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**FOOD AID AND PRODUCER PRICE
INCENTIVES**

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EXECUTIVE SUMMARY

Food aid, (aid supplied as food commodities on grant or concessional terms), has played a useful role in Government of Bangladesh efforts to increase food security in the last three decades. At the national level, food aid has added to foodgrain availability, helping to reduce the gap between foodgrain consumption needs and supply from domestic production. And at the household level, food aid has increasingly been targeted to poor households, increasing their access to food. Moreover, resources from food aid have helped successful development projects and programs in Bangladesh. However, sustained increases in domestic production of both rice and wheat have increased the likelihood of disincentive effects arising from continued large inflows of food aid.

Food aid to Bangladesh and total global food aid deliveries (both predominantly in the form of wheat) have varied substantially over time. Total food aid worldwide increased between the 1970s and the 1980s, and peaked in 1992/93 at 15.2 million tons. Subsequently, total food aid flows declined steeply to only 5.6 million MTs in 1996/97 as U.S. contributions fell from 8.5 million MTs in 1992/93 to only 2.3 million MTs in 1996/97. Total food aid again increased in 1998/99 and 1999/2000 to over 10 million MTs each year, with the U.S. contributing about 60 percent of the total, similar to its average over the past two decades. These fluctuations in food aid at the global level to a large extent reflect supply considerations in donor countries.

Food aid to Bangladesh has declined over time, from on average of about 1.2 million tons per year in the 1970s and 1980s to only about 600 thousand tons by the end of the 1990s. Uses of food aid have also changed over time. In the seventies, much of the food aid was sold in PFDS channels, with the counterpart funds used for general public expenditures. In later years, donors introduced conditions for the use of counterpart funds, stipulating that they be used for jointly agreed projects, and eventually discontinued monetization of food aid through sales channels. Reforms of the PFDS in the late 1980s, including a gradual reduction of the subsidy in sales channels, eventually

led to closing of major sales channels in the early 1990s. By the late 1990s, about 85 percent of all PFDS distribution was disbursed through channels targeted to poor households and food aid accounted for about one-third of total PFDS distribution of about 1.8 million MTs per year. In contrast, food aid from 1986/87 through 1991/92 averaged 1.4 million MTs per year, accounting for nearly 60 percent of average distribution of 2.4 million MTs.

DISINCENTIVE EFFECTS OF FOOD AID

Food aid can potentially adversely affect domestic food production and incomes in several ways. First, it can reduce domestic prices and farmers' incentives for domestic production. Second, food aid can enable countries to neglect their domestic agriculture through inadequate lower public investment in rural infrastructure, agricultural research and extension, as well as price and trade policies biased against the agricultural sector. Third, food aid supported projects can potentially distort local labor markets. This report focuses on producer price disincentive effects in the context of Bangladesh.

Since food aid ultimately increases market supply of wheat, it has the potential to lower domestic wheat prices and adversely affect incentives for domestic wheat production and incomes of wheat farmers. Whether food aid actually lowers market prices, however, depends on whether food aid is simply replacing public or private imports, or whether food aid is actually increasing total domestic supply of wheat. In other words, in order to avoid depressing market prices below import parity prices, the total level of food aid must not exceed the amount of wheat that would be imported by the private sector under free trade in the absence of food aid.

From early 1998 through mid-2000, private sector imports were substantial and Bangladesh domestic prices for wheat closely tracked import parity prices. Private sector wheat imports surged in the months immediately after the mid-1998 floods, averaging 111 thousand MTs per month from September through December 1998 and remained high through 1999/2000. In 1999/2000, a total of 1.619 million MTs of wheat was

supplied to domestic markets through private sector imports (806 thousand MTs) of wheat and public net distribution (total distribution less domestic procurement of 813 thousand MTs). Given that domestic prices remained close to estimated import parity prices for most of the year, and perhaps more important, that large amounts of wheat were imported by the private sector, it appears that food aid did not lead to price disincentive effects for Bangladesh wheat farmers in 1999/2000.

After April 2000, however, national average domestic wheat prices fell to an average of 1.1 Tk/kg below estimated import parity levels. Nonetheless, private sector imports remained high. From April through June 2000, this was apparently due to imports of exceptionally low-priced wheat (about \$130/MT C&F Chittagong) from the EU and Turkey. Later in 2000, however, private market imports considerably slowed, suggesting that private imports of non-milling wheat (wheat with a lower gluten content, like that produced in Bangladesh) may not have been profitable.

The “safe” level of food aid (the maximum amount of food aid that can be distributed without having an adverse effect on wheat prices) depends on several factors, including international wheat prices, price-responsiveness of wheat consumers and producers (as reflected in elasticities of wheat supply and demand), and domestic rice prices. The higher the import parity price of wheat, the smaller the amount of net public distribution of wheat that can be distributed without depressing domestic wheat market prices below import parity. For example, with a medium-level rice price of 12.24 Tk/kg (the average wholesale price in 1999/2000), raising the import parity price of wheat from 9.2 to 12.2 Tk/kg reduces the “safe level” of food aid from 1.132 to 0.623 million MTs, (assuming inelastic supply and demand for wheat). More elastic supply and demand parameters imply that changes in the import parity price have a larger effect on the total quantity of wheat import demand. Thus, with a more elastic demand and supply, raising the import parity price from 9.2 to 12.2 Tk/kg reduces the “safe level” of food aid from 0.999 to 0.004 million MTs. Finally, rice prices have a major impact on the “safe level”

of food aid. With low rice prices, wheat demand falls, by about 200 thousand MTs with inelastic parameters and 350 to 400 thousand MTs with elastic parameters.

Disincentive effects of food aid on wheat prices are plausible in Bangladesh. Net public wheat distribution on the order of 800 thousand MTs (the figure was 813 thousand MTs in 1999/2000) exceeds the “safe level” of food aid under all scenarios with low rice prices except that of low international prices and inelastic demand parameters. Even with inelastic demand parameters, the “safe level” of net wheat public foodgrain distribution is only 838 thousand MTs, only 25 thousand MTs more than actual distribution in 1999/2000, (a year, however, that had lower international wheat prices).

Note that these figures are based on the distribution pattern of wheat in 1999/2000, when 351 thousand MTs of wheat were distributed through Food For Education, Vulnerable Group Development and Vulnerable Group Feeding, programs for which participants have a high marginal propensity to consume (MPC) wheat out of transfers received. Assuming an MPC for wheat of about 0.3 in these programs, then these programs created an additional wheat demand of about 105 thousand MTs. If cuts in wheat distribution take place in these programs, this additional wheat demand will be lost, as well, with a potentially negative effect on domestic prices.

With net PFDS wheat distribution of 900 thousand MTs and medium-level rice prices, wheat prices in Bangladesh would be 10.44 Tk/kg in the absence of non-milling wheat imports by the private sector. This price is 10.6 percent below long-term import parity of 11.67 Tk/kg (calculated using the average dollar price of U.S. Hard Red Winter #2 wheat over the 1995/96 – 1999/2000 period, adjusted for quality, transport and marketing costs). If net PFDS wheat distribution were only 600 thousand MTs, then the market-clearing price would be 12.32 Tk/kg, which would be above the long-term import parity price.

Thus, net PFDS wheat distribution of 900 thousand MTs has small price disincentive effects on wheat production even with medium-level rice prices, and the

disincentive effects are quite large (-20.3 percent) when domestic rice prices are low, as in 2000. Reducing net PFDS wheat distribution to 600 thousand MTs completely eliminates the price disincentive effect with medium-level rice prices (and inelastic parameters). If the more elastic parameters are a better indication of medium-term supply and demand behavior, however, then there are still significant price disincentives, even with average medium-level rice prices and only 600 thousand MTs of net wheat distribution.

Reducing net PFDS wheat distribution from 900 to 600 thousand MTs can be accomplished relatively easily by substituting domestic wheat procurement for commercial imports and stock drawdowns. Cutbacks below 600 thousand MTs, of course, imply a reduction in food aid.

CONCLUSIONS

If good rice harvests continue so that real rice prices remain at their levels of 2000, and if international wheat prices return to their average 1995-99 levels, then net public wheat distribution may need to be cut to levels below the current amount of food aid received (650 thousand MTs in 2000/2001) to avoid reducing domestic prices below import parity.

Cuts in food aid, however, could potentially cost Bangladesh millions of dollars per year in resources that currently provide the resources for programs that increase access to food by poor households. A major loss of resources for food security need not occur in this scenario, though. In place of the food aid imports, donors could provide the equivalent value of resources in the form of cash, either to permit the Government of Bangladesh to procure foodgrain locally for these programs or to use directly in re-designed Cash for Work or other cash programs.

Continued good harvests depend on adequate funding of agricultural research and extension, maintaining appropriate price incentives for production, timely input supplies at reasonable prices, and the weather. If these prerequisites are met, foodgrain

availability targets are likely to be achieved. Resources, however, will continue to be required for programs that increase access to food by the poor, contribute to increased utilization of food and result in improved nutritional outcomes. Thus, it is important that resources devoted for food security in Bangladesh not decrease, even if the need for food aid to increase availability of foodgrains diminishes.

1. INTRODUCTION

Food aid, (aid supplied as food commodities on grant or concessional terms),¹ has played a very large and useful role in Government of Bangladesh efforts to increase food security in the last three decades. At the national level, food aid has added to foodgrain availability, helping to reduce the gap between foodgrain consumption needs and supply from domestic production. And at the household level, food aid has increasingly been targeted to poor households, increasing their access to food. Moreover, resources from food aid have helped successful development projects and programs in Bangladesh and many other developing countries (Singer et al., 1987, Clay and Stokke, 1991, Ruttan, 1993).

As Bangladesh foodgrain production has increased, due in large measure to green revolution technology, improved seeds, investments in irrigation, and increased use of fertilizer, food aid's share of total foodgrain availability has fallen. There are important exceptions to this long-term trend of diminishing importance of food aid, however, when exceptional domestic production shortfalls occur, such as in 1998, when major floods severely damaged the *aman* rice crop and food aid levels were substantially increased. Nonetheless, general increases in domestic production, the demonstrated effectiveness of private sector imports to augment domestic supply, the relatively high cost of delivery of food aid, and concerns over possible price disincentive effects on domestic production have led some food aid donors to reconsider their use of food aid as a tool to enhance food security in Bangladesh. Other critics of food aid have pointed to the political and commercial motives that have sustained food aid flows, criticisms that may be equally

¹ Food aid includes donations of food commodities by governments, intergovernmental organizations such as the World Food Programme (WFP), and private voluntary and non-governmental organizations, monetary grants tied to food purchases, and sales and loans of food commodities on credit terms with a repayment period of three years or more (FAO, 1980).

applicable to other forms of aid.

The conditionality attached by donors to food aid has varied over time, and even across programs for a single donor in a single year. In addition, over the past three decades, food aid to Bangladesh has gradually shifted from program (non-project) to project food aid, (along with a continuing component of emergency relief, when needed) though the distinction between these categories is often not easily made.² No matter what the end use of food aid, however, it also provides balance payment and budgetary support for Bangladesh, saving the country foreign exchange and government budgetary resources.

This study examines the role of food aid in food security in Bangladesh, placing a special emphasis on implications of changes in the level of food aid inflows for market prices, domestic production and government expenditures. Chapter 2 examines the evolution of food aid flows globally. Chapter 3 summarizes the findings of a major review of global food aid policies and programs by Shaw and Clay (1993). Chapter 4 presents an overview of the debate regarding disincentive effects of food aid. Chapter 5 discusses food aid in Bangladesh, providing a brief history and a description of food-assisted programs and data on levels, composition and trends in food aid and public foodgrain distribution. Chapter 6 contains an analysis of the impact food aid on market prices, imports and domestic production. Conclusions and policy implications are presented in Chapter 7.

² The early literature and official statements by donors emphasized the role of food in directly supporting development by: program food aid releasing balance of payments constraints and providing budgetary support for development plans with ambitious growth rates, and project food aid being used to create infrastructure and develop human capital. Humanitarian assistance received only slight mention. (Shaw and Clay, 1993; p. x).

2. EVOLUTION OF GLOBAL FOOD AID FLOWS

HISTORICAL BACKGROUND³

Food aid programs have been a major part of development assistance since the middle of 20th century. Following World War II, food aid was included in U.S. rehabilitation efforts in western Europe and gradually used in relief and development assistance by more donors and to more recipients. Subsequently, the creation of the World Food Programme (WFP) in 1961 added an important multilateral dimension. Then, in 1967, an important step was taken with the signing of the first Food Aid Convention, an international agreement in which more donors committed to provide food.

The 1970s were a decade of international food crisis, with many developing countries confronting what had come to be known as problems of food insecurity. The United Nations World Food Conference held in Rome in November 1974 called for an improved policy for food aid. The problems of food insecurity and poverty in Asia still dominated the international agenda, with famine in Bangladesh in 1974 and severe distress elsewhere in the region. But the food crisis in Africa also caught the attention of the world community. The international aspect of food aid was further enhanced with the continued growth of WFP, the establishment of the International Emergency Food Reserve and agreement on guidelines and criteria governing all food aid.

The 1980s have been described as the lost decade of development for many developing countries, a situation exacerbated by food crisis and hunger in Africa. By this time, developments in telecommunications had created a 'global village' so that the interactions of drought and civil war provided headlines and television pictures worldwide, resulting in the Band Aid phenomenon of massive public support for help to

³ This section draws heavily on the Introductory Chapter (Convergence and Diversity) of Shaw and Clay (1993).

developing countries. These events also provoked a considerable amount of policy analysis on how to make food aid more effective in providing relief and in strengthening food security. The 1980s also became the decade of structural adjustment as developing economies hard hit by international recession and debt struggled to cope with the economic and human consequences of what increasingly came to be seen as unavoidable national and sectoral adjustment.

Poverty alleviation in developing countries was once again prominent on the international agenda at the beginning of the 1990s. The simultaneous outbreak of large-scale natural and man-made disasters, particularly, though not exclusively, in Africa, dominated the work of donors and aid agencies, resulting in a shift of effort from development activities to emergency relief, and a search for ways to strengthen the interrelation between the two. The role of WFP increased further, particularly in providing assistance to famine-threatened populations and in feeding the ever-growing number of refugees and displaced people, as well as in helping to co-ordinate food aid from all sources.

TRENDS IN GLOBAL FOOD AID

World food aid varied between 8 to 9 million tons in the 1970s, between 9 and 13 million tons in the 1980s, and between 6 and 15 million tons in the 1990s (Table 2.1, Figure 2.1). Over the period as a whole, however, there was a slight upward trend in food aid, as world food aid grew at an annual rate of 0.38 percent per year from 1971/72 to 1999/2000. Average growth rates varied by period, with a negative annual growth rate of food aid of 0.84 percent per year in the 1970s, a positive annual growth rate of 3.29 percent in the 1980s, and a negative annual growth rate of 6.07 percent in the 1990s.

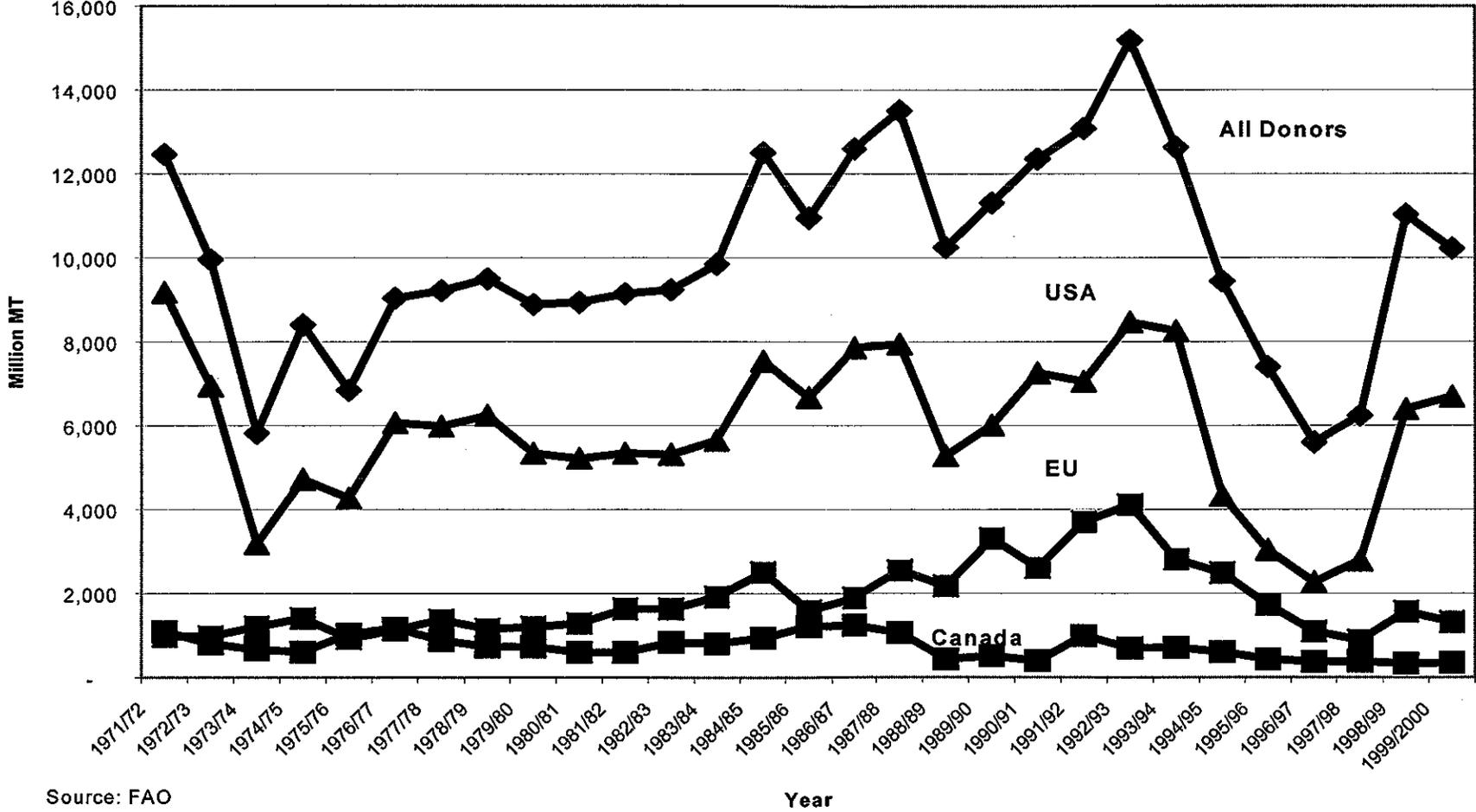
As part of the Uruguay Round of GATT in the mid-1980s, farm support programs were reduced, affecting the world trade of agricultural products. The reduction in food aid began even prior to the Uruguay Round agreement, however. During 1971/72 to 1985/86 food aid grew at an annual rate of 1.53 percent, but declined by 3.35 percent per

Table 2.1 — Food Aid by Various Donor Countries, 1971-2000

Year	(000 MT)															
	All Donors	Canada	US	EU	Japan	Australia	Oth. Europe	Oth. Donors	All Donors	Canada	US	EU	Japan	Australia	Oth. Europe	Oth. Donors
1971/72	1.25	0.11	0.92	0.10	0.07	0.02	0.00	0.02	12,468	1,093	9,174	978	731	215	32	243
1972/73	1.00	0.08	0.69	0.10	0.05	0.03	0.01	0.03	9,956	808	6,948	978	528	259	113	322
1973/74	0.58	0.07	0.32	0.12	0.04	0.02	0.01	0.01	5,818	664	3,186	1,209	350	222	116	71
1974/75	0.84	0.06	0.47	0.14	0.02	0.03	0.04	0.08	8,399	612	4,722	1,413	182	330	368	773
1975/76	0.68	0.10	0.43	0.09	0.00	0.03	0.01	0.02	6,844	1,034	4,273	928	33	261	119	196
1976/77	0.90	0.12	0.61	0.11	0.01	0.02	0.02	0.02	9,042	1,176	6,066	1,131	68	230	198	172
1977/78	0.92	0.09	0.60	0.14	0.01	0.03	0.02	0.04	9,211	884	5,988	1,374	135	252	193	385
1978/79	0.95	0.07	0.62	0.12	0.04	0.03	0.02	0.05	9,500	735	6,238	1,159	352	329	154	533
1979/80	0.89	0.07	0.53	0.12	0.07	0.03	0.02	0.04	8,887	730	5,339	1,206	688	315	160	449
1980/81	0.89	0.06	0.52	0.13	0.09	0.04	0.02	0.03	8,942	600	5,212	1,292	914	370	210	344
1981/82	0.91	0.06	0.53	0.16	0.05	0.05	0.02	0.04	9,140	600	5,341	1,639	507	485	206	361
1982/83	0.92	0.08	0.53	0.16	0.05	0.03	0.02	0.03	9,238	843	5,315	1,639	517	349	214	301
1983/84	0.98	0.08	0.57	0.19	0.04	0.05	0.02	0.04	9,849	817	5,655	1,923	445	460	181	368
1984/85	1.25	0.09	0.75	0.25	0.03	0.05	0.02	0.06	12,511	943	7,536	2,508	295	466	205	558
1985/86	1.09	0.12	0.67	0.16	0.05	0.03	0.02	0.05	10,949	1,216	6,675	1,600	450	345	157	505
1986/87	1.26	0.12	0.79	0.19	0.05	0.04	0.02	0.05	12,599	1,240	7,861	1,896	529	368	236	470
1987/88	1.35	0.11	0.79	0.26	0.06	0.04	0.03	0.08	13,503	1,062	7,946	2,554	561	355	267	758
1988/89	1.02	0.04	0.53	0.22	0.04	0.04	0.03	0.06	10,249	430	5,286	2,175	441	353	274	550
1989/90	1.13	0.05	0.60	0.33	0.04	0.03	0.02	0.01	11,315	512	6,018	3,313	430	305	193	95
1990/91	1.24	0.04	0.73	0.26	0.05	0.03	0.03	0.01	12,357	387	7,260	2,608	512	349	336	142
1991/92	1.31	0.10	0.71	0.37	0.04	0.03	0.03	0.03	13,086	996	7,052	3,707	387	328	292	323
1992/93	1.52	0.07	0.85	0.41	0.04	0.02	0.03	0.09	15,184	702	8,466	4,114	358	232	307	936
1993/94	1.26	0.07	0.83	0.28	0.04	0.02	0.03	0.02	12,633	712	8,258	2,812	378	219	289	235
1994/95	0.94	0.06	0.43	0.25	0.04	0.03	0.09	0.05	9,443	602	4,321	2,488	398	258	922	454
1995/96	0.74	0.04	0.30	0.17	0.08	0.02	0.08	0.04	7,397	436	3,037	1,731	821	181	757	434
1996/97	0.56	0.04	0.23	0.11	0.03	0.02	0.08	0.05	5,605	373	2,273	1,099	292	170	849	549
1997/98	0.62	0.04	0.28	0.09	0.04	0.03	0.09	0.06	6,241	384	2,787	890	356	296	946	582
1998/99	1.10	0.03	0.64	0.16	0.09	0.03	0.10	0.05	11,034	332	6,390	1,572	936	267	1,012	525
1999/2000	1.02	0.03	0.67	0.13	0.03	0.03	0.08	0.05	10,228	349	6,693	1,324	303	264	844	451
Average 1970's									8,905	876	5,824	1,146	297	262	162	337
Average 1980's									10,587	848	6,217	1,843	535	387	211	466
Average 1990's									10,430	544	5,586	2,433	487	261	590	428

Source: FAO/INTERFEIS

Figure 2.1 — Food Aid of USA, EU and All Donors



Source: FAO

year during the 1985/86 to 1999/2000 period. The rate of growth from 1993/94 to 1999/2000, i.e. since the signing of the WTO agreement, was only negative 1.76 percent per year. Throughout these periods, wheat food aid was on average only around 0.003 percent of developed countries' wheat production, ranging from 0.0033 percent in the 1970s to 0.0042 percent in the early nineties but then declined to 0.0026 percent by 2000.

Over time, food aid contributions by donor have become more diversified. Food aid began with United States aid under Public Law 480, and in the 1950s the U.S. was the sole donor of food aid. By the 1970s, the US share was just over sixty percent, with the EU and Canada each contributing about 10 percent of the total. During the decade from 1987/88 to 1997/98, contributions by the U.S., Canada and Japan declined, Australia's contribution remained roughly constant, and that of the EU increased. However, in the late 1990s, the U.S. enjoyed bumper wheat harvests, and U.S. food aid contributions in 1998/99 and 1999/2000 almost equaled the preceding four years' contributions combined (Table 2.2 and Figure 2.2).

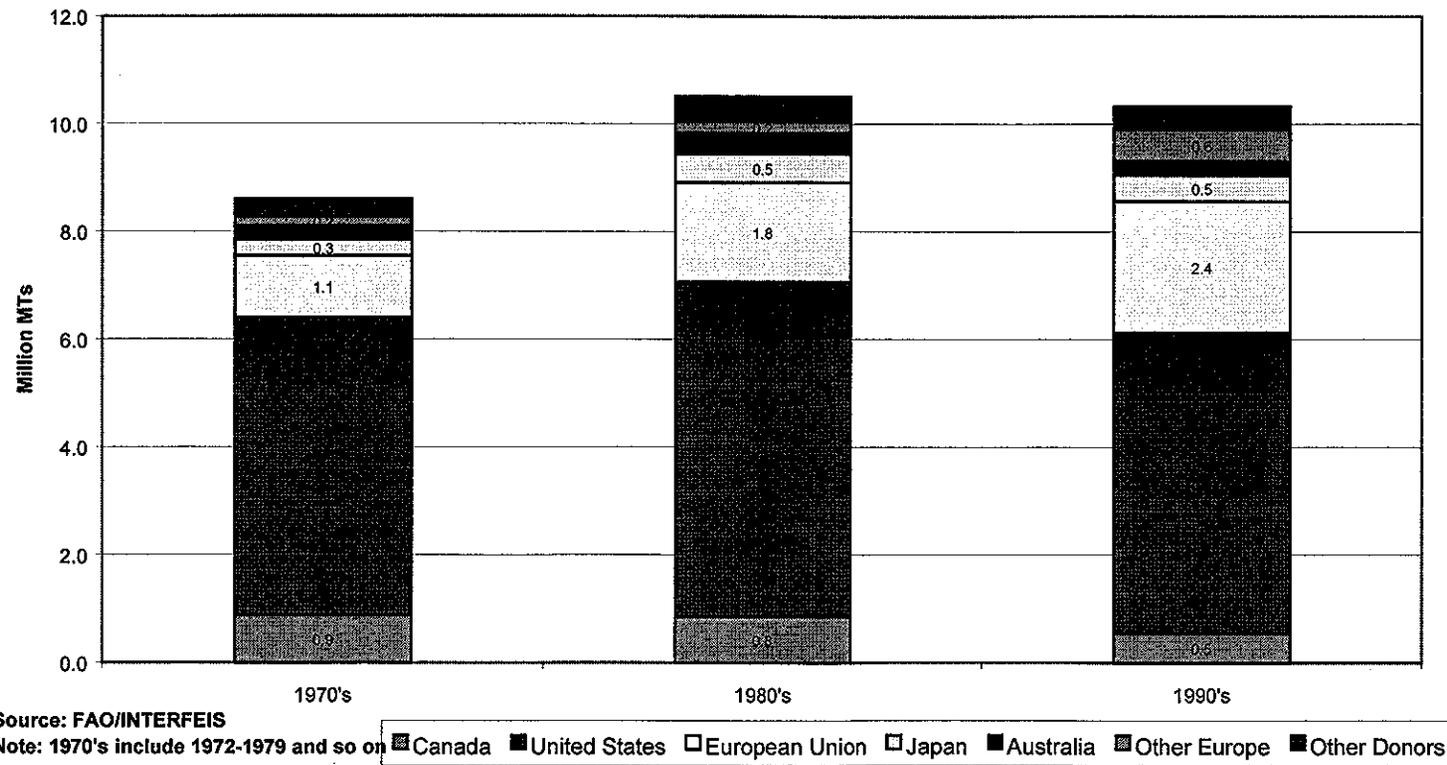
Table 2.2 — Global Food Aid by Donor

	(in million MTs)		
	1970's	1980's	1990's
Canada	0.9	0.8	0.5
United States	5.5	6.2	5.6
European Union	1.1	1.8	2.4
Japan	0.3	0.5	0.5
Australia	0.3	0.4	0.3
Other Europe	0.2	0.2	0.6
Other Donors	0.3	0.5	0.4
All Donors	8.9	10.6	10.4

Source: FAO/INTERFEIS

Note: 1970's include 1971/72-1978/79 and so on

Figure 2.2 — Composition of Food Aid by Donor: Average in 1970's, 1980's and 1990's



The composition of food aid has also fluctuated along with the total volume of aid and the source of food aid. Wheat and wheat flour accounted for about 70 percent of food aid in the 1970s, 66 percent in the 1980s and only 53 percent in the 1990s. Increases in the share of non-cereal food aid, from a mere 1.70 percent during the 1970's to about 11.50 percent in the 1990's account for much of the difference in wheat's share. The quantity of coarse grain distributed as food aid has also increased, from an average of 1.1 million MTs per year in the 1970s to 2.7 million MTs per year in the 1990s, while the quantity of other cereals declined from 1.9 million MTs per year to 1.5 million MTs in the same period (Table 2.3 and Figure 2.3)

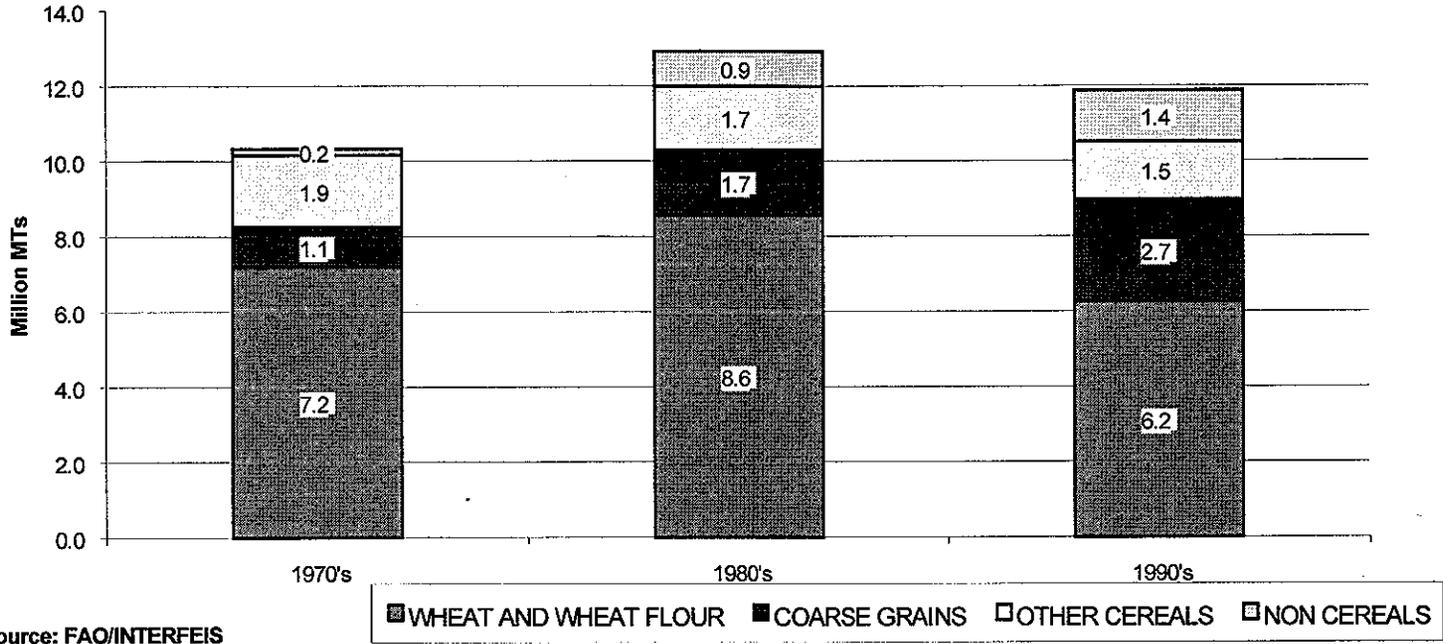
Finally, delivery mechanisms of food aid have changed over time, as well. During the 1990s, program aid declined from 8.45 million MTs in 1990 to 2.73 million MTs in 1998, before increasing again to 7.39 million MTs in 1999. Project aid remained almost constant during the decade, but emergency relief aid fluctuated substantially, from 2.04 MMTs in 1990 to 4.70 MMTs in 1999 (Table 2.4 and Figure 2.4).

Table 2.3 — Composition of Food Aid by Commodity

	(in Million MTs)		
	1970's	1980's	1990's
Wheat and Wheat Flour	7.193261	8.556168	6.24733
Coarse Grains	1.060324	1.74466	2.723226
Other Cereals	1.906037	1.687463	1.535855
Cereals, Total	10.15962	11.98829	10.50641
Non Cereals	0.171136	0.928127	1.364943
Total Food Aid	10.33076	12.91642	11.87135

Source: FAO/INTERFEIS

Figure 2.3 — Composition of Food Aid by Commodity: Average in 1970's, 1980's and 1990's



Source: FAO/INTERFEIS
 Note: 1970's include 1970-1979 and so on



Table 2.4 — Global Food Aid Deliveries by Category: 1990-1999

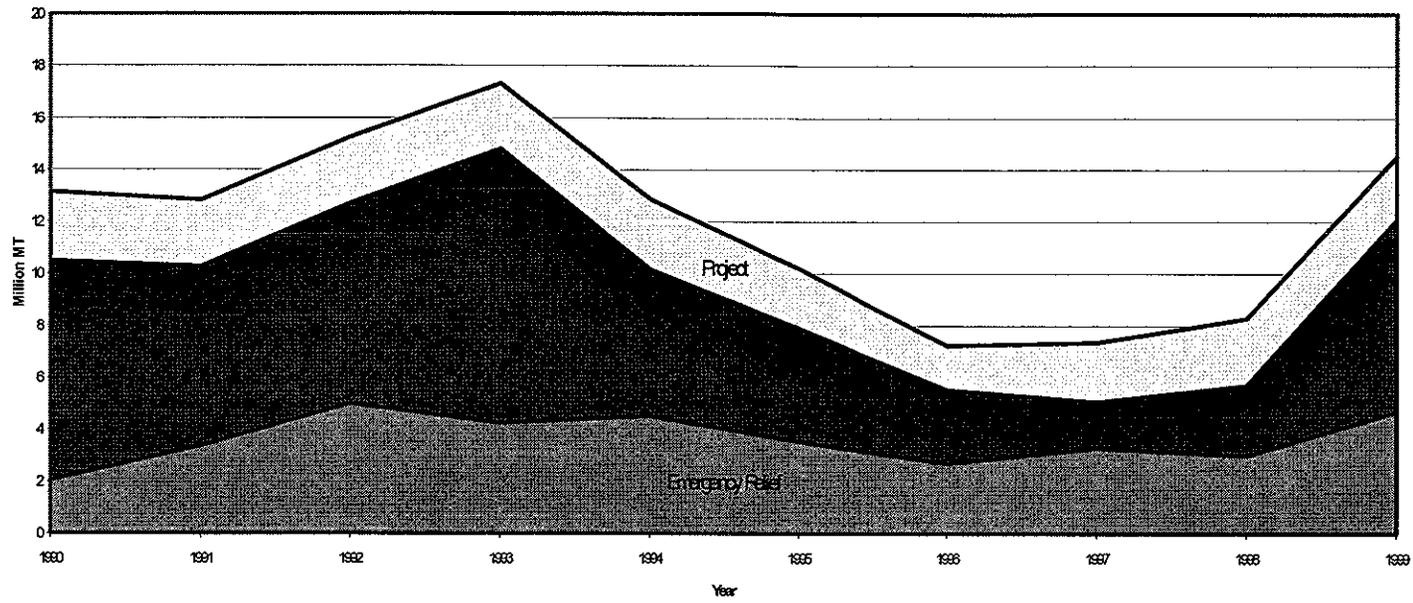
(in million MTs)

Year	Emergency			Total
	Relief	Program	Project	
1990	2.04	8.45	2.66	13.2
1991	3.37	6.9	2.55	12.8
1992	5.01	7.69	2.57	15.3
1993	4.25	10.57	2.51	17.3
1994	4.52	5.66	2.71	12.9
1995	3.55	4.34	2.31	10.2
1996	2.69	2.86	1.7	7.3
1997	3.31	1.77	2.29	7.4
1998	2.98	2.73	2.57	8.3
1999	4.69	7.39	2.42	14.5

Source: WFP/INTERFAIS

Figure 2.4 — Global Food Aid Deliveries by Category: 1990-1999

Source:



WFP/INTERFEIS

3. THE CHANGING GEOGRAPHICAL FOCUS OF FOOD AID

From the 1970's to the early 1990's, there was a substantial shift in focus of food aid flows from South Asia to Africa, which is illustrated by the experiences of the three South Asian Countries of Bangladesh, India and Pakistan in contrast to those of other recipient countries⁴. These and other Asian countries had been moving towards self-sufficiency in basic food staples, exploiting the technological opportunities of the Green Revolution. In contrast, no general trends were observable for food aid in the middle-income countries of Latin America or the Middle East and North Africa during this period. Much of Sub-Saharan Africa experienced increasing food deficits with high population growth and urbanization, but low per capita economic growth rates exacerbated by drought and other disasters. Variability in food production has resulted in acute problems of food insecurity.

Following the marked increase in global food aid deliveries to both Asia and the sub-Saharan Africa in the early 1990s, there was a gradual decline in the food aid to these regions from 1993 to 1996. Thereafter, food aid for Sub-Saharan Africa gradually declined while food aid to Asia increased sharply. The most dramatic fluctuations in food aid, though, was for food aid to Europe and the CIS countries, which increased very sharply from 1991-1994, then fell until 1998, only to increase again in 1999 (Table 3.1 and Figure 3.1).

During the 1990s, Bangladesh was the largest recipient of food aid, receiving an average of 868 thousand MTs per year, 7.2 percent of the total (Table 3.2 and Figure 3.2). The next three largest recipients were all in Sub-Saharan Africa: Ethiopia (6.2 percent),

⁴ This paragraph is based on Shaw and Clay (1993).

Table 3.1 — Global Food Deliveries by Region: 1990-1999

Year	(in million MTs)					Total
	Sub-Saharan Africa	North Africa and Middle East	Asia	Latin America and Caribbean	Europe and CIS	
1990	2.99	2.81	2.79	2.31	2.25	13.2
1991	4.03	3.08	2.7	2.01	0.9	12.8
1992	6.18	1.53	2.66	1.85	3.07	15.3
1993	4.87	0.96	2.19	2.1	7.2	17.3
1994	4.48	0.87	2.52	1.32	3.71	12.9
1995	3.3	0.63	2.39	0.93	2.96	10.2
1996	2.6	0.57	2.01	0.76	1.31	7.3
1997	2.47	0.37	2.82	0.65	1.06	7.4
1998	2.82	0.35	3.23	0.99	0.87	8.3
1999	2.84	0.46	4.9	1	5.29	14.5

Source: WFP/INTERFAIS

Egypt (3.8 percent), and Mozambique (3.2 percent). India and Pakistan, with shares of 2.8 and 1.9 percent, respectively, were also among the top ten food recipient countries.

IMPACTS OF THE POST-WTO NATIONAL AGRICULTURAL POLICIES ON WORLD WHEAT PRODUCTION

As shown in Table 3.3, world production of wheat grew at a rate of 2.05 percent per year during the 1970-2000 period. However, the average growth rate in production after the signing of WTO in 1994 was only 1.39 percent per year, down 1.04 percent in comparison with the pre-WTO period, (2.40 percent per year). The decline in the growth rate of wheat production of developing countries was even more pronounced. In the post WTO period, wheat production in developing countries grew by an average of 1.47 percent per year, compared with 3.52 percent in the pre-WTO period. The growth rate of developed countries, however, declined only marginally from 1.85 percent per year in the 1970-93 period to 1.34 percent per year in the 1994-2000 period, (Table 3.4, Figure 3.3).

Among major food aid donor countries, wheat production trends in the post-WTO period were mixed. US wheat production actually declined in the post WTO period, except for bumper crops in 1997 and 1998, and the trend growth rate was -0.26 percent

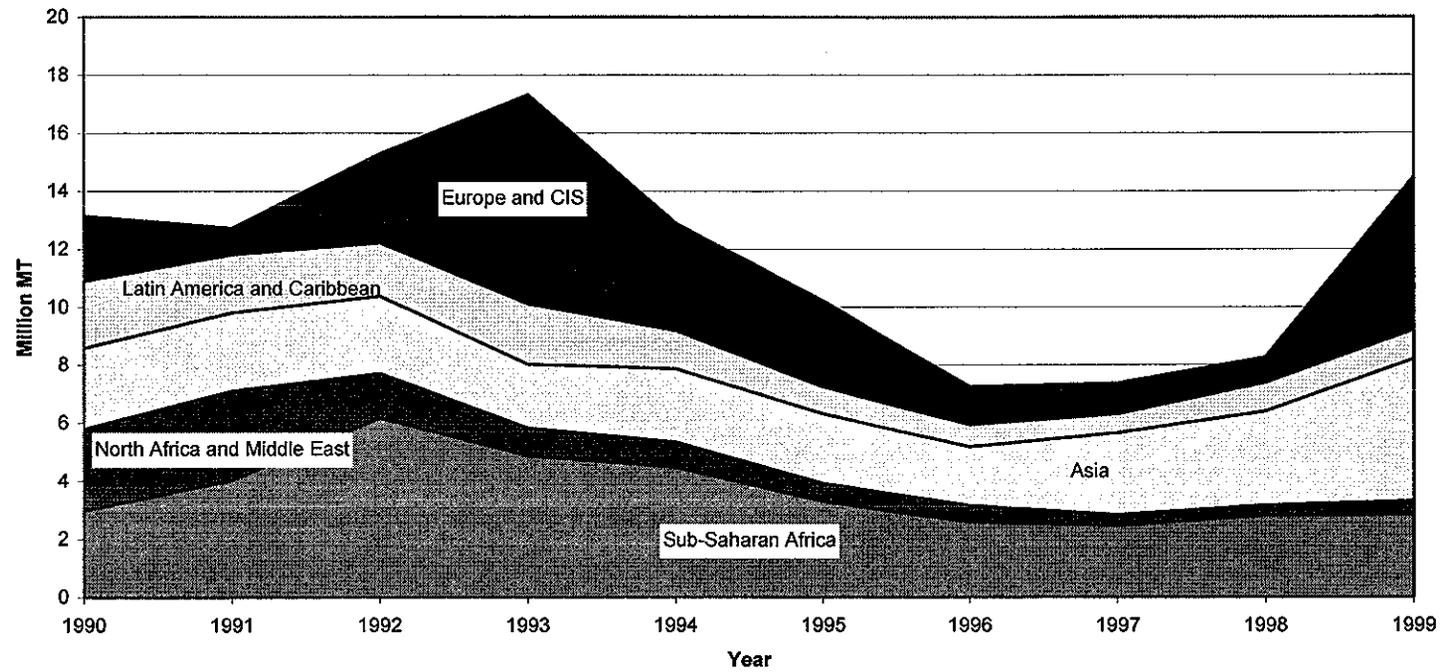
Table 3.2 — Global Food Aid Deliveries by Top 10 Recipient Countries: 1990-1999

(in 000 MT)

Year	Angola	Ethiopia	Mozambique	Sudan	Egypt	Bangladesh	India	Korea, DPR	Pakistan	Peru	Former Yugoslavia	other countries	Total
1990	123.6	863.8	422.6	230	1065.6	1050.2	382.2	0	461.9	359.4	0	8190.7	13150
1991	135.6	943.8	542.7	549.6	1823.6	1083	250.1	0	358.3	406.3	0.2	6723	12816
1992	113.7	1209.7	1045.9	705.7	616.6	976.2	325.9	0	324.6	563.3	165.4	9395.4	15277
1993	173.5	533.6	457.9	340	220.8	395.6	390.4	0	210.8	453.6	372.1	14142.8	17319
1994	343.9	948.6	378.9	431.6	295.2	1095.4	360	0	140.2	391.2	527.4	8506	12891
1995	219.7	635.7	385.7	81.7	208.9	590.3	398.3	544.5	118.8	254.7	383.7	6762.7	10201
1996	250.6	457	151.3	108.3	154.9	575	359.1	510.1	53.6	171.4	232	4455.7	7247
1997	181.4	434.3	175.5	115.3	74.4	712.8	300.3	914.5	182	139.6	231.3	4146.9	7377
1998	202.8	594.7	201.2	205.8	66.5	879.7	330.9	785.6	57.6	262.2	125.1	4691	8278
1999	133.6	914.1	119	331.5	61.2	1324.6	348.4	993.9	449.1	90.9	335.5	9734.7	14501
Avg													
1990-99	187.84	753.53	388.07	309.95	458.77	868.28	344.56	374.86	235.69	309.26	237.27	7674.89	11905.7

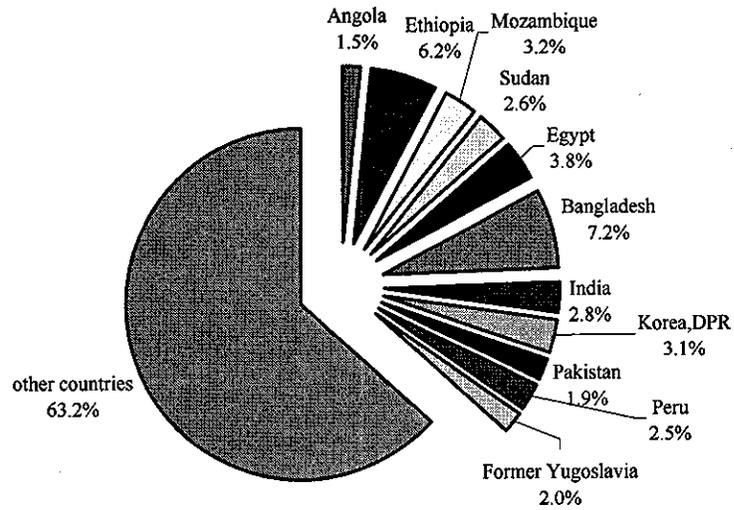
Source: WFP/INTERFAIS

Figure 3.1 — Global Food Deliveries by Region: 1990-1999



Source: WFP/INTERFEIS

Figure 3.2 — Average Global Food Aid Deliveries by Recipient Country in the 1990's



Source: FAO/INTERFEIS

Table 3.3 — Area Production and Yield of Developing Countries, Developed Countries and World

Year	Developing countries			Developed countries			World		
	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
1970	83.97	94.36	11,237	124.05	216.41	17,445	208.02	310.76	14939
1971	85.56	103.86	12,139	128.36	243.67	18,983	213.92	347.53	16245
1972	89.85	114.56	12,751	123.91	228.48	18,439	213.76	343.05	16048
1973	87.03	106.52	12,240	132.35	262.85	19,860	219.38	369.37	16837
1974	89.34	113.95	12,755	132.82	244.93	18,441	222.16	358.88	16154
1975	91.00	127.04	13,960	135.64	228.80	16,868	226.64	355.84	15700
1976	96.54	145.44	15,066	137.55	273.87	19,911	234.08	419.32	17913
1977	92.10	125.00	13,572	136.24	256.78	18,848	228.34	381.78	16720
1978	94.53	145.41	15,383	134.94	298.10	22,091	229.47	443.51	19327
1979	96.59	159.99	16,564	131.69	262.82	19,957	228.28	422.81	18522
1980	96.26	150.62	15,647	140.92	289.43	20,538	237.19	440.05	18553
1981	95.34	159.93	16,774	143.80	289.67	20,144	239.14	449.60	18801
1982	96.94	179.64	18,530	141.51	297.06	20,991	238.46	476.69	19991
1983	98.77	194.92	19,735	131.49	294.57	22,402	230.26	489.49	21258
1984	97.81	204.32	20,889	132.94	307.96	23,164	230.76	512.28	22200
1985	99.38	204.67	20,594	130.60	294.81	22,574	229.98	499.48	21718
1986	99.57	218.64	21,959	128.16	309.85	24,176	227.73	528.49	23207
1987	99.20	210.92	21,263	121.33	294.06	24,236	220.53	504.98	22899
1988	97.61	213.79	21,902	120.73	286.72	23,749	218.34	500.51	22923

Source: FAO/INTERFEIS

production in million MT
yield 100 Kg/Ha
area in million HA

Table 3.3 — Area Production and Yield of Developing Countries, Developed Countries and World (continued)

Year	Developing countries			Developed countries			World		
	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
1989	101.26	225.18	22,238	125.50	313.01	24,941	226.76	538.19	23734
1990	102.43	234.49	22,893	128.77	357.74	27,782	231.19	592.23	25616
1991	103.42	241.84	23,384	119.78	304.84	25,450	223.20	546.69	24493
1992	101.16	245.93	24,312	121.30	319.18	26,313	222.46	565.11	25403
1993	103.41	253.52	24,516	119.52	310.82	26,007	222.93	564.34	25315
1994	102.19	248.62	24,329	112.97	278.42	24,647	215.16	527.05	24496
1995	100.59	254.28	25,278	117.78	295.84	25,118	218.37	550.12	25191
1996	106.36	274.11	25,773	123.39	309.65	25,095	229.74	583.76	25409
1997	103.57	286.27	27,640	124.61	326.86	26,230	228.18	613.12	26870
1998	106.34	278.74	26,211	119.54	313.52	26,228	225.88	592.26	26220
1999	102.54	275.92	26,909	112.35	309.23	27,524	214.89	585.15	27231
2000	99.90	264.85	26,512	115.29	317.38	27,530	215.18	582.22	27057
Average 1970's	90.65	123.61	13,566.70	131.76	251.67	19,084.30	222.41	375.28	16841
Average 1980's	98.22	196.26	19,953.10	131.70	297.71	22,691.50	229.92	493.98	21528
Average 1990's	103.20	259.37	25,125	120.00	312.61	26,039	223.20	571.98	25624

Source: FAO/INTERFEIS

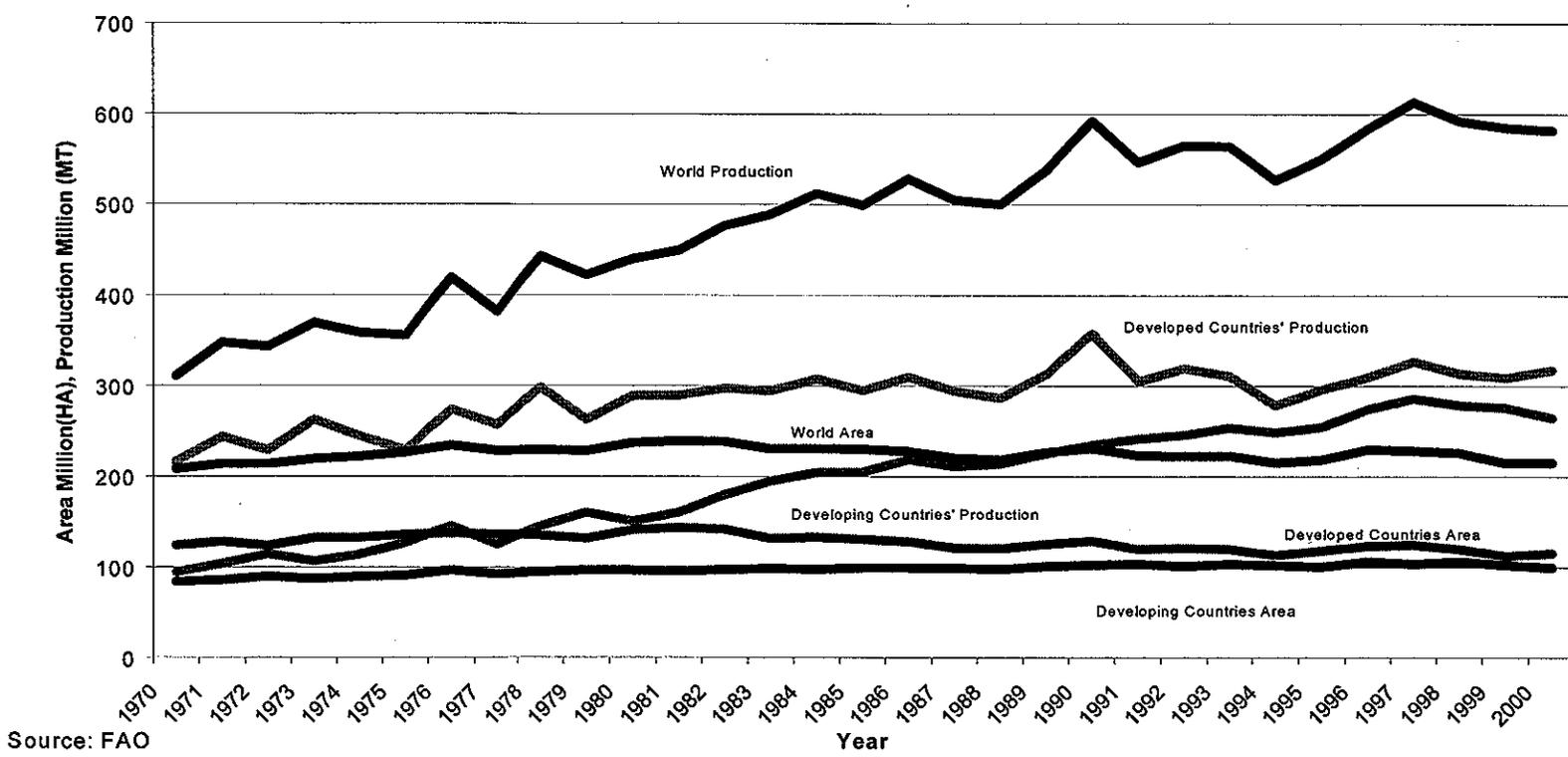
Table 3.4 — Growth of Area, Production and Yield of Wheat 1970-2000

	1970-2000	1970-1993	1993-2000
Canada			
Area	1.24	2.93	-2.23
Yield	1.13	0.72	2.48
Production	2.36	3.65	2.47
Australia			
Area	-0.23	0.05	2.29
Yield	1.56	1.99	0.75
Production	1.33	0.02	3.04
USA			
Area	-0.06	0.34	-2.1
Yield	1.04	1.00	1.84
Production	0.98	1.34	-0.26
EU			
Area	0.04	0.04	1.72
Yield	2.57	2.96	1.39
Production	2.61	2.3	3.01
Developed Country			
Area	-0.49	-0.34	-0.27
Yield	1.02	1.5	1.07
Production	1.51	1.85	1.34
Developing Country			
Area	0.62	0.78	-0.1
Yield	3.63	4.31	1.36
Production	3.02	3.52	1.47
World			
Area	-0.01	0.14	-0.19
Yield	2.03	2.54	1.20
Production	2.05	2.40	1.39

Note: Growth rate was calculated using semi-log trend

Source: FAO Database/INTERFEIS

Figure 3.3 — Area and Production of Wheat in Developing, Developed Countries and World



Source: FAO

Figure 3.4 — Production under Wheat 1971-2000

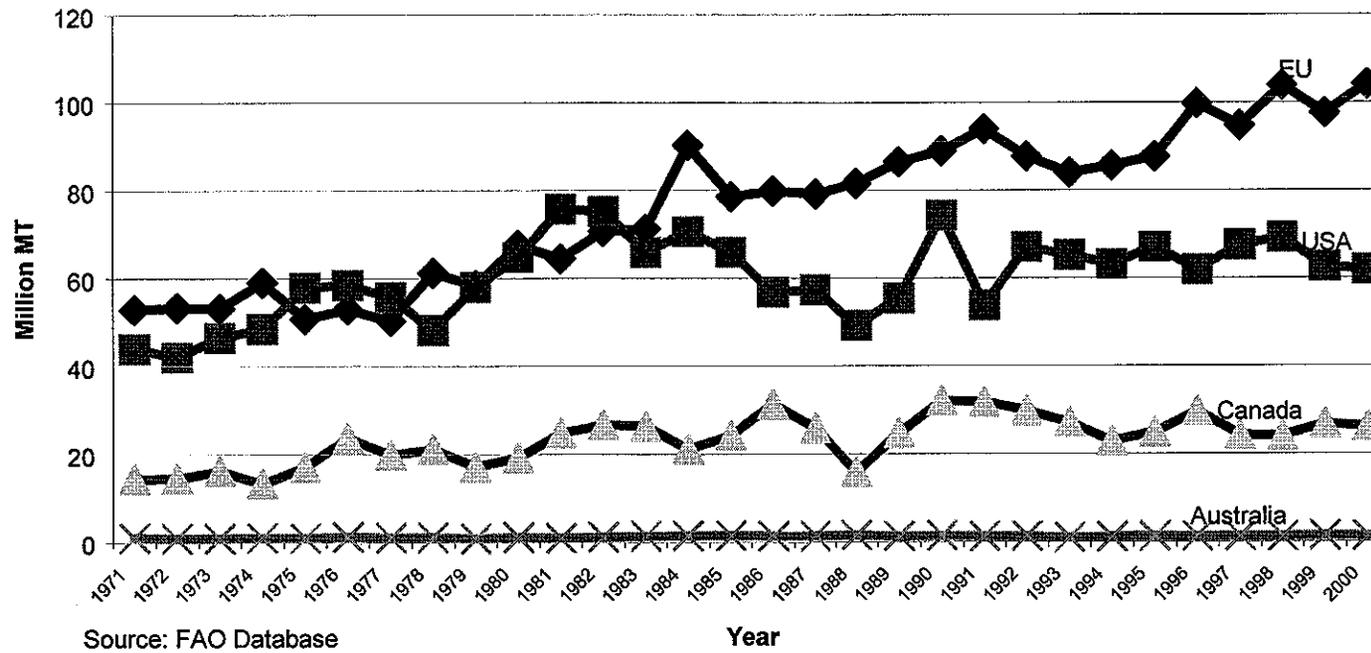


Figure 3.5 — Area under Wheat 1971-2000

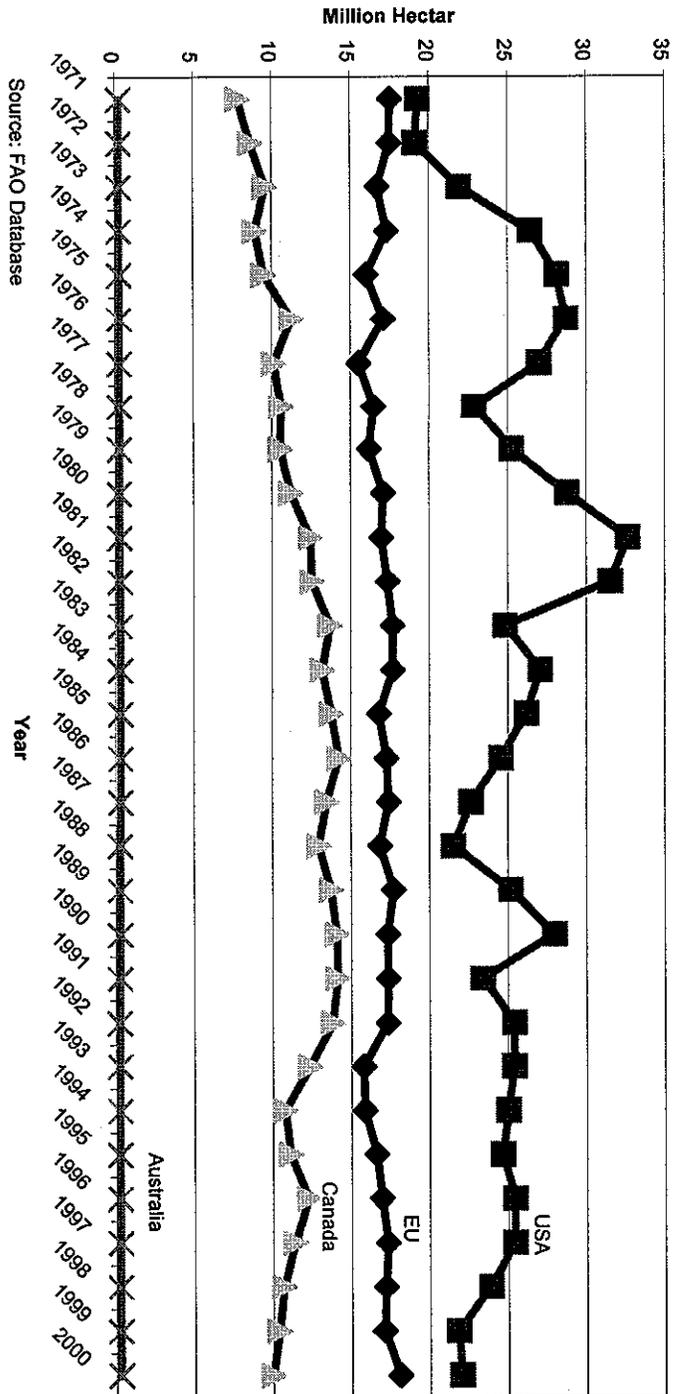
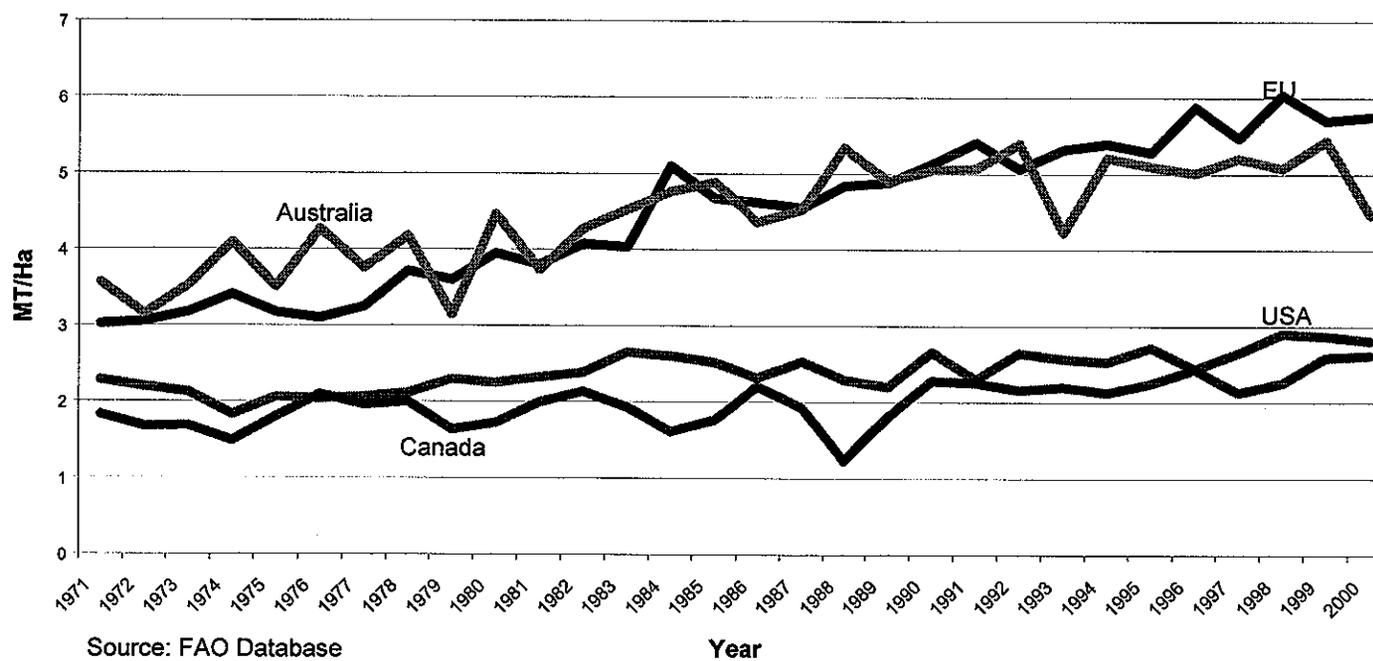


Figure 3.6 — Yield of Wheat 1971-2000



per year. The trend growth rate of Canada's wheat production declined by 1.18 percent in the post- WTO period compared with the pre-WTO period, but was still positive (2.47 percent). Production of wheat also increased in the EU and Australia (Table 3.5 and Figure 3.4).

Set aside programs appear to have played a major role in the deceleration in growth rates in wheat production of Canada and USA. Wheat yields increased in the two countries, however, in part because low yielding land was taken out of production under set aside programs (Figures 3.5 and 3.6). The data suggest that technological change and other factors contributed as well.

Following the analysis of Swinbank (1997),⁵ the impact of agriculture support programs is shown in Figure 3.7, where the initial price is P_0 , the production is Q_0 , and the supply curve is $S_0'S_0$. When the level of support is reduced, the price drops down to P_1 . If set aside land were the same quality as average land cultivated, production would fall to Q_0' . Instead, production falls only to Q_0'' because when support is reduced, the farmers set aside less fertile land. As a result, average yield increases, compensating a portion of the production loss due to the decrease in area. If technological change is also occurring, the supply curve shifts to S_1S_1 , parallel to S_0S_0 . With a reduction of price supports, the new supply curve is S_1' , parallel to S_0' . In this case, production can be even greater (Q_1) than initial production (Q_0), even though land was set aside.

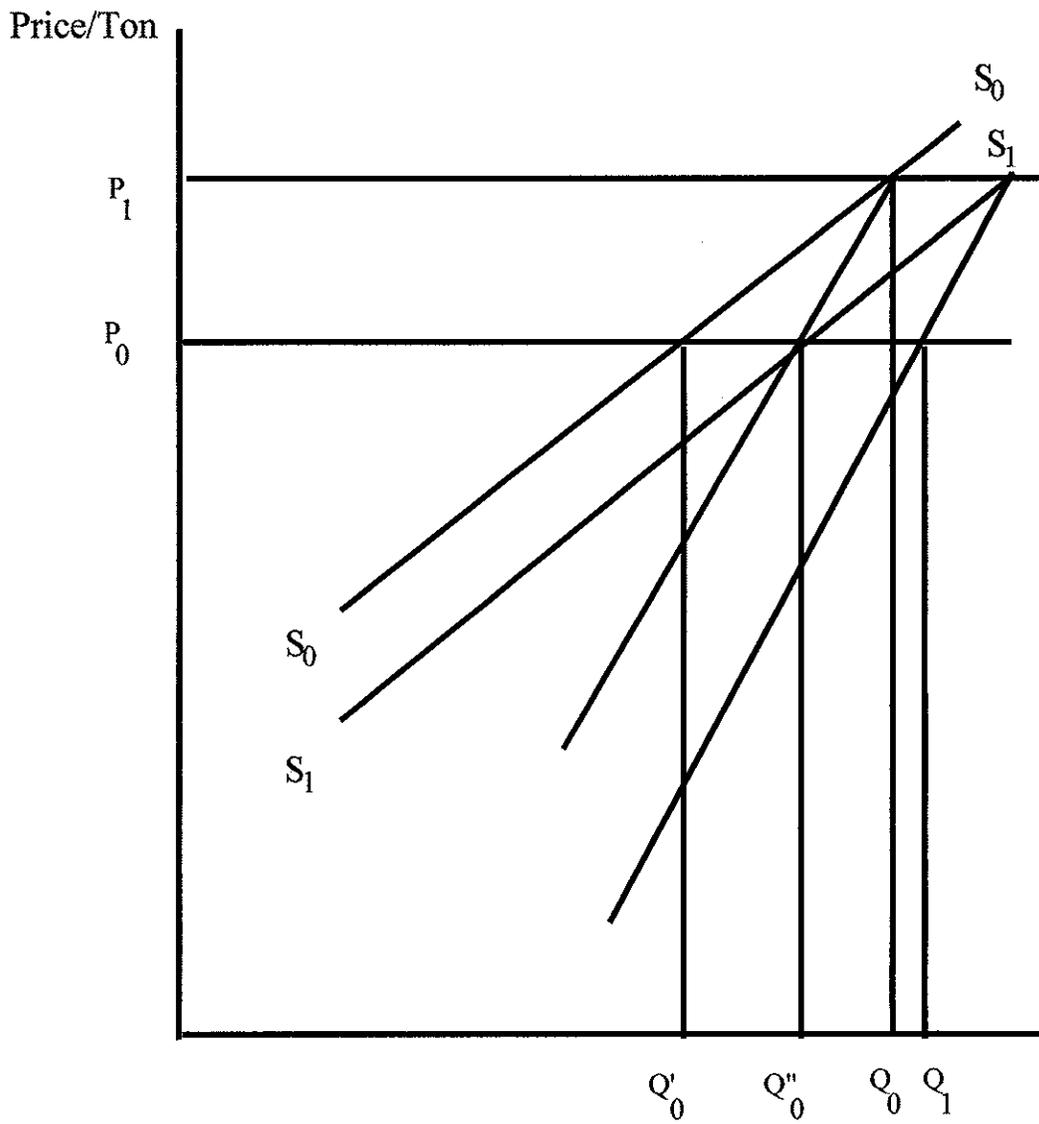
In the case of Canada, yield gains more than compensated for the loss of acreage. About half of this yield gain (7.77 percent) is estimated to have resulted because low yielding land was taken out of production, and the other half of the yield gain (7.30

⁵ Alan Swinbank. 1997. "The New CAP" in Christopher Ritson and David Harvey (eds.) *The Common Agricultural Policy* (Second Edition). New York: CAB International. pp.95-114.

percent) is due to other factors, including technological change (Table 3.6).⁶ In the U.S. case, the yield gain (10.93 percent), only partially offset the decline in area and production still fell. Nonetheless, high yields on land not taken out of production accounted for about half (5.43 percent) of the total yield gain.

⁶ The decomposition of yield changes due to the set aside programs and those due to technology changes were calculated as follows. First, it is assumed that technological change in yields was constant for the immediate pre-WTO period and the post-WTO period and that average yields of the land taken out during the set-aside program was the same quality of land as the land added to area in the immediate pre-WTO period. Thus, the observed yield in the pre-WTO period is $Y_{t1} = w_1 Y_{b1} + (1-w_1) Y_{sa1}$, where Y_t is total average yield, Y_b is the yield on the best land and Y_{sa} is the yield on the land will be set aside in period 2.) In the second period, $Y_{t2} = w_2 Y_{b2} + (1-w_2) Y_{sa2}$. The growth in yields due to technological change in average yields is thus approximately $= \frac{1}{2}(Y_{t1} + Y_{t2})$.

Figure 3.7 — Effects of a Set-Aside Program on Production



Source: Authors' calculation

Table 3.5 — Area, Production and Yield of Wheat in Major Food Aid Donor Countries

Year	Area (M.Hectare)				Production (MMT)				Yield (HKG/HA)			
	EU	USA	Canada	Australia	EU	USA	Canada	Australia	EU	USA	Canada	Australia
1971	17.54	19.30	7.85	0.27	52.93	44.05	14.41	0.97	30,178	22,829	18,351	35,577
1972	17.47	19.14	8.64	0.27	53.31	42.08	14.51	0.86	30,513	21,983	16,799	31,461
1973	16.71	21.91	9.58	0.27	53.10	46.56	16.16	0.94	31,775	21,248	16,876	35,268
1974	17.32	26.45	8.94	0.27	59.01	48.50	13.30	1.10	34,078	18,333	14,884	40,938
1975	16.00	28.12	9.48	0.27	50.75	57.89	17.08	0.95	31,717	20,582	18,020	35,063
1976	17.11	28.70	11.25	0.29	52.99	58.48	23.59	1.23	30,975	20,375	20,963	42,634
1977	15.52	26.99	10.12	0.29	50.37	55.67	19.86	1.07	32,465	20,629	19,632	37,588
1978	16.48	22.86	10.58	0.29	61.23	48.32	21.14	1.19	37,150	21,136	19,987	41,771
1979	16.19	25.27	10.52	0.27	58.36	58.08	17.20	0.85	36,048	22,980	16,341	31,457
1980	17.09	28.78	11.21	0.27	67.57	64.80	19.29	1.20	39,534	22,513	17,212	44,673
1981	16.95	32.64	12.43	0.27	64.47	75.81	24.80	1.03	38,035	23,229	19,959	37,370
1982	17.34	31.54	12.52	0.29	70.69	75.25	26.72	1.24	40,763	23,859	21,336	42,767
1983	17.64	24.84	13.68	0.31	71.19	65.86	26.47	1.42	40,348	26,509	19,345	45,300
1984	17.70	27.09	13.16	0.32	90.23	70.62	21.19	1.50	50,983	26,073	16,099	47,632
1985	16.80	26.18	13.73	0.32	78.53	65.98	24.25	1.56	46,731	25,197	17,665	48,862
1986	17.27	24.56	14.23	0.32	79.91	56.90	31.38	1.41	46,267	23,167	22,052	43,605
1987	17.41	22.65	13.46	0.32	79.21	57.36	25.95	1.45	45,492	25,330	19,279	45,284
1988	16.85	21.53	12.94	0.29	81.59	49.32	15.91	1.56	48,411	22,913	12,293	53,436
1989	17.72	25.17	13.72	0.28	86.45	55.43	24.80	1.36	48,779	22,024	18,076	49,015
1990	17.35	27.97	14.10	0.28	88.98	74.29	32.10	1.40	51,279	26,567	22,769	50,479
1991	17.38	23.39	14.16	0.27	94.00	53.89	31.95	1.38	54,087	23,038	22,559	50,735
1992	17.34	25.40	13.83	0.25	87.80	67.14	29.88	1.33	50,623	26,433	21,604	53,938

Table 3.5 — Area, Production and Yield of Wheat in Major Food Aid Donor Countries (continued)

Year	Area (M.Hectare)				Production (MMT)				Yield (HKG/HA)			
	EU	USA	Canada	Australia	EU	USA	Canada	Australia	EU	USA	Canada	Australia
1993	15.82	25.38	12.37	0.24	84.05	65.22	27.23	1.02	53,137	25,699	22,003	42,246
1994	15.87	25.00	10.77	0.24	85.61	63.17	22.92	1.26	53,937	25,270	21,275	52,088
1995	16.62	24.67	11.12	0.26	87.71	67.12	24.99	1.30	52,783	27,209	22,467	50,952
1996	16.95	25.42	12.26	0.25	99.72	62.00	29.80	1.24	58,833	24,388	24,304	50,069
1997	17.32	25.43	11.41	0.26	94.71	67.52	24.28	1.35	54,684	26,552	21,280	52,044
1998	17.19	23.88	10.68	0.26	103.88	69.33	24.08	1.34	60,423	29,034	22,549	50,749
1999	17.12	21.82	10.37	0.26	97.69	62.66	26.86	1.42	57,047	28,723	25,909	54,348
2000	18.10	22.03	10.00	0.29	104.14	61.95	26.20	1.31	57,531	28,117	26,200	44,690
Average 1970's	16.70	24.31	9.66	0.28	54.67	51.07	17.47	1.02	32,767	21,122	17,984	36,862
Average 1980's	17.28	26.50	13.11	0.30	76.98	63.73	24.07	1.37	44,534	24,081	18,332	45,794
Average 1990's	16.90	24.83	12.11	0.26	92.42	65.23	27.41	1.30	54,683	26,291	22,672	50,765

Source: FAO Database

Note: 1970's include 1971-1979, 1980's include 1980-1989 and 1990's include 1990-1999

Table 3.6 — Decomposition of Change in Wheat Yields, 1992/94 - 1998/2000

	Canada	USA
Total Change in Yield	15.07	10.93
Change due to Technological Change	7.3	5.43
Set Aside of Less Fertile Land	7.77	5.52

Source: FAO Data and author's calculations

4. FOOD AID MECHANISM AND IMPACTS⁷

Beginning in the early 1980s, development policy in general, and food aid policy in particular, has involved numerous themes and programs, such as poverty alleviation, structural adjustment, food security strategies, human resources development, women in development and environmental protection. Not only have the objectives of food aid become more complex, but also various delivery mechanisms have been used, including direct distribution of food aid commodities, monetization, triangular transactions, local purchase and exchange arrangements. Thus, there is a wide diversity of experience among donors and recipients, making evaluation of food aid policies and programs extremely complex.

In the study by Shaw and Clay (1993), the eight recipient countries in the sample reflected the considerable diversity in *food aid uses* and changing patterns of use amongst developing countries. In Asia, the trend has been more towards project aid, with a decline in the proportion of program aid. In contrast, Honduras, under the impact of severe economic recession, has been more dependent on program food aid for sale on local markets. In Sub-Saharan Africa, there has been a considerable increase in emergency food aid. The relative importance of different channels for the supply of food aid is related in a complex way to change its uses. Historical factors, and the specifics of country situations, explain why certain donors are more prominent in some developing regions and countries than others, and whether WFP or NGOs are relatively more important in providing project or relief food aid.

Shaw and Clay (1983) also observed that during the 1980s, a broad consensus was reached on the need to integrate food aid more closely with financial and technical assistance. From a macro-economic perspective, the balance of payments or budgetary

⁷ This chapter is based on Shaw and Clay, 1993.

support that can be provided by food aid, particularly in the context of structural adjustment, requires its integration into overall financial planning. The development effectiveness of project aid has been limited by lack of complementary local currency and foreign exchange as well as human resources in planning, management and implementation. The eight cases in their study showed general recognition of this requirement.

During the 1980s there was also increased recognition of the advantages of greater flexibility in supplying food aid commodities rather than providing them only from donor countries. These advantages included reducing transport and other costs, speeding up delivery and providing commodities more in keeping with the food habits of recipients. Food aid commodities have been acquired in the same region or country of operations. Commodity exchanges can be especially useful in countries that are periodically, or more or less continuously, self-sufficient in certain food staples. In South Asia, imported cereal food aids are channelled into the public distribution systems. In Pakistan, this arrangement has played a crucial role in providing relief food to the large Afghan refugee population. In Bangladesh, the use of public stocks, to be replenished later by food aid supplies, has been a crucial aspect of food security during and immediately after major natural disasters. Imported food aid commodities have been exchanged for locally produced foods. Local purchases of foodstuffs to be used as food aid in the same country now take place, as in the German-funded food-aided projects in Honduras. Food aid commodities, mainly cereals, have been obtained in one developing country for use as food aid in another through what are referred to as 'triangular transactions', but logistical and quality control problems, among others, have impeded these transactions.

FOOD AID MANAGEMENT

The case studies in Shaw and Clay (1993) illustrate the variety of ways in which food aid is managed in recipient countries. Where cereals are integrated into the public distribution system, as in the three South Asian countries, or are handled by the

government food authority, as in Tunisia, significant savings in cost and time in the delivery of the aid can result both for development and in times of emergency. Similarly, where the government has set up a special food aid management unit, common logistics and delivery systems and procedures have resulted in economies of scale and increased efficiency.

There is complexity of food aid deliveries facing recipient countries. Food aid is provided bilaterally, either directly on a government-to-government basis or through NGOs on behalf of the bilateral food aid programme; multilaterally, mainly by WFP; or by NGOs financially from their own resources. The proportion of food aid provided through these different channels varied among the eight recipient countries. The number of donors ranges from 4 in the case of Lesotho to 17 in Bangladesh, each with their own procedures, schedules and requirements.

CHANGING DONOR POLICIES AND PRACTICES

Donors of food aid can be grouped into several broad categories. First, the agricultural exporters – the United States, Canada, Australia and the European Community – became food aid providers as a way of utilizing surpluses for a mixture of developmental, humanitarian, foreign policy and domestic agricultural policy and trade objectives. Other donors, that are not major agricultural exporters, have historically seen themselves as providing finance for food as part of the international commitment to humanitarian relief and developmental assistance under FAC or to multilateral programmes and the work of voluntary agencies. Historically, the latter group has shown more flexibility in resourcing, contributing relatively more to meeting the non-commodity costs of food aid.

Donors have handled food aid separately from financial and technical assistance. Food aid has, therefore, acquired its own institutions, procedures and legislation. This has imposed a different mind-set, has led to difficulties in coordinating food with other aid, and has made transfers unacceptably rigid. If assistance were planned and

implemented within a common policy framework and a common set of programmes and projects, the effectiveness and efficiency of all aid transfers would be enhanced (World Bank/WFP, 1991).

CONCLUSIONS

Shaw and Clay (1993) concluded that there is a need for realism in terms of what can be done with food aid. Food aid should not be seen as a panacea. It is less flexible than financial assistance for a variety of reasons that relate to constraints on the donor, as well as on the recipient side. The resources made available continue to a large extent to reflect supply considerations in donor countries, and also, where alternative triangular transactions and local purchases are attempted, what food is available regionally and locally. There are continuing budgetary constraints on food aid, with annual programming that relates to the budgetary cycles in donor countries. The separate programming of food aid from other forms of aid continues in both recipient and donor countries. In recipient countries, food aid programs often continue to be handled by separate administrative entities with responsibilities for poverty alleviation, social welfare or food distribution and subsidies. The multiplicity of donors is a potentially more severe constraint, because integration of food aid requires more complex logistical management arrangements than financial assistance.

5. DISINCENTIVE EFFECTS OF FOOD AID

A widespread criticism of food aid is that it creates disincentives effects by lowering local food prices, thereby discouraging local production; enabling recipient governments to neglect local agriculture and long-term food security; attracting workers away from vital activities during the agricultural year; creating a dependency mentality; and changing food habits.

Shaw and Clay (1993) found that the experiences of the three Asian countries in their sample, in moving towards self-sufficiency, are consistent with the widespread professional view of practitioners and economists that disincentive effects are avoidable (Cathie, 1991; Maxwell, 1991; Clay and Stokke 1991; Singer et al, 1987). Nevertheless, as the Bangladesh case illustrates, there are potential problems in making the transition to self-sufficiency in an economy where food aid has an important role in sustaining anti-poverty and food security programmes. They concluded that there is little evidence of strong negative impacts.

The disincentive effect has been aptly described as the “storm centre” of the debate on food aid (Baribeau and Gerrard, 1984). In fact, there is a voluminous literature on this issue.⁸ The literature on the disincentive effect was initiated by Schultz (1960) with the observation that if food aid were sold on the market, it would depress prices and lead to a loss of output. In the succeeding quarter century, the basic concept has developed and a good deal of empirical testing has taken place. The literature review by Maxwell and Singer (1979) showed that thinking had divided into three streams, with the original focus on prices being supplemented by attention to agricultural policies and to labour markets. There was a subsidiary concern with the impact of food aid on food habits and a shift in taste away from locally produced commodities. The price

⁸ For a critical review of this literature, see Maxwell (1991).

disincentive was the dominant issue, with empirical testing having evolved from simple time-series analysis to multiple equation econometric models incorporating differentiated markets.⁹ The general conclusion of the empirical work was that a price disincentive had mostly been avoided by an appropriate mix of policy tools, including demand expansion, price support to producers and differentiated markets to increase consumption.

Research since 1979 has contributed to disincentive *concepts, measurement techniques* and *policy findings*. Regarding *concepts*, a recurrent theme in the literature has been that the potential for disincentives is in practice restricted by the way in which food aid is used. In the first place, much cereal food aid simply replaces commercial imports, at least in non-emergency situations; it cannot be held responsible for disincentive effects that would have occurred in any case as a result of commercial imports. In the second place, the literature has stressed that disincentives can be avoided if food aid is associated with additional consumption, so that the depressing effect on prices of the additional supply of food is matched by the stimulating effect of extra demand. Additional consumption can be stimulated directly, by distributing food to hungry people or indirectly, by increasing expenditure on poverty alleviation programmes. It is argued that a combination of measures along these lines can significantly reduce the risk of disincentives – although not the need to monitor them and plan remedial action in case they do develop.

Despite this focus on the circumstance in which disincentives may be avoided, recent research has continued to add new layers of complexity to disincentive analysis. There has been particular concern with the relationship between food aid, food policy and overall development strategy. For example, the USAID (1983) has taken material concerned with the relationship between food aid and local market structure and related it to thinking on linkages between agriculture and other sectors in the development process

⁹ There was a strong bias to India, with 12 out of 21 studies reviewed dealing with the Indian experience of PL 480; of the remainder, only one dealt with a country in sub-Saharan Africa.

(Mellor 1976, 1980). It argues that beneficial linkages can be disrupted by food aid, which causes an "uncoupling" of processing industries from the agriculture sector. Backward and forward linkages are lost. Buchanan-Smith (1988) is also concerned with market structure. She argues that food aid can undermine the incentive to local traders and cause greater year-to-year variability in prices by reducing the level of inter-annual storage.

Turning to the issue of measurement, there is a traditional dichotomy in the literature between attempts to measure the disincentive effect using econometric models and more pragmatic approaches what Clay and Singer (1985) have described as "checklist approach". The former are mostly found in academic studies (see, for example, Blanford and Plocki, 1977), the latter, as Clay and Singer point out, are characteristically found in evaluation studies by food aid donors. The non-formal approach is seen as being less rigorous, particularly in dealing with inter-sectoral linkages and dynamic growth effects but conceptually easier and much less demanding of data.

Finally, the findings of disincentive analysis. As noted earlier, the established view in the literature is that food aid has the capacity to cause disincentive effects but these can be and often are avoided by government policy. This is a view confirmed in recent evaluations (Maxwell, 1983, USAID, 1983, CIDA 1983), as well as in recent literature reviews (Baribeau and Gerrard, 1984; Clay and Singer, 1985, Raikes, 1988; Thomas et al., 1989), although Jackson (1982) has provided evidence of labour disincentives on particular projects. Clay and Singer conclude that "the debate on the past macroeconomic and agricultural impact of food aid remains inconclusive ... (however) massive disincentive effects do not seem to have occurred".

Recent research has focussed on sub-Saharan Africa, which confirms this mixed picture. A recent review concluded that "among the major recipients of food aid in sub-Saharan Africa, there is evidence of market disruption and policy disincentive effects" and cited evidence from Somalia, Sudan, Tanzania and Botswana. However, it found that

“experience in some other countries receiving smaller quantities of food aid has been evaluated more positively”. Studies of Rwanda, Kenya, Cameroon and Lesotho are cited in support of the conclusion (Thomas et al., 1989). In Ethiopia, the second largest recipient in Sub-saharan Africa after Sudan, there is no evidence of major disincentive, although as discussed in the case study below, “warning signals” have been flashing for a price disincentive. Reflecting the conceptual shift that has been taking place, the review observes that “increasingly, donor and recipients attention has been focused on linking food aid to a major restructuring of domestic food markets, often as part of an economy-wide structural adjustment”.

Maxwell (1991) feels that the existing literature remains inadequate in many respects: incomplete with regard to its coverage of food aid commodities and uses, insufficiently well-rooted in the general literature on food policy and biased to ex-post analysis, especially in countries with good time-series data of prices, production and imports. All these makes it of little practical help to donors and recipients faced with the day-to-day problems of planning, monitoring and managing a variety of food aid activities. Maxwell (1991), therefore, suggests an alternative, pragmatic approach to the disincentive issue, and also applies the methodology to three practical cases in Senegal, Ethiopia and Sudan. The main conclusions of the study are that a systematic approach to disincentive analysis is feasible even in difficult cases and that focussing on the link between food aid and food policy can help ensure that food aid has positive, incentive effects.

An important lesson to be drawn from the case studies of Maxwell (1991) is that comprehensive taxonomy of disincentive effects makes it possible to carry out a systematic analysis even where data are poor. In particular, the distinction between micro and macro levels of analysis and the separate consideration of price, policy, labour and food habit disincentives are important. They also illustrate the value of a step-by-step procedure building on the notion of early warning indicators and clear reference points.

It may be emphasized that in all three cases considered in the study, the warning lights were flashing to indicate the possibility of disincentive effects. In Ethiopia, the main focus was on the low producer price of cereal staples; in Senegal, it was on the neglect of consumption issues in food policy; and in Sudan it was on the impact of cheap bread on import dependence. In all three cases, policy changes were needed but a constructive role remained for food aid.

These conclusions are broadly in line with the literature on food aid. Potential disincentive effects of food aid can be offset by appropriate government policy, which is not normally determined primarily by the flow of food aid. However, the effects of food aid can be disproportionate at sub-national level.¹⁰ In general, the case studies support the view that food aid needs to be integrated into an overall food strategy if disincentives are to be avoided and the full potential of food aid incentives realized (Maxwell, 1991).

¹⁰ The findings in Ethiopia, particularly, underline the importance of careful monitoring of food interventions in isolated communities where food markets are volatile (Maxwell, 1991).

6. FOOD AID POLICIES AND PROGRAMS IN BANGLADESH

TRENDS OF FOOD AID TO BANGLADESH

During the 1970s and 1980s, Bangladesh was one of the world's largest recipients of food aid, receiving on average about 1.2 million MTs per year. During the first five years of the 1980s, food aid averaged 18.3 billion (2000) Taka in real terms, equal to 22.1 percent of total aid, 11.6 percent of government expenditures and 10.9 percent of total imports (Table 6.1 and Figure 6.1).

Food aid in Bangladesh fell sharply (by an average rate of 5.95 percent per year in quantity terms), however, during the negotiation period of the Uruguay round (1985/86-1993/94). In value terms, average food aid from 1989/90 through 1993/94 was only about half that of 1979/80-1983/84. It declined even further to an annual average of only 6.3 billion (2000) Taka from 1994/95 through 1999/2000, one third of its total fifteen years earlier. Moreover, as total government expenditures and external trade have increased, food aid's importance in the fiscal balance and the balance of payments has dramatically shrunk. In 1983/84 food accounted for 21.8 percent of total aid, 11.6 percent of government expenditures and 11.7 percent of the value of imports. By 1997/98, these shares had fallen to 7.9 percent, 1.7 percent and 1.3 percent, respectively (Table 6.2 and Figure 6.2).

In quantity terms, the trend in food aid was slightly positive in the late 1990s, however, due to the large increase in emergency food aid to Bangladesh following the flood of 1998. Normal food aid flows during late 1990s were only about 600 thousand MTs per year, though (Figure 6.3).

Table 6.1 — Food Aid, Government Expenditures and Imports, 1977/78 - 1998/99

Year	Food Aid	Total Aid	(Billion 2000 Taka)	
			Government Expenditure	Imports
1978	10.2	72.2	122.8	122.0
1979	14.1	81.2	141.4	129.4
1980	26.3	85.7	166.2	170.8
1981	12.1	71.3	146.6	161.3
1982	15.5	83.4	153.6	175.7
1983	18.2	83.8	153.6	164.3
1984	19.4	89.2	167.2	165.5
1985	16.2	83.5	163.0	174.0
1986	14.1	91.0	175.1	164.7
1987	15.1	106.6	184.8	175.1
1988	18.0	98.5	180.2	179.3
1989	12.5	92.1	185.7	186.3
1990	9.4	90.8	195.1	188.5
1991	12.9	83.5	181.5	167.3
1992	12.0	80.0	196.0	172.0
1993	5.9	81.4	215.0	197.8
1994	5.6	74.6	201.8	200.7
1995	6.5	82.2	245.1	275.6
1996	6.5	68.3	251.1	325.5
1997	4.9	71.5	266.5	345.7
1998	4.8	61.0	290.0	367.0
1999	8.8	76.2	302.2	397.8
2000	0.0	0.0	0.0	371.9
1980-84	18.3	82.7	157.4	167.5
1985-89	15.2	94.3	177.8	175.9
1990-94	9.2	82.1	197.9	185.3
1995-99	6.3	71.8	271.0	342.3
1980-99	12.2	82.7	201.0	217.7
Share of Food Aid				
1980-84	1.000	0.221	0.116	0.109
1985-89	1.000	0.161	0.086	0.086
1990-94	1.000	0.112	0.046	0.049
1995-99	1.000	0.088	0.023	0.018
1980-99	1.000	0.148	0.061	0.056

Note: Real 2000 prices computed using the non-food consumer price index.

Source: GOB data and authors' calculations.

Figure 6.1 — Food Aid, Government Expenditure and Imports, 1978 to 1999 (Real 2000 Taka)

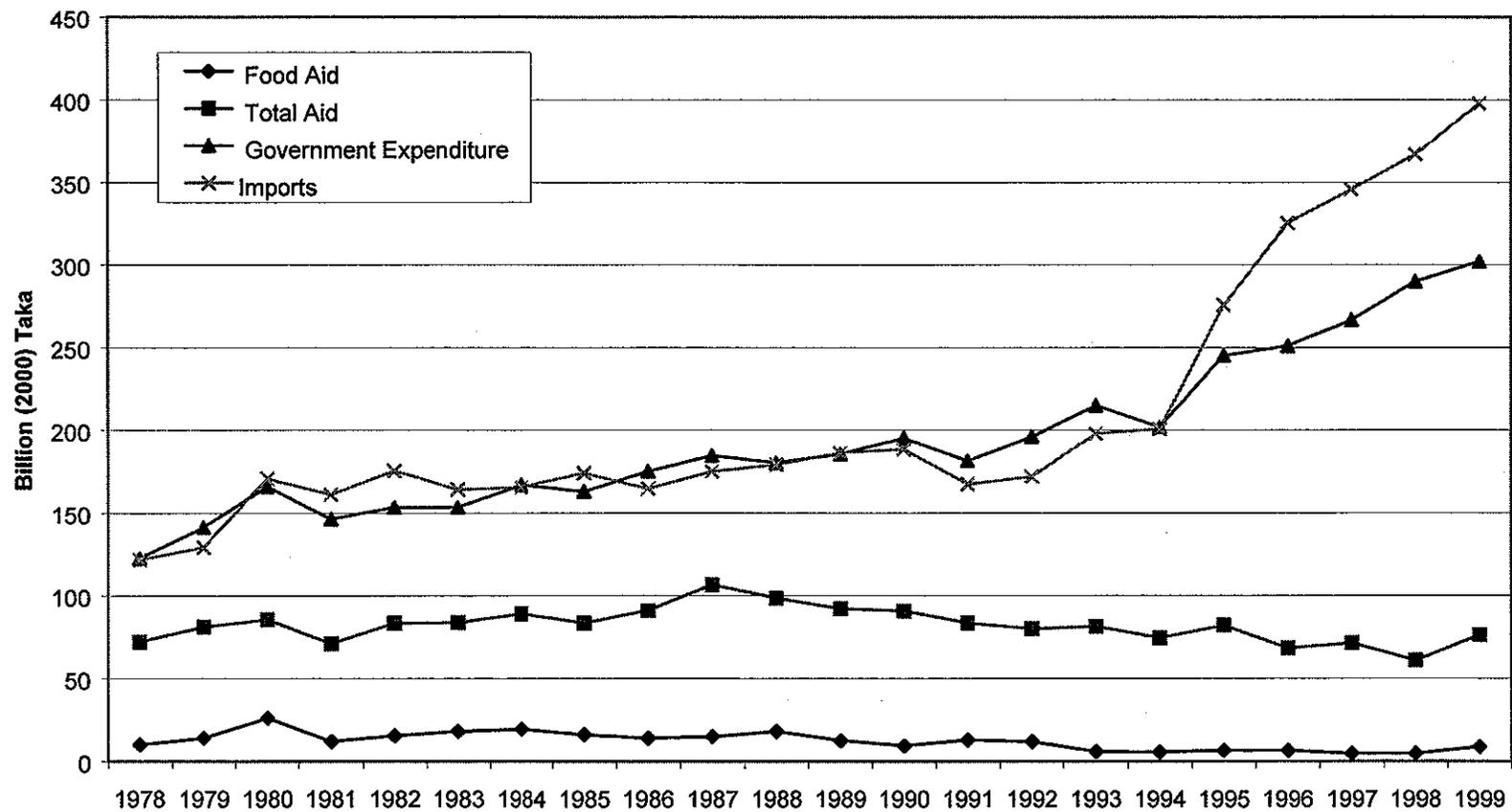


Table 6.2 — Food Aid as a Percentage of Total Aid, Imports and Government Expenditure

Year	(Percentage)			
	Food Aid as % of Total Aid	Food Aid as % of Total Export	Food Aid as % of Total Import	Food Aid as % of Total Govt. Exp
1978	14	24	8	8
1979	17	29	11	10
1980	31	50	15	16
1981	17	27	7	8
1982	19	37	9	10
1983	22	37	11	12
1984	22	34	12	12
1985	19	26	9	10
1986	16	25	9	8
1987	14	21	9	8
1988	18	24	10	10
1989	14	18	7	7
1990	10	12	5	5
1991	15	16	8	7
1992	15	12	7	6
1993	7	5	3	3
1994	8	5	3	3
1995	8	4	2	3
1996	10	4	2	3
1997	7	2	1	2
1998	8	2	1	2
1999	12	3	2	3

Source: GOB data and authors' calculations.

Figure 6.2 — Food Aid as a Percentage of Total Aid, Imports and Government Expenditure

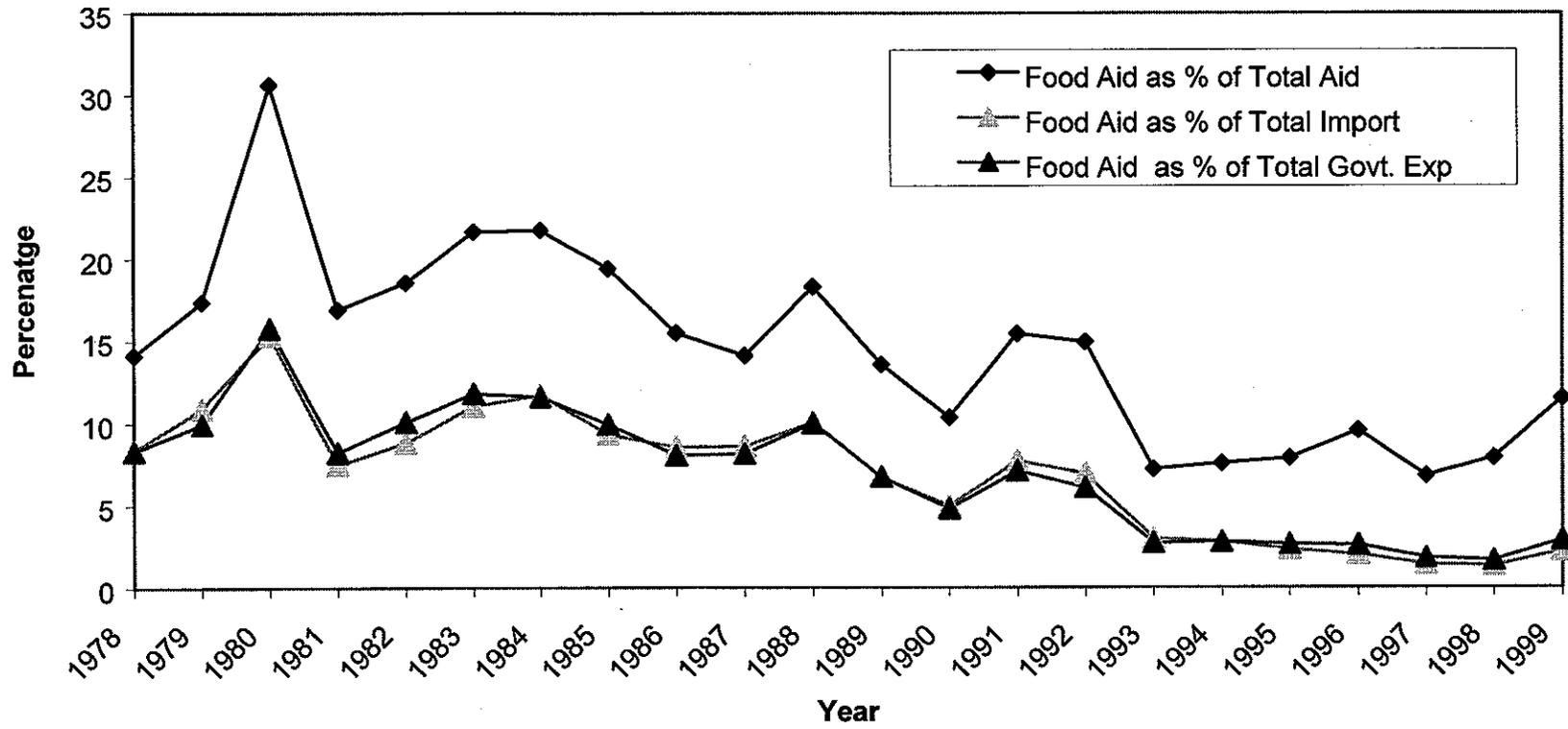


Figure 6.3 — Food Aid to Bangladesh, 1980/81-2000/2001

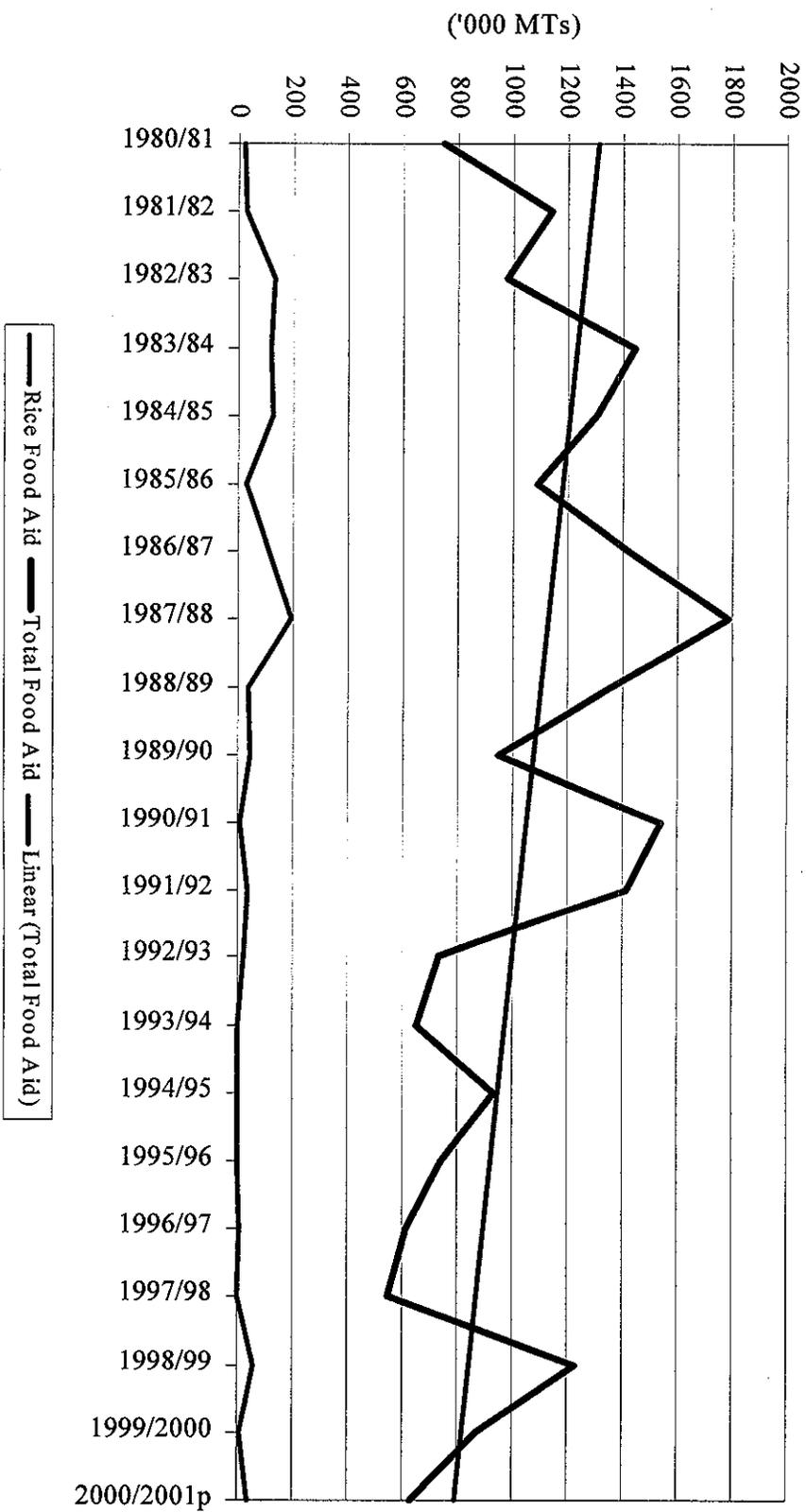


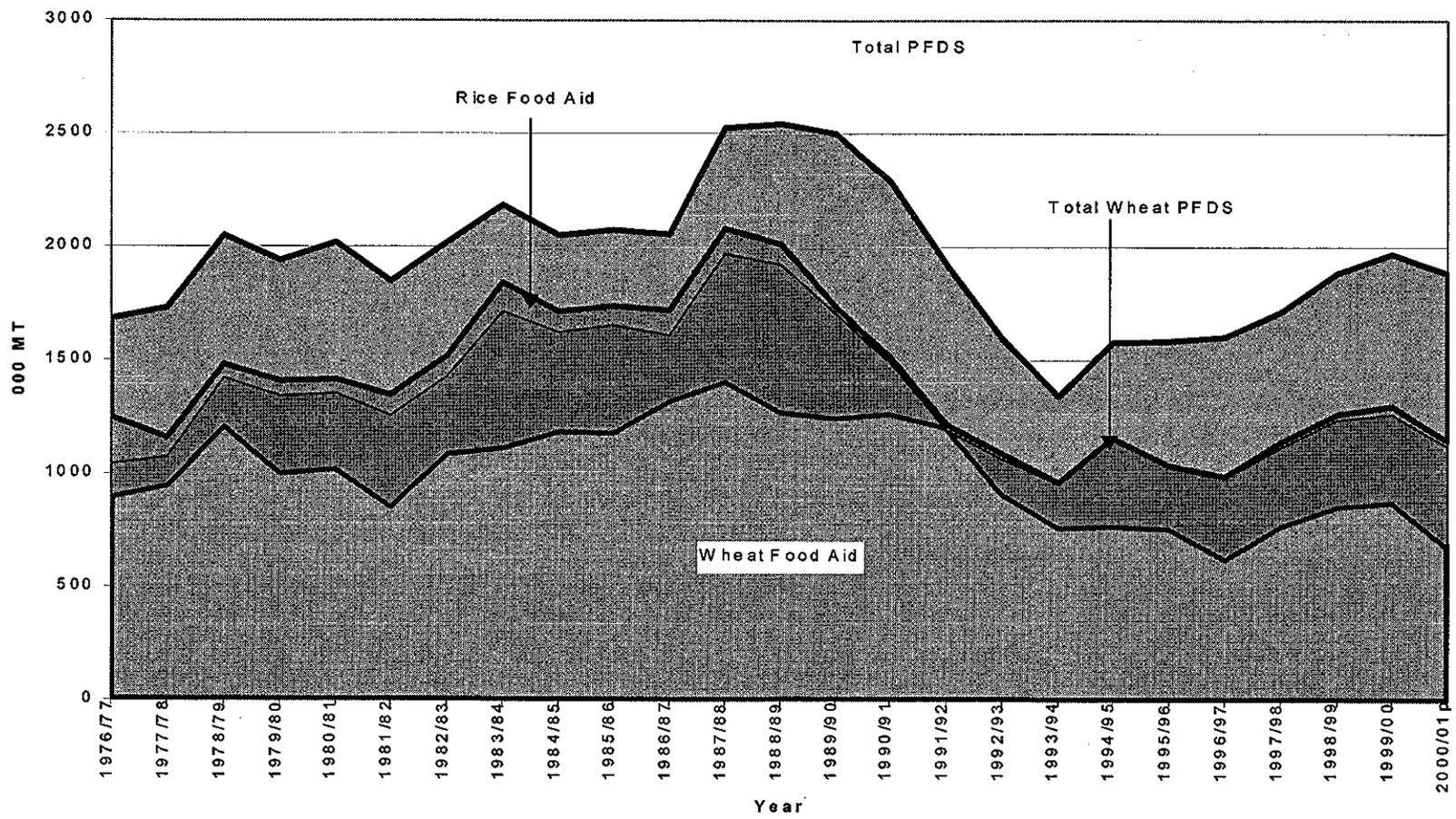
Table 6.3 — Trends in Food Aid and PFDS Distribution

Financial Year	(000 MTs)		(000 MTs)		(000 MTs) Total PFDS	Wheat PFDS-Food Aid	Rice PFDS-Food Aid	3 Year Moving Average			Rice PFDS-Food Aid	Total PFDS
	Rice Aid	Food PFDS	Wheat Aid	Food PFDS				Wheat PFDS-Food Aid	Rice Food Aid	Wheat Food Aid		
1975/76	395	517	919	1170	1687	251	122					
1976/77	111	798	552	693	1491	141	687	905	140	204	437	1,685
1977/78	104	606	1244	1271	1877	27	502	951	122	89	570	1,731
1978/79	50	571	1057	1255	1826	198	521	1212	209	60	567	2,048
1979/80	24	702	1336	1738	2440	402	678	1008	333	64	532	1,937
1980/81	119	515	632	1031	1546	399	396	1026	328	58	605	2,018
1981/82	30	772	1111	1295	2067	184	742	863	392	93	501	1,849
1982/83	131	496	845	1439	1935	594	365	1093	334	93	498	2,018
1983/84	117	503	1324	1548	2051	224	386	1117	600	124	342	2,183
1984/85	125	400	1181	2162	2562	981	275	1188	437	90	336	2,051
1985/86	27	373	1060	1167	1540	107	346	1186	466	87	336	2,074
1986/87	108	495	1317	1626	2121	309	387	1324	285	109	336	2,055
1987/88	192	468	1595	2035	2503	440	276	1409	557	113	447	2,527
1988/89	40	719	1316	2239	2958	923	679	1273	648	91	530	2,542
1989/90	41	675	908	1489	2164	581	634	1251	458	30	758	2,498
1990/91	10	971	1530	1401	2372	-129	961	1271	221	30	772	2,294
1991/92	39	759	1375	1586	2345	211	720	1207	-12	23	713	1,930
1992/93	19	476	716	597	1073	-119	457	915	155	19	509	1,598
1993/94	0	350	654	1026	1376	372	350	768	187	6	379	1,341
1994/95	0	329	935	1244	1573	309	329	775	382	0	424	1,581
1995/96	1	593	737	1202	1795	465	592	760	273	4	550	1,587
1996/97	10	739	608	653	1392	45	729	631	351	4	617	1,603
1997/98	0	529	549	1092	1621	543	529	777	339	23	576	1,715
1998/99	59	530	1174	1603	2135	429	471	863	377	21	624	1,885
1999/00	5	876	865	1024	1900	159	872	876	389	34	670	1,969
2000/01p	40	707	589	1167	1874	578	667	681	438	28	735	1,883
2001/02p	40	707	589	1167	1874	578	667					

Source: Directorate of Food and NBR

Note: Food aid only includes only grant
All PFDS Figures are gross figures

Figure 6.4 — Food Aid and PFDS Distribution, 1976/77-99/2000 (3 Year Centered Moving Average)



The Bangladesh government operates both sale programs and non-sale food distribution programs in the Public Foodgrain Distribution System (PFDS). Up until the early 1990s, much of food aid was distributed through sales programs at subsidized prices. In the peak years of food distribution and food aid, from 1986/87 through 1991/92, food aid averaged 1.4 million MTs per year, accounting for nearly 60 percent of average total public distribution of 2.4 million MTs. In the early 1990s, however, food aid flows were greatly reduced and major sales channels were closed. By the late 1990s, food aid accounted for only about one-third of total PFDS distribution of about 1.8 million MTs per year (Table 6.3 and Figure 6.4).

FOOD AID AND MAJOR PFDS CHANNELS

After the famine of 1974, the Bangladesh Government introduced the Vulnerable Group Feeding Program (VGF). Later, in the 1980s, it was renamed the Vulnerable Group Development Program, (VGD) and financed with food aid from WFP. From early 1980s, the bilateral donors started to contribute to the program. The Food for Work program was introduced in 1974 with food aid from WFP to create rural infrastructure, create employment opportunity for the unskilled rural labor and pay them wage in kind. Many bilateral donors started contributing to the program. Similar programs were also started under US PL-480 Title-II, and managed by CARE. The Rural Maintenance Program (RMP), a Cash for Work Program was introduced in 1984/85. A new program called Food for Education Program (FFE) was started in 1993 entirely financed by the Government of Bangladesh for attracting the poor students to school and to retain them.

In the seventies, a significant amount of food aid was program food aid and the other portion was used for projects like FFW, VGF/VGD and relief. The government of Bangladesh used to sell the program food aid in the Public Distribution System (PFDS) channels and use the counterpart funds in non-tied public expenditure. USA in its PL480 Title III agreement first introduced the conditionality of using the counterpart fund in jointly

agreed project. Canada introduced the Rural Maintenance Program (RMP), consisting of cash for work projects, in 1984/85. In this case, Canadian food aid was sold (monetized) to generate cash for use in the RMP. Canada's program food aid was not tied to any project but it discontinued its program food aid from the late 1980s. The EC also discontinued its program food aid from the early 1990s.

In the 1980s, the reforms were initiated in the food-assisted programs in Bangladesh mostly by the donors both in sales channels and non-sales channels of PFDS. In the sales channels, prices were gradually raised to levels close to market prices, reducing the subsidy and making these channels less attractive for their beneficiaries. Ultimately, both Statutory Rationing (in urban areas) and Palli Rationing (in rural areas) were terminated in the early 1990s. As a result, the share of the public foodgrain distribution through programs targeted to the poor increased from 39.4 percent in 1992 to 84.7 percent in 1999/2000 (Table 6.4 and Figure 6.5).

To formulate reforms in non-sales channels of PFDS, a joint GOB Donors Task Force was constituted -- the SIFAD (Strengthening of Institution of Food Assisted Development). The SIFAD Task Force made a number of recommendations on the reforms of channels like VGD and FFW along with their integration in the Planning process of Bangladesh. In the non-sales channels programs a number of reforms were introduced. In the VGD program, a training program was introduced. This required a monetization of a portion of food aid to generate cash. Government of Bangladesh was asked to contribute a portion of resources to the program.

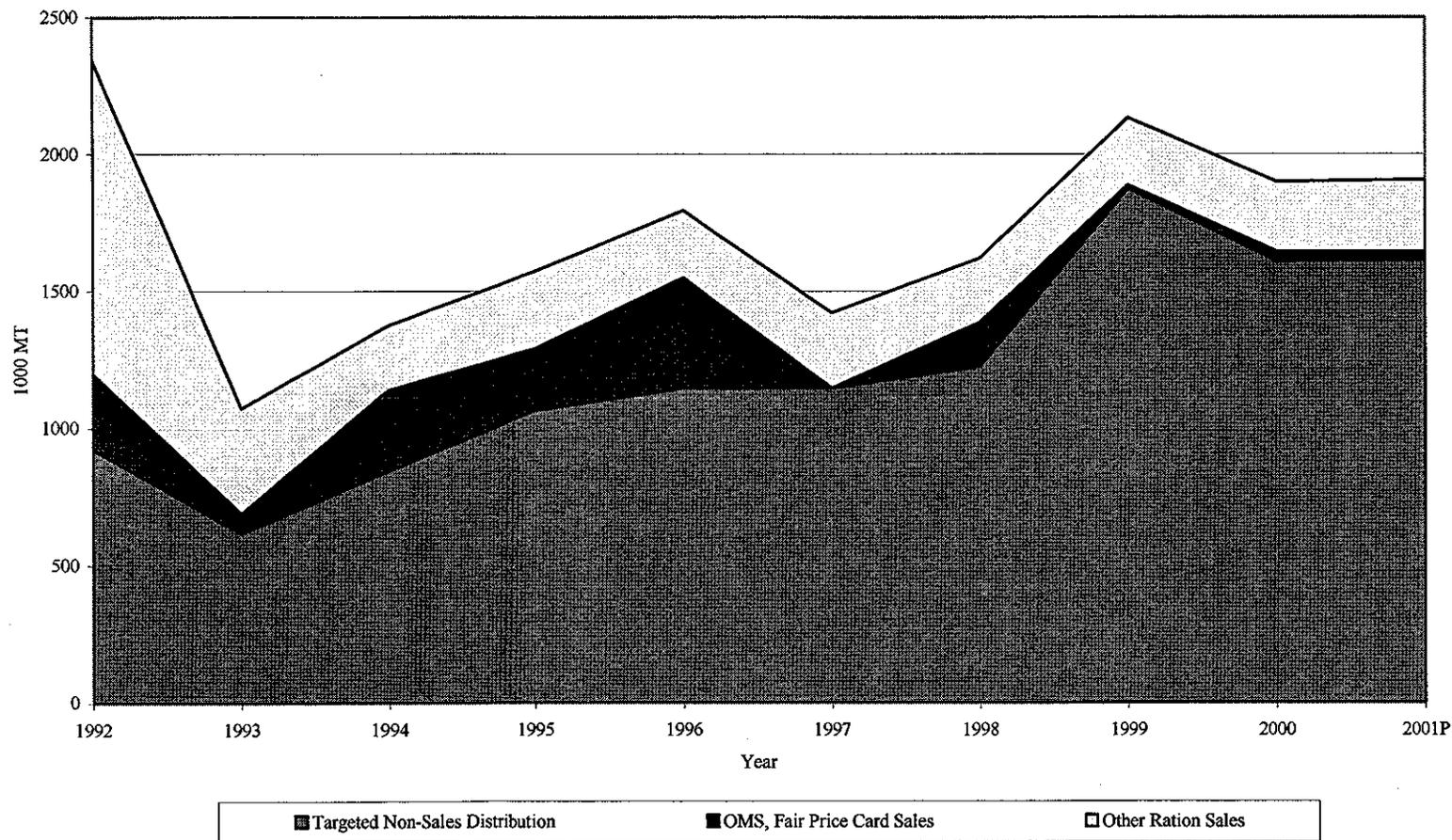
The FFW program also underwent serious reforms as questions were raised by the donors about the utility, quality and desirability of the already created structures under FFW. It was held that many of the structures were actually harmful, causing environmental degradation, water logging and reductions in fish production due to absence of structures. Moreover, the roads created under the programs did not provide facility of movement in all weather conditions. Following the recommendation, WFP moved away from its previous

Table 6.4 — Yearly Channel-wise Distribution of Foodgrain from Public Stock

(in 000 MTs)

Channel	1988/89			1989/90			1990/91			1991/92			1992/93			1993/94		
	Rice	Wheat	Total															
SR	0	203	203	7	149	156	46	189	235	0	169	169	0	56	56	0	0	0
P&PR	182	151	333	386	46	432	479	0	479	215	2	217	0	0	0	0	0	0
Essential Programs	81	56	137	95	46	141	86	57	143	90	60	150	93	62	155	97	65	162
Other Priority	93	330	423	62	217	279	75	132	207	60	150	210	4	11	15	3	3	6
Large Employee Industries	0	40	40	1	34	35	9	32	41	30	28	58	0	13	13	1	13	14
Open Market Sales	167	125	292	16	31	47	74	14	88	274	1	275	7	65	72	172	124	296
Fair Price Cards																		
Flour Mills	0	87	87	0	168	168	4	278	282	0	254	254	0	87	87	0	18	18
PC	0	0	0	0	111	111	0	88	88	0	88	88	0	40	40	0	0	0
MO	0	0	0	0	0	0	0	0	0	0	0	0	7	11	18	0	0	0
FS	0	0	0	3	0	3	4	7	11	0	0	0	0	0	0	0	0	0
Other/Auction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	29	35
Ration	523	992	1515	570	802	1372	777	797	1574	669	752	1421	111	345	456	279	252	531
FFW	21	590	611	28	429	457	38	420	458	12	485	497	205	163	368	1	424	425
Test Relief	141	168	309	71	77	148	70	45	115	52	145	197	104	12	116	13	88	101
VGD	5	501	506	6	181	187	86	139	225	26	204	230	56	77	133	0	167	167
Gratuitous Relief	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FFE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	78
Vulnerable Group Feeding																		
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57	17	74
Relief	167	1259	1426	105	687	792	194	604	798	90	834	924	365	252	617	71	774	845
Total	690	2251	2941	675	1489	2164	971	1401	2372	759	1586	2345	476	597	1073	350	1026	1376

Figure 6.5 — Channel-wise Distribution of Foodgrain from Public Stock



scheme based approach to project based approach. The selection of projects had to be made through rigorous project selection criteria, and the quality of construction improved. Food for Work with donor resources was renamed as RD (Rural Development), and a cash component was introduced as part of the labor wage, to be paid out of the GOB contribution. FFW (RD) components implemented by CARE started using cash as its focus shifted from earthwork to create structures on roads. Finally, in the late 1990s, EU started proposing that it would replace its food aid with cash. Although the EC cited a number of rationales in favor of its move to cash, the GOB did not agree and continued to express its preference for in kind food aid.

The donors started to quit the so-called local initiative FFW programs from late 1980s. In view of their political and social importance, the Government of Bangladesh started to provide its own resources to fund RD, FFW and VGD. As a result, the share of these programs in public expenditures increased over time.

7. IMPACTS OF FOOD AID ON DOMESTIC PRICES AND IMPORTS

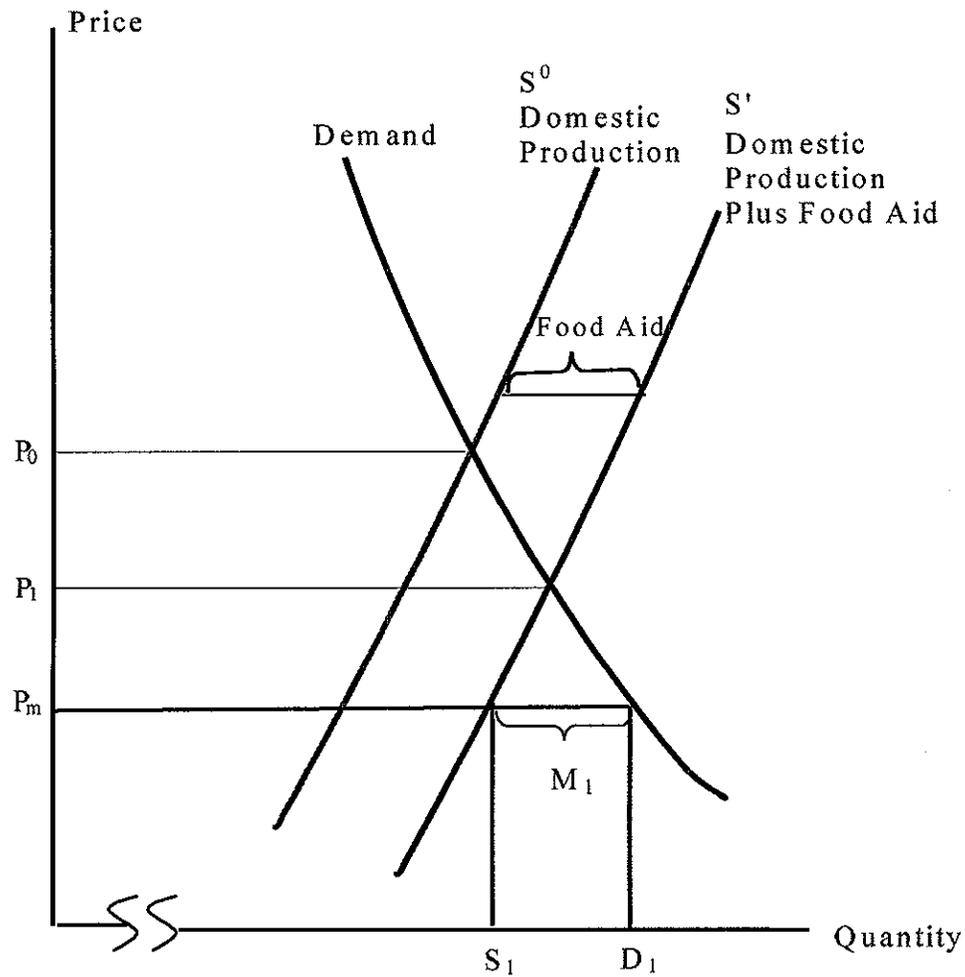
THEORETICAL FRAMEWORK

Since food aid ultimately increases market supply of wheat, it has the potential to lower domestic wheat prices and adversely affect incentives for domestic wheat production and incomes of wheat farmers. Whether food aid actually lowers market prices, however, depends on whether food aid is simply replacing public or private imports, or whether food aid is actually increasing total domestic supply of wheat. In other words, in order to avoid depressing market prices below import parity prices, the total level of food aid must not exceed the amount of wheat that would be imported by the private sector under free trade in the absence of food aid.

Note that in the discussion that follows, it is assumed that wheat food aid results in a corresponding distribution of wheat through the Public Foodgrain Distribution System, i.e. that there is no change in public stocks. Note also that in terms of impact on market prices and private imports, food aid has the same effect as public commercial imports distributed through the PFDS, though of course public commercial imports are purchased with the GOB's own resources, not donor finances.

Figure 7.1 illustrates the impact of food aid on domestic prices and private sector imports. Food aid adds to domestic supply of wheat, shifting the supply curve from S_0 to S' . In the absence of private sector trade, total supply equals total demand at a price of P_1 . However, if the world price P_M (import parity) is below P_1 , then there will be private imports equal to M_1 , in addition to food aid (F_1).

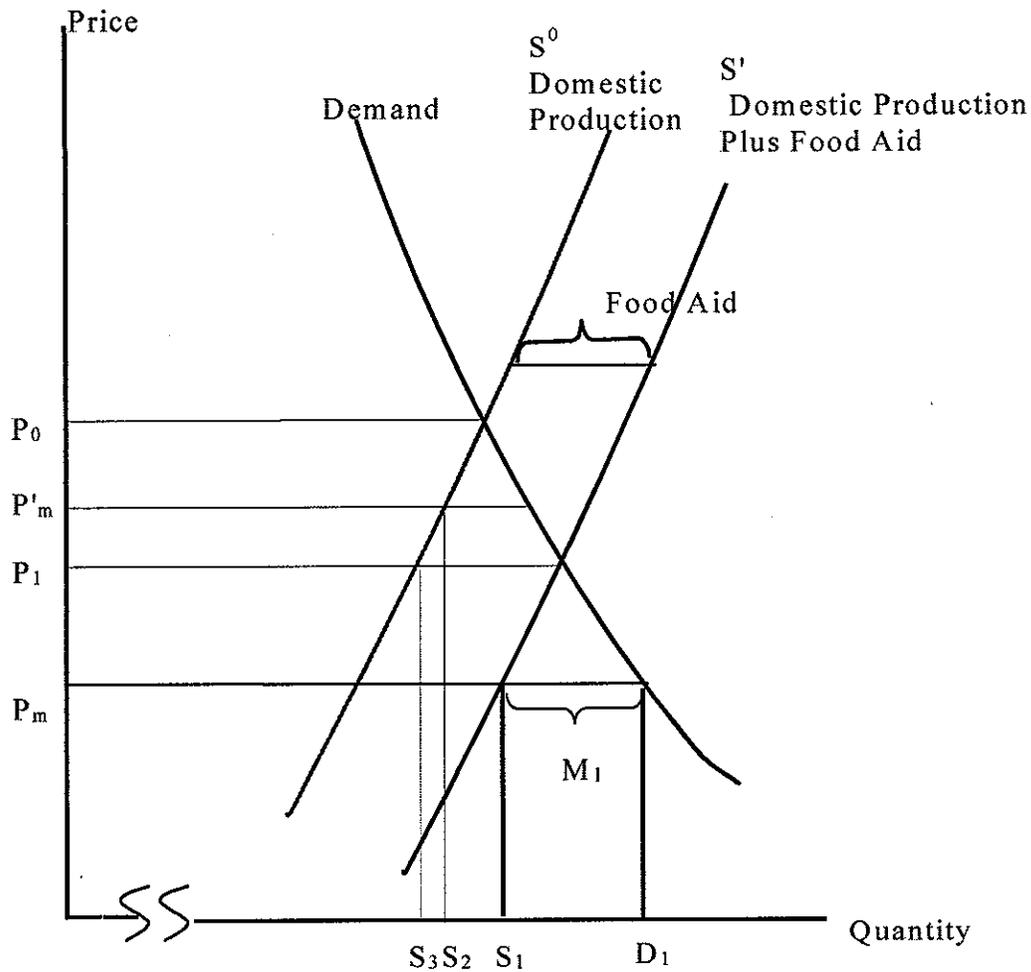
Figure 7.1 — Food Aid, Domestic Prices and Imports



Source: Author

Moreover, as long as food aid is less than or equal to the level of private sector imports that would be imported in the absence of food aid (M_1 plus F_1), then food aid has no disincentive effects on domestic production, since domestic market prices will be equal to import parity (PM). However, in comparison to a higher, long-term import parity price of PM' , food aid may cause disincentive effects even when there are private

Figure 7.2 — Disincentive Effects of Food Aid



Source: Author

sector imports (Figure 7.2). At the import parity price of PM' , domestic production would be S_2 in the absence of food aid, compared with only S_3 , with food aid.

The import parity price in any given year could be higher than the long-term average import parity price, as well. In this case, even though food aid reduces domestic producer prices below import parity and has a disincentive effect on domestic production,

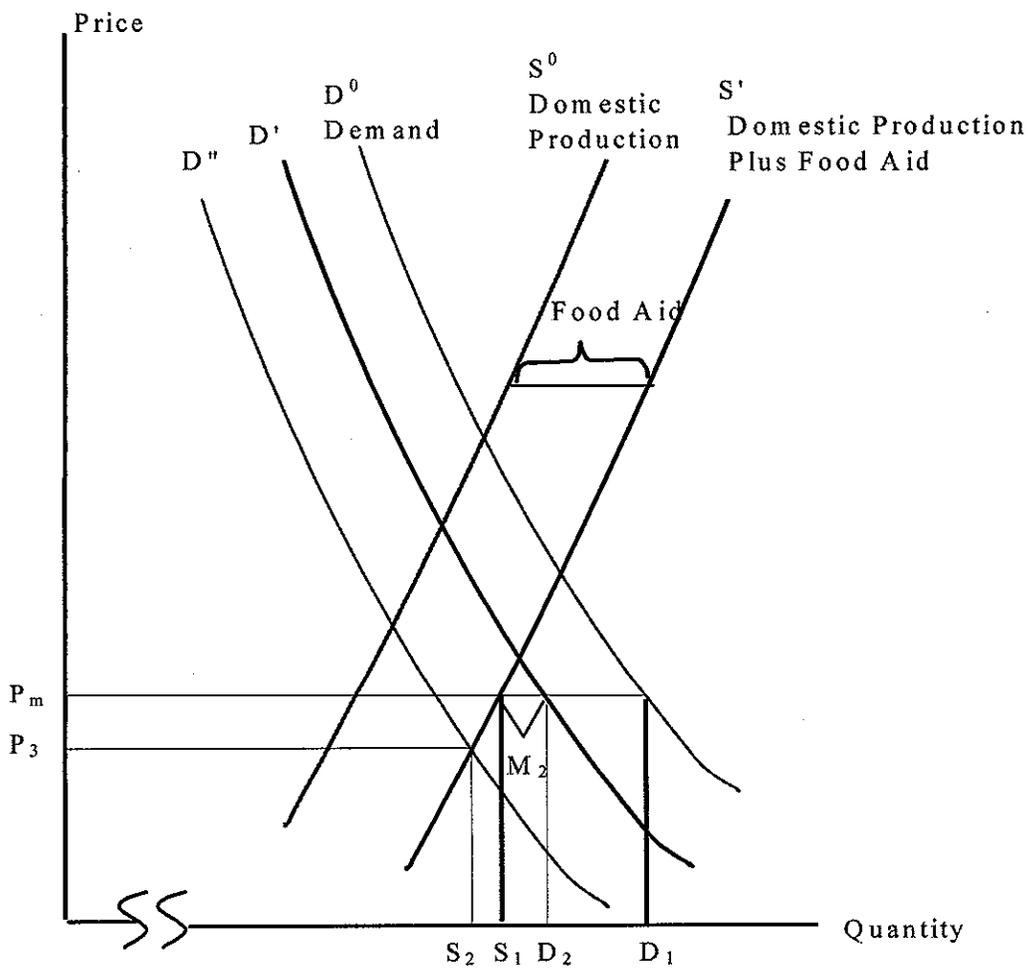
domestic prices would still be high in comparison with other years. Since excessively high prices can have a serious negative impact on access to food by poor households, price stabilization is one of the major objectives of food policy of the Government of Bangladesh. Thus, rather than using the current import parity price, it is more appropriate to compare domestic prices with a reference price calculated on the basis of medium-term average of world prices, (though the exact definition of this reference price is subject to debate).

The basic analytical framework described above focuses on the import parity price of wheat and the short-run response of consumers and producers to changes in the wheat price, holding other factors constant. But other factors, which influence the shape and location of the domestic supply curve for wheat, the shape and location of the domestic supply and demand curves for wheat must also be taken into account. Domestic supply is determined not only by farmers' expected price of wheat during the growing season, but also by the expected prices of alternative crops, expected yields, available production technologies, weather and prices and availability of inputs. Domestic demand is determined by the responsiveness of consumers to changes in the wheat price (reflected in the shape of the demand curve), as well as the prices of other goods (most importantly, rice) and the level and distribution of household incomes (both of which shift the demand curve to the right or left). Other factors also influence total demand including demand for wheat as animal feed and the amount of wheat distributed through programs targeted to poor women and children.

The impacts of reductions in demand for wheat can on domestic prices, production and imports are shown in Figure 7.3. In years of a good rice harvest, demand for wheat in Bangladesh falls as consumers choose to consume more rice and less wheat. A shift in the demand curve from D_0 to D' reduces total private sector imports to M_2 , but domestic prices remain equal to the import parity level PM . However, an even larger shift in domestic demand to D'' leads to an excess of supply over demand at the import parity price PM . As a result, the domestic price drops to P_3 and private sector imports

cease. In this case, a level of food aid that did not lead to price disincentive effects with a normal level of demand (D_0), caused prices to fall below import parity levels when demand fell to D'' .

Figure 7.3 — Impact of Reduced Demand on Production, Prices, and Imports



Source: Author

Two other factors are particularly important. First, there are major quality differences for wheat. Domestically produced wheat is soft wheat with a relatively low gluten content, and is not suitable for many baking purposes (biscuits, cakes, and many types of breads). To meet the demand for these products, wheat millers use imported wheat with higher gluten content (so-called milling wheat). Discussions with a large international grain company representative indicate that roughly 30 thousand MTs of milling wheat per month is used in Bangladesh, totalling about 360 thousand MTs per year. Thus, private sector imports of wheat of comparable quality to Bangladesh wheat in 1999/2000 were about 540 thousand MTs, (360 thousand MTs less than the total 806 thousand MTs of private sector wheat imports).

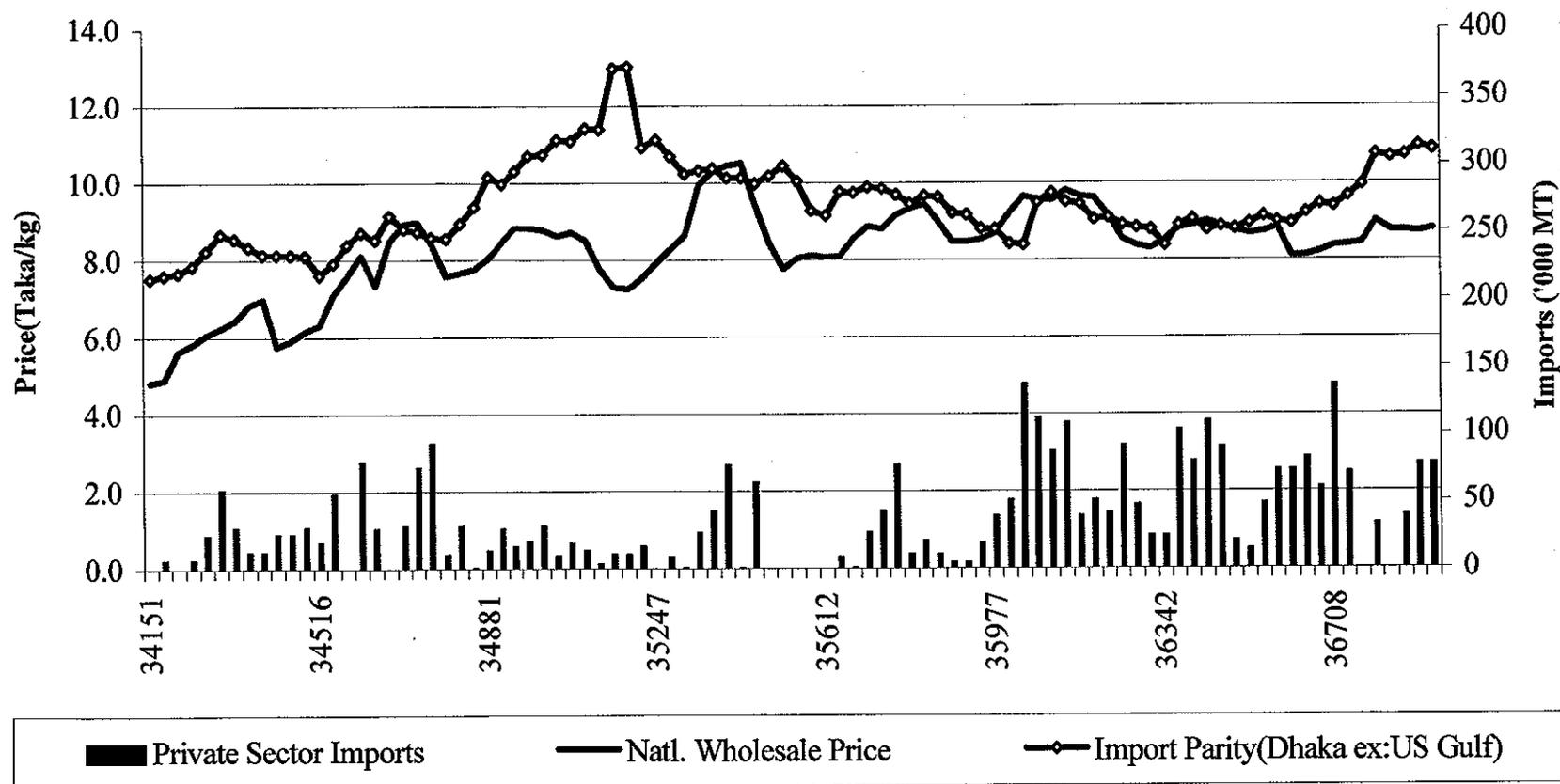
Second, the Bangladesh wheat harvest is concentrated in a few months (March-April), and that the bulk of Food For Work wheat distribution typically occurs from January through May (when soils are dry enough to permit heavy earthwork for road-building and repair), there are potentially large seasonal effects of PFDS distribution. Spreading the distribution of wheat throughout the year through other channels (such as Food For Education), is one means of minimizing the risk of depressing market prices to the detriment of producers.

BORDER PRICES AND PRIVATE SECTOR IMPORTS

For much of the last three years, private sector imports have been substantial and Bangladesh domestic prices for wheat have closely tracked import parity prices, (Figure 7.4).¹¹ Private sector wheat imports surged in the months immediately after the mid-1998 floods, averaging 111 thousand MTs per month from September through December 1998.

¹¹ Import parity prices were in fact lower than shown in 1993 due to the U.S. Export Enhancement Program which subsidized wheat exports.

Figure 7.4 — Wheat Prices and Quantity of Private Wheat Imports in Bangladesh, 1993-2001



Note : . Private import quantity data is smoothed to adjust for reporting problems in April 1998, June 1999, and March 2000.
 Source : FPMU, DAM, MIS DG Food, USDA and CMIE (1998, 1999, 2000).

Imports were again high from September through December 1999, (averaging 75 thousand MTs per month), and totalled 1.611 million MTs from July 1998 through June 2000.

In 1999/2000, the private sector imported 806 thousand MTs of wheat, and domestic wheat prices (national wholesale) averaged 8.64 Tk/kg. In addition, public net distribution (total distribution less domestic procurement) added 813 thousand MTs of wheat to domestic supplies. Thus, a total of 1.619 million MTs of wheat was supplied to domestic markets through private imports and the PFDS in 1999/2000. Given that domestic prices remained close to estimated import parity prices for most of the year, and perhaps more important, that large amounts of wheat were imported by the private sector, it appears that food aid did not lead to price disincentive effects for Bangladesh wheat farmers in 1999/2000.

After April 2000, however, national average domestic wheat prices fell to an average of 1.1 Tk/kg below estimated import parity levels. Nonetheless, private sector imports remained high. From April through June 2000, this was apparently due to imports of exceptionally low-priced wheat (about \$130/MT C&F Chittagong) from the EU and Turkey. Later in 2000, however, private market imports considerably slowed, suggesting that private imports of non-milling wheat may not have been profitable.

ESTIMATES OF THE SAFE LEVEL OF FOOD AID

Several earlier studies have estimated the magnitude of disincentive effects of food, including the Centre for International Economics (1997), Dorosh and Haggblade (1998) and Dorosh (2000).

CIE (1979) used a basic short-run supply and demand framework to analyze the impacts of expanding food aid beyond the "safe" level. This analysis did not estimate the "safe" level itself, however, but instead used three alternative assumptions regarding the market clearing levels of production, consumption and imports of rice and wheat. Then, using alternative estimates of supply and demand parameters, they simulated the impact

of an additional 100 thousand MTs of food aid on the level of domestic wheat production. The biggest impacts on production occurred with unresponsive (inelastic) demand parameters and response (elastic) supply parameters). In this case, additional food aid beyond the “safe level” would increase total supply and depress market prices, but demand would increase only slightly and production drop sharply. Under various scenarios with these parameters, and additional 100 thousand MTs of food aid resulted in a reduction of between 81 and 91 thousand MTs of wheat production.

Dorosh (2000) calculated the safe level of food aid for 1996/97 based on historical levels of production, food aid, private sector imports and prices, along with alternative assumptions regarding world prices and supply and demand elasticities (Table 7.1).

Table 7.1 — Estimates of Wheat Imports in Absence of Food Aid, 1996/97 Base

	World Price	Domestic Price		Wheat Imports
	(\$/MT)	(Tk/kg)	(% Change)	(Thousand MTs)
Base 1996/97	221	8.99	0.0	933
Free Trade	221	10.15	12.9	710
Low World Price				
Base Parameters	197	9.32	3.6	868
Inelastic	197	9.32	3.6	894
Medium World Price				
Base Parameters	208	9.81	9.1	773
Inelastic	208	9.81	9.1	839

Notes: Base parameters: wheat elasticity of supply (0.61), wheat elasticity of demand (-0.5).

Inelastic parameters: wheat elasticity of supply (0.2), wheat elasticity of demand (-0.4).

Source: Dorosh (2000).

Even though the private sector imported 222 thousand MTs of wheat in 1996/97, wheat prices in Bangladesh in 1996/97 averaged only Tk/kg 8.99, significantly below import parity prices, estimated at Tk/kg 10.15. This suggests that private sector imports were a different quality of wheat than domestically produced wheat. However, the substantial difference between estimated import parity and domestic prices appears to be

too large to be accounted for only by quality differences.¹² Thus, the data indicate that food aid (or more accurately, net domestic distribution made possible by food aid and government commercial imports), depressed prices below import parity. Under free trade, total imports would have been only 710 thousand MTs, compared to 933 thousand MTs actually imported in 1996/97. With lower prices, the free trade level of imports is higher, 868 to 894 thousand MTs at a world price of \$/MT 197, and 770 to 839 thousand MTs at a world price of \$/MT 208.

ANALYTICAL FRAMEWORK: A SIMPLE QUANTITATIVE MODEL OF THE WHEAT MARKET

The drop in wheat market prices below import parity levels (based on U.S. hard red winter wheat prices adjusted for quality) in the second half of 2000 suggest that food aid (or more exactly net public foodgrain distribution)¹³ may have had disincentive effects on domestic production. In this section, we present a simple model in order to quantify the impacts of the major factors outlined above on domestic prices, private imports and the "safe" level of food aid, the level of food aid beyond which there will be disincentive effects on domestic wheat production. The model is similar to those used in earlier

¹² Erratic market conditions may have fooled some traders, as well.

¹³ Note that net distribution plus private imports is equivalent to total imports if there are no changes in government stocks. The results from Dorosh (2000) shown above also assume no change in government stocks and show only total imports (not the breakdown between food aid, commercial imports and private imports).

Determining the level of total imports is equivalent to determining net domestic distribution (NDD) plus private sector imports (M) when change in government stock (DST) is zero.

From the identity for change in government stocks, (and assuming no storage losses),

$$AID + GI + DP - DD = \text{change in government stocks,}$$

where AID is food aid, GI is government commercial imports, DP is domestic procurement and DD is domestic distribution. Defining net domestic distribution (NDD) as domestic distribution (DD) less domestic procurement (DP), and adding private sector imports (I) to both sides of equation (1), we have:

$$AID + GI + I = \text{change in government stocks} + NDD + I$$

and total imports = NDD + I, when change in government stocks is zero.

studies, but uses an updated base scenario (1999/2000), and unlike CIE (1997) and Dorosh (2000), it explicitly takes into account differences in quality of wheat and the impacts of changes in rice prices.

The model determines domestic wheat prices, production, demand and private imports, given the international price of wheat and an exogenous domestic price of rice.¹⁴ Changes in domestic wheat demand are calculated using the base level of demand, changes in the prices of rice and wheat and the own-price elasticity of demand of wheat and the cross-price elasticity of demand for wheat with respect to the price of rice.¹⁵ Similarly, changes in domestic wheat production are calculated using the base level of demand, changes in the prices of rice and wheat and the own-price elasticity of supply of wheat and the cross-price elasticity of supply for wheat with respect to the price of rice.

Supply of food aid is added to domestic production (less a ten percent deduction for seed, feed and wastage) to get total supply. In addition, in the simulations presented in Tables 7.3 and 7.4, private sector imports of milling wheat (360 thousand MTs), which are assumed to be insensitive to the changes in wheat prices modeled here, are added to total supply. The model then calculates a market-clearing price of wheat given total supply and demand for wheat in the absence of private sector imports for ordinary wheat. If this price is below the import parity price, then this price represents the market price of wheat in Bangladesh. If, however, the equilibrium price is above the import parity price, the model uses the import parity price to recalculate demand. In this case, imports are determined as the difference between domestic supply and demand.

¹⁴ Since total wheat demand and supply in Bangladesh are small relative to rice (approximately 21.3 million MTs of wheat compared to 3.3 million MTs of rice in 1999/2000), changes in wheat prices have only a minor impact on the price of rice. Thus, keeping the price of rice exogenous is an appropriate simplifying assumption for analysis of changes in food aid. Quantitative analysis of rice policy and broad food policy issues, however, require a model with an endogenous price of rice, wheat and other commodities as in Dorosh and Haggblade (1995, 1997).

¹⁵ The own-price elasticity of demand for wheat is defined as the percentage change in wheat demand given a one percent change in the real price of wheat. Similarly, the cross-price elasticity of demand for wheat with respect to the price of rice is defined as the percentage change in wheat demand given a one percent change in the real price of rice.

AVOIDING PRICE DISINCENTIVE EFFECTS: EMPIRICAL ESTIMATES OF THE
"SAFE" LEVEL OF FOOD AID

Table 7.2 presents estimates of domestic wheat prices, production and private sector imports under scenarios of international wheat prices, domestic rice prices, and consumer and producer price responsiveness (as measured by demand and supply elasticities). Given a base of 1999/2000, Scenario 1 models an increase in the import parity price of wheat (due to the exchange rate devaluation in mid-2000). In this case, higher producer prices lead to a 2.0 percent increase in domestic production, a 3.2 percent decline in domestic demand, reducing the overall net demand for privately imported or PFDS wheat (non-production net-supply) from 1.62 to 1.48 million MTs. Given an assumed 600 thousand MTs of food aid and a public net distribution of 917 thousand MTs of wheat, private imports would be 563 thousand MTs (1.480 million MTs less 917 thousand MTs).

An increase in international wheat prices (U.S. Hard Red Winter #2, FOB Gulf) to \$155/MT (the average level of the previous five years) could reduce demand for privately imported or PFDS wheat to about 1.20 million MTs, as domestic production increases and total demand declines (Scenario 2).

The biggest potential impacts on wheat demand could come, however, from continued bumper crops of rice. A reduction in the average wholesale price of rice from 12.0 Tk/kg to 10.5 Tk/kg¹⁶ could reduce demand for privately imported or PFDS wheat to 1.24 million MTs at 1999-2000 world wheat price level (Scenario 4), or to about 940 thousand MTs at the higher, five-year average world price level (Scenario 5). Given that import demand for milling wheat is about 360 thousand MTs per year, total demand for privately imported or PFDS ordinary wheat would be only about 580 thousand MTs in the latter scenario. Net PFDS distribution greater than this amount would drive domestic prices below import parity levels.

¹⁶ The national average nominal price of coarse rice at the wholesale level from July through December 2000 was 11.6 Tk/kg, and the average price in December 2000 was 11.9 Tk/kg.

Table 7.2 — Wheat Imports and Domestic Prices Under Alternative Scenarios

		Scenario 1	Scenario 2	Scenario 3	Scenario 4
		2000/2001	Higher World	Low Rice	Low Rice Price
	Base	Production and	Price (FOB \$155)	Price	High World
	1999-2000	World Price		(11.2 Tk/kg)	Wheat
					Price (FOB \$155)
Supply					
Production	1.840	1.877	1.975	1.927	2.020
Losses	0.100	0.100	0.100	0.100	0.100
Less 10 Percent Losses	0.184	0.188	0.197	0.193	0.202
Net Production	1.656	1.689	1.777	1.735	1.818
Public Net Distribution	0.813	0.917	0.917	0.917	0.917
Private Imports	0.806	0.563	0.217	0.327	0.019
Total Supply	3.275	3.169	2.911	2.978	2.754
Total Imports	1.671	1.363	1.017	1.127	0.819
Non-production Net Supply	1.619	1.480	1.134	1.244	0.936
PFDS					
Food Aid	0.865	0.600	0.600	0.600	0.600
Govt Commercial Imports	0.000	0.200	0.200	0.200	0.200
Domestic Procurement	0.211	0.250	0.250	0.250	0.250
Offtake	1.024	1.167	1.167	1.167	1.167
Stock Loss	0.018	0.017	0.017	0.017	0.017
Change in Public Stocks	0.034	-0.134	-0.134	-0.134	-0.134
Demand					
Total Demand	3.275	3.169	2.911	2.978	2.754
CIF Price of Wheat (\$/MT)	162	162.00	197	162	194
Exchange Rate (Taka/\$)	50	54.00	54	54	54
CIF price (Tk/kg)	8.10	8.75	10.64	8.75	10.48
Handling, Transport (Tk/kg)	1.45	1.45	1.45	1.45	1.45
Import Parity (Tk/kg)	9.55	10.20	12.09	10.20	11.93
Quality Calibration factor	0.905	0.90	0.90	0.90	0.90
Domestic Wheat Price (Tk/kg)	8.64	9.23	10.94	9.23	10.79
Percent Change Price		6.79	26.58	6.79	24.88
Percent Change Production		1.99	7.33	4.74	9.78
Percent Change Demand		-3.23	-11.12	-9.06	-15.91
Elasticity of Supply of Wheat	0.30	0.30	0.30	0.30	0.30
Elasticity of Demand of Wheat	-0.50	-0.50	-0.50	-0.50	-0.50

Source: Authors' Calculations.

Note: Domestic price of wheat is national average wholesale price from DAM.

SENSITIVITY ANALYSIS

Table 7.3 presents estimates of the “safe level” of food aid under alternative assumptions regarding, international wheat prices, price-responsiveness of wheat consumers and producers (as reflected in elasticities of wheat supply and demand), and domestic rice prices. The higher the import parity price, the smaller the amount of net public distribution of wheat that can be distributed without depressing domestic wheat market prices below import parity. For example, with a medium-level rice price of 12.24 Tk/kg (the average wholesale price in 1999/2000), raising the import parity price of wheat from 9.2 to 12.2 Tk/kg reduces the “safe level” of food aid from 1.132 to 0.623 million MTs (assuming inelastic supply and demand for wheat). More elastic supply and demand parameters imply that changes in the import parity price have a larger effect on the total quantity of wheat import demand. Thus, with a more elastic demand and supply, raising the import parity price from 9.2 to 12.2 Tk/kg reduces the “safe level” of food aid from 0.999 to 0.004 million MTs. Finally, as in Table 7.2, rice prices have a major impact on the “safe level” of food aid. With low rice prices, wheat demand falls by about 200 thousand MTs with inelastic parameters, and by 350 to 400 thousand MTs with elastic parameters.

Table 7.3 also shows wheat price disincentive effects are easily possible in Bangladesh. Net public wheat distribution on the order of 800 thousand MTs (the figure was 813 thousand MTs in 1999/2000) exceeds the “safe level” of food aid under all scenarios with low rice prices except that of low international prices and inelastic demand parameters. Even with inelastic demand parameters, the “safe level” of net wheat public foodgrain distribution is only 838 thousand MTs, only 25 thousand MTs more than actual distribution in 1999/2000, (a year, however, that had lower international wheat prices).

Table 7.3 — Maximum Level of Net Wheat PFDS without Causing Wheat Producer Price Disincentives

	International Wheat Price		
	162 \$/MT (9.2 Tk/kg)*	194 \$/MT (10.8 Tk/kg)*	222 \$/MT (12.2 Tk/kg)*
Medium Rice Prices - 12.24 Tk/kg (2000)			
Inelastic Parameters	1.132	0.838	0.623
Elastic Parameters	0.999	0.417	0.004
Low Rice Prices - 11.2 Tk/kg (2000)			
Inelastic Parameters	0.916	0.633	0.425
Elastic Parameters	0.589	0.045	-0.345

Source: Authors' Calculations

* The international wheat price shown is the cost, insurance and freight price, Chittagong (\$/MT), U.S. HRW#2.

Notes: These simulations assume inelastic demand for milling wheat imports of 360,000 MTs per year.

Import parity prices include shipping and handling costs to wholesale Dhaka, adjusted with 0.905 quality factor.

Note that these figures are based on the distribution pattern of wheat in 1999/2000, when 351 thousand MTs of wheat were distributed through Food For Education, Vulnerable Group Development and Vulnerable Group Feeding, programs for which participants have a high marginal propensity to consume (MPC) wheat out of transfers received. Assuming an MPC for wheat of about 0.3 in these programs (del Ninno and Dorosh, 2000), then these programs created an additional wheat demand of about 105 thousand MTs. If cuts in wheat distribution take place in these programs, this additional wheat demand will be lost, as well, with a potentially negative effect on domestic prices.

Table 7.4 — Impact of Food Aid on Domestic Wheat Prices (Disincentive Effects)

	Net PFDS Wheat Distribution (thousand MTs)	
	600	900
Medium Rice Prices - 12.24 Tk/kg (2000)		
Inelastic Parameters	12.32Tk/kg ***	10.44Tk/kg -10.6%
Elastic Parameters	10.26Tk/kg -12.1%	9.47Tk/kg -18.9%
Low Rice Prices - 11.2 Tk/kg (2000)		
Inelastic Parameters	11.00Tk/kg -5.8%	9.310Tk/kg -20.3%
Elastic Parameters	9.20Tk/kg -21.2%	8.483Tk/kg -27.3%

Source: Authors' Calculation

Notes: Wheat prices shown in the table are the prices which result from the specified level of net public foodgrain distribution if private sector imports of non-milling wheat are zero. Percentages shown indicate the percentage below a long-term import parity price of 11.67 Tk/kg. These simulations assume inelastic demand for milling wheat imports of 360,000 MTs per year.

Table 7.4 shows the size of the potential price disincentive effect of 600 and 900 thousand MTs of net public wheat distribution under alternative assumptions for rice prices and model parameters. The prices shown in the table are the prices that result from the specified level of net public foodgrain distribution if private sector imports of non-milling wheat are zero. In other words, these prices show the market clearing prices in the absence of private sector imports of non-milling wheat.

With net PFDS wheat distribution of 900 thousand MTs and medium-level rice prices, wheat prices in Bangladesh would be 10.44 Tk/kg in the absence of non-milling wheat imports by the private sector. This price is 10.6 percent below long-term import

parity of 11.67 Tk/kg (calculated using the average dollar price of U.S. Hard Red Winter #2 wheat over the 1995/96 – 1999/2000 period, adjusted for quality, transport and marketing costs). If net PFDS wheat distribution were only 600 thousand MTs, then the market clearing price would be 12.32 Tk/kg, which would be above the long-term import parity price.

With low rice prices, even 600 thousand MTs of net PFDS wheat distribution is sufficient to bring down market-clearing prices to 11.0 Tk/kg, 5.8 percent below long-term import parity. 900 thousand MTs of net PFDS wheat distribution with low rice prices drops wheat prices to 9.31 Tk/kg, 20.3 percent below long-term import parity. Using more elastic demand parameters, the potential price disincentive effects are even larger, ranging from 12.1 to 27.3 percent under the various scenarios.

Thus, net PFDS wheat distribution of 900 thousand MTs has small price disincentive effects on wheat production even with medium-level rice prices, and the disincentive effects are quite large (-20.3 percent) when domestic rice prices are low, as in 2000. Reducing net PFDS wheat distribution to 600 thousand MTs completely eliminates the price disincentive effect with medium-level rice prices (and inelastic parameters). If the more elastic parameters are a better indication of medium-term supply and demand behavior, however, then there are still significant price disincentives, even with medium-level rice prices and only 600 thousand MTs of net wheat distribution.

Reducing net PFDS wheat distribution from 900 to 600 thousand MTs can be accomplished relatively easily by substituting domestic wheat procurement for commercial imports and stock drawdowns. Cutbacks below 600 thousand MTs, of course, imply a reduction in food aid.

8. CONCLUSIONS

If good rice harvests continue, food aid could result in disincentive effects, and if international wheat prices return to their average 1995-99 levels, then net public wheat distribution may need to be cut to levels below the current amount of food aid received (650 thousand MTs in 2000/2001) to avoid reducing domestic prices below import parity.

Cuts in food aid, however, could potentially cost Bangladesh millions of dollars per year in resources that currently provide the resources for programs that increase access to food by poor households. A major loss of resources for food security need not occur in this scenario, though. In place of the food aid imports, donors could provide the equivalent value of resources in the form of cash, either to permit the Government of Bangladesh to procure foodgrain locally for these programs or to use directly in re-designed Cash for Work or other cash programs.

Continued good harvests depend on adequate funding of agricultural research and extension, maintaining appropriate price incentives for production, timely input supplies at reasonable prices, and the weather. If these prequestites are met, foodgrain availability targets are likely to be achieved. Resources, however, will continue to be required for programs that increase access to food by the poor, contribute to increased utilization of food and result in improved nutritional outcomes. Thus, it is important that resources devoted for food security in Bangladesh not decrease, even if the need for food aid to increase availability of foodgrains diminishes.

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