as food and, jute, the raw material for the large number of jute mills in West Bengal.There was a shift in the cropping pattern from paddy to jute immediately after the partition in West Bengal thereby further aggravating the food availability situation in the state. All these factors contributed towards strengthening the public distribution system of food in West Bengal.

12.12 Both statutory and modified rationing systems exist in West Bengal as a part of public distribution arrangements. The state is obliged to distribute foodgrains and other esssential items through ration shops to inhabitants of the designated statutory rationing area at a pre-determined price under statutory rationing system. On the other hand, under a modified rationing system the government is not committed to distribute essential items in a designated area. The government may supply foodgrain as and when it deems it necessary and feasible, and the consumers are free to buy from other sources.

12.13 The number of persons covered by the shops in statutory and modified rationing areas vary considerably. There were about 2750 statutory ration shops and 15,783 modified ration shops in West Bengal at the beginning of 1983. 74 average number covered by each shop in the statutory rationing area was about 3000, the number in the modified rationing area was around 1000. The number of persons per shop in statutory rationing shops remained virtually constant over the years, but there were substantial variations in the number per shop in modified rationing areas.

12.14 Rice and wheat are distributed through ration shops. There has been a change in the proportion of offtake of rice and wheat over the years. In the early 1970s the offtake of wheat was larger than that of rice, but from mid-1970's onward rice offtake exceeded that of wheat offtake. The offtake of rice in modified rationing areas account for more than half of the total ration offtake, but the per capita offtake is below that of statutory rationing areas because of the wider coverage in modified rationing areas. Similarly, the distribution of wheat in modified rationing areas account for about 40 percent of the wheat offtake in the state, but the per capita offtake is less than half the per capita offtake in the statutory rationing areas. Moreover, variations in the per capita offtake of rice in the modified rationing areas were much higher than variations in the per capita offtake in statutory rationing areas.

12.15 Entitlement of rice and wheat per adult per week increased from 1 kilogram and 1.65 kilogram in early 1970's to 3 kilograms and 2.25 kilograms respectively by early 1980's under statutory rationing. Most of the rice supplied was procured from within the state for statutory rationing areas, but in modified rationing areas, the supply was primarily procured by imports from outside the state.

12.16 The open market price of rice remained above the ration price in every year, but the gap between the open market price and the ration price varied from year to year. In general the gap was not substantial, but in some years it was more than 50 percent. The gap between open market prices of wheat and that of ration price of wheat was also small.

12.17 The quantity of rice as well as that of wheat and wheat products received by the state from the central poll varied substantially over the years from early 1970's to early 1980's. In general the average quantity received from the central pool accounted for about a fifth of the foodgrain availability in this state, the balance being the quantity available from production within the the State. The maximum

level of rice made available through local procurement mills was the most important method of procurement. Procurement prices of paddy and rice are generally made consistent with the prices fixed by the central government. The farm price of paddy was much higher than the procurement prices in most of the years.

12.18 Out of a population of 54.5 million in 1981, 27.2 million were covered under statutory and modified statutory rationing. One third of 45 million people outside the statutotry rationing area belonging to households with a cultivated area of more than 2.5 acres were considered self sufficient in food. Thus actual coverage of 17.8 million under modified rationing left roughly 12 million eligible population with no access to public distribution system.

12.19 During the period 1972/3 - 1981/2 on average, about 54 percent of cereals distributed through the public distribution system was allotted to areas under statutory rationing, which accounted for 17.3 percent of the population of the state in 1981. About 49 percent of total rice and 59 percent of total wheat were distributed in statutory rationing areas. The average quantity of cereals for the 10 years came to a daily per capita distribution of 243 grams - 107 grams of rice and 136 grams of wheat. Modified rationing areas accounted for 46 percent of cereals. About 40 percent of the population was excluded from statutory rationing areas. They accounted for 51 percent of the rice and 41 percent of the wheat distributed through the public distribution system.

12.20 The statutory rationing system generally benefits the urban population while a large proportion of rural population fall outside the modified rationing scheme. Yet it can be argued that improvement in food security for the poor has in fact resulted from the government activities. But the question remains about the efficiency of the system. The cost of procurement and that of running ration shops is very high, especially in those years when the food production of the state fall short of the long-run trend. The gap between the procurement and ration shop prices widen in these years and at the same time, the State government has to incur the cost of increased imports from outside.

12.C <u>Food Distribution System in Sri Lanka</u>:

12.21 Sri Lanka is a relatively small country with a population of around 15 million in 1980. Rice is the staple food, but the domestic production of rice is not adequate to meet the requirement. It is estimated that during late 1970s imported rice provided about one-fifth and imported wheat about a quarter of the cereal calories consumed. In fact, domestic production of rice provided slightly more than a half of these basic staple - food calories.

12.22 Sri Lanka has a tradition of following a social welfare oriented development programme from the pre-independent days. After independence in 1948, the social welfare oriented programmes were further strengthened, among which, food distribution is a major component. In fact it has introduced a major policy reform for distributing food from ration system to food coupon system in 1979.

12.23 The Ration System:- Rationing scheme and food subsidy in Sri Lanka was implemented to ensure equitable distribution of available supplies which was drastically reduced due to reduction in food imports during the Second World War. The ration system initiated after 1942, involved the distribution of rice at subsidized prices through an extensive network of cooperatives and an active government programme of price support and procurement of agricultural commodities, particularly rice, to supply the public distribution system. These two forms of direct government involvement - rice procurement and rice distribution - have continued as major government food policy to ensure adequate food supply to the country's rapidly growing population over the years until 1979. In fact the government has pursued a policy of maintaining rice price through the guaranteed Price Scheme, and encouraging production mainly through irrigation, land settlement, and the subsidization of inputs. This meant that a large portion of the food subsidy accounted for a producer subsidy.

12.24 Distribution of rice under the ration system through wholesale and retail is carried out by the cooperative network and private authorized distributors. Rice was distributed weekly to consumers who held ration books or token cards. In the late 1950's, four pounds of rice per person per week were issued under the ration at a heavily subsidized price. In late 1966, the government reduced the basic ration by 50 percent, but in order to relieve the pressure on low-income groups, the ration entitlement of two pounds of rice was issued free of charge. Additional amounts could be purchased at reduced prices. During the food crisis in 1973/4, the basic ration was further reduced, and the free ration was provided only to non-income tax payers. These changes in the income requirements meant that only about 50 percent of the population was eligible to receive the free ration.

12.25 Food Subsidy was only a part of the social welfare oriented development programme of Sri Lanka. The other components are free education and free health services. Free education was introduced in 1944 and broad-based health care even earlier. After Sri Lanka's independence in 1948 larger expenditures were allocated to these programmes increasing its coverage so that almost everyone had access to these welfare programmes. Its implications on such social indicators as life expectancy, mortality and literacy rates were impressive. Sri Lanka ranks in the middle of the World

Bank's list of low income countries in terms of per capita income. On a social welfare basis, it has literacy and health levels more common to countries with per capita GNP five to ten times as large[1]. Providing inexpensive fund to the consumers and at the same time giving producer subsidy to increase food production became increasingly expensive for the treasury. With limited investment funds, the costs of these food subsidies to an increasing population eventually contributed to economic stagnation. This has resulted in the old subsidised rationing system being replaced by a Food Stamp System.

Food Stamp System:

12.26 In September 1979 a food kerosene scheme was introduced. Households consisting of five or less members receiving an income of Rs. 300 or less per month were eligible to possess food stamps that could be exchanged for a basket of goods including rice, wheat flour, dried and condensed milk, and kerosene. The value of the food stamps was determined by the size and age composition of each family. Children below the age of 8 were given Rs. 25 worth of food stamps per month. Children over 8 and below 12 were given Rs. 20 and those over 12 were given Rs. 15 worth food stamps per month.

12.27 The food stamp system roughly covers the poorest 40 percent of the population. Food Stamps are issued and distributed every three months and they are valid only for one month with the consumers.

12.28 The reform had substantial impact in the budgetary cost. In 1979 the subsidies on account of the ration system amounted to 14% of total public expenditures or 6% of GNP which was halved in 1980 as a result of changing over to the food stamp system. It is estimated that the new scheme has increased by more than 30% the transfer per capita to the poorest when compared with the old system[2]. But the program has more limited impact on the children. Furthermore, since the food stamp were not indexed their real purchasing power decreased over time. Consequently there was evidence of some deterioration in nutrition in 1981[3]. Therefore, it is not clear whether the change in food distribution system may been more cost effective in terms of reaching the needy. Furthermore, how the resources released by decreased food subsidy payments are utilised will have significant implications for reduction in poverty in general to compensate for the wider coverage of the earlier system.

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1 See World Bank (1981). World Development Report, Washington D.C.

2 See Selowky M. (1980), Food Prices and the Indexing of the Food Stamp Program in Sri Lanka: An Evaluation of the Trade-Offs, World Bank.

3 See Survey Report of the Food Stamp Scheme, Ministry of Plan Implementation, Colombo 1981, as reported in Mateus, A:

12.D Review of Experiences:

12.29 In this section we shall make an attempt to draw lessons for Bangladesh from critically comparing the pros and cons of alternative food distribution schemes in different countries described earlier. The types of experiences reviewed range from untargeted food price stabilization programme in Indonesia to geographically targeted ration shop or fair price shop scheme in West Bengal in India and the recent food coupon system targeted by income as well as the earlier untargeted subsidized food ration system in Sri Lanka. In other words, food distribution experiences of countries with different socio-economic cum political institutions, which in their turn, differ in varying degrees with that of Bangladesh are reviewed here. Therefore, detailed comparable country analyses are required for critically evaluating these alternative schemes for drawing lessons for Bangladesh. Unfortunately the existing country studies on food distribution systems differ, among other things, in scope, focus and coverage. Therefore, comparative evaluation of the alternative food systems in terms of such broad heads as pricing, management, marketing etc. is not possible. Yet some broad conclusions of general validity may emerge from a critical review of existing country studies which can be useful for designing a public food distribution system for Bangladesh.

12.30 Indonesia's food distribution policy of adequate supply of food, at stable prices for the country's large and growing population require both holding and maintenance of an adequate buffer stock which in its turn have both domestic and foreign exchange cost implications as well as having impact on domestic food production. This untargeted system benefits everyone in the country and the operational cost of such a system is also quite large requiring foreign exchange to import food during the bad crop years, building enough storage capacity and procurement cost from domestic production at a minimum price set before the harvest and distributing it at a subsidised price for maintaining price stability. Such untargeted schemes are not only the most costly for the state budget[1] but usually increase the food consumption of the well-nourished. In Egypt,it has been estimated[2] that the food subsidy scheme imposes an implicit tax of about 20% on producers while subsidized foods constitute 22% of the import bill. Therefore, it is clear that such untargeted schemes are costly in terms of foreign exchange requirements, disincentive to the producers, leakage through benefiting the well-nourished and above all very costly to the budget.

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1 See Davies, J.M. (1979), The Fiscal Role of Food Subsidy, IMF Staff Papers.

2 See IBRD, World Development Report, 1982.

12.31 Indonesia has been able to successfully carry out an untargeted costly food distribution policy because it is not only by far the richest country among the ones discussed here but also because it is much more favourably placed in terms of foreign exchange constraint compared to these countries. This becomes obvious when we chronicle the experience of Sri Lanka, a country comparable in terms of per capita income and foreign exchange earning capability, with that of Bangladesh. It also started off with an untargeted ration scheme similar to that of Indonesia as a part of its overall welfare oriented development programme soon after its independence in 1949. But the programme foundred on the rock of resource constraint and had to be substituted by food coupon system targeted by income in 1979. The budgetary costs of the food ration subsidies increased from about 8% of total government expenditure in 1966 to 17% in 1975 and in 1979 they were still about 14% of total government expenditures[1]. As a percentage of GNP they increased from 2% in 1967 to about 6% in 1979. The new scheme of the food coupon system targeted by income resulted in a decrease to one half of budgetary cost, in 1980 the total subsidies amounted to about 7% of total public expenditures, and 2% of GNP. The new scheme increased by more than 30% the transfer per capita to the poorest when compared with the old system[2]. The Targeting of the system increased the benefit cost ratio from 4.4 in the ration system to 42.8 in the food stamp programme[3]. Hence it is clear that a targeted food distribution scheme is more appropriate for a resource poor developing country such as Bangladesh.

12.32 Designing a targeted system that can reach all the needy while economising on cost compared to untargeted system is again a very complicated exercise. For example, in the Sri Lanka case it was found that the food stamp system had limited impact on children while the untargeted scheme had a more egalitarian distribution of the basic staple.

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1 See Matens, A. (1983), Targeting Food Subsidies for the Needy: The use of cost-Benefit Analysis in Institutional Degin, World Bank Staff Working Paper No.617.

2 See Selowsky, M (1980), Food Prices and the Indexing of the Food stamp programme in Sri Lanka; An Evaluation of the Trade-offs, World Bank.

3 See Garen S. and I Chandra Sakhar (1979), The Impact of Public Food Distribution an Food Consumption and Welfare in Sri Lanka, International Food Policy Research Institute.

12.33 Choice of the optimal basket of goods and the prices to be charged for each of them by income group is an important aspect of designing a good targeted food distribution system. The demand for a subsidized commodity is primarily determined by the quality of the product, the price differential with the open market, the level and distribution of incomes and income elasticities of demand for the product[1]. Therefore, the greatest impact on consumption of the poor can be achieved with the lowest cost if the commodity accounts for a large share of the budget of the household, has a high income elasticity at low income levels, and has low or negative elasticities among middle and upper income groups. This has been empirically demonstrated in the case of subsidised atta (wheat flour) distribution in Pakistan[2]. Similarly wheat, a commodity that has these characteristics in rural Bangladesh[3] may be considered to be the ideal commodity to be used for targeting in the case of Bangladesh.

12.34 A careful analysis[4] of alternative schemes for targeting food subsidies based on benefit-cost calculations suggest that the most efficient programmes, most targeted and less costly are the special intervention programmes designed for Malnourished and most vulnerable group, children and pregnant-lactant mothers. The remaining funds should be targeted to other most malnourished groups targeted by region (Slums, poor rural areas) and using coupon system.

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1 See Kumar, Subh K. (1979), Impact of subsidized Rice on Food consumption and Nutrition in Kerala, Research Report 5, International Food Policy Research Institute, Washington.

2 See Ragers, B.L. and Levinson, F.S. (1976), "Subsidized Food Consumption Systems in Low-Income Countries. The Pakistan Experience" Discussion Paper No.6. International Nutritional Planning Programme, M.I.Y.

3 See Rahman, A., and Omar Haider Chowdhury, (1982), "Projections of Consumer Demand in Bangladesh 1984/85 and 1989/90" Research Report New Series No. 30, Bangladesh Institute of Development Studies.

4. See Mateus, A (1983) Targeting Food Subsidies for the Needy: The use of Cost-Benefit Analysis and Institutional Design, World Bank Staff Working Papers No. 617, PP.35

12.35 Vulnerable group feeding (VGF) programme in Bangladesh falls under the first category of most targeted intervention programmes. Hence, its scope and coverage may be extended. The food stamp system of Sri Lanka, on the other hand, involve a lot of paper work and administrative load. It involves issuing and distributing food stamps every three months. The food commissioner is responsible for the printing and issuing of the food stamps that are distributed through the local office. The whole chain starting from issuing of food stamps to reaching it to the consumer and getting reimbursements on them involve consumers, retail distributors, wholesale dealers and the Treasury. Sri Lanka with a long tradition of government intervention in almost all aspects of economic activity and as a consequence having large and experienced bureaucracy, in contrast to other developing countries, have been able to run this elaborate system quite effectively. But for Bangladesh the experience of its neighbour West Bengal, similar in socio-cultural and economic background, may be more fruitful.

12.36 A net work of ration shops or fair price shops distribute government procured and imported food at below open market prices in such big cities as Calcutta and Bombay in India. These shops are located geographically near slums and poor urban areas. But the cost of procurement and fair price shop programme become quite high in those years when internal food supplies fall short of the long run trend. The gap between procurement and fair price shop prices widense in those years and at the same time the government has to bear the cost of increased import. Targeting by commodity such as inferior quality wheat, poor man's staple, as discussed earlier can reduce the cost of the programme and at the same time reach the most needy. Hence, fair price shops, targeted by region and commodity may be given serious consideration while designing food distribution system for Bangladesh.

CHAPTER 13

RECOMMENDATIONS FOR RESTRUCTURING OF PFDS

One: <u>It is recommended that SR be abolished altogether</u>

<u>Implilcations</u>: In 1983/4, where we presented the trend values of SR offtake in various years, 13% of the PFDS was offtaken. We estimate on the basis of our aggregative model estimations in Ch. 3 that a decline in the offtake to the tune of 13% will increase market price of rice by 3.5% and reduce per capita consumption of foodgrain by 1.5%. Note, however, that our model being an aggregative one, the above proportionate response of per capita consumption likely <u>overstates</u> the real effect of the proposed cut on average consumption of SR population. This is so because we have shown that in 1984/5 daily caloric intake per capita in two SR areas - a reliable indicator of average food intake - is significantly above the corresponding representative urban average for 1973/4 and 1976/7 and, perhaps in 1984/5 as well. It will be maintained that the orders of the aggregative price and consumption changes due to the recommendation, though apparently unfavourable are, not sufficiently large to negate its validity. Especially so, because the decline in average consumption in rural areas will be higher (due to the market price increase) than is shown by our aggregative model, and because we believe it is both possible and desirable to deal with this (rural) consequences via a separate recommendation.

<u>Justification</u>: SR is geared towards the subsidisation of the incomes of nonpoor households (ch. 8; Abdullah, 1985). We have argued that, on the consumption side, alleviation of poverty in general, and of the food insecurity of the particularly vulnerable, are the only economic rationale of food subsidies under the present circumstances for a resource-constrained Bangladesh.

Two <u>It is recommended that the rationing quota in the remaining three priority channels, viz. EP, OP, and LE be halved in a phased manner, say, during the period of Third Five Year Plan of the country.</u>

<u>Implications</u>: In 1983/ where we worked in terms of trend values, combined of in EP, OP and LE stood at 563 thousand tons. This recommendation would permit the annual redirection of 56 thousand tons of grain into channels which, according to our perspective, deserve an expanded scope. The possible availability of this balance for re-direction implies that about 20% of decline in the offtake sought in <u>recommendation one</u> will be thus neutralised. No additional price and consumption effects will, according to our aggregative model, be relevant due to this recommendation, as a redirection only is involved.

Justification: EP, OP and LE consumers are on average presumably as well-off as many SR households, although t are most probably distinctly better off than the gene rural population. Besides, the pragmatic-cum-politi considerations are at their most persuasive when one de with these three channels. And yet it is clear that, o the SR is abolished, consistency in policy-making requi that the benefits of these rationing channels be pared do too. Besides consistency, the population in SR areas likely to raise far more noise if they are singled out objectives of the constriction of subsidy benefits. Hence is necessary that restructuring of the priority ration should embrace a phased-out sizing down of the benefits f these three priority channels.

Three: It is recommended that the ratio between issue price market price in four channels, namely EP, OP, LE and MR maintained where they are in 1985/6.

Implication: This recommendation implies that we are favour of restructuring the priority rationing direct through operating on the quota, and not indirectly throu operating on the ration-to-market prices, as well. reason for doing so is that we believe that implementi recommendation two will itself cause major politic difficulties, which will be amplified if furth constriction of benefits via price route was on the card.

Four: It is recommended that wheat be substituted for rice in t remaining traditional rationing channels where both rice a wheat is presently distributed (i.e., EP, OP and MR) in phased manner, so that is distributed in the last year the Third Five Year Plan.

Implication: The results of our aggregate price mod (Chapter - 3) bring out the implication of th recommendation rather neatly. It has been observed th raising the share of wheat from the current level of 65% 80% results in an increase of market price of rice by on 2.2% in a normal crop year. Also, if rice is complete substituted by wheat on ration distribution, this would le to a price increase by 4.5%. The impact on per capi consumption is very marginal. This, however, assumes th total ration distribution remains unchanged at the level 2.33 million tons. If the recommendation of raising whe share is combined with the earlier recommendation to aboli SR altogether, the impact on market price and per capi consumption will be considerably different. The combin recommendations of abolishing SR and complete substituti of rice by wheat, if implemented as a one-shot procedu would result in a price increase by about 8.0% and p capita decline on foodgrain consumption by 1.8%. Not however, that we have advocated a staged approach on t second recommendation in the preceding sentence.

Justification: The main justification, of course, is the considerably reduced amount of budgetary subsidy on foodgrains that such recommendations would entail. Since unit subsidy on wheat is smaller as compared to rice, as increase in the share of wheat in total distribution will result in lowering the amount of foodgrain subsidy even if total offtake remains unchanged. If increasing the wheat share in combined with a 13% cut in ration offtake as recommended earlier through abolition of SR, the resulting budgetary subsidy will be reduced even more. Increasing the share of wheat in ration distribution is also consistent with the recent shift in consumer's preference in favour of wheat as reflected in the higher MRS value of ration wheat for market rice (.75 as compared to .58 in Raisuddin study) postulated in this study.

Five: It is recommended that wheat, not distributed in EP, OP and LE due to recommendation two, be redirected in FFWP and MR on a 50:50 ratio:

Implications: Revised price and consumption effects of the net decrease in the overall off-take incorporating the changes proposed in recommendations one and two, already presented, are of relevance when pondering these implications. Implementing this will have to wait upon implementation of related recommendations made below, regarding re-structuring MR modalities.

Justification: An expansion in the MR and FFWP will be necessry to make use of "saved" foodgrains. From poverty alleviation and rural developmental perspectives, the cases for MR and FFWP cannot be over-emphasised. We shall have a further recommendation to make about restructuring MR itself, for we believe that the existing despensation in MR leaves something to be desired.

Six: It is recommended that the allocational criterion of the MR be revised to include the following. The entire MR wheat allocation will be allotted to approved millers in pourashavas and in the unions who in turn would market the atta. Three sets of eligible MR beneficiaries are to be recognised, in order of their respective priority to be duly reflected in their "notional" entitlement per card per unit of time; namely (i) MR card holders in famine-prone upazillas (ii) MR cardholders in non-famine-prone upazillas, and (iii) MR cardholders in pourashavas. The allocation of MR foodgrain, both wheat and rice, among these locational entities should be governed by the principle that an adult card in (i) should have the weight in terms of entitlement 1.25 times that of an adult card in (ii) and that a card in

(iii) should have the weight of 0.67 that of (ii). The allocation of MR among districts should similarly be derived from a country-wide compilation of MR cards at issue in (i) famine-prone and non-famine-prone upazillas, and (ii) in pourashavas, similar weights being applied. Rice in MR may be distributed among cardholders through the medium of MR dealers, so long as rice is distributed.

Implications: This recommendation implies that MR households in famine prone upazillas deserrve greater, and those in the pourashavas deserve less, priority than MR households in an average Bangladesh upazilla. Since number of cards at issue by upazilla and pourashavas within districts are readily available, the revised allocational quota by district and by upazilla can be drawn up without any major difficulty. Another implication is that this amounts to a restoration of the Government's 1983 (May) decision to make approved millers MR the sole source of wheat derived atta.

Justification: The instrument of MR has to be more creatively used in dealing with a gradation, confirmed by a succession of researches, of food security within rural Bangladesh. The percentage weights noted are not adduced as hardandfast categories, but represent our own value judgement about the relative distress among the three regional types.

Seven: We recommend that field monitoring capabilities at the disposal of the PIOs at the upazilla be increased so as to prevent abuse and enhance effective use of the expanded scale of the FFWP. The availability of such monitoring input on the side of the implementing agencies involved will likely improve further the effectiveness of the WFP monitoring outfit.

Eight: It is recommended that in order to contain the speculative activities in rice market leading to excessive hoarding, an affective OMS program should be undertaken during the lean season.

Implications

The results of our traders' survey (chapter 5) indicate that more than 90% of traders in both the wholesale and retail group consider open market sale of foodgrain by the government as an important factor affecting their stock decisions. Most of the traders are aware of such a program and also believe that it has the potential of arresting the price hike during the lean period. However, the survey also revealed that although OMS operation influences the amount of rice the traders decide to stock, the impact is quantitatively small - only 11% for wholesalers and 18% for retailers on the sample. This underscores the need to back OMS market intervantion by the willingness to sell large quantities of grains if it is to be effective on dampening

speculations in private grain trade and on containing price increases. The experience for 1982/83 also demonstrates that OMS operation can be effective particularly when adequate quantities of grain (particularly rice) are released on the market. Ravallion and Van der Walle study (1985) serves as a reminder that Government's promises as opposed to actions themselves will have little impact in lowering traders' price expectations.

Justifications

An effective OMS program through its dampening effect on private grain speculations will have a favourable impact on seasonal supply and price stabilization. This would contribute significantly towards protecting consumers' welfare in general and particularly those disadvantaged groups who are very vulnerable to meet price increas-- has also been observed in the survey that none of the other rationing variables has any impact on traders' stock decisions. This may minimise possible reservations against doing away with the SR in recommendation one.

Nine: It is recommended that OMS Program be strengthened by making available larger amount of foodgrains with greater share of rice diverted from SR and other preferred categories (EP, OP and MR) so that it can serve as an effective tool for price stabilization during the lean season period.

Implications/Justifications

Experience of 1982/83 has demonstrated that OMS can serve as an effective tool for supply and price stabilization if adequate quantity of food grains are released in time. Montgomery study (1983) has shown how OMS offtake during September November '83 period largely succeeded in moderating seasonal fluctuations in market prices by targetting the foodgrains to meet the shortfall anticipated in aman harvest in various subdivisions. Experience of 1983/84 and 1984/85, on the other hand, has revealed that such a potential has not been properly realised primarily because of limited quantity of foodgrains made available for OMS operations in these years, particularly during the lean season. An additional reason for relatively modest impact of OMS on foodgrain prices, particularly in 1984/85 was relatively small amount of rice sold under OMS. The main constraint on the ability to undertake sizeable OMS operations to stabilize market prices is the government's continued emphasis on traditional distribution channels in the existing structure of PFDS. However, if our earlier recommendations regarding restructuring of PFDS (particularly recommendation one and four) - that of abolishing SR altogether and reducing the share of rice in

traditional channels (EP, OP and MR) are implemented, then our preliminary calculations show that an additional 2.40 lakh tons of rice (about .90 lakh tons from SR and about 1.50 lakh tons from EP, OP and MR) may be diverted from other channels from distribution under OMS[1]. This would raise the share of OMS in total PFDS offtake from the current level of 8% to about 22%. Such enlarged volume of distribution with greater quantities of rice should enable the government to exert a far greater stabilizing influence on foodgrain prices throughout the year than is currently feasible. The enhanced ability of the government to stabilize market prices of foodgrains would have beneficial impact on a much wider segment of the populaiton, even those consumers benefitted by the traditional channels since a significant proportion of their foodgrains requirements also are met from purchase in the open market.

Ten: The suggested principle (as enunciated on Chapter 6) may be accepted as the basis of setting ration prices over time.

Implications/Justifications

The suggested principle is based on the objective of protecting consumers' welfare (in the sense of maintaining foodgrain consumption at the base on some desired level) in the face of changes in consumers' income and market price of rice while ensuring that the fiscal burden due to budgetary subsidy does not exceed a tolerable limit. An iterative procedure was suggested in Chapter 6 to arrive at a set of ration prices consistent with this objective. A trade-off was clearly identified while demonstrating the workability of this principle. In order to maintian base level consumption of foodgrain in the face of increased per capita expenditure and market price of rice, the ration prices may need to be set at such a level that the resulting budgetary subsidy may be considered unacceptable, given the procurement costs of foodgrain and volume of PFDS offtake. To keep the fiscal burden within an acceptable limit, ration prices may need to be revised upward which may then involve some sacrifice in foodgrain consumption. It was also observed that given the historical trend on consumers' income market prices, and procurement costs of foodgrains, the adoption of such principle requires that some burden of adjustment would be borne by the volume of PFDS offtake. In particular, PFDS offtake may need to be reduced by targetting itself to a smaller but more needy disadvantaged groups in the society which is consistent with th analytical and philosophical perspective of this work.

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1 Only an additional 2.40 lakn tons of rice are released because 1.70 lakh tons of wheat made available through abolition of SR would have to be redirected to EP, Op and MR channels to compensate for the diversion of rice from these channels due to lowering of rice share from 35% to 20%.

Eleven: It is recommended that in order to moderate price during a period of short market supply, no new channel of PFDS be created. Instead, timely triggering of the OMS as a policy decision, followed up with appropriate degrees of grain releases in OMS will, we believe, contribute to moderate what may otherwise be excessive increases in market prices. In addition, it is recommended that the government has at fiscal year-end total stock of about 1.00 million tons.

Implications:

This implies that we are recommending a continuation of the OMS in part on the basis of the results of our traders' survey, as also of what work has been done previously on the price stabilisation ability of OMS during the lean period. In addition, the second recommendation implies the necessity of building a large food reserve, including minimum operational stocks, during the monsoon which may be available as a buffer if, due to some disaster, foodgrain situation ought to significantly worsen. Especially this recommendation does have major implication for what GOB and food aid donors have to do. Given that public procurement of boro rice and wheat has been no more than 15% or so of this desired quantity in more recent years, it stands to reason that the pre-monsoon procurement programme of the government has to be supplemented by action by food donors to Bangladesh.

Justification:

The estimate of the desirable year-end stock of 1.25 million ton is, according to the World Bank, based on minimum stocks of about 500000 - 550000 tons. Our estimate of minimum operational stock is virtually the same as that recommended in a recent World Bank publication, but our estimate of minimum emergency stock is lower than in the Bank document. The latter is so because we have recommended an abolition of SR, and the reorientation of the PFDS to redress the privations of the poorest - something that we believe will increase the capacity of the poor to deal with calamities and will thus lessen somewhat the pressure on public stock. Besides, the figure of 1.25m. tons of year-end stocks suggested by World Bank will represent a massive jump from the levels of end-year stock of the last couple of years. June stocks have, despite the 1 million-plus stocks of 1984/5, been on average about 0.75 million metric tons only. The order of increase suggested by the World Bank would appear to be a little too ambitious, and would stretch the limits of financeability. In contrast, a target of 1 million metric tons as the year-end stock of a normal year appears much more within feasible limits, is likely to hold in check traders' hoarding proclivities if the intents of the Govt. about the building up of such an emergency stocks were publicly and frequently related to the strengthening of the OMS, and thus would likely lessen somewhat the bullish elements of a sudden increase in prices.

Twelve: It is recommended that the VGFP be operated at th existing level until there were to occur a demonstrate improvement in the capability of its recipients to use th food assistance as an effective catalyst in their reasonabl achievement of economic self-reliance during the tenure o the feeding program.

Thirteen: It is recommended that procurement programme b continued but efforts be made to ensure that small an marginal farmers might benefit from teh incentive prices t a greater degree than has been thought to be the case in th past.

Fourteen: It is recommended that Fair Price Shops (FPS) be opene on pilot basis within particularly poor neighbourhoods within what are now the six SR areas. The idea is that wher subsidised foodgrains are distributed form rationing outlets located in poor neighbourhoods, the poor will primarily participate in the program. Besides locational targetting, further targetting by commodity may also be feasible. It is further recommended that the FPS be operated by individuals who are themselves residents of the poor neighbourhoods. Foodgrains to be distributed will so be priced as to allow two-thirds the unit subsidy provided via MR.

Fifteen: It is recommended that the government should seek to quicken the pace of farm technology modernisation at the same time as to redirect a growing part of its benefits in favour of the landless, functionally landless, marginal - and small - farm households via the mechanisms of the labour, land and capital markets. PFDS can at best make a short run contribution to the problem of rural poverty, but the real challenge in the countryside of Bangladesh is to initiate and sustain an efficient, secure and egalitarian growth involving the agricultural sector in general, and its food sector in particular. Our suggested specific recommendations about PFDS are made in the hope that their possible implementation would promote the feasibilityof this final, and quite general, recommendation which, we are all too aware, does not directly belong to the jurisdiction of our client, the Food Ministry of the Government of Bangladesh.

This appendix presents a list of categories of ration beneficiaries which were within the jurisdiction of MR until about 1976 but which were re-located to other priorities(OP).They are here categorised into two broad groups, one based on their employment status and the other on largely the basis that their inclusion into OP is due to their numerousness.

(a) Employment Status:

1. Govt. employees outside SR areas /retired govt. employees
2. Railway employees
3. WAPDA "
4. NCB "
5. BIWTA "
6. Primary school teacher
7. Secondary school teacher, clerical & menial staff of schools.
8. College employees
9. Madrasa teachers / employees
10. Board of Secondary education employees
11. Retired Primary school teacher / employees
12. Fire Service people
13. BADC employees.
14. Family Planning/maleria eradication/rural development/ Cholera hospital/ atomic energy centre Cox's Bazar/ & Mymensingh

15. BCSIR employees at Rajshahi

16. S.M. Firm, Modhupur.

17. BIWTC

18. Chowkider/Dafadars of UP

19. Agricultural Complex, Joydebpur

20. BIWTA workshop, Barisal

21. Secretary of UPs

22. Port workers at Chittagong and Chalna

(b) Other categories:

1. Inmates of orphanages

2. Students of hostels of educational institutions

3. Inmates of Correction Centre, Tongi

Table A2.1

Aggregate & per capita Availability of Rice and Wheat, Bangladesh, 1960/1-1969/70

(Figures are 000 long tons)

Year	Rice: Net production	Rice: Internal procurement	Rice: Offtake	Rice: Availability	Wheat: Net production	Wheat: Internal procurement	Wheat: Offtake	Wheat: Availability	Population Million	Availability/person/capita (lb): Rice	Wheat	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1960/1	8567	24	310	8853	29	-	169	198	55.6	.997	.021	.998
1961/2	8518	26	350	8842	35	-	220	255	57.3	.947	.027	.974
1962/3	7857	10	599	8446	40	-	649	689	59.1	.877	.072	.949
1963/4	9411	4	239	9646	31	-	419	450	60.9	.972	.045	1.017
1964/5	9303	13	234	9524	28	-	475	503	62.8	.931	.049	.980
1965/6	9302	95	419	9626	32	-	545	577	64.6	.914	.055	.969
1966/7	3482	8	499	8973	48	-	566	614	66.5	.828	.057	.885
1967/8	9896	22	232	10106	52	-	416	468	68.4	.907	.042	.949
1968/9	10048	9	256	10295	83	-	774	857	70.4	.897	.075	.972
1969/70	10544	20	419	10943	93	-	905	998	72.4	.928	.085	1.013

Note : Net production - internal procurement + offtake = availability. This definition applies to the next table, too.

Source: Net production data from Tolley et al (1981), procurement & offtake data are form Berlage (1972), who took those numbers from sources within the Department of Food, Government of Bangladesh.

Table A2.2

Aggregate & per capita Availability of Rice & Wheat, Bangladesh 1972/3-1984/5

(Figures, unless indicated are in 000 long tons)

Year	Rice				Wheat				Population	Availability/person/day (lb)		
	Net production	Internal procurement	Offtake	Availability	Net production	Internal procurement	Offtake	Availability	Million	Rice	Wheat	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1972/3	8937	10	422	9349	81	-	2196	2274	74.3	.772	.188	.960
1973/4	10549	7	123	10665	98	-	1604	1702	76.4	.857	.137	.994
1974/5	9997	139	181	10039	104	-	1578	1682	78.0	.790	.132	.922
1975/6	11305	413	509	11401	194	7	1161	1348	79.9	.876	.104	.980
1976/7	10410	313	785	10882	230	3	672	899	81.7	.817	.068	.885
1977/8	11487	541	596	11542	309	11	1249	1547	83.7	.846	.113	.959
1978/9	11381	317	562	11626	437	50	1233	1620	85.6	.834	.116	.950
1979/80	11285	226	691	11750	729	124	1710	2315	87.7	.822	.162	.984
1980/1	12296	841	508	11963	968	176	991	1783	89.9	.817	.122	.939
1981/2	12074	287	759	12546	857	13	1277	2121	91.6	.840	.142	.982
1982/3	12592	168	596	13020	970	26	1418	2362	93.6	.854	.155	1.009
1983/4	12843	145	495	13193	1073	121	1523	2475	95.7	.846	.159	1.005
1984/5	13062	133	406	13335	1318	215	2139	3242	98.2	.833	.203	1.036

Source Net production & procurement data are from (BBS,1985), except for figure for 1982/3 through 1984/5, which are from PPMS Food Situation Report, June 1985.

Table - A3.1

Data Used in the Aggregate Price Model

Year	Population (Million)	Domestic Production (Million ton)	Import (M.T)	PFDS Offtake Rice (M.T)	PFDS Offtake Wheat (M.T)	Internal Procurement (Million Tk.)	Disposable Income (Million Tk)	Food Aid Utilized (Million US $)
1972/73	74.3	10.02	2.38	.42	2.20	.01	44096	183
1973/74	76.4	11.83	1.67	.12	1.61	.07	70904	229
1974/75	78.0	11.22	2.29	.18	1.58	.20	125185	382
1975/76	79.9	12.77	1.46	.50	1.17	.42	106346	314
1976/77	81.7	11.82	.80	.78	.69	.31	104502	122
1977/78	83.7	13.11	1.64	.59	1.26	.55	146091	178
1978/79	85.6	13.13	1.16	.56	1.24	.35	172433	179
1979/80	87.7	13.34	2.73	.70	1.70	.35	200321	375
1980/81	89.3	14.70	1.06	.50	1.02	1.02	238142	195
1981/82	91.6	14.30	1.26	.75	1.29	.30	267588	231
1982/83	93.6	15.07	1.84	.50	1.44	.19	295361	255
1983/84	95.7	15.50	2.06	.51	1.54	.26	324527	240

Source : Bangladesh Bureau of Statistics and Ministry of Food, Govt. of Bangladesh.

Notes: (1) Figures for food aid disbursed in million US dollar were converted into million taka using the official exchange rates prevailing during the period.

Table -A3.2

Data Used in the Aggregate Price Model

Year	Market Price of Rice (Tk./md.)	Ration Price of Rice (Tk./md.)	Ration Price of Wheat (Tk./md.)	Procurement Price of Rice (Tk./md.)	Weighted Average of Ration Price (Tk./md.)	General Wholesale Price Index (1969/70=100)	GNP Deflator (1972/73=100)
1972/73:	78.0	30.0	20.8	54.0	22.3	179.0	100.0
1973/74:	106.0	41.7	31.7	73.0	32.4	250.0	141.0
1974/75:	216.0	60.0	50.0	120.0	51.0	399.0	241.0
1975/76:	126.0	74.2	59.2	120.0	63.7	359.0	183.0
1976/77:	113.0	90.0	70.0	120.0	80.6	362.0	177.0
1977/78:	145.0	90.8	70.8	134.0	77.2	408.0	231.0
1978/79:	157.0	101.7	80.8	136.0	87.3	446.0	261.0
1979/80:	211.0	120.0	90.0	165.0	98.7	502.0	295.0
1980/81:	178.0	137.1	104.8	170.0	115.5	540.0	326.0
1981/82:	226.0	166.7	120.7	191.0	137.7	609.0	367.0
1982/83:	250.0	201.7	137.7	210.0	151.3	643.0	385.0
1983/84:	278.0	225.0	150.0	225.0	168.7	747.0	449.0

Source: Bangladesh Bureau of Statistics and Ministry of Food, Govt. of Bangladesh.

Table A4.1

Monthly Wholesale Coarse Rice Prices as Percentages of Centred 12-month Moving Average of prices, 1972/3-1984/5.

	1972/3	1973/4	1974/5	1975/6	1976/7	1977/8	1978/9	1979/80	1980/1	1981/2	1982/3	1983/4	1984/5
July		99.1	83.2	113.0	39.7	112.9	95.2	119.7	95.3	93.4	91.2	96.2	103.5
August		95.3	95.5	97.5	99.4	105.4	94.0	113.2	93.6	88.3	92.9	94.2	100.4
September		95.7	109.8	100.9	99.8	105.9	100.4	100.4	94.9	89.1	107.9	102.7	105.5
October		96.8	129.0	92.9	102.0	104.9	98.6	99.9	95.6	97.0	111.1	102.6	102.3
November		88.2	104.3	79.4	97.3	92.7	94.6	94.6	94.4	96.0	99.1	93.6	97.6
December	83.9	81.4	88.1	85.0	86.7	90.6	86.8	90.6	92.5	93.0	91.1	94.5	100.1
January	89.8	83.6	98.8	96.8	86.0	97.5	86.6	99.2	95.3	97.5	98.9	99.2	103.1
February	95.7	86.6	118.6	100.6	92.5	98.2	85.9	103.0	100.3	112.6	99.1	96.9	103.5
March	103.3	93.4	125.0	99.3	95.8	105.4	90.7	105.8	104.2	115.5	102.9	101.1	106.4
April	112.9	96.5	118.6	97.6	102.9	108.9	97.4	111.8	108.5	121.3	103.2	102.2	107.5
May	110.1	88.3	106.4	98.2	100.5	101.5	98.7	106.1	100.7	96.3	97.2	99.4	96.1
June	103.1	86.2	105.6	95.5	106.7	96.5	114.2	100.2	93.7	91.0	97.0	99.0	90.4

Source : Data compiled from the Directorate of Agricultural Marketing.

Table A4.2

Ratio between Wholesale Wheat Prices to 12-month Moving Average, 1974/5 - 1984/5

	1973/4	1974/5	1975/6	1976/7	1977/8	1978/9	1979/80	1980/1	1981/2	1982/3	1983/4	1984/5
July		81.7	129.2	103.0	123.0	96.3	145.8	96.2	93.7	96.1	94.7	103.3
August		99.3	107.3	106.1	106.1	96.9	126.9	96.3	92.4	101.0	99.4	97.3
September		123.6	89.0	105.1	92.8	107.4	112.5	101.3	95.5	117.3	109.6	111.2
October		154.4	82.0	102.2	105.9	110.3	103.2	101.7	103.8	105.9	109.7	110.9
November		91.9	71.4	87.6	100.5	108.3	86.1	101.2	92.7	98.1	100.8	106.3
December		67.6	72.5	91.7	87.7	95.5	85.3	99.5	99.9	97.9	100.2	104.1
January		99.9	94.8	91.5	104.2	88.6	98.4	103.4	102.7	102.7	111.6	106.8
February		111.3	108.5	88.9	124.3	86.8	112.1	106.7	100.1	105.4	110.4	104.6
March		115.2	90.0	89.4	100.1	79.5	102.6	95.4	105.3	93.0	89.3	90.6
April		117.4	87.9	93.3	95.0	78.3	98.9	94.6	101.3	86.9	88.4	91.5
May		113.9	96.5	104.2	94.6	84.6	100.1	96.5	99.9	93.9	88.3	87.2
June	91.1	113.8	96.9	116.5	96.9	104.7	97.5	94.5	93.2	92.9	89.0	85.9

Source : Directorate of Agricultural Marketing.

Table A4.3

Geographical Concentration of Rice/Paddy Procurement Activity, Bangladesh, 1979 - 1985

(%)

Sl. No.	Name of District	1979/80 - 1981/2	1982/3 - 1984/5
(1)	(2)	(3)	(4)
1.	Dhaka	4.0	1.5
2.	Tangail	1.5	1.2
3.	Mymensingh	8.5	7.2
4.	Jamalpur	3.2	1.5
5.	Faridpur	.2	.2
6.	Rajshahi	24.2	9.1
7.	Pabna	1.9	2.7
8.	Bogra	4.1	13.4
9.	Rangpur	6.9	12.7
10.	Dinajpur	20.4	38.3
11.	Khulna	1.8	.6
12.	Jessore	.5	.1
13.	Kushtia	.5	.08
14.	Barisal	1.6	1.1
15.	Patuakhali	4.7	2.1
16.	Chittagong	1.9	.5
17.	Hill. Tract	1.7	.1
18.	Noakhali	2.0	1.3
19.	Comilla	2.6	1.4
20.	Sylhet	7.7	4.2
21.	Bandarban	.006	.1

Source : Food Division data on district-wise procurement

Table A4.4

Ratio of Trend Growers' Prices to Procurement Prices, 1976/7-1984/5

(%)

	1976/7	1976/7	1976/7	1976/7	1976/7	1976/7	1976/7	1976/7	1976/7
July		94.45	94.56	116.0	88.88	92.78	111.0	107.0	117.0
Aug.		95.53	95.57	116.0	86.93	96.93	110.0	107.0	116.0
Sept.		96.73	97.76	115.0	86.47	102	107.0	106.0	114.0
Oct.		97.82	99.09	113.0	83.78	107	106	107.0	113.0
Nov.		97.68	101.0	111.0	83.99	106	108	107.0	111.0
Dec.	80.92	95.51	106	107.0	84.18	105	109	108.0	109.0
Jan.	83.32	95.40	108	104.0	85.66	105	109	109.0	
Feb.	85.83	95.22	110	100.0	85.92	107	109	110.0	
Mar.	88.14	94.25	113	94.02	85.62	110	108	111.0	
Apr.	90.57	94.02	114	94.55	87.43	111	107	113.0	
May.	91.67	93.14	115	92.24	90.17	110	107	115.0	
June	92.98	93.85	115	90.95	91.03	110	107	116.0	
July-Sept		95.57	95.96	115.67	87.43	97.24	109.33	106.67	115.67
Oct.-Dec.		97.04	102.03	110.33	83.98	106.0	107.67	107.67	111.0
Jan.-Mar.	85.76	94.96	110.33	99.34	85.73	107.33	108.67	110.0	
Apr.-June	91.74	93.67	114.67	92.58	89.54	110.33	107.0	114.67	
Annual	88.75	95.31	105.75	104.48	86.67	105.23	108.16	109.75	113.34

Note: Each figure is the percentage of the 12 month moving average to monthly growers' prices of the corresponding moveing average of monthly procurement price.

Source: BBS, Monthly Statistical Bulletin, various issues for growers' price; Food Division for the procurement prices.

APPENDIX - 4A

Estimation of Aman 1982 Anticipated Shortfalls by using Elasticities
(prices in Taka/Maund)

	Shortfall A Long Tons	Shortfall B Long Tons	Expected Price A Oct.7	Expected Price B Oct.7	Actual Price Oct.7	Surplus (+)/ Deficit (-) (000 tons)
	(1)	(2)	(3)	(4)	(5)	(6)
1. Nawabganj	4339	1296	215	270	245	-29.8
2. Natore	2741	1476	231	248	270	-50.1
3. Naogaon	4380	1959	220	231	240	+19.3
4. Dinajpur Sadar	5422	5422	225	225	245	+80.2
5. Thakurgaon	6974	3920	220	236	261	+48.7
6. Rangpur	6485	3554	226	236	250	+30.1
7. Kurigram	4960	4758	235	236	270	- 13.7
8. Nilphamari	3697	3856	235	234	261	+18.9
9. Gaibandha	8800	8629	213	21[illegible]	260	+6.3
10. Bogra Sadar	5062	4255	233	236	255	+38.4
11. Jaypurhat	12053	8806	217	225	250	+79.9
12. Pabna Sadar	1938	1848	247	248	268	-68.0
13. Sirajganj	5265	3265	234	234	270	+65.8
14. Bagherhat	4652	4675	242	242	270	-7.4
15. Satkhira	7275	4715	231	248	285	-63.3
16. Barisal	9349	9453	203	203	260	-77.7
17. Bhola	8574	6554	215	225	265	+51.8
18. Jhalokati	4151	4171	214	214	285	-21.5
19. Perojpur	4699	2954	220	236	270	-36.4
20. Patuakhali	11784	1329	201	248	255	+41.0

APPENDIX 4A (Contd.)

	Shortfall A Long Tons	Shortfall B Long Tons	Expected Price A Oct.7	Expected Price B Oct.7	Actual Price Oct.7	Surplus (+)/ Deficit (-) (000 tons)
	(1)	(2)	(3)	(4)	(5)	(6)
21. Barguna	5830	757	215	253	260	+29.0
22. Jessore Sadar	5324	4242	237	248	290	-56.1
23. Jhenaidah	4164	136	236	236	280	- 7.0
24. Magura	2313	2313	243	243	290	-10.7
25. Narail	1357	987	240	248	270	-12.7
26. Kushtia Sadar	2177	1270	210	225	250	-61.3
27. Chuadanga	1061	705	224	236	265	-12.0
28. Meherpur	1067	671	226	248	295	+10.3

APPENDIX 4A (Contd.)

	Shortfall A Long Tons	Shortfall B Long Tons	Expected Price A Oct.7	Expected Price B Oct.7	Actual Price Oct.7	Surplus (+)/ Deficit (-) (000 tons)
	(1)	(2)	(3)	(4)	(5)	(6)
29. Kishoreganj	5583	5583	214	214	255	+2.7
30. Netrokona	8497	1592	212	242	250	+68.2
31. Mymensingh	12884	8794	215	225	250	+67.3
32. Jamalpur	7093	4062	201	219	250	-26.2
33. Sherpur	5160	5160	214	214	255	+22.3
34. Tangail	13313	9950	213	225	270	+10.5
35. Faridpur	2171	1815	242	248	280	-77.8
36. Goalanda	2076	2076	241	241	290	-39.7
37. Gopalganj	1576	1568	253	253	280	-62.9
38. Madaripur	2718	2100	242	263	300	-65.7
39. Sariatpur	3449	3449	236	236	300	-44.7
40. Munshiganj	1484	1484	236	236	300	-20.5
41. Manikganj	2684	2684	236	236	270	-51.7
42. Narsingdi	1911	1920	242	242	270	-45.0
43. Ramgati	-161	-344	259	270	250	-.9
44. Bandarban	84	-180	233	257	240	+5.9
45. Noakhali Sadar	1[illegible]78	5221	237	252	270	+9.0

APPENDIX 4A (Contd.)

	Shortfall A Long Tons	Shortfall B Long Tons	Expected Price A Oct.7	Expected Price B Oct.7	Actual Price Oct.7	Surplus (+)/ Deficit (-) (000 tons)
	(1)	(2)	(3)	(4)	(5)	(6)
46. Feni	5644	2910	231	252	275	+43.6
47. Comilla	14332	14332	225	225	275	-28.2
48. Chandpur	5698	5698	231	231	290	-100.3
49. Brahmanbaria	5493	5493	225	225	280	-72.3
50. Sylhet	5521	4652	234	240	275	-74.9
51. Sunamganj	6919	6032	229	236	312	+19.9
52. Moulavi Bazar	3201	3938	253	248	280	+7.3
53. Habiganj	7237	7237	214	214	272	-6.6

APPENDIX - 4B

Estimation of Aman 1983 Anticipated Shortfall using Expected Price, Actual price and Price Elasticity of Demand

	Sub-Divisions	Anticipated Shortfall (000 tons)	Expected Price (Tk./md)	Actual Price (Tk./md)	Expected Aman Output (000 tons)	Surplus (+)/ Deficit (-) (000 tons)
1.	Gazipur	-	256	256	72.48	-16.2
2.	Narsingdi	-1.26	234	255	61.11	-92.7
3.	Munshiganj	-1.24	229	266	33.24	-94.3
4.	Manikganj	-3.37	227	266	85.32	-20.5
5.	Faridpur Sadar	-.55	249	260	53.86	-74.0
6.	Madaripur	-.46	250	263	38.50	-71.7
7.	Goalundo	-.22	257	267	25.07	-46.7
8.	Gopalganj	-1.15	240	261	57.30	-28.6
9.	Sariatpur	-.23	260	267	37.73	-51.6
10.	Tangail	-4.29	232	256	180.19	+81.8
11.	Mymensingh	-6.02	225	241	368.25	+108.7
12.	Netrokona	-13.16	225	286	211.05	+171.8
13.	Kishoreganj	-1.66	231	242	151.16	+121.8
14.	Jamalpur Sadar	-.68	244	249	144.00	+7.2
15.	Sherpur	-1.43	237	249	122.84	+28.6
16.	Sylhet	-4.47	236	260	190.98	+20.7
17.	Moulavi Bazar	-.63	248	242	113.64	+16.1
18.	Habiganj	-4.41	232	259	164.76	+88.2
19.	Sunamganj	-3.16	229	260	101.54	+57.1
20.	Comilla Sadar	2.96	259	270	302.95	-3.0

APPENDIX - 4B (Contd.)

	Sub-Divisions	Anticipated Shortfall (000 tons)	Expected Price (Tk./md)	Actual Price (Tk./md)	Expected Aman Output (000 tons)	Surplus (+)/ Deficit (-) (000 tons)
21.	Brahmanbaria	-1.83	242	259	113.59	+13.6
22.	Chandpur	-2.79	235	268	86.48	-95.1
23.	Noakhali Sadar	+.34	263	261	196.38	-32.0
24.	Nawabganj	-1.34	226	249	57.34	-38.4
25.	Natore	-.30	257	261	82.87	-15.7
26.	Naogaon	-6.08	219	241	263.05	+78.7
27.	Khagrachari	-	246	246	23.41	+.4
28.	Cox's Bazar	-.93	242	249	139.78	+47.2
29.	Patya	+.49	241	236	101.89	-33.0
30.	Laxmipur	-2.83	241	270	102.35	-31.6
31.	Feni	-.31	258	261	117.38	+.8
32.	Pabna Sadar	-1.66	235	254	89.41	-37.5
33.	Serajganj	-3.89	228	256	137.88	-17.3
34.	Dinajpur	+.29	236	235	297.65	+95.8
35.	Thakurgaon	-3.35	208	236	108.29	+46.8
36.	Panchgarh	-1.77	222	241	90.01	+34.8
37.	Rangpur	-5.41	225	249	220.50	+32.6
38.	Nilphamari	-4.58	229	261	142.47	+8.9
39.	Kurigram	-2.98	231	249	166.29	+46.7
40.	Gaibandha	-7.30	221	256	200.03	+60.0

APPENDIX - 4E (Contd.)

Sub-Divisions	Anticipated Shortfall (000 tons)	Expected Price (Tk./md)	Actual Price (Tk./md)	Expected Aman Output (000 tons)	Surplus (+)/ Deficit (-) (000 tons)
41. Lalmonirhat	-5.39	205	245	120.05	+51.8
42. Bogra Sadar	-4.94	235	252	296.98	+82.1
43. Joypurhat	-2.55	227	248	119.73	+49.6
44. Satkhira	-4.41	236	260	188.65	-19.1
45. Bagerhat	-2.42	239	260	179.67	-15.9
46. Barisal Sadar	-3.10	223	244	143.25	-116.5
47. Perojpur	-3.13	222	252	100.80	-35.2
48. Bhola	-1.89	234	247	147.68	+5.4
49. Jhalokathi	-1.01	230	246	63.20	-15.8
50. Patuakhali	-.77	246	250	205.99	+32.7
51. Borguoa	-1.66	238	251	132.14	+25.5
52. Kushtia Sadar	-1.01	224	251	36.57	-75.5
53. Chuadanga	-.48	238	259	23.60	-16.8
54. Meherpur	-.37	235	261	14.64	-85.8
55. Jessore Sadar	-1.92	241	257	125.77	-35.5
56. Jhenaidaha	-.16	247	249	84.03	-52.2
57. Magura	-.88	232	255	38.70	+17.7
58. Narail	-.65	245	260	45.90	-15.5

APPENDIX - 4C

Estimation of Aman 1984 Anticipated Shortfall using Expected Price, Actual Price and Price Elasticity of Demand

	Anticipated Shortfall (000 ton)	Expected Price (Tk/md.)	Actual Price (Tk/md.)	Expected Aman Output (000 ton)	Surplus (+)/ Deficit (-) (000 ton)
1. Dinajpur	-7.98	276.9	309.2	297.65	+95.8
2. Thakurgaon	-.22	299.2	301.9	108.29	+46.8
3. Panchgarh	-2.25	279.9	310.2	90.01	+39.8
4. Rangpur	-3.95	284.4	307.0	220.50	+32.6
5. Nilphamari	-3.95	284.4	318.7	142.47	+8.9
6. Kurigram	-5.71	280.5	322.5	166.29	+46.7
7. Gaibandha	-5.73	27.6	305.4	200.03	+60.0
8. Lalmonirhat	-3.93	272.7	311.6	120.05	+51.8
9. Bogra	-2.12	293.4	302.5	296.98	+82.1
10. Joypurhat	-.25	285.7	288.3	119.73	+49.9
11. Naogaon	-2.00	274.8	283.9	263.05	+78.7
12. Natore	-2.53	268.5	304.1	82.87	-15.7
13. Chapai Nawabganj	-1.29	275.3	302.2	57.34	-38.4
14. Pabna	-.48	291.8	298.6	89.41	-37.5
15. Sirajganj	-2.92	280.9	306.8	37.88	-17.3
16. Kushtia	-.78	282.4	308.5	36.57	-75.5
17. Chuadanga	-.57	266.7	294.8	23.60	-16.8
18. Meherpur	-.42	270.9	305.0	14.64	-85.8

APPENDIX - 4C (Contd.)

	Anticipated Shortfall (000 ton)	Expected Price (Tk/md.)	Actual Price (Tk/md.)	Expected Aman Output (000 ton)	Surplus (+)/ Deficit (-) (000 ton)
19. Jessore	-1.64	275.4	291.0	125.77	-35.5
20. Jhenaidaha	-2.68	269.4	306.8	84.03	-52.2
21. Magura	-1.33	267.1	307.0	38.70	+17.7
22. Narail	-.05	311.2	312.9	45.90	-15.5
23. Satkhira	-1.29	295.3	304.1	188.65	-19.1
24. Bagerhat	-3.13	289.9	311.9	179.67	-15.9
25. Barisal	.43	297.6	293.7	143.25	-116.5
26. Perojpur	.32	301.5	297.4	100.80	-35.2
27. Jhalokathi	-.31	284.6	290.7	63.20	-15.8
28. Bhola	-.16	310.3	311.8	147.68	+5.8
29. Patuakhali	-1.97	277.7	289.2	205.99	+32.7
30. Borguna	-1.07	281.1	291.0	132.14	+25.5
31. Gazipur	1.17	322.2	299.6	72.48	+16.2
32. Narsiangdi	-2.00	275.3	314.5	61.11	-92.7
33. Munshiganj	.66	274.5	298.5	33.24	-94.3
34. Manikganj	-.39	298.5	304.5	85.32	-20.5
35. Faridpur	.46	322.2	310.3	53.86	-74.0
36. Madaripur	.20	304.3	311.1	38.50	-71.7
37. Goalundo	-.83	271.6	310.8	25.07	-46.7
38. Gopalganj	-.46	283.6	306.0	25.07	-28.6

APPENDIX - 4C (Contd.)

	Anticipated Shortfall (000 ton)	Expected Price (Tk/md.)	Actual Price (Tk/md.)	Expected Aman Output (000 ton)	Surplus (+)/ Deficit (-) (000 ton)
39. Shariatpur	-.47	284.1	299.6	37.73	-51.6
40. Tangail	-.50	301.2	304.9	180.19	+81.8
41. Nymensingh	-4.34	276.8	291.0	368.25	+108.7
42. Netrokona	-3.97	270.3	292.4	211.05	+171.8
43. Kishoreganj	-4.95	261.3	298.5	151.16	+121.8
44. Jamalpur	-4.19	274.1	308.8	144.00	+7.2
45. Sherpur	.03	304.6	304.5	122.84	+28.6
46. Sylhet	-.35	277.7	279.9	190.98	+20.7
47. Moulavi Bazar	-.93	270.3	279.9	113.64	+16.1
48. Habiganj	-.11	283.4	284.2	164.76	+88.2
49. Sunamganj	-.48	279.5	285.2	101.54	+57.1
50. Comilla	5.10	279.9	300.4	302.95	-3.0
51. Brahmanbaria	-1.04	268.8	279.5	113.59	+13.6
52. Chandpur	-.24	302.2	305.9	86.48	-93.1
53. Noakhali	.01	289.9	281.7	196.83	-32.0
54. Feni	-.14	278.5	279.9	117.36	+.8
55. Laxmipur	-2.76	253.8	283.6	102.35	-31.6
56. Cox's Bazar	1.97	298.2	279.9	139.78	+47.2
57. Khagrachari	.15	284.0	276.2	23.41	+.4

APPENDIX - 4D

Estimated Regression Equations Relating OMS/MR Offtake to Anticipated Shortfall and Surplus/Deficit Position Using 1983-84 Data:

(1) OMS Offtake 1 =	15950.83 +	29.59 ASF (1.90)		R^2 = .06
(2) OMS Offtake 2 =	1421.43 -	5.06 ASF (1.16)	-144.55 SURDEF (1.45)	R^2 = .04
(3) OMS Offtake 3 =	1437.13 -	5.25 ASF (1.20)	-144.14 SURDEF (1.44)	R^2 = .04
(4) OMS Offtake 4 =	7338.81 -	15.81 ASF (.62)	+167.01 SURDEF (.29)	R^2 = .01
(5) OMS Offtake 5 =	16127.31 -	34.05 ASF (.87)		R^2 = .01
(6) OMS Offtake 6 =	17898.07 -	36.96 ASF (.86)		R^2 = .01
(7) OMS Offtake 7 =	4615.33 -	9.40 ASF (.61)	+85.59 SURDEF (.24)	R^2 = .01
(8) OMS Offtake 8 =	10098.99 -	20.71 ASF (.52)		R^2 = .01
(9) OMS Offtake 9 =	10967.84 -	23.77 ASF (.82)	-67.36 SURDEF (.10)	R^2 = .01
(10) OMS Offtake 10 =	5652.82 -	11.85 ASF (.88)	+116.61 SURDEF (.26)	R^2 = .01
(11) OMS Offtake 11 =	12395.49 -	25.81 ASF (.23)		R^2 = .01
(12) OMS Offtake 12 =	854.34 -	57.0 ASF (.23)	-26.84 SURDEF (.47)	R^2 = .004
(13) MR Offtake 1 =	15950.00 +	29.58 ASF (1.90)		R^2 = .06
(14) MR Offtake 2 =	32574.59 +	28.68 ASF (.72)	-792.66 SURDEF (.87)	R^2 = .04
(15) MR Offtake 3 =	42763.33 +	31.12 ASF (.61)	-760.03 SURDEF (.87)	R^2 = .03
(16) All Offtake 1 =	28179.10 +	17.01 ASF (.47)		R^2 = .004
(17) All Offtake 2 =	59478.47 +	2.07 ASF (.03)	-1156.14 SURDEF (.62)	R^2 = .01
(18) All Offtake 3 =	75936.73 -	5.25 ASF (.05)	-1301.14 SURDEF (.55)	R^2 = .01

APPENDIX - 4E

Estimated Regression Equations Relating OMS/MR Offtake to Anticipated Shortfall and Surplus/Deficit Position using 1984-85 data

(1) OMS Offtake 1 =	235.20 + 27.02 ASF	-.20 SURDEF		R^2 = .14
	(2.36)*	(.55)		
(2) OMS Offtake 2 =	396.60 + 38.00 ASF	-.18 SURDEF		R^2 = .11
	(2.17)*	(.30)		
(3) OMS Offtake 3 =	437.24 + 44.07 ASF	-.45 SURDEF		R^2 = .13
	(2.24)*	(.66)		
(4) OMS Offtake 4 =	1480.05 + 72.73 ASF	-.78 SURDEF		R^2 = .01
	(.61)	(.19)		
(5) OMS Offtake 5 =	1728.21 + 48.03 ASF	-2.39 SURDEF		R^2 = .03
	(.58)	(.83)		
(6) OMS Offtake 6 =	2105.25 + 61.46 ASF	-3.92 SURDEF		R^2 = .05
	(.63)	(1.17)		
(7) OMS Offtake 7 =	957.21 + 53.53 ASF	-.55 SURDEF		R^2 = .02
	(69)	(.22)		
(8) OMS Offtake 8 =	1168.93 + 43.82 ASF	-1.46 SURDEF		R^2 = .04
	(.83)	(.81)		
(9) OMS Offtake 9 =	140.68 + 54.15 ASF	-2.46 SURDEF		R^2 = .07
	(.89)	(1.17)		
(10) OMS Offtake 10 =	1156.39 + 60.84 ASF	-.63 SURDEF		R^2 = .01
	(.69)	(.21)		
(11) OMS Offtake 11 =	1381.99 + 45.42 ASF	-1.82 SURDEF		R^2 = .04
	(.71)	(.82)		
(12) OMS Offtake 12 =	1671.56 + 56.93 ASF	-3.01 SURDEF		R^2 = .06
	(.76)	(1.17)		
(13) OMS Offtake 13 =	1244.85 + 45.71 ASF	-.56 SURDEF		R^2 = .01
	(.39)	(.14)		
(14) OMS Offtake 14 =	1331.61 + 10.03 ASF	-2.21 SURDEF		R^2 = .02
	(.13)	(.85)		
(15) OMS Offtake 15 =	1668.01 + 17.39 ASF	-3.47 SURDEF		R^2 = .03
	(.20)	(1.14)		
(16) MR Offtake 1 =	850.19 - 78.33 ASF	+.19 SURDEF		R^2 = .13
	(2.44)*	(.18)		
(17) MR Offtake 2 =	984.22 - 88.31 ASF	+.31 SURDEF		R^2 = .13
	(2.41)*	(.25)		
(18) MR Offtake 3 =	1160.01 - 105.64 ASF	+.33 SURDEF		R^2 = .13
	(2.44)*	(.22)		

(19) MR Offtake 4 =	2194.80	-199.51 ASP	-.92 SURDEF		R^2 = .09
		(2.14)*	(.29)		
(20) MR Offtake 5 =	3054.11	-304.00 ASP	-.67 SURDEF		R^2 = .11
		(2.40)*	(.15)		
(21) MR Offtake 6 =	3463.72	-341.30 ASP	-.64 SURDEF		R^2 = .11
		(2.38)*	(.13)		
(22) MR Offtake 7 =	3044.99	-277.84 ASP	-.73 SURDEF		R^2 = .10
		(2.29)*	(.17)		
(23) MR Offtake 8 =	4038.75	-329.30 ASP	-.36 SURDEF		R^2 = .12
		(2.40)*	(.06)		
(24) MR Offtake 9 =	4623.73	-446.94 ASP	-.30 SURDEF		R^2 = .12
		(2.43)*	(.05)		
(25) All Offtake 1 =	4525.04	-205.11 ASP	-1.51 SURDEF		R^2 = .02
		(1.04)	(.22)		
(26) All Offtake 2 =	5766.56	-344.27 ASP	-2.75 SURDEF		R^2 = .05
		(1.61)	(.37)		
(27) All Offtake 3 =	6728.97	-385.88 ASP	-4.22 SURDEF		R^2 = .04
		(1.53)	(.49)		
(28) All Offtake 4 =	3080.39	-140.52 ASP	-.88 SURDEF		R^2 = .02
		(1.12)	(.20)		
(29) All Offtake 5 =	3924.56	-220.81 ASP	-1.54 SURDEF		R^2 = .05
		(1.59)	(.32)		
(30) All Offtake 6 =	4573.65	-249.44 ASP	-2.50 SURDEF		R^2 = .04
		(1.51)	(.44)		
(31) All Offtake 7 =	3630.73	-165.12 ASP	-1.12 SURDEF		R^2 = .02
		(1.08)	(.22)		
(32) All Offtake 8 =	4626.27	-267.84 ASP	-2.00 SURDEF		R^2 = .05
		(1.95)	(.35)		
(33) All Offtake 9 =	5394.72	-301.26 ASP	-3.15 SURDEF		R^2 = .04
		(1.52)	(.46)		

APPENDIX - 4F

Ratios of OMS Off-take to Anticipated Shortfall

Sub-Division/ Districts	1983-84 OMS Offtake (ton)	1983-84 Anticipated Shortfall(ASF) (ton)	1983-84 (OMS/ASF)	1984-85 OMS Offtake (ton)	1984-85 Anticipated Shortfall(ASF) (ton)	1984-85 (OMS/ASF)
1. Gazipur	1715	0	-	2598	1170	22.2
2. Narshingdi	1209	1260	.96	1202	2000	.60
3. Munshiganj	346	1240	.29	2777	660	4.21
4. Manikganj	350	3370	.10	1805	390	4.63
5. Faridpur	1658	550	3.01	2461	460	5.35
6. Madaripur	394	460	.86	2009	200	10.45
7. Goalundo	862	220	3.91	1499	830	1.81
8. Gopalganj	508	1150	.44	2520	460	5.45
9. Shariatpur	370	230	1.61	1415	470	3.01
10. Tangail	404	4290	.09	2258	500	4.51
11. Mymensingh	1848	6020	.31	4397	4340	1.01
12. Netrokona	648	13160	.05	1848	3970	1.01
13. Kishoreganj	666	1660	.40	883	4950	.18
14. Jamalpur	971	680	1.43	3636	4190	.87
15. Sherpur	570	1430	.40	2347	30	78.2
16. Sylhet	325	4470	.07	1913	350	5.47
17. Moulavibazar	433	0	-	1463	930	1.57
18. Habiganj	326	4410	.07	1553	110	14.12
19. Sunamganj	70	3160	.02	1050	480	2.19
20. Comilla Sadar	2284	2960	.77	4784	5100	.94
21. Brahmanbaria	277	1830	.15	2592	1040	2.49

APPENDIX 4F (Contd.)

Sub-Division/ Districts	1983-84 OMS Offtake (ton)	1983-84 Anticipated Shortfall(ASF) (ton)	1983-84 (OMS/ASF)	1984-85 OMS Offtake (ton)	1984-85 Anticipated Shortfall(ASF) (ton)	1984-85 (OMS/ASF)
22. Chandpur	422	2790	.15	4746	240	19.77
23. Noakhali Sadar	3786	0	-	4423	10	44.23
24. Nawabganj	1058	1340	.79	914	1290	.71
25. Natore	219	300	.73	478	2530	.19
26. Naogaon	448	6080	.07	700	2000	.35
27. Khagrachari	19	0	-	212	150	1.41
28. Cox's Bazar	47	930	.05	1340	1970	.68
29. Patya	29	0	-	n.a	n.a	n.a
30. Laxmipur	694	2830	.25	1315	2760	.48
31. Feni	627	310	3.43	1818	140	12.99
32. Pabna Sadar	1063	1660	.64	3458	480	7.20
33. Serajganj	925	3890	.32	950	2920	.33
34. Dinajpur	0	0	-	364	7980	.05
35. Thakurgaon	521	3350	.16	1769	220	8.04
36. Panchgarh	226	1770	.15	527	2250	.23
37. Rangpur	12	5410	.002	296	3950	.07
38. Nilphamari	9	4580	.002	427	3950	.11
39. Kurigram	112	2980	.04	1359	5710	.24
40. Gaibandha	0	7300	0	1024	5730	.18
42. Lalmonirhat	11	5390	.002	762	3930	.19
43. Joypurhat	62	2550	.02	469	250	1.88
44. Satkhira	1000	4410	.23	1211	1290	.94

APPENDIX 4F (Contd.)

Sub-Division/ Districts	1983-84 OMS Offtake (ton)	1983-84 Anticipated Shortfall(ASF) (ton)	1983-84 (OMS/ASF)	1984-85 OMS Offtake (ton)	1984-85 Anticipated Shortfall(ASF) (ton)	1984-85 (OMS/ASF)
45. Bagerhat	612	2420	.25	1067	3130	.34
46. Barisal Sadar	915	3100	.30	3891	430	9.05
47. Perojpur	723	3130	.23	1530	320	4.78
48. Bhola	879	1650	.46	921	160	5.76
49. Jhalokathi	596	1010	.59	902	310	2.91
50. Patuakhali Sadar	2600	770	3.38	5888	1970	2.99
51. Baroguna	1126	1660	.68	4752	1070	4.44
52. Kushtia Sadar	40	1010	.04	3886	780	4.98
53. Chuadanga	417	480	.87	1787	570	3.14
54. Meherpur	208	370	.56	1681	420	4.00
55. Jessore Sadar	1048	1920	.55	2867	1640	1.75
56. Jhenaidaha	389	160	2.43	1202	2680	.45
57. Magura	150	880	.17	1508	1330	1.13
58. Narail	268	650	.41	3466	60	57.77
TOTAL	38,478	134,810		112,985	99,350	

Note: Considerable downward bias seemed have been introduced into the esitmation of anticipated shortfall(ASF) for 1984/5 due to much higher level of market price of rice prevailed during the months of July and August, 1984 resultingfrom bad boro and aus crop harvest in 1984.

APPENDIX - 4G

Estimated Regression Equations Relating OMS/MR Offtake to Degree of Price Fall (1984-85 data)

Set - I

1. P Fall 1 = 13.60 -11294.0 OMS Offtake 1 R^2 = .04
(1.47)
2. P Fall 1 = 13.11 - 4778.9 OMS Offtake 2 R^2 = .02
(.95)
3. P Fall 1 = 12.69 - 3010.3 OMS Offtake 3 R^2 = .01
(.70)
4. P Fall 1 = 12.62 - 829.3 OMS Offtake 4 R^2 = .01
(.68)
5. P Fall 1 = 13.73 - 1516.6 OMS Offtake 5 R^2 = .02
(1.15)
6. P Fall 1 = 13.76 - 1269.4 OMS Offtake 6 R^2 = .02
(1.16)
7. P Fall 1 = 12.82 - 1575.8 OMS Offtake 7 R^2 = .01
(.79)
8. P Fall 1 = 13.79 - 2333.0 OMS Offtake 8 R^2 = .02
(1.17)
9. P Fall 1 = 13.71 - 1869.2 OMS Offtake 9 R^2 = .02
(1.14)
10. P Fall 1 = 12.72 - 1183.6 OMS Offtake 10 R^2 = .01
(.74)
11. P Fall 1 = 13.77 - 1943.3 OMS Offtake 11 R^2 = .02
(1.17)
12. P Fall 1 = 13.74 - 1589.4 OMS Offtake 12 R^2 = .02
(1.15)
13. P Fall 1 = 12.31 - 638.1 OMS Offtake 13 R^2 = .004
(.48)
14. P Fall 1 = 13.46 - 1675.1 OMS Offtake 14 R^2 = .02
(1.07)
15. P Fall 1 = 13.71 - 1542.3 OMS Offtake 15 R^2 = .02
(1.18)
16. P Fall 1 = 15.54 - 1069.1 All Offtake 1 R^2 = .02
(1.05)
17. P Fall 1 = 18.10 - 1369.5 All Offtake 2 R^2 = .03
(1.36)
18. P Fall 1 = 18.25 - 1205.3 All Offtake 3 R^2 = .03
(1.41)

19. P Fall 1 = 16.02 - 1769.0 All Offtake 4 R^2 = .02
(1.08)

20. P Fall 1 = 18.18 - 2041.9 All Offtake 5 R^2 = .03
(1.32)

21. P Fall 1 = 18.18 -11758.2 All Offtake 6 R^2 = .03
(1.34)

22. P Fall 1 = 15.79 - 1421.2 All Offtake 7 R^2 = .02
(1.06)

23. P Fall 1 = 18.17 - 1727.4 All Offtake 8 R^2 = .03
(1.34)

24. P Fall 1 = 18.24 - 1502.5 All Offtake 9 R^2 = .03
1.38)

25. P Fall 1 = 9.67 + 2970.69 MR Offtake 1 R^2 = .002
(.31)

26. P Fall 1 = 10.12 + 2011.68 MR Offtake 2 R^2 = -
(.22)

27. P Fall 1 = 11.97 - 235.48 MR Offtake 3 R^2 = -
(.03)

28. P Fall 1 = 18.44 - 3727.9 MR Offtake 4 R^2 = .03
(1.37)

29. P Fall 1 = 18.29 - 2591.9 MR Offtake 5 R^2 = .005
(1.12)

30. P Fall 1 = 18.82 - 2474.9 MR Offtake 6 R^2 = .02
(1.17)

31. P Fall 1 = 19.07 - 2938.5 MR Offtake 7 R^2 = .02
(1.17)

32. P Fall 1 = 18.66 - 2073.3 MR Offtake 8 R^2 = .02
(.97)

33. P Fall 1 = 19.52 - 2041.8 MR Offtake 9 R^2 = .02

(1.07)

APPENDIX 4G (Contd.)

Set - II

1.	P Fall 2	=	17.41	-12148.0	OMS Offtake 1	R^2 =	.03
				(1.33)			
2.	P Fall 2	=	16.69	- 4511.7	OMS Offtake 2	R^2 =	.01
				(.76)			
3.	P Fall 2	=	16.58	- 3737.5	OMS Offtake 3	R^2 =	.01
				(.74)			
4.	P Fall 2	=	18.36	- 2794.8	OMS Offtake 4	R^2 =	.07
				(1.99)			
5.	P Fall 2	=	18.45	- 2320.0	OMS Offtake 5	R^2 =	.04
				(1.51)			
6.	P Fall 2	=	18.49	- 1937.2	OMS Offtake 6	R^2 =	.04
				(1.52)			
7.	P Fall 2	=	18.54	- 4602.8	OMS Offtake 7	R^2 =	.07
				(2.02)			
8.	P Fall 2	=	18.39	- 3383.2	OMS Offtake 8	R^2 =	.04
				(1.45)			
9.	P Fall 2	=	18.36	- 2798.4	OMS Offtake 9	R^2 =	.04
				(1.45)			
10.	P Fall 2	=	18.46	- 3700.8	OMS Offtake 10	R^2 =	.07
				(2.01)			
11.	P Fall 2	=	18.43	- 2892.0	OMS Offtake 11	R^2 =	.04
				(1.48)			
12.	P Fall 2	=	18.43	- 2401.9	OMS Offtake 12	R^2 =	.04
				(1.49)			
13.	P Fall 2	=	17.97	- 2883.2	OMS Offtake 13	R^2 =	.06
				(1.91)			
14.	P Fall 2	=	18.32	- 2835.1	OMS Offtake 14	R^2 =	.04
				(1.55)			
15.	P Fall 2	=	18.51	- 2434.7	OMS Offtake 15	R^2 =	.04
				(1.60)			
16.	P Fall 2	=	23.81	- 2366.6	All Offtake 1	R^2 =	.07
				(2.01)			
17.	P Fall 2	=	19.97	- 2518.1	All Offtake 2	R^2 =	.06
				(1.86)			
18.	P Fall 2	=	23.17	- 1437.8	All Offtake 3	R^2 =	.04
				(2.43)			

19. P Fall 2 = 24.42 - 3720.5 All Offtake 4 R^2 = .07
(1.97)

20. P Fall 2 = 23.03 - 2416.9 All Offtake 5 R^2 = .03
(1.32)

21. P Fall 2 = 23.11 - 2103.7 All Offtake 6 R^2 = .03
(1.36)

22. P Fall 2 = 24.15 - 3065.7 All Offtake 7 R^2 = .07
(2.00)

23. P Fall 2 = 23.08 - 2061.1 All Offtake 8 R^2 = .03
(1.36)

24. P Fall 2 = 23.17 - 795.1 All Offtake 9 R^2 = .03
(1.39)

25. P Fall 2 = 13.23 + 3115.49 MR Offtake 1 R^2 = .001
(.28)

26. P Fall 2 = 14.15 + 1570.2 MR Offtake 2 R^2 = -
(.15)

27. P Fall 2 = 15.73 - 334.62 MR Offtake 3 R^2 = -
(.03)

28. P Fall 2 = 21.03 - 3130.60 MR Offtake 4 R^2 = .02
(.97)

29. P Fall 2 = 19.27 - 1525.9 MR Offtake 5 R^2 = .01
(.55)

30. P Fall 2 = 19.31 - 1362.5 MR Offtake 6 R^2 = .01
(.54)

31. P Fall 2 = 21.45 - 2422.9 MR Offtake 7 R^2 = .01
(.81)

32. P Fall 2 = 20.13 - 2783.2 MR Offtake 8 R^2 = .06
(1.86)

33. P Fall 2 = 19.73 - 1134.6 MR Offtake 9 R^2 = .004
(.50)

QUESTIONNAIRE FOR TRADERS' SURVEY

1. Name of Respondent .....

2. Age..... 3. Address .....

4. Educational Qualifications.....

5. Date and Time for Interview.....

6. Interviewer's Name.....

7. Coder's Name.....

8. Identification of Respondent

Bepari	Aratdar	Wholesaler	Miller Owner	Retailer

9. Type of Functions Performed

(a)	Assisting Buying and Selling	Primary	Secondary
(b)	Buying and Selling in the same Market	Primary	Secondary
(c)	Buying from One Place and Selling in Another Market	Primary	Secondary
(d)	Financing Buyers and Sellers	Primary	Secondary
(e)	Providing Business Premises and Temporary Storage	Primary	Secondary
(f)	Buys Paddy and Sells Rice	Primary	Secondary
(g)	Any other Function (Please Specify)	Primary	Secondary

10. What particular variety of rice you specialise in your trading activity ?

Coarse ____ Medium _____ Fine _____

11. What type of market information is needed by you ?

(i) Crop Condition _____

(ii) Price _____

(iii) Market Arrival _____

(iv) Stock _____

(v) Any Other _____

12. What are the means through which you obtain your desired information ?

(i) Radio broadcast____

(ii) Newspaper _____

(iii) Telephone _____

(iv) Market Visit _____

(v) Other dealers _____

(vi) Transport agencies used for carrying foodgrains _____

13. If you expect a production shortfall and an increase in price in the future, how does it affect your buying/selling activity and storage decision ?

(a) Do you buy more and sell less now ?

Yes_____ No _____

(b) If yes, then what is the average period and amount of such stock ?

(i)_____days

(ii) _____maund

14. Please give an account of the amount of rice you have bought and sold in the last six weeks.

(a) Purchase (md) : 1st____ 2nd ____ 3rd ___ 4th ___ 5th ___ 6th ____

(b) Sale (md) : 1st____ 2nd ____ 3rd ____4th ___ 5th ___ 6th ____

(c) Purchase Price (Tk/md) : 1st____ 2nd ____ 3rd ____4th ____5th ____ 6th ____

(d) Sale price (Tk./md.) : 1st____ 2nd ____ 3rd ____4th ____5th ____ 6th ____

15. From where you generally procure your paddy/rice ?

(a) _____

(b) _____

(c) _____

(d) _____

16. Which price do you consider in deciding whether or not to store grain ?

(i) tommorow's price _____

(ii) price you expect after three days_____

(iii) price you expect in the next week _____

(iv) price you expect in the next month _____

(v) any other price (Please specify) _____

17. What factors other than future prices guide your storage decisions ?

(i) future scarcity _____

(ii) current market arrival _____

(iii) government stock _____

(iv) ration offtake _____

(v) rice harvest _____

(vi) other traders' behaviour _____

(vii) ration price _____

(viii) ration quota _____

(ix) ration offtake _____

(x) import of foodgrains _____

18. Are you aware of such government operation known as "Open Market Sale" of foodgrains ?

Yes_____ No _____

19. If yes, do you think that the government can arrest or bring down prices of rice through such program ?

Yes _____ No _____

20. If yes, does this program affect your storage decisions ?

Yes _____ No _____

21. If yes, how does this program affect your storage decisions ?

(i) when to store _____

(ii) how much to store _____

(iii) how long to store _____

22. Do you anticipate that aman harvest this year will be

(i) less than last year _____

(ii) greater than last year _____

(iii) about the same as in last year _____

23. If greater or less, how much greater or less as compared to last year ?

_____(Percentage)

24. Do you think such greater or less production will lead to lower or higher prices in the next few weeks ?

Yes _____ No _____

25. If yes, what is the amount of such price decrease or increase ?

_____(Percentage)

26. Has government imposed any restrictions on purchase of foodgrains ?

Yes _____ No _____

27. If yes, what are those restrictions ?

(i) _____

(ii) _____

(iii) _____

28. Has government imposed any restrictions on sale of foodgrains ?

Yes _____ No_____

29. If yes, what are those restrictions ?

(i)_____

(ii) _____

(iii) _____

30. Has government imposed any restrictions on movement of foodgrains ?

Yes _____ No _____

31. If yes, what are those restrictions ?

(i) _____

(ii) _____

(iii) _____

32. Has government imposed any restrictions on storage of foodgrains ?

Yes _____ No _____

33. If yes, what are those restrictions ?

(i) _____

(ii) _____

(iii) _____

34. Does the restriction on storage period sometimes force you to sell even at a loss ?

Yes _____ No _____

35. If yes, what amount of loss you are to bear ?

_____ (Percentage)

36. Does the government regulation has increased your cost of operating foodgrain trade ?

Yes _____ No _____

37. If yes, then in what way does it increase your costs, and by how much ?

(a) _____

(b) _____(Percentage)

We have defined $W^{S}_{o} = (a_{w}\ Y_{o})^{S}\ /\ P^{R}_{wo}$ and $W^{M}_{o} = (a_{w}\ Y_{o})^{M}/P^{R}_{wo}$

Hence, $(W^{S}_{o}/W^{M}_{o}) = (a_{w}\ Y_{o})^{S}\ /\ (a_{w}\ Y_{o})^{M}$

Also, we have

$(P^{R}_{w1})^{S} = (a_{w}Y_{1})^{S}/W^{S}_{o}$ and $(P^{R}_{w1})^{M} = (a_{w}Y_{1})^{M}/W^{M}$

Hence, it follows that

$(P^{R}_{w1})^{S} = (P^{R}_{w1})^{M}$ if $(a_{w}Y_{1})^{S}/W^{S}_{o} = (a_{w}Y_{1})^{M}/W^{M}$

i.e. if $(a_{w}Y_{1})^{S}/(a_{w}Y_{1})^{M} = (W^{S}_{o}/W^{M}_{o})$

i.e. if $(a_{w}Y_{1})^{S}/(a_{w}Y_{1})^{M} = (a_{w}Y_{o})^{S}/(a_{w}Y_{o})^{M}$

In other words, ration prices of wheat will be indentical in the two sample of households (SR and MR) if the ratio of expenditure on wheat between SR and MR households remain unchanged over time, which happens if money income and hence total expenditure of both the households increases in the same proportion.

Table A7.1

Combined Rice and Wheat offtake from Various Categories of offtake in Bangladesh PPDS, 1973/4 - 1983/4

(000 long ton)

Year	Monetised rationing channels								FPW and Relief			Others	Grand Total
	EP	OP	LR	FM	OMS/MO	SR	MR	Total	FPW/CD	VGF/GR	Total		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1973/4	88.6	204.3	95.2	134.0	1.4	476.5	893.9	1893.9	-	140.2	140.2	-	2034.1
1974/5	95.1	231.1	92.5	146.6	3.7	437.6	564.5	1571.1	36.8	109.7	146.5	-	1717.6
1975/6	98.8	239.5	84.1	153.1	23.2	398.7	434.6	1431.9	92.3	103.2	195.5	-	1627.4
1976/7	104.5	266.0	78.4	181.2	25.1	391.3	373.7	1420.9	177.3	59.6	236.9	-	1657.8
1977/8	104.0	315.7	74.9	188.2	42.0	415.0	312.3	1452.2	212.4	36.0	248.4	-	1700.6
1978/9	100.3	419.5	90.1	192.2	62.6	453.2	349.5	1667.5	303.8	43.6	347.4	-	2014.9
1979/80	89.2	429.4	78.8	162.2	60.8	417.1	291.7	1521.3	327.3	50.0	377.3	-	1898.5
1980/1	91.1	423.7	64.3	142.3	60.6	380.6	348.8	1511.4	377.3	58.3	435.5	-	1978.0
1981/2	[illegible]	383.[illegible]	54.3	125.8	67.8	317.7	341.2	1384.3	366.5	67.1	433.5	30.8	1849.0
19[illegible]	[illegible]	[illegible]	63.8	125.5	119.4	299.5	412.5	1498.7	402.5	89.8	492.3	-	2022.2
198[illegible]/[illegible]	[illegible]	[illegible].3	68.9	132.8	159.5	285.6	403.9	1545.4	468.2	178.1	646.3	-	2191.7

Note: [illegible]s are three yearly moving averages

Source: Data obtained from Food Directorate Files, and then averaged.

Table A7.2

Relative Shares of Various PFBS Categories, Bangladesh 1973/4 through 1983/4

Year	BP	OP	LR	PM	OHS/MO	WR	HR	FPS/CB	VGP/GR /R	Others
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1973/4	4.4	10.0	4.7	6.6	.0006	23.4	43.9	-	6.9	-
1974/5	5.5	13.5	5.4	8.5	.002	25.5	32.9	2.1	6.4	-
1975/6	6.1	14.7	5.2	9.4	1.4	24.5	26.7	5.7	6.3	-
1976/7	6.3	16.0	4.7	10.9	1.5	23.6	22.5	10.7	3.6	-
1977/8	6.2	18.6	4.4	11.1	2.5	24.4	18.4	12.5	2.1	-
1978/9	5.0	20.8	4.5	9.5	3.1	22.5	17.4	15.1	2.2	-
1979/80	4.7	22.6	3.7	8.5	3.2	22.0	15.4	17.2	2.6	-
1980/1	4.6	21.4	3.3	7.2	3.1	19.2	17.6	19.1	2.9	-
1981/2	5.1	20.7	2.9	6.0	3.7	17.2	18.5	19.8	3.6	1.7
1982/3	5.0	18.7	3.2	6.2	5.9	14.8	20.4	19.9	4.4	-
1983/4	5.3	17.3	3.1	6.1	7.3	13.0	18.4	21.4	8.1	-

Note: Row percentages need not add to 100, due to rounding errors

Source: Table A7.1

Table A7.3

Weekly Quota Per Adult Card in SR, MR, and Other Priority Rationing, 1972/3 - 1984/5

(seers/capita)

Year	SR			MR			Other Priority		
	Rice	Wheat	Total	Rice	Wheat	Total	Rice	Wheat	Total
1972/3	1.4	1.6	3.0	1.4	1.6	3.0	1.13	1.9	3.03
1973/4	0.75	2.25	3.0	1.0	2.0	3.0	-	3.0	3.0
1974/5	0.67	2.16	2.83	1.08	1.75	2.83	0.50	2.5	3.0
1975/6	1.3	1.2	2.5	1.25	1.25	2.50	1.29	1.29	2.58
1976/7	2.1	1.2	3.3	1.96	1.63	3.59	1.04	1.88	2.92
1977/8	1.7	1.3	3.0	1.71	1.29	3.00	1.0	2.0	3.0
1978/9	1.5	1.5	3.0	1.5	1.5	3.0	1.0	2.0	3.0
1979/80	1.4	1.6	3.0	1.42	1.42	2.84	1.0	2.0	3.0
1980/1	.88	1.87	2.75	0.88	1.88	2.76	0.88	1.88	2.76
1981/2	.60	1.60	2.2	0.60	1.60	2.20	0.60	1.60	2.2
1982/3	.50	1.50	2.0	0.5	1.5	2.0	0.5	1.5	2.0
1983/4a	.54	1.60	2.0	0.54	1.60	2.0	0.54	1.60	2.0
1984/5a	.54	1.60	2.14	0.54	1.68	2.14	0.54	1.60	2.14

Note:a) With effect from July 18, quotas in public rationing are set in kg. we have denominated this entire table in seers, in order to ensure comparability with earlier years.

b) The values in the table were obtained by averaging quotas on an annual basis by using as weights the number of months for which a given quota was in force.

Source: Food Directorate records

Table A7.4

Relative Shares of Rice and Wheat in Weekly Quota, SR, MR, and Priority Rationing, 1973/4 - 1983/4

(Moving Averages)

Year	SR		MR		Other Priority	
	Rice	Wheat	Rice	Wheat	Rice	Wheat
1973/4	31.8	68.2	39.4	60.6	18.0	82.0
1974/5	33.57	66.42	40.5	59.5	22.23	77.8
1975/6	46.43	53.57	47.6	52.4	34.1	65.9
1976/7	57.43	42.57	53.87	46.13	39.63	60.4
1977/8	56.77	43.23	53.87	46.13	34.07	65.9
1978/9	51.13	48.87	52.33	47.67	33.3	66.7
1979/80	42.9	57.1	43.97	56.03	32.83	67.2
1980/1	35.33	64.67	36.4	63.6	30.83	69.2
1981/2	28.1	71.9	28.07	71.93	28.07	71.9
1982/3	25.77	74.23	25.77	74.23	25.77	74.2
1983/4	25.0	75.0	25.0	75.0	25.0	75.0

Source: Table A7.2

Secular changes in the percentage of ration price to open market price
1972/3 - 1984/5

(Taka/maund)

Year	Rice						Wheat					
	Whole-sale issue Prices	Whole-sale Open market Prices	Col.2/ Col.3 (%)	Retail issue Prices	Open Market Retail Prices	col.5/ col.6 (%)	Whole-sale issue Prices	Whole-sale Open market Prices	Col.8/ Col.9 (%)	Retail issue Prices	Retail Market Prices	col.11/ col.12 (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1972/3	28.91	75.27	38.40	30.0	81.2	36.9	19.62	-	-	20.00	40.0	52.0
1973/4	39.80	100.46	39.62	41.67	109.5	38.0	29.80	79.20	37.63	31.67	87.1	36.4
1974/5	50.0	209.53	27.63	60.0	222.7	26.9	48.00	140.00	34.07	59.00	145.2	34.4
1975/6	70.92	124.50	56.96	73.33	140.6	52.2	56.35	76.74	73.43	58.75	90.0	65.3
1976/7	87.00	113.13	76.90	90.0	121.4	74.1	67.00	79.06	84.75	70.00	70.0	89.7
1977/8	92.0	138.46	66.44	95.0	154.2	61.6	72.00	91.49	78.72	75.00	95.0	78.9
1978/9	98.67	152.27	64.80	101.67	168.8	60.2	77.83	91.38	85.17	80.83	97.0	83.3
1979/80	120.33	201.41	59.74	123.33	227.3	54.3	98.33	116.31	77.66	93.33	132.0	70.7
1980/1	140.05	168.44	83.12	143.8	195.3	73.6	107.75	110.46	97.55	111.50	124.0	89.[illegible]
1981/2	162.75	220.40	73.84	166.75	239.1	69.7	116.67	135.09	86.36	120.67	152.0	[illegible]
1982/3	200.00	239.61	53.47	205.0	264.7	77.4	134.50	162.33	82.86	139.50	183.[illegible]	[illegible]
1983/4	209.00	261.63	79.90	215.0	290.2	74.1	139.00	166.07	83.40	145.0	175.6	[illegible]
1984/5	235.5	294.4	80.00	241.5	329.7	73.2	153.00	171.0	89.50	158.95	189.0	84.[illegible]

Sources: Wholesale and retail issue prices are from the Food Division files; open market whole sale coarse rice price and wheat price are from data collected by the Directorate of Agricultural Marketing. Open Market rice retail Prices are those of coarse rice. In this connection, use has been made of a time series on whole sale prices of both coarse and medium rice in Dhaka. The weighted average proportionate difference between the two for the 1960's was applied to time series data on Bangladesh wide medium rice retail prices in arriving time series data on retail coarse rice prices. Retail wheat market prices were obtained from Economic Indicators of Bangladesh, Dec. 1981 and June 1985

Table A7.6

Number of Beneficiaries of PFDS in Urban Areas, Bangladesh, 1972/3 - 1984/5, in Absolute and Relative Terms

(000s)

Year	SR	RP	OP	LR	OMS/MO	MR	Total	Urban Population	% of urban population covered by PFDS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1972/3	3243.1	212.9	450.6	405.9	22.3	5179	9593.8	5356	179.1
1973/4	3449.1	234.5	564.7	445.1	-	2311	7104.4	5958	119.2
1974/5	3403.1	293.2	691.0	548.0	-	1900.9	6997.8	6627	105.6
1975/6	2915.1	312.5	709.8	670.3	70.3	1245.6	60011.5	7371	81.6
1976/7	2391.0	274.0	651.9	471.9	270.5	476.5	4544.6	8199	55.4
1977/8	3148.2	340.0	914.4	691.7	28.6	730.5	5861.4	9120	64.3
1978/9	2912.3	265.3	1095.9	505.9	323.0	652.6	5835.0	10140	57.5
1979/80	3430.9	234.5	1503.6	825.5	630.3	850.2	7475.0	11209	66.2
1980/1	2609.7	270.1	1083.5	241.6	0.53	407.4	4612.8	12559	36.7
1981/2	2927.1	382.7	1429.7	428.3	438.3	1378.3	6984.9	13972	50.0
1982/3	3178.5	401.0	1749.7	590.1	1115.1	1136	8162.4	15543	52.5
1983/4	2824.2	420.0	1348.5	469.0	1138	1233	7434.3	17290	43.0
1984/5	2601.1	579.3	1542.2	501.9	1515.0	1644.9	8385.2		

Table A7.7

Number of Beneficiaries of PPDS in Rural Areas, Bangladesh, 1972/3 - 1984/5, in Absolute and Relative Terms

(000s)

Year	EP	OP	LR	OMS/MO	MR	FPW/CD	Total	Rural Population	% of Rural population covered by PPDS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1972/3	318.6	675.2	161.7	6.9	5179	-	6341.4	63492	10.0
1973/4	352.5	846.7	148.6	-	2311	-	3658.8	64631	5.7
1974/5	439.1	1038.0	183.2	-	1980.9	-	3641.2	65790	5.5
1975/6	460.3	1185.1	221.9	23.4	2907.5	312	5118.2	66972	7.6
1976/7	410.2	978.2	156.6	85.7	1112.4	328.5	3071.6	68176	4.5
1977/8	510.3	1370.9	230.2	9.7	1723.4	720.6	4565.1	69402	6.6
1978/9	397.2	1643.2	195.0	107.4	1522.4	609.8	4475.0	70653	6.3
1979/80	352.5	2256.1	274.8	221.9	1984.2	1243.9	6333.4	71926	8.8
1980/1	405.9	1626.0	79.9	0.15	958.7	919.4	3982.1	73229	5.4
1981/2	574.4	2144.6	142.1	145.6	3217.3	1033.3	7257.3	74551	9.7
1982/3	581.0	2625.0	196.0	371.7	2651.2	1151.9	7596.1	75893	10.0
1983/4	632.2	2021.7	156.6	378.7	2610.8	1225	7025.0	77267	9.0
1984/5	869.0	2315.0	167.0	505.9	2824.1	1598.3	8271.3	—	—

Methodology of the sample Surveys:

The Statutory Rationing Survey:

Sample surveys were conducted in Dhaka and Khulna. 116 households were selected in Dhaka and 40 households in Khulna. The survey instruments were designed mainly to collect the following (i) income, and expenditure by detailed commodity groups; (ii) length and extent of participation in SR of sample households, (iii) their preferences for various varieties of ration commodities; (iv) their perceptions as to the rate of substitution between ration rice and wheat; (v) the quantitative importance of actual ration offtake in the context of household foodgrain requirements; (vi) the frequency of ration offtake, etc.

Our Inception Report had indicated clearly that households that are covered by SR activities will be sampled. What proportion of the population of the SR areas are in fact covered by SR activities was, therefore, not an issue for investigation. If it were, then we would have needed a repreesentative set of sample in urban areas of a size generating appropriate degrees of statistical confidence. The universe for the desired set of samples would have to be the entire population of the SR areas. Instead, we confined our sampling to SR - covered households.

Two ways were open to us of randomising the selection of the sample households. First, there are 9 rationing areas in Dhaka and 5 in Khulna. One ration dealer could be selected at random from among all the dealers enlisted in these areas. A dealer is expected to cater to between 1500 to 2500 ration households. A sample could have been selected at random from th elist of names and address maintained with each of the random ration dealers. This option appeared more satisfactory on first thought than the alternative, which is presented shortly. But, on closer examination, this option was found wanting. During survey pretests, it became abundantly clear that addresses maintained by the dealers were frequently dated inadequately specified, or simply phoney. The valid addresses proved difficult to locate, due to chaotic serialising of the plot numbers. On several occasions, correct location, with considerable difficulty, was returned with the dismaying discovery that the household had moved out of the locality long since, and that thepresent residents did not bother to use SR facilities. In the light of these circumstances, it was decided to utilise

the alternative. The alternative that was used instead involved the following. First, a large number of address of card-holders of randomly selected dealers were secured by accosting persons as they were lifitng due ration in the capacity of card holders or of proxies for them. These addresses were assumed to provide something by way of a sample frame, and the desired numberof households per rationing area was randomly selected from the list of these addresses. This amounted to a survey of SR-covered households that had a certain degree of material incentives in lifting the raiton. These are households who take rationing activities as improving their welfare, and who, therefore, are likely to take them seriously. From these addresses, 116 households representing 9 rationing areas in Dhaka and 40 households representing 5 rationing areas in Khulna were selected.

It may not be a miss to point out here that this sampling methodology does give a bias to our results concerning the distributional effects of SR offtake of an average household. It can be argued that this bias has a desirable feature. The possible bias lies in that the quantity of ration foodgrain per capita lifted by the sample households is likely to be higher than if we had selected our sample through the alternative discarded above. As it is, even in the present sample, a certain, though small, proportion of households only lift ration once a week. Had we selected the sample from a list of all households having cards, the proportion of households that lift ration rarely or not at all would perhaps have been higher. In effect then our sample is likely to somewhat overstate the quantities of raiton foodgrains in the consumption mix of the average SR household.

Interviewing was done by female field investigators. Respondents in the SR surveys were almost always house wives. During pretests it became clear that selection of heads of households as respondents would become infeasible. This was, in part, because men were found to be much less available at home when called on, and in part because they were, on the few cases that they were available, found to be less familiar with the answers of the questions being asked than their wives. Two of the salient components of the SR questionnaire dealt with household food and nonfood purchases, and with the frequency, quantities and other characteristics of the ration lifted. It is hardly surprising that housewives, who frequently disburse household budgets and organise lifting of the ration, proved to be more knowledgeable than their husbands.

Table A9.1

Magnitude of Income Effect of Rationing among Urban Households, 1973/4

Expenditure size classes Tk./month	Additional food grain consumed due to income effect of rationing seer/capita/year	Income implied by col.2a col 2x2.66	Overall income effect due to rationing	Capita/yr after rationing	Capita/year without income effect of rationing col.5-col.4	Income due to rationing as of income/cap
(1)	(2)	(3)	(4)	(5)	(6)	(7)
100	31.2	83.1	176.8	357.4	180.6	49.5
100-149	22.4	59.6	145.9	538.	392.1	27.1
150-199	27.3	72.3	168.5	558.5	390.0	30.2
200-249	22.0	58.9	142.6	655.4	512.8	21.8
250-299	18.3	49.1	119.5	711.0	591.5	16.8
300-399	14.6	39.3	95.8	786.5	690.7	12.2
400-499	9.6	26.1	67.6	887.3	819.7	7.8
500-749	5.1	13.9	39.7	1102.7	1063.0	3.6
750-999	3.4	9.1	28.8	1309.8	1281.0	2.2
1000-1499	2.0	5.4	18.6	1603.8	1585.2	1.2
1500-1999	0.8	2.2	9.4	2041.1	2031.7	0.5
2000+	0.4	1.1	6.7	3413.0	3413.0	0.2

Note : a) Weighted average price of rice and wheat in 1973/4 was Tk. 2.66 per seer

Source : Ahmed 1979, BBS 1982

Table A8.2

Magnitude of Income Effect of Rationing in 1973/4, if Rationing Parameters of 1984/5 were in Force

Expenditure size classes Tk./month	Extra food grains consumed due to income effect of rationing	Income implied by col.2	Overall income effect	Total income capita/yr	Income/Capita/yr without income effect of rationing	Income due to rationing as % of with rationing/ incomes/capita
(1)	(2)	(3)	(4)	(5)	(6)	(7)
100	14.3	38.0	61.1	337.4	276	22.7
100-149	10.3	27.4	66.6	538.0	471	12.4
150-199	12.5	33.2	77.4	558.5	481	13.8
200-249	10.1	26.9	65.4	655.4	590	10.0
250-299	8.4	22.9	54.7	711.0	656	7.7
300-339	6.7	18.0	43.9	786.5	743	5.6
400-499	4.4	11.5	30.8	887.3	857	3.5
500-749	2.3	6.4	18.3	1182.7	1164	1.6
750-999	1.56	4.2	13.3	1309.8	1297	1.1
1000-1499	0.9	2.5	8.6	1603.8	1595	0.5
1500-1999	0.4	1.1	4.7	2041.1	2036	0.2
2000+	0.2	0.5	3.0	3413.8	3410	

Note: This table seeks to find out what would have the magnitude of the income effect of rationing in 1973/4, had, ceteris paribus, two important parameters of the rationing systems of 1984/5 were in force in 1973/4, too. These are (i) the quota of ration; (ii) the ratio of market prices to ration retail issue prices of rice and wheat. (i), (ii) and the extent to which people lift their quota determine the extent of the income transfer implied by rationing. The index of income effect of rationing, constructed in Table A8.3, is made use of in constructing this table.

Table A8.3

Changing Levels of Food Subsidies Through SR and OP, 1972/3 - 1984/5
Bangladesh

(Values in Taka)

	Rice				Wheat				Rice + Wheat			Index of rationing income effect (1973/4=100)
	Quota/ year/ capita	Cost of (2) at ration price	Cost of (2) at market price	(3) % of (4)	Quota/ year/ capita	Cost of (6) at ration price	Cost of (6) at market price	(7) % of (8)	(3) + (7)	(4) + (8)	(10) % of (11)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1972/3	65.5	49	133	36.8	91.0	47	91	51.6	96	224	42.8	116
1973/4	39.8	41	187	38.3	117.8	92	255	36.1	133	362	36.7	100
1974/5	30.4	46	169	27.2	121.2	152	440	34.5	198	609	32.5	88
1975/6	67.3	123	237	51.9	64.7	95	146	65.1	218	383	56.9	155
1976/7	81.6	184	248	74.2	80.1	140	156	89.1	324	404	80.2	218
1977/8	70.2	167	271	61.6	85.8	161	204	78.9	328	475	69.1	188
1978/9	65.8	165	274	60.2	91.0	184	221	83.3	349	495	70.5	192
1979/80	62.4	192	355	54.1	67.6	158	223	70.9	350	578	60.6	165
1980/1	45.8	165	224	73.7	97.5	272	302	90.1	437	2526	83.	226
1981/2	31.2	138	186	77.4	83.2	251	316	79.4	381	502	75.9	207
1982/3	26.8	133	178	78.2	78.0	272	357	76.[illegible]	405	527	76.9	218
1983/4	28.1	151	204	74.0	83.2	302	365	82.[illegible]	453	569	79.6	217
1984/5	28.1	170	232	73.3	83.2	331	393	84.2	501	625	80.2	218

Note : Rice and wheat quotas are averages of SR and OP, annualised, in seer. Cols 3 and 7 use retail issue prices of ration. Cols. 4 and 8 use retail market prices of rice and wheat.

Col.5 = Col.3 as % of Col.4
Col.9 = Col.7 as % of Col.8
Col.12 = Col.10 as % of Col.11

Source: Quota and ration issue price information is from the Food Division. Data on market prices are from Table A7.3.

Methodology of the Modified Rationing (MR) Survey:

It was envisaged in the Inception Report that the MR surveys would embrace five districts of Comilla, Jamalpur, Rangpur, Faridpur and Jessore. These five districts were thought to represent two types of regional consideration. First, they were supposed to represent flood plains associated with the three major river systems: Comilla (Chandpur) with Meghna; Jamalpur and Rangpur, with Brahmaputra; and Faridpur (Madaripur) with the Ganges. Second, from the viewpoint of cropping pattern, while Comilla and Jessore are part of the rice and wheat bowl of Bangladesh, south-eastern parts of Faridpur and Rangpur are largely one-crop, low-lying char lands, with Jamalpur representing something of an intermediate nature. Between them, these five districts may be thought to capture the two major types of ecological and agricultural differences among regions. This is not to claim however, that the 5 district sample is representative of the entirety of the rural areas of Bangladesh.

On this question of representives of the sample let one thing be said rather flat-footedly, at the outset. The task before the rural survey was to examine what effects MR was having on incomes of the rural people concerned. In point of fact, only households who belong to the two of the lowest-income categories are meant to be covered by the rural offtake within MR. Not everyone in the rural areas is supposed to benefit from MR.

A sample frame representative of the entire population of the rural was therefore besides the point. As is frequently the case, cluster sampling is resorted to in situations like these, where there are reasons to believe that variances between clusters are greater than those within. It is well-known that adoption of cluster sampling is inimical to tenets of representative sampling. This arises because the assumption of independence for the selection o the first stage cannot any longer be maintained. Nevertheless, if sufficient care is exercised, it is still possible to maintain a representative sample. The rural sample here uses the principle of clustering in that the five districts chosen are from some five defined agro-ecological clusters of the country, which have been described already. As will be clear from the following, the nature of our rural inquiry required that we further cluster the upazillas that were selected from the five districts chosen. The focal consideration for the final clustering was whether or not the upazilla was famine-prone.

A close consideration of the questions noted in para 9.3 would appear to suggest that the principal driving query before the MR survey is about the extent of food interventions that MR is currently bringing about for relatively poor people in rural areas. To be more precise, a description of the extent of the distribution of foodgrain within MR in favour of poor people as well as an analysis of some of the important determinants of the participation by the poor in MR are among important objectives of the exercise. The desire to know how the MR is administered for rural people, and about the foodgrain supplementation from other program sources is by way of verifying the presence of other influences which may either complicate or facilitate the problem of food intervention for poor rural people.

Given this view of the MR survey, this is how we actually proceeded in selecting the respondents for it. First, all upazillas in the five districts were clustered on the basis of whether thy are famine-prone or not. For this end, use was made of a study done by Dr. Bruce Currey[1] (Currey, 1978) that utilises a fairly sound methodology in grading each upazilla in each district of the country in terms of its degree of susceptibility to famine. Three such degrees were recognised: (1) very liable to famine; (2) liable to famine; (3) not liable to famine. From each district, one of the upazillas that was graded by Currey as in (1) or (2) above waas first selected. A second upazilla, neither in (1) or (2) above was then so selected that it still appeared, on the criterion of reasonably close proximity to the famine-prone upazilla, to belong to the same broad agro-ecological

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1. Dr. Currey constructed an index of stress at the upazilla level by identifying nine such measures as may either cause or represent the effects of susceptibility to famine, and then by attaching to them scores. These are, (1) frequency of flooding, (2) incidence of drought, (3) population pressure, (4) low crop yields, (5) food deficit (6) lack of alternative employment, (7) poor land transport (8) river erosion (9) incidence of cyclones, and (10) maldistribution of agricultural inputs. zone. From the famine-prone and other upazilla, we then selected one union each such that it was rated by knowledgeable.people contacted (e.g. DC, Food, UFO, businessmen in upazilla head-quarters etc.) as below average for the upazilla concerned.

At union level, of course, no detailing of the geography of stress is available. Recourse must, this being the case, be made to making as informed a judgement as possible about the situation of the unions to be chosen. An attempt was made to base the selection at this stage on three measureable criteria: (1) the number of MR dealers approved to serve the union concerned; (2) total quantity of FFWP and VGFP wheat distributed within particular unions (3) whether the union is well-known about its incidence of farm worker out-migration.

Once the unions were selected, the desired number of households listed on the 'A' and 'B' categories was drawn randomly. A structured questionnaire was then administered on 25 households from each of two upazillas in a districts, making a total of 250 households in the given districts. One return was found unusuable, and discarded. The MR survey of covered households is thus bases on 249 rural households.

Methodology followed in "Non-covered Households" Survey:

Our TOR had asked for, inter alia, an examination of the circumstances of nonparticipation by the poor, especially in rural rationing. This appeared to call for a survey of households that are not covered in the MR regime and yet ought to be covered if they belonged to the admissible chowkidari tax brackets. 50 such non-covered households per district were selected. The MR respondents were each asked if they knew a household head who they knew for sometime now, who were roughly of the same economic situation as they were, but who were never issued with foodgrains under MR. The idea was to find out (a) what percentage of these households are within the tax brackets admissible to MR, (b) what landed, income status and family sizes they have (c) whether their nonparticipation is voluntary or forced etc.

Methodology followed in the U.P. Functionary Survey:

The D.C. Food, the UFO, the elected functionaries of the UP are the three sets of actors who are consequential in understanding how the distribution of MR foodgrains is actually administered. We chose to elicit the perceptions of the UP functionaries as to how the MR in fact works and why. One reason for this selection is that there has not, to this date, been any systematic attempt to obtain the UP perceptions on this subject. Little is known anyway about the distribution of benefits within MR, and our collective ignorance is perhaps at its greatest concerning two aspects of the situation: (a) the perceptions of the poor rural people, who are intended beneficiaries of the programme, about MR and (b) the perceptions of the elected representatives of the local government institutions. Through the UP Functionary survey, we hope to bring a new element to the limited prevailing practice of research in this important area of policy.

The questions that were sought to be answered through this survey embraced the following: (a) whether individual households are periodically issued with cards; (b) are stipulated conditions of eligibility in fact adhered to; (c) what proportion of the total union households are covered, de jure, in the MR; (d) the manner in which inter-union allotment of upazilla allocation is made; (e) in case of an inadequate union-level allotment, the manner in which intra-union distribution is handled; (f) the perceptions of the functionaries themselves as to the extent of the people who were genuinely needy but could not be reached, etc. From every union five UP functionaries were selected: the Chairman, three members, and the Union Family Planning Assistant. In all, there were 48 such interviews.

MR Dealer and Chakki-owner Survey:

An assessment of the changed distribution regime of MR of 1983 being an important objective of the rural part of this exercise, the idea of surveying chakki-owners and MR dealers suggested itself to us. In all, 26 and 28 of chakki-owners and MR dealers each were interviewed from five districts.

Table A9.1

Quantity of Foodgrain Distributed per card, in Rural and Urban Areas, Modified Rationing, 1983/4 1984/5

Division/District	1983/4		1984/5		1983/4		1984/5		1983/4		1984/5	
	Qty. UP	Qty. Poura-shava	Qty. UP	Qty. Poura-shava	No.of cards UP	No.of cards Poura-shava	No.of cards UP	No.of cards Poura-shava	Qty.dist. per cards UP	Qty.dist. per card Poura-shava	Qty.dist. per cards UP	Qty.dist. per card Poura-shava
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Dhaka Division												
Narsingdi	7253	289	6033	193	168.2	7.5	188.7	8.7	41.9	30.3	34.0	24.1
Manikganj	4243	2218	3660	2451	201.2	7.1	201.2	7.1	22.9	340.1	19.0	375.9
Jamalpur	6467	2493	5207	1194	590.0	70.0	598.0	79.5	11.9	30.7	9.7	16.3
Gopalganj	5144	484	4245	420	197.0	2.3	203.0	2.3	20.4	229.1	22.7	198.0
Mymensingh	19510	2364	11351	3450	544.7	22.9	544.7	22.9	39.0	112.4	22.6	164.0
Netrokona	5729	2591	-	-	471.0	8.5	-	-	13..2	331.9	-	.
Faridpur	5230	1026	4992	1241	39.7	9.9	40.0	10.0	143.4	112.0	130.5	135.1
Tangail	9231	4124	8105	3266	167.9	23.9	116.9	23.9	59.0	107.9	75.5	140.0
All districts	62807	15589	43631	12215	2400.5	153.1	1884.5	154.4	28.6	110.7	25.3	86.4

Note: Cols. 2-5 are in long tons
Cols. 6-9 are in 000s,
Cols. 10-13 are in seers.

Source: Data collected from D.C. Food, of 31 new districts.

Table A9.1 Contd.

Division/District	1983/4		1984/5		1983/4		1984/5		1983/4		1984/5	
	Qty. UP	Qty. Poura-shava	Qty. UP	Qty. Poura-shava	No.of cards UP	No.of cards Poura-shava	No.of cards UP	No.of cards Poura-shava	Qty.dist. per cards UP	Qty.dist. per card Poura-shava	Qty.dist. per cards UP	Qty.dist. per card Poura-shava
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Rajshahi Div.												
Lalmonirhat	3410	976	2925	920	31.6	5.2	31.6	5.2	117.7	204.3	100.0	192.6
Dinajpur	5076	2005	3926	1094	-	25.1	-	25.1	-	121.6	-	82.1
Natore	4593	662	2354	950	116.3	5.5	110.3	5.5	43.0	131.0	21.6	109.6
Nilphamari	4011	3115	2956	2542	47.0	20.0	47.0	20.0	92.9	169.6	60.4	130.4
Sirajganj	6526	3742	9970	2290	22.5	10.1	225.0	10.1	315.0	225.1	40.1	137.7
Kurigram	7305	2205	6213	1607	231.9	7.9	231.9	7.9	34.3	314.[illegible]	29.1	221.5
Naoga	6053	2176	5443	2406	197.5	6.0	197.5	7.2	33.3	348.4	30.0	376
Bogra	7621	2095	7062	2494	1910.0	74.1	1893.3	79.7	4.3	42.5	4.0	34.0
All districts	44603	18656	40849	15191	2556.0	162.7	2744.6	168.7	19.1	125.3	16.3	98.4

Table A9.1 Contd.

Division/District	1983/4		1984/5		1983/4		1984/5		1983/4		1984/5	
	Qty. UP	Qty. Poura-shava	Qty. UP	Qty. Poura-shava	No.of cards UP	No.of cards Poura-shava	No.of cards UP	No.of cards Poura-shava	Qty.dist. per cards UP	Qty.dist. per card Poura-shava	Qty.dist. per cards UP	Qty.dist. per card Poura-shava
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Khulna Div.												
Barguna	3002	2992	3387	6019	120.0	3.0	122.0	3.0	35.2	1006.0	30.2	1724.9
Jessore	7236	1137	6091	1057	224.2	19.6	224.2	19.6	35.1	63.1	33.4	50.7
Khulna	6227	-	5040	-	249.0	-	249.4	-	27.1	-	25.5	-
Barail	140	3741	106	2351	98.1	6.3	98.1	6.3	1.5	-	1.1	-
Satkhira	6433	325	6006	246	187.1	41.7	187.1	41.7	37.4	8.4	34.9	6.4
Magerhat	7173	239	5796	257	156.0	5.0	156.0	6.0	50.0	52.0	40.4	46.6
Barisal	9176	723	9250	561	265.2	17.3	265.2	17.3	37.6	45.5	37.9	35.3
All districts	40267	9157	37284	10491	1300.4	92.9	1302	94.7	33.8	107.7	31.3	121.0

Table A9.1 Contd.

Division/District	1983/4		1984/5		1983/4		1984/5		1983/4		1984/5	
	Qty. UP	Qty. Poura-shava	Qty. UP	Qty. Poura-shava	No.of cards UP	No.of cards Poura-shava	No.of cards UP	No.of cards Poura-shava	Qty.dist. per cards UP	Qty.dist. per card Poura-shava	Qty.dist. per cards UP	Qty.dist. per card Poura-shava
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Chittagong Div.												
Sylhet	9973	4039	8562	3641	238.6	15.2	238.6	16.2	45.5	346.6	39.0	240.7
Moulvibazar	3567	1082	3705	1314	26.0	6.6	27.0	6.0	144.9	310.5	149.4	210.4
Khagrachari	5366	-	3778	-	391.3	-	39.3	-	26.0	-	10.5	-
Comilla	15320	2753	13195	2694	-	16.5	-	15.7	-	101.6	-	106.8
Noakhali	7845	3445	5412	2945	203.3	15.9	232.6	16.0	42.0	235.9	25.3	200.4
Bandarban	7456	3299	2100	1952	203.0	-	241.5	-	39.9	-	9.4	-
Cox's Bazar	4124	1475	3567	5356	50.0	3.5	58.0	3.5	76.3	—	66.0	—
Sunamganj	8013	1092	5979	950	230.9	3.4	230.9	3.4	41.5	349.7	28.1	304.2
Chittagong	23154	45847	16302	44646	3731.0	477.6	420.4	470.4	6.7	104.5	42.2	103.3
All districts	89626	64632	62600	63498	5083.7	538.7	1041.1	532	19.3	131.1	37.1	130.4

Table A9.2

Variability of Monthly MR Offtake of Foodgrains, by (new) Districts, 1983/4, 1984/5

Division/ districts	CV of monthly foodgrain distribution in MR		Division/ districts	CV of monthly foodgrain distribution in MR	
	1983/4	1984/5		1983/4	1984/5
(1)	(2)	(3)	(4)	(5)	(6)
Rajshahi			**Dhaka**		
Lalmonirhat	34.3	50.9	Manikganj	34.6	42.0
Dinajpur	73.7	75.3	Narsingdi	42.9	42.9
Natore	28.6	48.7	Mymensingh	47.7	46.9
Nilphamari	29.0	49.2	Tangail	71.6	46.9
Serajganj	27.7	78.0	Jamalpur	24.9	49.1
Kurigram	24.2	42.6	Faridpur	41.5	48.7
Bogra	35.4	47.0	Gopalganj	36.4	50.0
Naoga	39.9	40.8	Netrokona	22.7	-
Khulna			**Chittagong**		
Barguna	37.9	78.2	Khagrachari	29.6	48.8
Bagerhat	31.7	52.4	Bandarban	36.8	45.8
Khulna	34.7	46.2	Cox's Bazar	27.3	48.1
Satkhira	39.1	56.5	Comilla	39.7	48.6
Barisal	38.1	44.1	Noakhali	28.1	47.6
Jessore	37.8	45.5	Sylhet	26.0	42.6
Narail	13.6	60.0	Moulvibazar	33.8	48.6
			Sunamganj	28.5	47.2
			Rangamati	27.1	37.3
			Chittagong	15.0	18.6

Source : Data obtained from DCs, Food.

Table A9.3

Quantity Distributed by New Districts in MR, 1983/4

(long ton, rice + wheat)

Sl. No.	Name of District	Qnty. allotted for distribution by Union Parishad	Qnty. allotted for distribution in Pourashava	(2) + (3)	Qnty. allotted to atta chakkis	(4) + (5)
	(1)	(2)	(3)	(4)	(5)	(6)
1.	Barguna	3882	2992	6874	1223	8097
2.	Lalmonirhat	3418	976	4394	1779	6173
3.	Dinajpur	5076	2805	7881	4417	12298
4.	Sylhet	9973	4839	14812	4319	19131
5.	Narsingdi	7253	209	7462	3539	11001
6.	Jessore	7236	1137	8373	4245	12618
7.	Moulvibazar	3567	1882	5449	2282	7731
8.	Manikganj	4243	2218	6461	2364	8825
9.	Natore	4593	662	5255	2528	7783
10.	Nilphamari	4011	3115	7126	4287	11413
11.	Jamalpur	6467	2493	8960	2976	11936
12.	Khagrachari	9366	-	9366	2322	11688
13.	Serajganj	6526	3742	10268	3441	13709
14.	Kurigram	7385	2285	9598	2098	11688
15.	Naoga	6053	2176	8229	3881	12110
16.	Comilla	15328	2753	18081	7222	25303

Table A9.3 Contd.

Sl. No.	Name of District	Qnty. allotted for distribution by Union Parishad	Qnty. allotted for distribution in Pourashava	(2) + (3)	Qnty. allotted to atta chakkis	(4) + (5)
	(1)	(2)	(3)	(4)	(5)	(6)
17.	Bogra	7621	2895	10516	5233	15749
18.	Khulna	6227	-	6227	2859	9086
19.	Noakhali	7845	3445	11290	2376	14666
20.	Bandorban	7456	3299	10755	2429	13184
21.	Cox's Bazar	4124	1475	5599	1870	7469
22.	Gopalganj	5144	484	5628	2588	8216
23.	Barail	140	3741	3881	46	3927
24.	Sunamganj	8813	1092	9905	2508	11963
25.	Satkhira	6433	325	6758	3335	10093
26.	Bagerhat	7173	239	7412	3229	10641
27.	Mymensingh	19510	2364	21874	9728	31602
28.	Netrokona	5729	2591	8320	2989	11309
29.	Faridpur	5230	1026	6256	3054	9310
30.	Chittagong	23154	45847	69001	11995	80996
31.	Dinajpur	4717	2459	7176	4782	11958
	Total	223613	105566	329239	112494	441733

Table A11.1

Selected Foodgrain Variables in Bangladesh, 1960/1 through 1984/5: Average Values and CV

Variables	1960/1 - 1969/70		1972/3 - 1984/5		both periods, taken together	
	Mean	CV	Mean	CV	Mean	CV
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rice output	9166	1.0	11326	1.1	10331	1.6
Wheat output	43	11.5	384	16.8	148	27.3
Foodgrain output	10266.3	8.7	13278.6	12.6	11968.9	17.1
Rice import	309	8.0	217	15.2	253	12.6
Wheat import	414	11.9	1400	5.4	827	12.3
Foodgrains import	774	6.7	1671	5.3	1196	7.9
Rice availability	9503	0.9	11566	1.1	10619	1.5
Wheat availability	529	8.3	1858	4.3	1076	10.8
Foodgrain avai' bility	10081	1.0	13484	1.2	11883	1.9

Source: For 1960/1-1969/70, figures on quantity of foodgrain output are from Thomas, 1982, for 1972/3-1984, they are from BBS, 1985.

Table A11.2

Estimated Trend Equations for Three Foodgrain Variables, 1960/1 through 1984/5

Periods/ Regressands	N	Constant term	Trend coefficient	$\bar{R}^2$	Residual Mean square	$\bar{Y}$	D - W statistic
1960/1-1969/70							
1. Net production	10	9.0	+ 0.024 (3.6)	0.57	0.0036	9.327	2.32
2. Imports	10	6.85	+ 0.11 (3.1)	0.49	0.1026	6.65	1.65
3. Availability	10	9.06	+ 0.028 (5.9)	0.79	0.0018	9.210	1.57
1972/3-1984/5							
4. Net production	13	9.15	+ 0.033 (11)	0.90	0.0018	9.30	3.02
5. Imports	13	7.42	+ 0.0023 (..)	(-)0.09	0.17	7.42	1.98
6. Availability	13	9.03	+ 0.028 (10.7)	0.90	0.0013	9.509	2.36
1960/1-69/70, 72/3-84/5							
7. Net production	23	8.98	+ 0.024 (13.5)	0.90	0.0032	9.27	2.46
8. Imports	23	6.38	+ 0.058 (4.5)	0.47	0.17	7.09	1.50
9. Availability	23	9.07	+ 0.026 (21.0)	0.96	0.0014	9.383	2.0

Notes: To conserve space, only overall relations, regardless of their division into rice and wheat, are reported here. CV around a trend line is computed as $(SEE/\bar{Y}) \times 100$, where SEE is standard error of estimate and $\bar{Y}$ is mean of logarithmic values of the dependent variable. SEE itself computed as under-root of residual mean square. The residual mean square equal to residual sum of squares divided by its degrees of freedom. Our estimates of instability is found to be much lower than that reported by Murshid, for reasons not presently known. The symbol .. denotes insignificant.

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