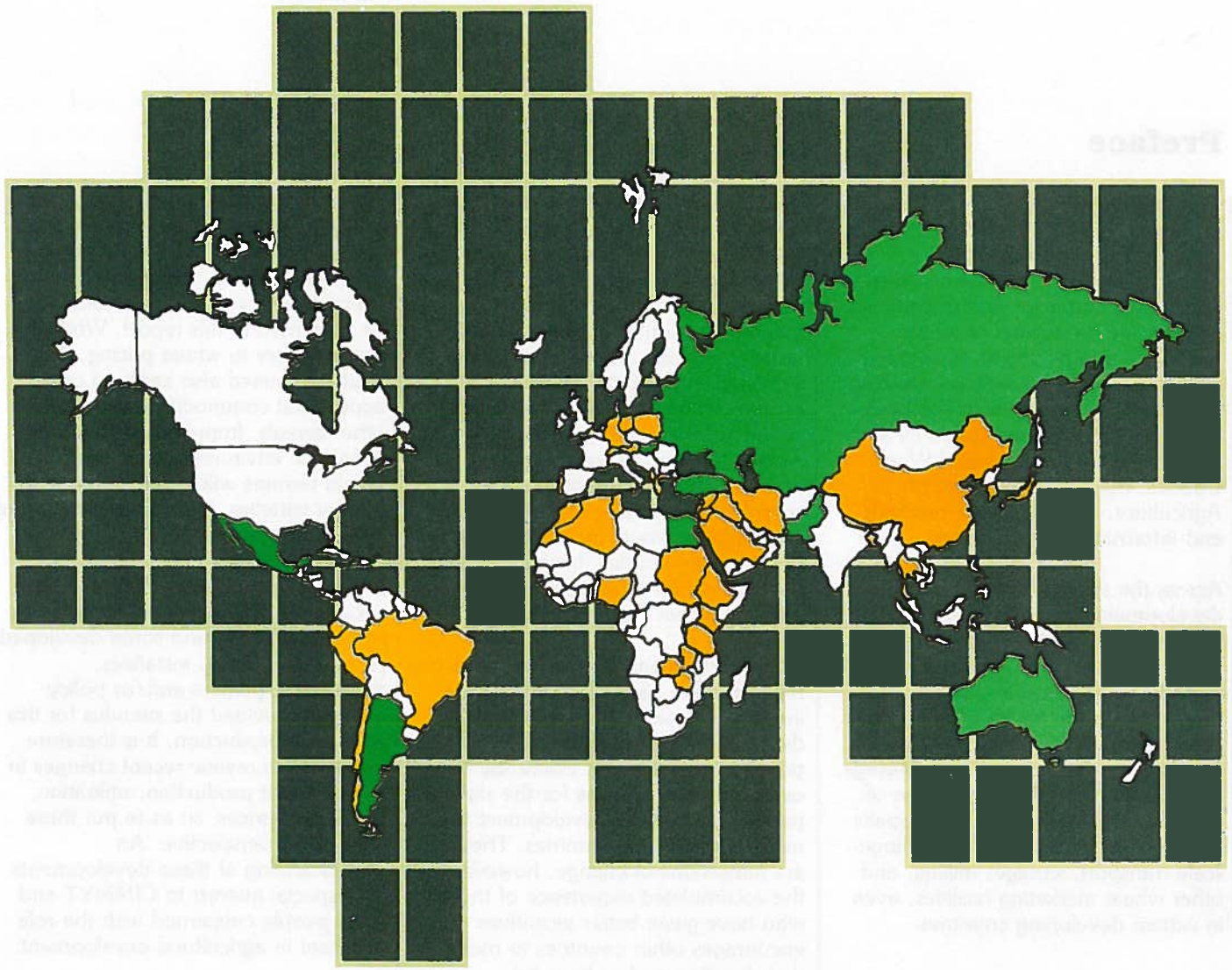

1985
CIMMYT World Wheat Facts and Trends

Report Three: A discussion of selected wheat marketing and pricing issues in developing countries

Preface

Previous issues of CIMMYT Wheat Facts and Trends focused on longer term changes in production, consumption, and imports of wheat in developing countries. In this issue we concentrate on aspects of wheat marketing and pricing in developing countries. While somewhat neglected in the past, more research has been done recently on these topics by such agencies as the International Wheat Council, the US Department of Agriculture, and by private research and information organizations.

Across the spectrum of economic development, there exists a fascinating breadth of technologies used to transport wheat from the farm, process it, and deliver bread and other wheat products into the hands of consumers. At one extreme is subsistence wheat farming, with traditional home storage, local milling, and the preparation of such wholemeal products as chapatis. At the other extreme one finds large-scale transport, storage, milling, and other wheat marketing facilities, even in certain developing countries.

The Third World wheat market has undergone dramatic changes during the past 15 years, associated with rising wheat consumption and imports, as well as with an increased marketable surplus in major wheat-growing regions. These changes are expected to continue well into the next century, when the enormous urban centers of the developing world will be among the world's largest consumers of wheat. It is important to obtain a sound understanding of the processes of change in wheat marketing in developing countries, because of the implications for international and national wheat research strategies.

As for our second theme, we focus on the important issue of economic incentives to farmers. In many food-deficit countries, farmers still lack production incentives. Some say this is one of the key reasons for the slow pace of agricultural development in a number of African countries. There are indications of change, however, as the accumulated experience of those who have given better incentives encourages other countries to move in that direction and as financial stringencies induce policy changes.

The importance of economic incentives to farmers in developing countries has been a key concern to CIMMYT and to our agricultural research colleagues throughout the Third World. Because most governments have intervened in the setting of wheat prices, and are likely to continue to do so, it is timely and appropriate that a discussion of alternative wheat pricing mechanisms be presented in this report. While the article relates to wheat pricing, the issues discussed also apply to other agricultural commodities, especially other cereals. Improvements in the economic environment for Third World farmers will foster the adoption of new varieties, and the application of new technologies.

In recent years, major increases have occurred in the wheat production of some developing and some developed countries. In many instances, appropriate policies and/or policy changes provided the stimulus for this additional production. It is therefore important to review recent changes in global wheat production, utilization, trade, and prices, so as to put these changes in perspective. An understanding of these developments is of special interest to CIMMYT and to all people concerned with the role of wheat in agricultural development.

Donald L. Winkelmann
Director General

The International Maize and Wheat Improvement Center (CIMMYT) is an internationally funded, nonprofit scientific research and training organization. Headquartered in Mexico, CIMMYT is engaged in a worldwide research program for maize, wheat and triticale, with emphasis on food production in developing countries. CIMMYT is one of 13 nonprofit international agricultural research and training centers supported by the Consultative Group for International Agricultural Research (CGIAR). The CGIAR is sponsored by the Food and Agriculture Organization (FAO) of the United Nations, the International Bank for Reconstruction and Development (World Bank), and the United Nations Development Programme (UNDP). The CGIAR consists of 40 donor countries, international and regional organizations, and private foundations.

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Notes

Introduction

This issue of CIMMYT World Wheat Facts and Trends is composed of four major sections. The first provides an overview of wheat marketing, focusing on developing countries. It begins with a brief review of recent changes in wheat marketing processes. This is followed by a discussion of the relationship between economic development and marketing margins at different levels of the wheat market for two major wheat products, bread and "family" flour. Data for this section were taken from a study of marketing margins for bread and flour which will be published as a CIMMYT Economics Program Working Paper (Longmire and Heid).

The second section concentrates on the role of prices in the wheat market, how world prices relate to particular country prices and why a country might set farm prices at levels that differ from world prices. The section presents some of the main implications policy makers should consider as they think about using different pricing mechanisms for setting farm level prices.

Section 3 provides a brief overview of the current global wheat situation: recent trends in production, trade and prices. The short-term and longer term prospects for the world wheat market are also considered. Although world prices are currently declining and competition in the export market is intensifying, longer term forces suggest that the market for wheat will continue to grow strongly.

Finally, section 4 presents selected statistics (in tabular form) relating to wheat production, consumption, trade, and prices. Data are provided for major wheat-producing and major wheat-consuming countries of the developing world (those growing more than 100,000 tons of wheat and those consuming over 100,000 tons of wheat annually, or both). Data are also provided for developed and centrally planned economies.

Wheat Marketing and Economic Development

Changes in Wheat Marketing

Important changes are occurring in the marketing of wheat and wheat products, especially in developing countries. First of all, a number of countries, notably China, India, Pakistan, Turkey, and Bangladesh, have dramatically increased their wheat production. During the past 15 years, developing countries have raised wheat production more rapidly than have wheat-producing countries of the developed world (Figure 1).

One consequence of this rapid increase in production has been that the amount of wheat entering the marketplace, the so-called "marketable surplus," has increased rapidly in Third World countries. Although precise data are not available, it is estimated that about 75% of global wheat production now enters the marketplace (Table 1, page 2). Countries in which considerable wheat is still consumed on the farm include India, Pakistan, China, and the wheat-growing countries of North Africa and the Middle East. Even in these countries, however, the proportion of wheat going to markets is increasing over time.

A second important factor affecting wheat marketing has to do with the growth of personal income in developing countries. As incomes rise, the consumption of bread and other baked wheat products increases. Along with rice and livestock products, wheat products are now displacing other staple foods in Third World diets, especially root crops and maize (CIMMYT 1983). This additional demand has been met by increased production in some wheat-producing countries but, for the majority, wheat imports have increased.

In many countries, wheat products also are strongly preferred by consumers living in urban areas compared to those living in rural areas. Thus, with urbanization (a particularly rapid occurrence in most developing countries), the urban market for wheat has expanded very quickly. By the year 2000, around 40% of the population of the Third World will be in cities; this urban population probably will account for over 50% of total wheat consumption in developing countries. Because of this, the amount of wheat entering the urban marketplace will increase dramatically during the next few

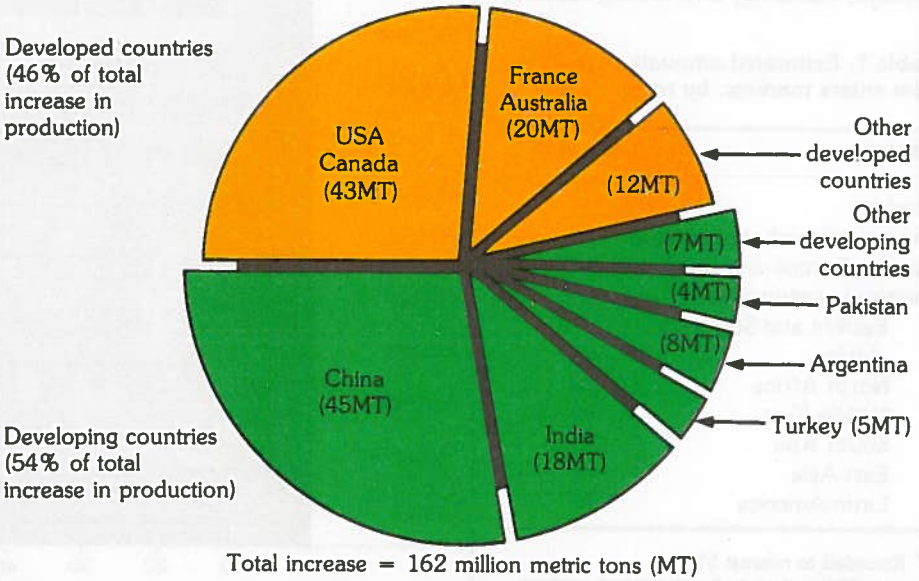


Figure 1. Expansion in world wheat production, 1970-72 to 1982-84, and where the additional production occurred

decades. This trend will require a major increase in wheat marketing facilities, as well as in wheat marketing and processing expertise in the developing world.

There are four major steps in the transformation of wheat into bread: 1) transport, storage and handling of whole wheat; 2) milling and delivery of flour and wheat by-products; 3) baking and distribution of bread; 4) retailing. The technologies used to provide these services vary widely according to: the type of end-product to be consumed; the type and source of the wheat; the food consumption traditions and customs of the country; the availability of a marketing infrastructure (especially transport, storage, milling, baking, and retailing facilities); and the relative price of inputs used in the provision of marketing services.

Rapid changes are occurring in the technologies of wheat marketing as well (Chamberlain 1975; Christensen 1982; Kent 1983; Sosland Publishing Company 1984). These technological developments have been adopted by many developing countries as they have modernized their transport, storage, handling, and milling facilities to accommodate rapidly growing urban markets. Sometimes, the existence and operation of these modern facilities are largely dependent on imported wheat. Indeed, the three largest flour mills in the world are now operating in major ports of Indonesia, Nigeria, and Sri Lanka. In many other developing countries, however, much remains to be done in developing wheat marketing processes. To better understand what needs to be done in these countries, one needs to comprehend how wheat marketing varies across different stages of economic development.

Table 1. Estimated amounts of wheat that enters markets, by region, 1984

Region	Percent[a/]
World	75
Developed market economies	95
Eastern Europe and USSR	80
Developing economies	50
Eastern and Southern Africa	40
North Africa	30
Middle East	50
South Asia	35
East Asia	45
Latin America	90

a/ Rounded to nearest 5%
Source: National agricultural research contacts and USDA regional reports. Aggregated according to production

Economic Development and Wheat Marketing

Major changes occur in the marketing of wheat as countries develop and as average personal income grows. These changes occur because the conditions affecting those people and institutions that provide the marketing services change: wages rise relative to the costs of capital equipment; the workforce becomes more educated and skilled, and is able to build and operate large-scale equipment; roads and other facets of the infrastructure improve, making grain transport in larger volume possible; and information services and communications improve. Demand for the end-products of the marketing process also changes, as does demand for the marketing services themselves. Factors giving rise to changes in demand include urbanization (and the associated growth in demand for convenience foods) and the change in consumer preferences, which is increasing the demand for improved quality, packaging, and availability.

Changes in demand for end-products—One noticeable result of development is that the amount of wheat sold as flour declines and the amount sold as more highly processed products increases. For the lowest

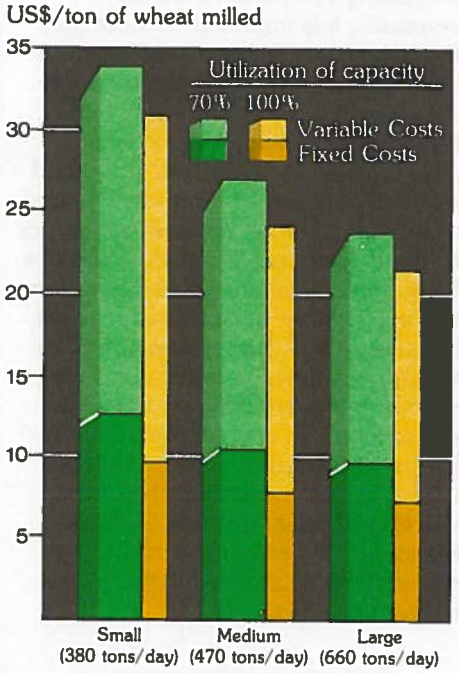
Figure 2. Share of wheat sold as flour and as baked wheat products in 11 countries with differing per capita incomes

income countries of the wheat-consuming developing world, over 90% of the milled wheat (excluding by-products) is bought as flour for home baking and cooking. As per capita income increases, this percentage drops rapidly (Figure 2). Indeed, from the survey conducted as background to this report, all countries with an average per capita income above US$ 1000 per year consumed 90% or more of their wheat in the form of processed and baked products, at least in the major urban centers. While the amount of ready-to-eat wheat products being sold in the rural areas of most of these countries is much lower than in urban centers, it appears that wheat products baked away from the home replace flour at an early stage of economic development and at a relatively low level of consumer income.

A number of estimates have been made of the relationship between changes in consumer income and the consumption of bread, bakery products, and flour. For developed countries, changes in flour consumption are negatively related to changes in income, whereas the consumption of bakery products is positively related. In many developed countries, bread consumption is largely unresponsive to changes in the income level of consumers.

For the developing world a different picture emerges. In countries for which demand estimates are available, the demand for bread and retail demand for flour generally are positively related to rising income. For bakery products, every 1% increase in income generally results in a greater than 1% boost in consumption. Many demand estimates are now quite dated, but the relationships are still expected to hold. If anything has changed, it is likely that the demand responsiveness of flour to rising income in developing countries has declined, relative to bread and baked products. This would occur as consumers, especially in the cities, increasingly rely upon the baking industry to meet their staple food needs.

Within low income groups, the consumption of baked wheat products is very responsive to prices. If the prices of breads and other bakery products increase rapidly relative to whole grain and flour, poor consumers will switch back to the less-processed products. As incomes increase, this responsiveness declines rapidly, and high income consumers do not respond much to price changes. For this reason, some countries, including the newly industrializing countries of Southeast Asia, have relatively high bread prices, with bread sales targeted at the specialty end of the food market. In all bread markets, specialty products have much higher margins than the large-volume products.



Source: Niernberger, FF. *et al.*, 1977

Figure 3. Estimated milling costs per ton of wheat miled, by size of mill and utilization of capacity, USA, 1975

Changes in the provision of marketing services—With economic development, significant changes occur in the sectors providing wheat marketing services. The number of marketing establishments providing various services changes dramatically. Usually, the size of the various types of equipment and facilities increases, with the number of establishments serving a given size market declining. As an example of this process of industry adjustment, in 1973, flour mills in the USA with a capacity of over 1000 tons per day accounted for 36% of total capacity; by 1983, this group of very large mills accounted for almost 50% of total capacity. Changes of this nature have been observed over time in many countries, not only for wheat, but also for a number of other foods and animal feedstuffs.

Economic development leads to a restructuring of the wheat marketing and processing sector primarily because there are economies of scale to be realized. These economies stem from higher volumes of throughput per unit of labor and, more importantly, capital. Thus, per unit output costs are reduced at key stages of the marketing process. Greater utilization of capacity also gives rise to cost savings and greater productivity. An example of how milling costs per ton of wheat vary by size of mill and utilization capacity is presented in Figure 3. However, significant cost savings can be achieved through the use of larger scale plants and equipment only if they are operated at high levels of capacity.

For the small mills commonly found in rural areas of developing countries, labor costs represent more than half of total costs. Indeed, in the case of home grinding of wheat, labor is the only major cost. Contrast this with highly capitalized mills, such as those found in most developed countries and increasingly in the urban centers of the developing world, in which labor comprises as little as 25-35% of total costs (Heid 1979).

Marketing Margins: The Price of Marketing Services

Marketing margins for food products are the difference between the price received at one level of the market, for example the farm, and a higher level. The total marketing margin for a given product, such as bread, is the difference between the price paid by consumers for the end-product and the payment received by farmers for their grain. Marketing margins can also be thought of in terms of the value added at each stage in the marketing process. In providing market services, middlemen add to the value of the product by holding it over time, transporting it, changing its form, and by facilitating changes in its ownership.

Marketing margins in fact constitute the price of a particular marketing service or bundle of services (Tomek and Robinson 1972). At all levels of the wheat market, factors affecting the supply of and demand for these services combine to establish their prices, except where overridden by pricing regulations or other institutional factors. Commonly, margins for transport, storage, and milling are determined on a cost-plus basis, so that the price of the raw materials at these levels of the market, plus the costs of providing the marketing service, largely determine the price of the product as it enters the next level of the market. However, in some situations (especially at higher levels of the market, e.g., baking and retailing), those providing the marketing service can "price up to the market" and move away from cost-plus pricing. This is the case particularly where there are few suppliers of services, where consumers and suppliers of services are not very responsive to price, and/or where consumer demand is especially strong for particular services.

When estimating marketing margins for a food product, a standardized "product form" or unit must be used since the original raw material (wheat in the case of bread) changes form as it moves through the marketing channels. When making comparisons among countries, a common product form becomes even more important. The standardized product form used here is one ton of whole wheat. By basing all margins calculations on this unit of wheat, major changes in the product can be taken into account. Two major changes occur as wheat is marketed: 1) at the milling stage, whole wheat is divided into flour and wheat by-products, and 2) at the baking stage, other ingredients are added to the flour as final products are made.

In making comparisons across countries, it is important to note that the types and quality of end-products (particularly bread) vary considerably. A loaf of bread in a US supermarket, for example, embodies a widely different bundle of services compared to the bolillos (small, bun-sized loaves) available at a small Mexican bakery, or to the unleavened bread available at a local store in Pakistan. Although flour is a much more standardized product, its quality also varies across countries. Quality variations in bread and flour stem in part from different flour extraction rates and different flour-in-the-bread formulae. For example, Syrian black breads are baked from wholemeal flour, whereas German breads are the product of highly refined flours combined with numerous ingredients.

In this report, marketing margins are based on flows of wheat from each country's major source (main production area or importation port) to the major consumption areas. As a result, the marketing channels comprise urban wheat marketing systems in each country. These are likely to be more developed and specialized than those in rural areas. Because wheat consumption in cities is higher on a per capita basis and growing more rapidly than in rural areas, the margins presented here are probably typical of the newly emerging urban wheat markets of developing countries. They are also probably typical of larger rural markets for wheat products.

Total marketing margins and development—In general, the total value added in the marketing of wheat-to-bread increases strongly with economic development. For wheat-to-flour, a much weaker relationship

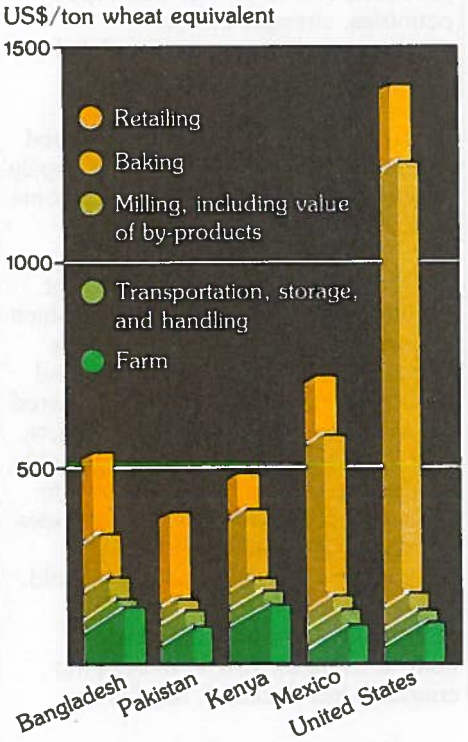


Figure 4. Marketing margins, wheat-to-bread, in five countries

exists between the total value added and rising per capita income. Figures 4 and 5 present the total value added in the marketing of wheat-to-bread and wheat-to-flour in five countries, along with the value added at different levels of the market. As shown, in Pakistan the total value added in marketing bread is about US$ 370/ton of wheat, of which farmers receive almost 30%. Contrast this with the marketing of bread in the USA, where the total value added is over US$ 1,400/ton and the farmer share is under 10%.

From the farmers' perspective, a convenient way of evaluating the prices of marketing services is to calculate the amount of wheat that must be sold to pay for them. Table 2 presents these conversions for the same five countries depicted in Figures 4 and 5. In most of the developing countries analyzed, the value of the bread made from one ton of wheat is equal to the value of two to three tons of wheat. Approximately half of this amount would pay for the marketing services required to produce flour. In developed countries, 7 to 14 tons of wheat are required to pay for the marketing of wheat-to-bread, while approximately two to three tons are needed to meet the costs of marketing flour (about double that of the developing countries).

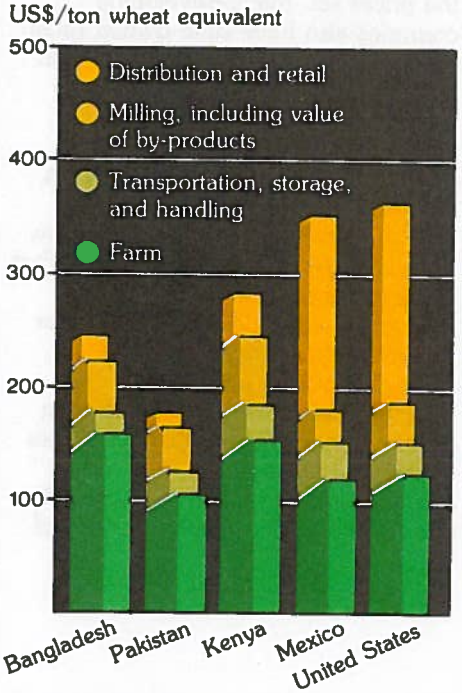


Figure 5. Marketing margins, wheat-to-flour, in five countries

The data strongly suggest that, as incomes rise, an increasing portion of what consumers spend on bread and flour pays for the value added beyond the farm level (Figure 6, page 6). For those countries with average per capita incomes below US$ 1,000 consumer expenditures on services beyond the farm level range from 60-75% for bread and 35-70% for flour. In contrast, for those countries with per capita incomes over US$ 10,000 the comparable figures are: for bread, more than 90%, and for flour, 65-75%. Furthermore, as per capita incomes rise, the farmers' share of the consumer outlay on flour declines relatively slowly, whereas the farmers' share of expenditures on bread declines more rapidly and to a much smaller percentage in high-income countries.

Transport, storage, and handling—After allowing for differences in the distances over which grain is moved, there appears to be no strong relationship between the level of economic development and marketing margins in the transport, storage, and handling sector. Two major factors may largely offset one another in this regard. The first is that with economic development, major improvements occur in the marketing infrastructure; wheat is handled and transported in bulk, with large volumes handled per unit of labor (resulting in considerable savings). Second, wage rates also increase rapidly with development, as do capital costs per ton of wheat transported, stored and handled; this largely offsets the labor and other input savings inherent in improved infrastructure and facilities.

While developing economies have much less in the way of wheat transport, storage, and handling facilities, the costs for moving and storing wheat in developing countries are about equal to those of the developed world, on average. This is largely because of lower wages and prices of other inputs, as well as a

Table 2. Amount of wheat (in kgs) farmers (or importers) must sell to pay for the different services in the wheat marketing systems of selected countries

Country	Product	Farm or import price of wheat[a/] (US$/t)	Transport, storage, and handling	Kilograms of wheat for: Milling	Baking	Retailing	All Services
Bangladesh	Bread	159.00	117	286	698	1210	2310
Pakistan	Bread	108.00	191	281	——1960——		2430
Kenya	Bread	157.00	251	188	1050	500	1990
Mexico	Bolillo	121.00	267	199	——2590——		3060
	Bread	121.00	267	199	3300	1210	4980
USA	Bread	125.00	221	282	8570	1410	10480

a/ For Bangladesh, the import price of wheat is quoted; for other countries, the farm price is used

Note: Prices as near as possible to January 1, 1985

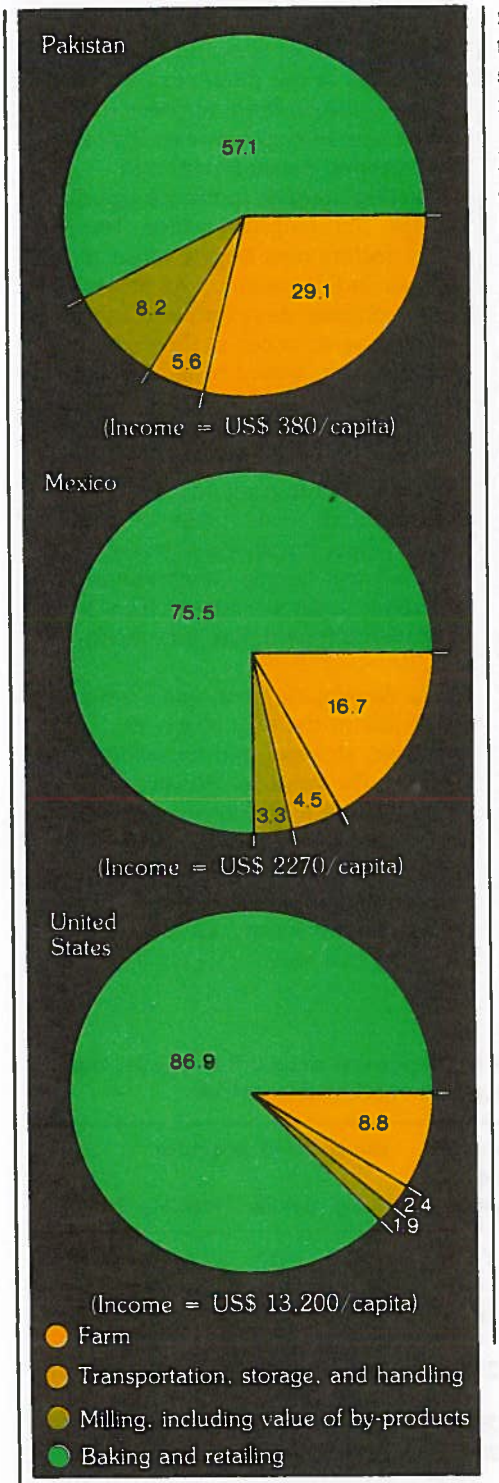


Figure 6. Percentage of value added, wheat-to-bread, by sector in three countries

much greater use of labor-intensive technologies in providing these services in developing country wheat markets.

Milling—In this sector, there is no evidence of declining margins with increasing levels of economic development. Lower wages and other input prices in developing countries appear to offset the increased volume of throughput, much higher labor productivity, higher capital-intensity, and infrastructure advantages of developed economies. For some developing countries, milling technology and throughput at the main ports or in large urban areas is now very similar to that found in industrialized countries. These mills can capitalize on the lower prevailing wage levels, as well as on many of the economic advantages of large mills in industrialized countries. This has encouraged some countries, notably Singapore, Hong Kong, Nigeria, and some Caribbean countries, to export flour made from imported wheat. For some countries, the value of the by-products of milling almost equals the costs of milling, so that the milling markup can be very small.

Baking—The value added by this sector is strongly related to per capita income. As incomes increase, consumers are willing to pay considerably more for baking services. The baking sector's higher marketing margins probably reflect the greater array of ingredients included in the end-products, as well as the fact that baking costs are higher in developed economies than in the developing world. Although more automated and industrialized in the developed world, the process typically remains more labor intensive than others in the marketing chain. To meet these higher costs, especially for wages, markups for baked foods are higher in the more developed countries.

Retailing—The margins for the retail sale of bread and flour generally appear to be determined by percentage markup pricing. Higher "wholesale" bread prices paid by retail outlets in more developed countries result in higher markups on a per kilogram basis. Although other pricing strategies may be used by retailers, markups on the order of 15 to 20% on the wholesale price of bread are common. In many developing countries, where baking and retailing often is done by the same establishment, the markup on baked foods will include an allowance for both services.

The governments of a number of developing countries regulate the prices of commonly consumed bread products and flour. Thus, the margins received by retail outlets depend upon the prices set. Many developing countries also have state-owned retail food establishments (CONASUPO in Mexico, for example) to sell basic foodstuffs at regulated prices.

Implications for Research

Several implications for agricultural and industrial research on wheat flow from changes in wheat marketing. First is the fact that, over time, in developing countries the demand for research into storage, transport, milling, and food processing technologies will grow. The differing circumstances of developing countries dictate that technologies must be adapted to local conditions, especially in rural areas. The relative scarcity of

Wheat Pricing

capital and the low cost of labor in many developing countries suggests that labor-intensive wheat marketing technologies are appropriate for these areas. As these countries develop, capital-intensive technologies will become more profitable.

Second is the important point that changes in technology are altering the wheat quality requirements of millers. As greater flexibility is introduced into the milling and baking sectors, wheats of lower protein content can be used to produce products that previously required higher protein wheats. Similarly, bakers can use a wider range of ingredients to make particular products, which opens up the possibility, for example, of baking breads with composite flours. At the same time, millers and bakers need more specific quality information; there is considerable scope for improving and implementing the procedures used to measure quality, and for defining grades of wheat in developing countries.

Third is the fact that the wheat grown in many developing countries will form the basic supply of flour in rural areas and in cities. Any technological developments at the farm level that reduce grain losses and enhance productivity in wheat marketing will benefit both farmers and consumers of developing countries.

Background

All governments establish policies that affect the returns to producers of agricultural products, as well as the costs to the users of those products. Some of these actions are taken at the commodity level, some at the sector level, and some at the level of the general economy. Examples include guaranteed prices, quotas on production or imports, import duties and export subsidies, taxes and subsidies applied to inputs, and exchange rate policies. These instruments of policy are managed through an array of institutions and administrative arrangements, all of which combine to create the agricultural policy environment of a given country.

One major aspect of that policy environment is examined here, namely the setting of support prices for wheat at the farm level. The discussion focuses on wheat pricing, but some issues raised have relevance to other commodity pricing. Indeed, the price of wheat relative to other inputs and outputs is critical to the overall incentives faced by farmers. There are other policies of importance to wheat pricing, especially those relating to exchange rates, trade and consumer food pricing. These are not dealt with here, for the sake of brevity, but must be included in any consideration of wheat pricing.

Role of prices

Most countries have mixed economies, which means that prices are determined through a blend of government actions and market mechanisms. Within markets, prices are the primary means by which economic signals are conveyed to producers, consumers, and the marketing system. A rising price for a specific item tells producers to make more of it and induces users to reduce their consumption. A higher price attracts resources to the production of that item and promises greater returns to those holding the resources required for production. Producers, consumers, and holders of resources usually make their decisions on the basis of relative prices, i.e., the price of one commodity as compared to the price of another, or to the price of an input, or to its price in the past, or to its price in world markets.

These are well-known functions of prices. They are summarized here because people tend to view prices from their own perspectives. Farmers, for example, see a commodity price as a critical factor in determining income, while consumers see the same price as a critical factor in the cost of feeding the family. It is of course both things, simultaneously; a single signal containing powerful information for producers, consumers, and holders of resources. Given the importance of prices, governments often intervene in markets to affect the prevailing prices of many commodities, especially for such staple foodstuffs as wheat.

World Prices

Wheat is traded worldwide and, because of this, world prices are an important consideration for policy makers. "The" world price of a commodity is an abstraction; there is no single price that constitutes the world price. Rather, there are prices in key export or import markets that are representative of the international

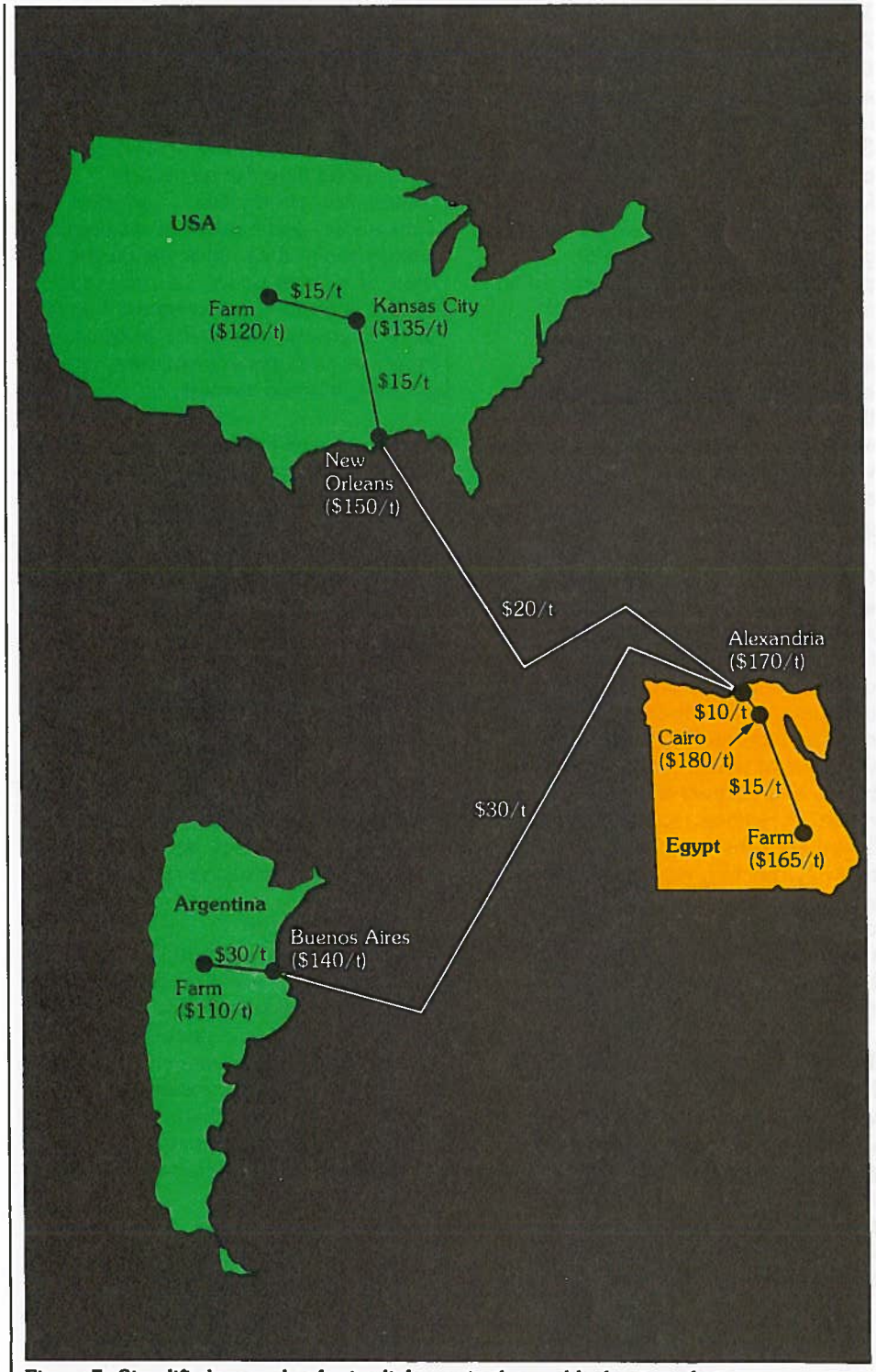


Figure 7. Simplified example of price linkages in the world wheat market

market and are often used as reference points for pricing in other markets. These prices are candidates for "the" world price of a particular commodity. Major markets influence one another; for example, the US export price of wheat is linked to the export price in Buenos Aires, and both are linked to import prices in Egypt (Figure 7). Even so, most would-be buyers or sellers look to a particular market in fixing the price of a given commodity, e.g., an important indicator price for hard red winter wheat is the US export price, quoted at US gulf ports. For wheat-buying countries, important indicators are the import prices in key markets, such as Japan and Egypt.

World prices are defined by quality, location and time. As well, world prices relate to a particular currency. In many developing countries, the exchange rate at which world prices are linked to domestic prices has been over-valued, either directly or indirectly, by trade policy, thus lowering domestic prices (Valdes 1985). The appropriate exchange rate in wheat pricing mechanisms should take account of major exchange rate anomalies, whether direct or indirect.

Some challenge the "fairness" of world prices, i.e., the extent to which they reflect the underlying forces of supply and demand. While world prices undoubtedly are influenced by the policies of countries trading in large volume, numerous studies have demonstrated that world prices respond to the global supply and demand situation. Adjusted for quality, distance, and time, world prices act as measuring sticks against which all prices can be compared, including domestic prices. In this view, properly adjusted world prices provide a background for measuring the real cost of any policy that makes domestic prices differ from world prices.

Some have claimed that willing buyers and sellers cannot count on the smooth functioning of a world market under stress. There are two concerns here: 1) instability of world prices, and 2) unavailability of commodities. Much of the apprehension about unavailability was dispelled during the last decade, when the market functioned effectively in providing product, although with wide swings in prices. Thus, the remaining concern is with the variability of world prices. Ironically, government intervention to stabilize domestic prices gives rise to considerable variability in the world prices of grains, especially rice and wheat (see box).

Differences between World Prices and Domestic Prices

Without government intervention, the domestic price of a commodity will bear a close relationship to world prices, adjusted for quality, time, and transport considerations. However, the governments of most wheat-producing and consuming countries intervene in domestic markets and, to varying degrees, divorce domestic prices from world prices. Governments have many ways to influence domestic markets, whether through pricing or by other means, such as quotas, duties, taxes, or subsidies. The reasons for taking such actions can be grouped under five major headings:

Stability—As noted earlier, world prices vary and, without intervention, these price fluctuations would be transmitted to domestic prices. It is argued that this variability increases the risk to farmers, which in turn induces them to follow less intensive production strategies. Thus, the argument goes, government should intervene so as to stabilize prices, reducing farmer risk and encouraging the use of more intensive practices, thereby increasing the average level of production.

Income distribution—Governments frequently seek to reshape the distribution of income, and one way to achieve such redistributions is through prices. An example would be to raise the price of a commodity produced by poor farmers in the expectation that their incomes will increase as a result. In other cases, governments have deliberately kept the price of staple commodities below world levels in order to lower the costs of food to urban consumers and thus, in effect, increase their incomes.

Domestic Pricing Policies and the World Wheat Market

Many pricing policies for wheat are established to protect domestic producers, and sometimes consumers, in a particular country from the vagaries of the world wheat market. However, an unintended consequence of these policies is to increase considerably the variability of world wheat prices (Johnson 1975; Josling 1980).

Very few countries directly link domestic prices to world prices. Among wheat exporting nations, only in the USA are they closely linked, and the export subsidies implemented recently are tending to change this relationship. Only Singapore, Hong Kong and a few nations that import small amounts of wheat link domestic prices directly to the world market. In the remaining countries, domestic prices range from being unresponsive to world prices (at least within a given marketing season), to being indirectly linked.

When the link between domestic and world prices is severed, producers, consumers, processors, and commercial and government stockholders make many of their decisions based on domestic prices, which are much more stable than world prices. These decisions are taken in an environment isolated from global supply and demand fluctuations—variability that is induced largely by changes in weather patterns and financial conditions. This results in the shifts of supply and demand being thrust onto a smaller residual international market, which absorbs the market shocks and translates them into more variable world prices.

Studies suggest that domestic pricing policies have considerably increased the variability of world wheat prices. One study estimates that this variability was about 90% greater as a result of domestic pricing policies that divorced consumer prices from the world market price (Zwart and Meilke 1979). Another study, however, suggests that if developing countries were to open their markets by directly linking domestic prices to international prices, the variability of domestic food prices would increase (Tyers and Chisholm 1982). Governments in developing countries are reluctant to do this, because expenditures on staple foods often constitute a high proportion of total income, especially for the poor.

Fluctuations in the world wheat market are absorbed largely through adjustments of stocks in the short term. Studies indicate that wheat stocks, especially in the United States, Canada, and the EEC, are relatively responsive to price. The demand for feed-wheat is relatively responsive to price changes, as well. Moreover, the demand for imports in developing countries can be price responsive when domestic prices fluctuate in line with world prices.

Food security—Some governments are apprehensive about the world market's capacity to supply their consumers in a timely way and at acceptable prices, should serious domestic production shortfalls occur. The concern is one of vulnerability to disruptions and constraints in moving grain through the food import pipeline. This concern for food security can lead to a strategy of holding larger stocks, so that shortfalls can be met out of locally stored foodstuffs. In turn, this strategy can lead to price increases for many agricultural commodities, in the expectation that such prices will induce producers to adopt more intensive production practices and thereby lower the probability that production in any given year will fall below desired levels.

Part of the food security argument, of course, rests on maintaining price levels acceptable to consumers. Proponents argue that better control over prices can be achieved by meeting shortfalls in current production from local stocks rather than through world markets.

Saving foreign exchange—The argument here is that domestic production of foodstuffs must be stimulated to reduce imports and/or to encourage exports. To do so, prices received by producers can be raised so as to encourage production. This is most often encountered when governments seek to maintain overvalued domestic currencies.

The above are the more common arguments advanced by governments to justify pricing policy interventions. Local circumstances greatly influence which of these justifications is applied and with what weight. The strengths and weaknesses of each argument cannot be discussed at length here. Suffice it to say that, whatever the pros and cons of intervention, governments will continue to intervene in domestic markets to varying degrees.

Costs of Pricing Policies

In pursuing the objectives described above, governments also must accept that there are costs associated with each policy alternative. These costs may be of a direct budgetary nature or they may be indirect costs that are not reflected in government accounts but borne, nevertheless, by producers and/or consumers. These "hidden" costs usually are large compared to direct costs. Indirect costs often arise from imposing constraints on domestic producers and/or importers that increase the costs of grain supplied to consumers.

For governments, the challenge is to pursue their policy goals in a cost-effective manner, and to weigh the concerns of the agricultural sector in the context of overall economic development. The question is one of how best to intervene, i.e., which pricing mechanisms can governments use to address their range of concerns in the most effective way, while ensuring that prices do not move dramatically out of line with markets.

In the past, many Third World farmers have been adversely affected by government intervention in the marketplace; farm prices have been set at low levels (for the benefit of consumers) and agriculture has been penalized in other ways relative to most other economic sectors (Schultz 1978). Many developing countries are in the process of adjusting agricultural and food policies to overcome these difficulties and to meet the financial stringencies of the 1980s. Recent preliminary evidence suggests that support prices for wheat in many developing countries are now more in line with the world market (Byerlee and Sain 1985). Some indication of these changes is presented in Figure 8.

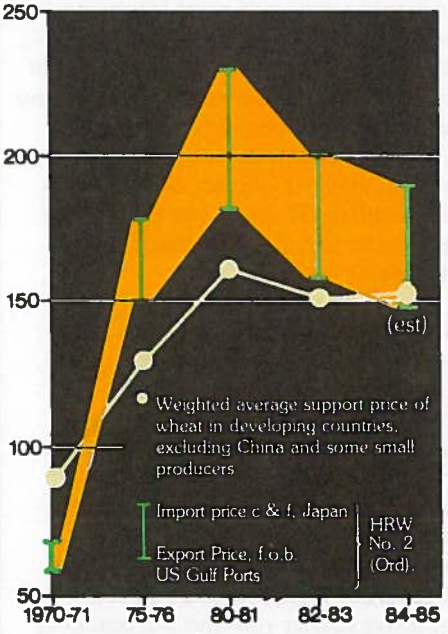
As would be expected, support prices of wheat for farmers vary widely from country to country, according to the policy intentions of each country and to market circumstances.

Alternative Pricing Mechanisms

Several methods are used singly or in combination to determine support prices of wheat in any given year. The following are used most widely:

- arbitrary negotiation;
- indexing of price to inflation;
- the cost of production;
- a moving average of world prices;
- current market pricing.

Table 3 summarizes the types of wheat pricing policies practiced in selected countries. Because many developing



Source: Calculated from IWC and FAO data

Figure 8. Average of support prices of wheat in developing coutries in relation to selected export and import prices, 1970-71 to 1984-85 (estimated)

countries are seeking improved ways of setting support prices, the advantages and disadvantages of each method are presented below.

Arbitrary negotiation—Many countries use the political process to set support prices for wheat. Even those having formal price-setting mechanisms often find that the ultimate decision is a political one. This is inevitable as long as food agencies and food are important factors in the political process.

Sole reliance on arbitrary negotiation to set prices entails a number of pitfalls. The approach can lead to support prices moving out of line with markets, which will result in financial imbalances or less obvious costs associated with transfers from one group to another in the economy. Various interest groups will bring pressure to bear for either higher or lower prices, and this often leads to choices that do not give appropriate market signals to producers, consumers, and marketing agencies.

Inappropriate price signals, which are seen by all interest groups as a product of government, are not often likely to encourage more efficient production and distribution of food. Rather, they are likely to encourage different groups to blame government for price changes, instead of encouraging them to accept the market changes that inevitably occur over time.

Fixing support prices by arbitrary negotiation can be used to achieve the policy objectives outlined above. Indeed, governments can readily adjust prices to redistribute income, encourage greater domestic food production, and save foreign exchange. However, additional uncertainty can stem from the very fact that the decisions made are themselves arbitrary.

Indexing—This approach involves tying support prices to some general indicator of inflation. A base period price is selected and this is indexed to either the general inflation rate or increases in specific farm input prices. Either way, there is a serious flaw in this approach: productivity changes occurring over the longer term are not taken into account, which means that support prices probably will increase more rapidly than market prices in the absence of support policies. Support prices will likely diverge from underlying market forces, and either tax payers or consumers will have to pay increasingly more to maintain the indexed support prices.

In the USA, the first fifty years of farm output price supports were based on the concept of maintaining output prices "at parity" with prices prevailing during the 1910-1914 base period. However, during this base period US farm output prices were exceptionally high. Recognizing this, and also the impact of productivity gains on US farm incomes, many support prices had been moved well below the original parity levels by the mid-1950s. The USA's experience with support price indexing suggests that wheat-growing countries of the developing world would have difficulty in 1) chosing a base period for setting support prices, and
2) ensuring that the indexed support price stays in line with market circumstances over the longer term.

For short-term adjustments of support prices within a particular marketing year, however, the approach may have some merit. Many countries with price supports currently set a flat support level that extends over the whole marketing season. In Mexico, for example, price supports normally are announced twice each year, just before harvesting the winter and summer crops, and usually are not adjusted at other times of the year. With no adjustment for inflation within the year, there is obviously a strong incentive for farmers to sell grain (for cash) as quickly as possible after harvest. Marketing agencies have an incentive to delay payment as long as possible, so that the amount paid to farmers, after allowing for inflation, is lower.

Table 3. Pricing policies practiced in major wheat-growing countries

Wheat pricing approach	Number of countries using this method	Examples of countries/regions using this method
Cost of production	13	Brazil, Sudan, Iran, Turkey
Indexing (from year-to-year)	4	Uruguay, Peru, Japan
Moving average of market prices	2	Australia
Arbitrary negotiation	24	Bangladesh, Pakistan, Morocco Mexico, EEC
Current market prices	5	Argentina

Source: Collaborators in developing countries and numerous reports describing wheat pricing policies published by International Wheat Council, FAO, and USDA

If the wheat support price were indexed to inflation during the marketing season, there would be less of a rush at harvest to sell wheat and the marketing agency would have no incentive to delay payments to growers. In Argentina, for example, support prices are adjusted every 10 days to allow for that country's very rapid inflation rate. A case can be made for linking support prices to inflation within the marketing season, but in doing so it is important that the original support level be soundly based.

Thus, indexing has the potential to provide a stable support price, albeit at a cost to government. The price-setting procedure is administratively simple, but the approach can lead to difficulties in aligning prices with longer term market trends. If applied in a similar fashion across commodities, indexing will tend to encourage expansion of those crops in which technological change is most rapid. This, in turn, will have consequences for food security and income distribution. The approach is not effective in protecting new industries, nor does it offer much as a means of addressing foreign exchange concerns. However, if applied within a given marketing year in countries experiencing relatively rapid inflation, the adjustment of support prices for inflation may help alleviate some of the difficulties faced by farmers and marketing boards.

Cost of production—With this approach, the support price of wheat to farmers is set according to estimates of what it costs to produce one ton of grain. These costs usually are calculated on the basis of large surveys among farmers, often assuming normal yields so that short-term seasonal fluctuations do not affect the estimate.

Despite the fact that many countries use this approach, cost-of-production pricing entails several difficulties. The first centers on multi-enterprise farms. Very few farmers grow only wheat, especially in developing countries, and it is difficult to establish the amount of fixed resources (such as land and family labor) used for each operation in a multi-enterprise farm. The tendency is to assign fixed costs according to some arbitrary rule that may have little or no justification. As well, returns to fixed resources are affected by prices and profitability, so the cost of production will change with prices. A related problem is that farmers alter the type and amount of variable inputs they use as input and output prices change.

Thus, there is no single cost of production, but rather an infinite range that is determined by the relative prices of wheat, other crops, and inputs. Indeed, the cost of production will be affected by the support prices set in previous years.

The cost-of-production measure is further complicated by differences in productivity across farms. An average cost of production hides the wide variation that occurs in production costs, due to managerial differences, differences in farm size, soil type, climate, etc. Over the longer term, the cost-of-production measure will reflect declining costs per unit of output associated with improved productivity, but it is difficult to adjust for short-term variations in costs due, for example, to weather.

The cost of production is thus an arbitrary measure having little or no practical basis. The approach carries with it a sizeable risk that prices will not reflect the underlying market forces. This may encourage wheat production when other crops are more economically suited, discourage cost-saving efficiencies, and could lead to structural stagnation in a wheat industry. As well, the method can be expensive to administer because of the amount of information often gathered. It should be noted that some developed wheat-exporting nations have moved away from cost of production pricing to other methods, including the use of moving averages.

In many instances, land values have been affected significantly by support prices determined using cost-of-production estimates that were well out of line with the market. In these instances, the benefits accrued primarily to the owners of land, as opposed to tenant or share farmers, and this carries important consequences for the distribution of wealth.

How then does cost of production fare with respect to the pricing goals listed earlier? As to stability, the strategy has some advantage because the measured costs (and therefore the derived support prices) vary little from one year to the next. For income distribution, the strategy has important consequences for owners of resources. As for the remaining considerations (food security and foreign exchange savings), the cost-of-production strategy has no advantages over any other approach, and it could prove to be a costly mechanism to government and the economy overall.

Moving average of world prices—This approach involves tying farm support prices to a moving average of world prices. There are two parts to the procedure: 1) applying a moving average formula to the world price, and 2) adjusting this formula price back to the farm level. For exporting countries, the export parity (f.o.b.) price is the world price, and for importers, the import parity (c.i.f.) price would be used. With sizeable international freight costs, the formula price for importers would be well

above that of exporters. The special case of an appropriate world price for those countries that neither import nor export wheat on a regular basis is discussed below in the section on current market pricing.

Typically, moving averages are formulated using a three to five year period, and support prices are arbitrarily set at fixed percentages (usually from 75-95%) of the moving average. An example: the 3-year moving average used to determine the guaranteed minimum price for farmers in Australia in 1979-83 was:

Guaranteed price =
$.95 (P_t + P_{t-1} + P_{t-2}) / 3$

Where: P_t is the estimated weighted average price of the current year, and P_{t-1} and P_{t-2} refer to the two preceding years, respectively.

Many possible formulae can be used to calculate moving average prices. Clearly, the more years included in the moving average, the more stable will be the guaranteed minimum support price. However, as the number of years included in a formula increases, the difference between the guaranteed price and current market prices will likely increase. Because of the lags in the formula, there can be years in which the formula price moves in the opposite direction of the current market price; the likelihood that this will occur increases as the number of years in the formula increases. Also, if the moving average is calculated using actual prices in an inflationary economy, a formula extending over many past years will cause the moving average to be artificially low. To overcome this effect, convert all past prices in the base period to current year equivalents using general rates of inflation, and then calculate the guaranteed minimum price.

One of the difficulties encountered in using a moving average formula is how to deal with years in which prices were exceptionally low or high. Such price movements can be caused by abnormal market circumstances, a severe worldwide crop shortfall, local drought, and other factors. If the purpose of a moving average support price is to guard against sudden and unanticipated changes in price (but under normal circumstances, the guarantee is to be a little below the market price), then a good case can be made for deleting exceptionally high and low prices. For example, the moving average that has been used to fix support prices for soybeans in the USA is calculated over a 5-year period and, on occasion, the highest and lowest of the previous five years' prices have been deleted.

For developing countries with current support prices set below world market levels, the moving average approach has a built-in mechanism that encourages the setting of prices over the longer term at levels more in line with the international market. At the same time, a phasing-in period and a relatively "long" moving average formula could provide considerable cushioning of prices locally. Realignment of local prices with world markets could occur over a number of years, so that farmers would have time to adjust crop production accordingly. Note also that this approach can factor in market price adjustments that a given country might want to make to encourage local production.

Figure 9 presents the results of applying a moving average formula to the US export price of wheat since the late 1960s. In this example, a formula similar to that applying to soybeans in the USA is used. The formula price was calculated as the moving average of the past five years, excluding the highest and lowest years. The formula price was then set at 90% of the international price.

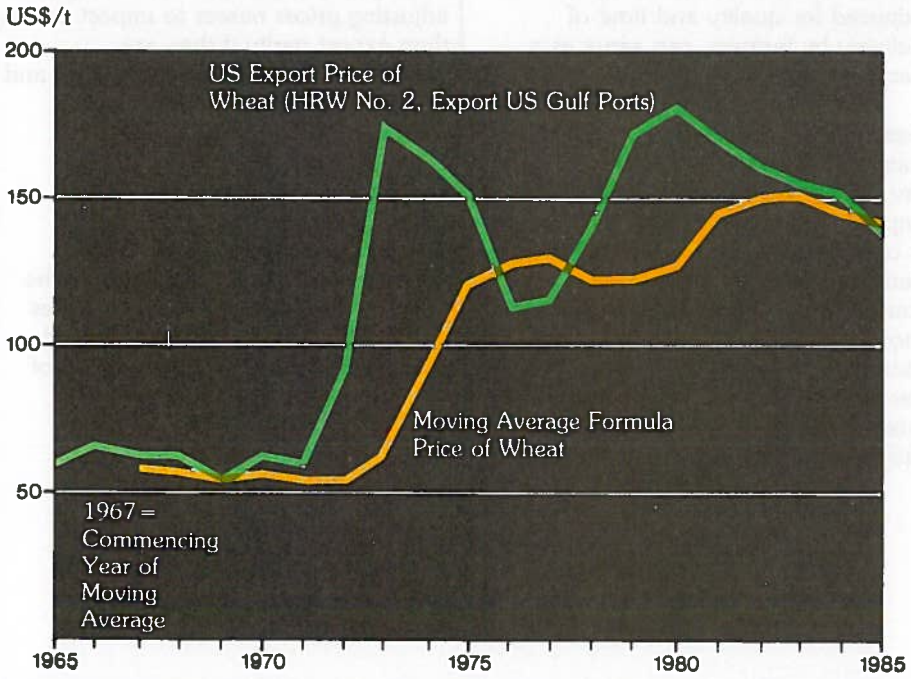


Figure 9. Comparison between the US export price of wheat and the price derived using a moving average formula, 1965-1985

One of the great advantages of this approach to setting price supports is the greater certainty associated with the price determination process. However, if the formula used is frequently adjusted, this advantage can be lost. Once the formula has been agreed upon and the mechanism is in place, farmers and marketing agencies can be more certain about prices, since they are largely determined from previous years.

Even with increased certainty, however, and even if farm prices are set in line with market levels over the longer term, marketing agencies can face financial imbalances. These imbalances can result from short-term declines in market prices, inadequate rewards for marketing services, or constraints imposed on the movement of consumer prices for wheat products.

Moving averages ensure that support prices reflect market trends over the longer term, while providing considerable buffering against short-term price fluctuations. Depending on the nature of the formula used, the moving average approach can be a relatively low-cost method for providing price supports. While it provides for a little less stability than some other approaches, it does not suffer from one of their key failings, which is the tendency for support prices to move seriously out of line with market trends. The moving average approach is usually neutral in its effect on the distribution of income over the longer term. However, the arbitrary nature of the formula allows policy makers to incorporate income transfers by changing the weight in the formula. With regard to foreign exchange and food security, the formula also can be adjusted to encourage domestic production and discourage imports.

Current market pricing—Very few countries of the developing world permit their wheat prices to be freely linked to the international market. Most countries are too concerned about fluctuations in prices to have such direct links to world markets.

Countries that set support prices for farmers can readily use current market prices as a guide for establishing the support level. For those countries that are either regular importers or exporters of wheat, the appropriate guide for setting the support price is the import or export market price, adjusted for current transport, storage, and handling costs to the farm level. The current price, perhaps averaged over a few months and suitably adjusted for quality and time of delivery by farmers, can serve as a very appropriate support price.

Setting an internal support price is more complex for those countries that are neither regular exporters nor importers of wheat. In this case, there is often a wide gap between import parity and export parity, with the gap roughly equalling twice what it costs to move grain into the international marketplace. Sometimes this gap can exceed US$ 60 per ton, and the internal support price can be set within this wide range. When supplies fluctuate, it is difficult to set the correct support price in advance and government stocks or imports (or exports) act as the shock absorber.

One way to remove some of the uncertainty in determining support prices is through food grain storage programs. With high interest rates, stockholding is an expensive way of providing food security. Currently, one ton of wheat carried in storage for one year costs more than US$ 20/ton in finance charges alone. Nevertheless, some countries are prepared to pay this cost. The establishment of internationally funded stockholding programs remains an elusive objective, even after many years of negotiations.

On balance, current market prices and market conditions offer a sound basis for setting support prices. While the support price would likely be less stable than if it were established using other methods, this approach would encourage relatively low levels of intervention, except in those years of unexpected market changes. Governments could readily factor in other policy objectives, for example adjusting prices nearer to import parity than export parity if they are concerned about foreign exchange and about encouraging domestic production.

Conclusion

Five different wheat pricing mechanisms have been considered here that are or could be used by the governments of developing countries to establish support prices. Some of the advantages and disadvantages of

each approach have been briefly described. Much more detailed consideration should be given to the alternatives available to policy makers interested in changing the current policy environment. Careful consideration also needs to be given to whether pricing policies are the most effective way to achieve the desired objectives.

In addition, careful thought should be given to how the support price will be maintained, whether by taxation, subsidies, active stockholding programs to regulate supply, or by more direct budgetary outlays, and especially how these factors will impinge on all stages of the wheat market. It is important that governments focus on the cost-effectiveness of alternative wheat pricing policies and, indeed, of all agricultural policies.

One of the tragic ironies of the modern world is that while food-surplus countries have burgeoning supplies of grain and are concerned with minimizing the costs of surpluses, countries facing chronic food deficits are confronted with severe hunger and malnutrition. Considerable support has been given to agriculture in developed countries, which is one of the main reasons for their burgeoning food surpluses. While there are many causes of the food shortages now occurring in certain African countries (and in some other developing countries), one important cause is the policy and market circumstances faced by the rural producers in these countries. If governments in food-deficit countries with prices well below the world market can provide stronger incentives to grow food, farmers, who comprise the majority of the poor in these countries, will respond.

The Current World Wheat Situation*

Production in Developed Countries

World wheat production in 1985 is predicted to reach over 520 million metric tons (MT), a level just exceeding the previous record of 1984 (Figure 10). Overall, the developed countries of the world are expected to produce some 330 MT in 1985, nearly 70 MT above the average production of 10 years ago.

In 1985, moderate production increases in North America and the Soviet Union will more than exceed expected declines in the harvests of Eastern and Western Europe and Australia. In 1984, Western and Eastern Europe enjoyed the largest production increases of the developed world; wheat crops in these regions benefited from exceptional growing conditions and production increased by 24 MT over the previous record of 1983. During the past decade, France and the United Kingdom experienced rapid growth in wheat production. Other countries of the EEC also have expanded wheat production sharply, principally through yield increases.

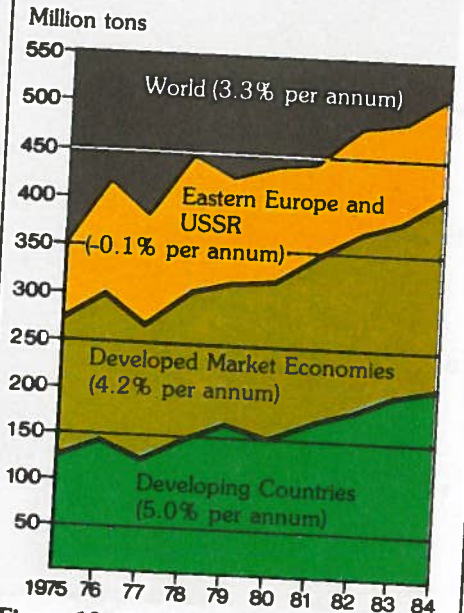


Figure 10. Trends in world wheat production, 1975-1984

In the USA and Canada, total production has been fairly stable over the past three years. North American production has been limited by several major factors: 1) agricultural land set-aside programs in the US (the impact of these programs was especially strong in 1983), 2) the 1984 drought in the Canadian prairies, and 3) recent concerns in the USA about the profitability of wheat farming, which reduced the area planted to winter wheat in the fall of 1984 and thus lowered the 1985 winter wheat harvest. Due to relatively low grain prices, high interest rates compared to inflation, and falling land values, the US farming sector currently faces a severe financial squeeze, which influences the commitment of resources to wheat production.

Wheat production in Australia in 1985 is expected to decline to normal levels after two years of exceptionally good weather. The USSR crop, also very responsive to weather conditions, is expected to reach 88 MT in 1985, the highest since 1980 (but only the ninth highest on record). Since 1970, the area planted to wheat in the Soviet Union has declined by more than 15 million hectares, an area larger than the total wheat plantings of Canada or Australia. In addition, the average yield of wheat in the USSR has stagnated at about 1.6 t/ha.

Production in Developing Countries

With the exceptions of 1977 and 1980, wheat production in the developing world has reached record levels in each of the last 10 years. Production has grown by almost 80 MT during this period. Over the past three years, Third World wheat production soared to new heights, spurred on by dramatic production increases in the major Asian wheat-producing nations.

* Based on information available up to July 31, 1985

Asia—China has increased its output of wheat in the past four years by over 30 MT, to become the foremost wheat-producing country in the world. These impressive gains have been achieved through a combination of higher yielding wheats and improved economic incentives for farmers. China's 1985 national average wheat yield will likely approach 3 t/ha, compared to about 2 t/ha only five years ago. Thus, China has recently experienced the dramatic yield increases that the countries leading the "Green Revolution" for wheat (Mexico, India and Pakistan) achieved in the 1960s (Figure 11).

Many observers argued that India had reached a wheat yield plateau around 1980, but India's production record in recent years suggests otherwise. The 1984-85 crop was almost 10 MT higher than that of four years earlier, and nearly 60% of this increase can be attributed to yield (which grew at more than 3% per year); the remaining 40% has been due to an increase in wheat area of just over 2 million hectares. Pakistan's 1984-85 crop was adversely affected by drought and, at about 11 MT, production fell about 2 MT short of their target. Wheat production in Bangladesh has continued to grow rapidly during the past few years, reaching about 1.2 MT in 1984, a 10-fold increase over their 1975 crop. The 1984 wheat harvests of other countries in South Asia were little changed compared to the previous few years.

Middle East and North Africa—Wheat production in this region has grown little in the past few years, despite continuing increases in wheat consumption. Turkey produced its third largest wheat crop in 1984, but weather conditions were less favorable for the 1985 crop and the country's estimated wheat area is lower. The most spectacular production increase in the Middle East has occurred in Saudi Arabia, which grew over 1.3 MT of wheat in 1984, compared with less than 200,000 tons three years earlier. Farmers dramatically responded to the US$ 1,000/ton support price for wheat (and other incentives), but Saudi financial cuts earlier this year have resulted in a reduction of this support to almost half its previous level. Drought limited wheat production in North Africa in 1984 and also is affecting the 1985 crop, especially in the countries of the Mahgreb.

Eastern and Southern Africa—Weather conditions have improved in this region and the rains in Ethiopia and Kenya will give a much needed boost to wheat production. The 1984 Kenyan wheat crop was more than halved by drought while the Ethiopian crop declined by about 25% to 700,000 tons. Overall, cereals production in Ethiopia was about 2 MT lower in 1984 than in 1983, and was only slightly higher than the average production of the mid-1970s, despite having some 6 million more people to feed. The prospects for the 1985 crop are better, thanks to improvements in the weather.

Latin America—Little overall change in wheat production has occurred in the countries of Latin America during the past three years. Argentina's production has hovered around 12-13 MT, despite efforts to boost output. Although wheat prices for Argentinian farmers are among the lowest in the world, fertilizer prices also have declined markedly over the past three years as the government has sought to boost grain production. Brazil's wheat crop in 1984 was just under 2 MT, almost 1 MT below its record crop of 1979. Reductions in plantings of wheat have been the major contributing factor, although average yields remain low and subject to considerable fluctuation. In 1984,

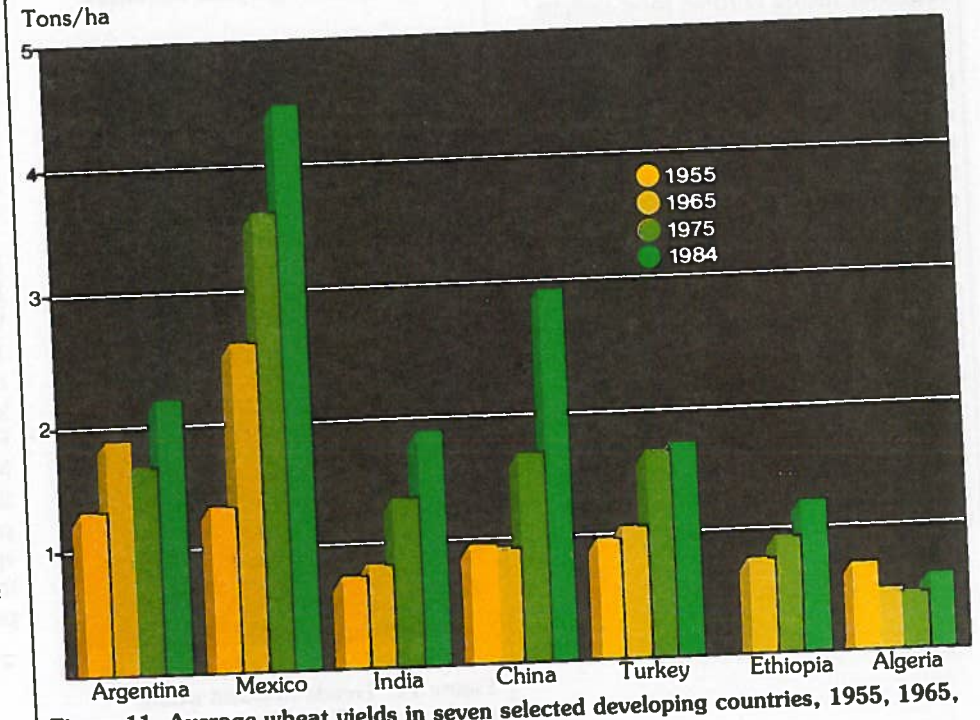


Figure 11. Average wheat yields in seven selected developing countries, 1955, 1965, 1975, 1984

wheat production in Chile expanded considerably, to nearly 1 MT, while the 1984 harvest in Uruguay was about average (but well above the poor crop of 1982). Wheat production in the Andean zone has been relatively stable over the past four years, at about 150,000 tons.

Wheat Utilization

Global use of wheat continued to expand in the early 1980s. From 1979-80 to 1984-85, worldwide utilization of wheat grew by more than 60 MT, about a 15% increase. During the same period, the use of wheat in the developing world rose by over 40 MT. One factor driving this expansion in wheat utilization is growth in use of wheat for feed, but the key factors remain population growth and rising consumer incomes. Food aid also has encouraged additional wheat consumption.

Population growth—World population is growing at 1.7% per year, but rates of growth vary considerably among countries. As a general rule, the rate of population growth declines as incomes rise, but there are countries (notably China) having much lower population growth rates than other countries at similar levels of average per capita income. In the developed world, wheat utilization is fairly stable and population growth (about 0.5% per annum) is one of the major factors leading to the increased utilization of wheat.

For the developing world as a whole, population is growing at just over 2% per year, and much more rapidly in those parts of developing countries (primarily the cities) where per capita wheat consumption generally is highest. Each year in the developing world, an additional 80 million people must be fed. This is equivalent to adding a country the size of Mexico to the Third World population every year. Eighty million additional people, at current levels of wheat consumption in developing countries, require an additional 5 MT of wheat each year.

Rising incomes—Although considerable variation exists across countries and consumer groups, every 1.0% increase in real income (income adjusted for inflation) in developing countries implies an average increase in per capita demand for wheat in the developing world of around 0.5%. If real incomes in the developing world were to grow at their average rate of the past two decades (3-4%), this would imply an additional per capita demand for wheat of around 1.5-2% per year; this translates into a need to produce an additional 3-4 MT of wheat each year. To this must be added the strong demand effect arising from changing lifestyles and urbanization. If Third World real incomes revert to their longer term growth rates, population and income effects would probably increase the demand for wheat in developing countries by 4-5% per year. During the past 15 years, utilization of wheat in the developing world has in fact doubled; the average annual growth rate has been 4.7% per year. At current levels of utilization, this annual growth rate is equivalent to an additional 11 MT of wheat per year.

Wheat as feed—The use of wheat as feed has increased considerably over the past three years, primarily because of high prices for maize relative to wheat in 1983 and early 1984, and because of the availability of large supplies of weather-damaged wheat, especially from the 1983-84 Australian harvest. The International Wheat Council estimates that in 1984-85 some 103 MT of wheat was used as feed, compared to 87 MT two years earlier. The Soviet Union, Eastern and Western Europe, and North America account for nearly 90% of the feed use of wheat. The use of wheat for feed increased in several developing countries (notably Mexico and South Korea) that took advantage of offers from Australia. Overall, however, reports from developing countries indicate that they use very little wheat in this way.

Food aid—Shipments of food aid (mainly wheat) increased to 11.8 MT in 1984-85, 2 MT above the previous year's level. The USA donated 62% of this total, with other major donors being the industrialized countries, particularly the major wheat exporters. African nations were the recipients of virtually all of these additional donations. Approximately one quarter of Africa's wheat imports are received currently as food aid.

Food subsidy programs—In recent years, many countries have been adjusting prices of bread and other wheat products upward to lower costs of expensive food subsidy programs. In the past three years, more than 20 developing countries have announced changes in their food subsidy programs that are designed to lower the subsidies provided. The combined effect of such changes could be to slow the growth in wheat utilization. However, many of the food subsidy programs will be phased slowly downward, so no dramatic effects on consumption are expected immediately. One method of phasing down the programs involves narrowing the range of breads and other wheat products eligible for subsidies. Another involves removing wheat from the list of items that can be imported at preferential (overvalued) exchange rates.

Wheat Trade

World trade in wheat in 1984-85 is estimated at 105 MT, some 5% above the record set the previous year. The bulk of the expansion is due to a huge 7 MT increase in Soviet wheat imports, resulting from their disappointing 1984 crop. Other countries increasing wheat imports by sizeable amounts in 1984-85 include Brazil, Pakistan, Turkey, Iraq, Syria, Israel, the Republic of Korea, and South Africa. Some other countries or regions, such as China, India, Western Europe, Eastern Europe, and Saudi Arabia, have taken advantage of large harvests to reduce imports and, in some cases, to expand exports (e.g., from the EEC). It is anticipated that Africa will import large amounts of wheat this year. Imports by Africa have roughly doubled during the past 10 years to 19 million tons, and almost 70% of this has gone to North African countries and to South Africa.

The principal importers of wheat have been developing countries and the centrally planned economies (Figure 12). There is every indication that wheat imports by developing countries will continue to grow. Since 1980, the only developing countries to significantly reduce imports have been China, India, Saudi Arabia, Afghanistan, Bolivia, Nicaragua, and several Caribbean countries.

Despite the financial stringencies faced by Third World nations in the 1980s, most have continued to expand wheat imports. In some of these countries, additional imports have been obtained as food aid; in many others, purchases have been made on credit subsidized by several major wheat-exporting nations. Developing countries, including China, imported about 60% of the wheat traded internationally in 1984-85, compared to 62% in 1979-80 and 57% in the early 1970s.

In 1984-85, 20% of the wheat produced will enter the international marketplace. This compares with just under 18% in the mid-1970s and about 20% in the mid-1960s. For other cereals, the proportions of production traded internationally are: rice, 4%; maize, 16%; sorghum, 19%; and barley, 11%.

Sizeable shifts in country shares of the world export market for wheat have occurred in the 1980s, a key reason for the heightened competition among major exporters (Figure 13). Wheat exports from the USA peaked at just over 49 MT in 1981-82, declined by 10 MT in 1982-83, and have remained at just under 40 MT for the past three years. While exports from the USA have been stable recently, wheat exports from the other four major exporters (the EEC, Canada, Australia, and Argentina) have increased by 15 MT.

This decline in the USA's market share (which was actually a return to market shares more typical of the 1960s and 1970s) was brought on by a confluence of factors: the very strong value of the US dollar relative to the currencies of competing exporters; the combination of land set-aside programs, major increases in government wheat stocks, and high support prices in the US; the continued subsidization of EEC farmers; and increased production in the four competing exporters due to abnormally good weather and the use of higher yielding varieties. In response, the USA recently announced an agricultural export subsidy program, with the subsidies to be paid with grain in storage under government title; the subsidies apply to a number of export commodities and are to be targeted at particular markets.

Wheat Prices and Stocks

World wheat prices have continued to decline, in US dollar terms, since their peak in 1980-81. Export prices of US Hard Red Winter wheat (No. 2), at US Gulf Ports, were about $133-$143/ton in May-June 1985, some 24% below the 1981 average. The average HRW export price for 1984 was just over $153/ton, about 13% below the long-term trend (Figure 14). More recent quotations have fallen more than 25% below the trend.

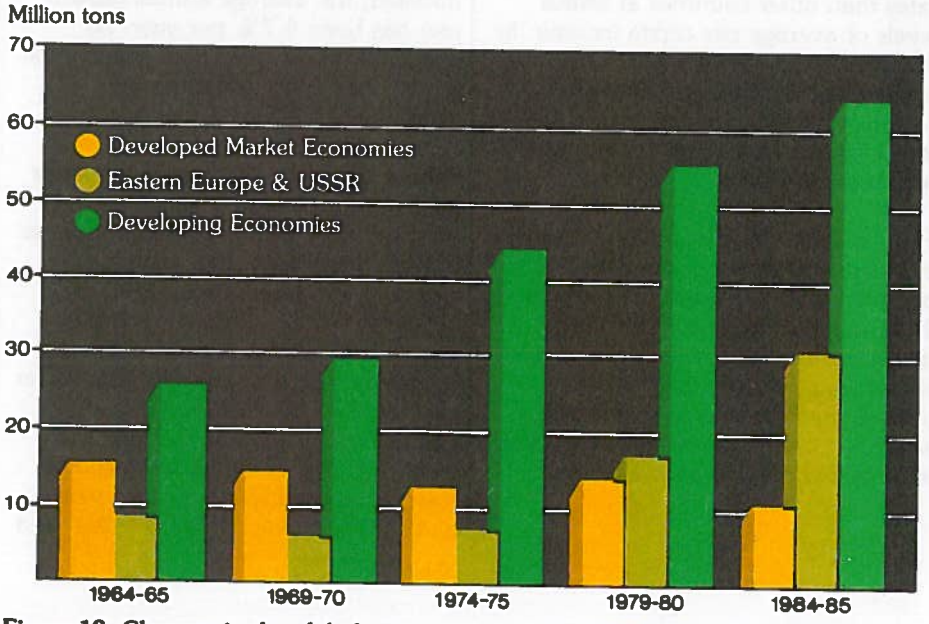


Figure 12. Changes in the global pattern of wheat imports, 1969-70 to 1984-85

The value of the US dollar relative to other currencies is a key factor behind these price declines. With a stock-holding program, the immediate price effect of a strengthening US dollar is overridden when prices are established by the market support price. Such has been the case in the USA in recent years. The US "loan" rate, essentially the US farm-level support price, has underpinned the US wheat market and, to some extent, the world market. Although the US support price was adjusted downward by 10% for the 1984 crop, in terms of other currencies it has been rising in recent years. The impact of these effects has been to increase the US share of total global stocks of wheat and to lower the US share of the export market.

While market prices denominated in US dollars have declined since 1980, in terms of many other currencies (and adjusted for differences in inflation rates with the USA) they have increased. This currency effect is shown in Figure 15 (page 20) for three currencies: US dollars, French francs, and Brazilian cruzeiros. It has been estimated that for the USA, every 10% increase in the value of the dollar against other currencies (adjusted for inflation differentials) will lead to a 6-7% decline in US dollar wheat export prices. Generally, since 1980 the US dollar has increased in strength against other currencies by 30-50%, after adjusting for inflation differentials. This has resulted in significant downward pressure on global wheat prices, expressed in US dollars.

Total closing stocks of wheat globally for the 1984-85 season are estimated at 133 MT, some 30 MT higher than two years before. The high interest rates of the early 1980s would suggest a lowering of stocks relative to utilization; thus, the current level of stocks is large, and is of increasing

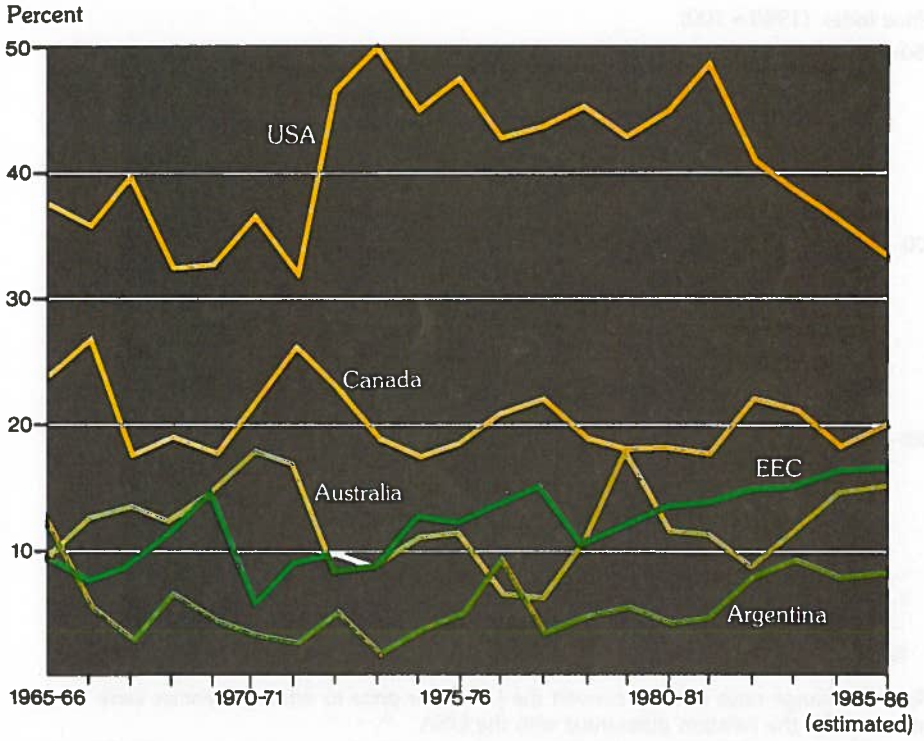


Figure 13. Shares of total world wheat exports, 1965-66 to 1985-86 (estimated)

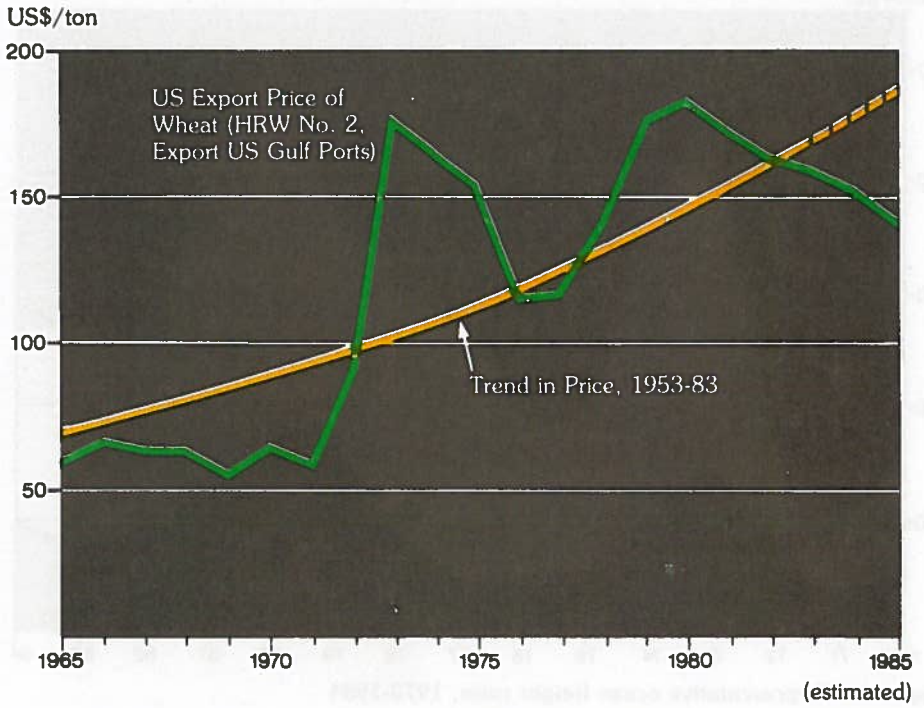
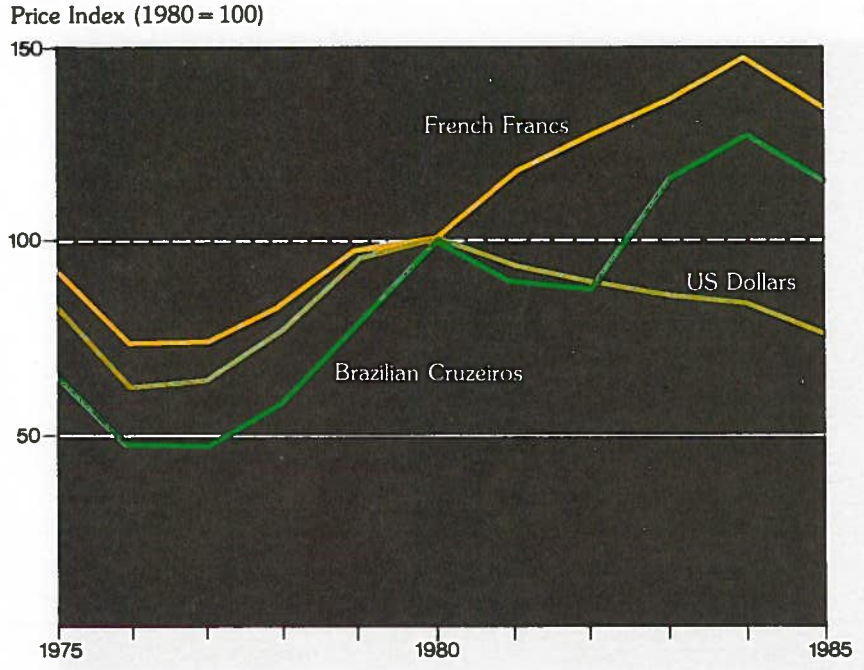


Figure 14. World wheat price movements, 1965-85, and the long-term trend, 1953-83



Note: Exchange rates used to convert the US dollar price to other currencies were corrected for the inflation differential with the USA.

Figure 15. Index of world wheat price in terms of US Dollars, French Francs and Brazilian Cruzeiros, 1975-1985

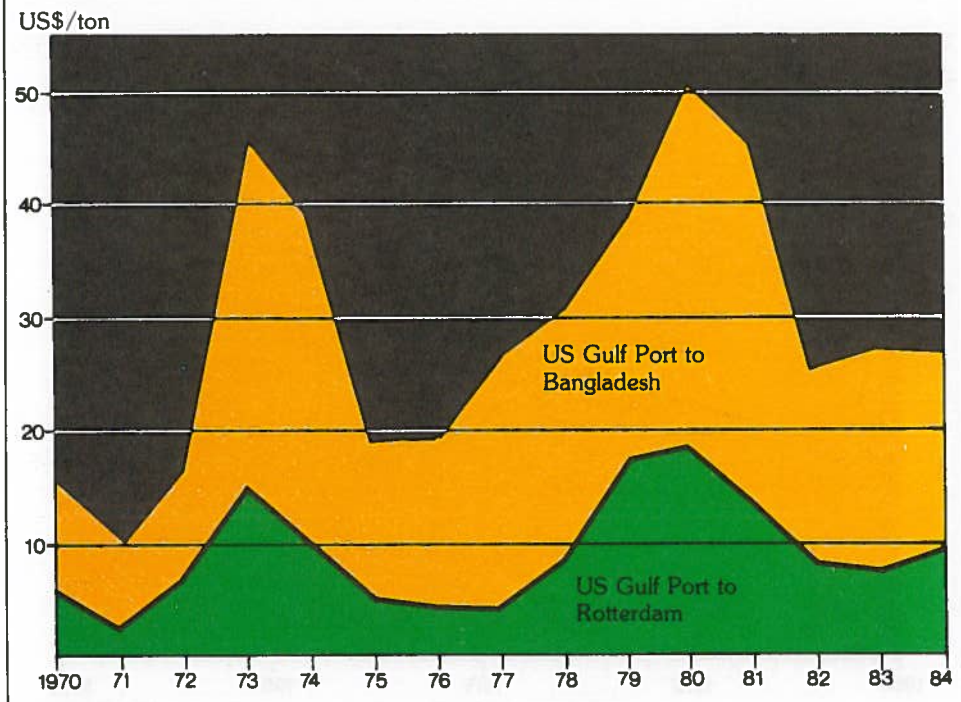


Figure 16. Representative ocean freight rates, 1970-1984

concern to all major wheat exporters. Closing wheat stocks were about 26% of utilization in 1984-85, a higher level than normal, and it is anticipated that carryover stocks will grow further in the coming year. With stocks relative to utilization at a level well above the average of the past five years, and prospects for a record crop in 1985, current market prices reflect a very "bearish" short-term outlook.

Prices of other wheats similar in quality to HRW (No. 2) have moved closely in line with US export prices for this grain. Generally, the trend in prices for wheats that differ in quality from HRW (No. 2) has been downward. However, there are exceptions. Durum wheat prices have declined far less than those for bread wheats, partly because of more rapid growth in demand in the developed world and partly because of tighter supplies in recent years. Prices for white wheats remained fairly stable during 1984-85, but dropped more than red wheats during 1983-84. These movements in US export prices are reflected closely in quotations for wheats produced by other exporters. However, disparities can emerge, such as the heavy discounting by Argentina during the period when they sold the bulk of their last harvest (December 1984 to April 1985).

Freight Rates

In the past three years there has been little change in ocean freight rates for transporting grain (Figure 16). Since the end of 1982, rates from US Gulf Ports to Rotterdam, an indicator of short-haul ocean freight rates, have fluctuated around US$ 7-10/ton. This is about half of the prevailing rate of five years ago. A similar rate pattern has pertained to long hauls. For shipment from US Gulf Ports to Bangladesh, an indicator of long-haul rates, the charge is currently around US$ 27/ton. Rates have fluctuated

around US$ 25-28/ton over the past three years, compared with highs of over US$ 50/ton in the late 1970s and early 1980s.

Two principal factors have led to the lower freight rates for ocean shipping of grain. First has been the excess capacity of the dry bulk carrier market. In recent years, laid-up shipping of dry cargo carriers increased from a minimum of 1.9 MT deadweight capacity as of June 1981, to a maximum of just over 26 MT in August 1983. As well, excess capacity in the ocean tanker market, whose rates tend to spill over to the dry bulk carrier market, rose from a minimum of 7 MT deadweight in December 1980, to 75 MT in April 1983.

A second factor (again) has been the strength of the US dollar. Since the rates are set in US dollars, the strengthening dollar has tended to force rates downward. In terms of other currencies, the decline of freight rates (denominated in dollars) in the first two years of the 1980s, and the relative stability of rates since then, translate into a considerably smaller decline, with rates tending to rise as local currencies have risen against the dollar in the past three years.

Other factors contributing to savings on freight costs in the longer term have been improvements in both the productivity of ocean grain carriers and in the loading and unloading facilities of ports.

Fertilizer Prices

Fertilizer prices fell sharply during the first two years of this decade, as did the prices of many other internationally traded commodities.

Since 1982, there has been relatively little movement in prices of fertilizer in the aggregate, although individual categories have experienced some fluctuation (Table 4). In 1983, export prices of urea fluctuated within a narrow range on either side of US$ 300/ton of nitrogen. The sharp reduction in US plantings of crops in that year was a key factor reducing global demand for nitrogen. In 1984, prices moved upward to around US$ 400/ton. Since then they have eased somewhat, to around $US 360/ton.

One factor tending to keep prices of nitrogen fertilizer down in recent years has been the falling price of petroleum and natural gas (in US$), with which nitrogen fertilizer is manufactured. Another factor has been the expansion of fertilizer supplies from several developing countries, including India and Mexico. Also, the nitrogen fertilizer manufacturing industry has relatively high levels of unutilized capacity. The strength of the US dollar has lowered nitrogen fertilizer prices in dollar terms, as well.

Table 4. World prices of fertilizer, 1980 to 1985[a/]

	Nitrogen US$/ton	Phosphorous US$/ton	Potash US$/ton
1980	485	393	223
1981	459	333	187
1982	341	300	135
1983	296	296	141
1984	374	287	155
1985	340	250	153

a/ 1985 price relates to first seven months of the year

Sources: World Bank and USDA

Phosphate fertilizers declined in price from a peak of US$ 400/ton of phosphorous in 1980 to US$ 300/ton in 1982. Since then, the price has fluctuated; it dropped to US$ 260/ton of phosphorous in May 1984, recovered to around US$ 300/ton in October 1984, and has since eased to US$ 250/ton. Prices of potash fertilizers have edged upward over the past three years, about in line with the general rate of inflation in the USA.

Compound fertilizer prices fluctuate less than those for other categories. The export price of 15:15:15, in bags, f.o.b. Western European ports, was around US$ 160-165/ton in the first half of 1985. This is some US$ 20/ton higher than prices one year earlier, which had more or less prevailed since 1982. Given the easing of prices of nitrogen and phosphorous in the first half of 1985, there is every chance that compound fertilizer prices will stay close to current levels for the next year.

Given the declining dollar price of petroleum, and the relatively stable prices of commodities globally in the mid-1980s, there is little prospect of strong increases in fertilizer prices, especially nitrogen. If global supplies of grain continue to grow rapidly, declining grain prices could in fact reduce demand for fertilizers, with consequent price effects on this major farm input.

The Outlook for Wheat

Although wheat trade has expanded recently, prices have been easing in the face of large harvests worldwide. Reports to date indicate that the 1985 crop is large, and this will continue to keep downward pressure on price in the next six months. The already large global stocks of wheat are likely to increase further during the next 12 months, unless there are major crop

shortfalls in several of the large wheat-growing nations. Forecasters are predicting a 6-8 MT decline in wheat trade during the coming year, placing considerable pressure on exporters. The heightened competition between major exporters, coupled with a stepping up in export credit and more direct export subsidies, will place further downward pressure on world wheat prices in the short term.

While short-term price prospects are gloomy (from the farmer's viewpoint), there are some longer term forces in the market that will keep demand for wheat growing at a strong pace. Foremost among these is a growing world population, as well as increasing urbanization. Growth in population and its relocation, both to cities and by migration to higher income countries, are spurring the increase in demand for wheat globally at a probable rate of around 3% per year. In addition, longer term increases in incomes are having an impact on the demand for wheat, potentially adding 1-2% annually to aggregate demand for wheat globally. Nearly all of this income effect is occurring in the developing world, although the extent to which the demand for wheat is affected is very dependent upon general rates of economic growth and the importance of the grain in the diet.

One of the key factors keeping downward pressure on wheat prices during the past few years has been the rapid increase in global average wheat yields. In the decade of the 1960s, average wheat yields grew at 2.5% per year. In the 1970s, this fell to 2.2%. However, during the first half of the 1980s the average yield increase has been 3.6% per year. Yield increases have been particularly strong in several of the major wheat-growing countries in the developing world, most notably China, India, and Argentina. However, major yield gains also have occurred in the developed world. Several countries/regions have extensive areas under higher yielding wheats, including the EEC, the USA, and Australia. Canada is likely to increase the area it devotes to these wheats as well. These changes, coupled with good yields in many other countries, are pushing the global supply of wheat to a much higher level than was expected five years ago.

There is every indication that wheat yields will continue their strong upward trend in the immediate future, weather permitting. Indeed, several other countries, especially the Soviet Union, have the potential to achieve sizeable increases in production, largely from higher yields. Couple this with relatively stable prices for inputs, and it appears that the supply of wheat will continue to grow strongly in the immediate future.

One of the critical factors that will affect the wheat market over the next few years is how policy makers in different countries will respond to growing stocks and declining prices. The US farm bill is due to be renewed in 1985, and it is proposed that the marketplace be allowed to have a greater role in determining support prices. If this occurs, some easing of prices could be expected, along with increasing competition in the export market as US wheat stocks are reduced. Downward pressure on the world price of wheat would also place considerable pressure on the farm programs of other countries, especially those of the EEC, which is currently attempting to reduce agricultural support. Another large wheat harvest could drive major grain exporters to seek restraints on production by means other than price, although this option is unlikely to be acceptable to all major grain exporters.

For most developing countries, the problems of a grain surplus are not of immediate concern. However, declining global wheat prices have affected, and could continue to affect the longer term incentives for increasing domestic wheat production in these countries. Thus wheat producers in the prominent wheat-growing countries of the developing world may experience a few years of lower incomes, unless their governments raise support prices explicitly to counter the general trend in global prices. For wheat-importing countries, the competition among exporters implies cheaper grain and some easing of costs for wheat imports. It probably implies some additional shipments of food aid, as well. In these countries, notably in Africa, there will be little economic incentive to boost wheat production, even though some of them are the very nations most in need of food and with the fewest prospects for expanding their foreign exchange earnings in order to buy wheat.

Where wheat is important as a source of income to poorer farmers in the developing world, the expected easing of world prices may mean a loss of income and a consequent reduction in their ability to buy essential goods and services. If these farmers are not sharing in the productivity gains in wheat production occurring globally, they require a special research and extension effort. CIMMYT is targeting its wheat germplasm development increasingly toward more difficult production environments and thus toward the resource-poor farmers who live in these areas (especially in Africa and the more isolated regions of Latin America and Asia).

Selected Wheat Statistics

The tables in this section each contain 38 statistics related to wheat production, consumption, trade, and prices, as well as some basic economic indicators. These statistics have been selected to provide the latest available information on world wheat production and utilization. It should be noted that some statistics included here are substantially different from the 1983 issue, due to routine updating and refining of statistics by the FAO Basic Statistics Unit, as well as the impact of droughts on yields and production, especially in African countries.

The developing countries included in these tables are classified as either wheat producers or wheat consumers. Wheat-producing countries are those in which wheat production either exceeds 100,000 tons per year or accounts for more than 50% of total wheat consumption. Wheat-consuming countries are all other developing nations in which total wheat consumption is greater than 100,000 tons per year. Average production and consumption data from 1981 to 1984 provide the basis for these classifications.

Developed countries producing more than 1 million tons per year have been included, as well as those in which wheat production accounts for more than 50% of total wheat consumption. Summary statistics presented for each geographical region include all countries in that region (see Annex 2 for a complete list).

Notes on the Variables

Variables 1, 2, 3: Source—*1985 World Population Data Sheet* of the Population Reference Bureau, USA.

Variables 4, 5: Source—*World Development Report, 1985.*

Variables 6 to 19: Calculated from the FAO *Tape of Production Statistics, April 1985.* Growth rates are calculated as $g = 100[\ln(X_t/X_{t_0})]/t$ where X_{t_0} is the average for the period t_0, 1961-65, X_t is the average for the period t, 1981-83 (or 1982-84), and t is the number of years between the midpoints of the two averages.

Variables 20 to 23: Source—FAO *Tape of Trade Statistics, April 1985.* Net imports are calculated as gross imports minus exports. Negative numbers indicate the country is an exporter.

Variable 24: Calculated as gross imports of wheat as a percent of total food grain imports. This variable was not analyzed for major wheat-exporting countries. Food grain imports are generally defined as the sum of gross imports of wheat and rice. However, in countries where maize imports exceeded the use of maize for animal feed, the surplus of maize imports over maize used as animal feed was included in food grain imports. Maize used for animal feed is based on the FAO *Food Balance Sheets, 1980-82.*

Variable 25: Total wheat utilization was calculated as the sum of net imports plus production plus opening stocks minus closing stocks over the 3-year period. Stocks data were taken from US Department of Agriculture, *Foreign Agricultural Circular-Grains* (FG-2-85) and IWC, *World Wheat Statistics.*

Variables 26 to 31 Source—FAO *Food Balance Sheets, 1979-81.* Based on changes in per capita caloric supply from 1961-65 to 1979-81. Growth rates calculated as defined for variable 14.

Variables 32 to 34: Source—ILO *Bulletin of Labour Statistics.* To convert the domestic retail price into US dollars, the official exchange rates from the IMF *International Financial Statistics* have been used.

Variables 35 to 38: Source—CIMMYT Economics Survey of scientists who are in frequent contact with farmers. Data refer to the wheat crop cycle harvested in 1984-85 for a major wheat-producing region within the country. The wheat price is the post-harvest price received by farmers. The nitrogen price is usually the price paid by farmers for the most common nitrogen fertilizer.

Eastern and Southern Africa

		Producers					Consumers		Regional Total or Average
		Ethiopia	Kenya	Sudan	Tanzania	Zimbabwe	Mozambique	Zambia	
General Indicators	1. Population, 1985 (millions)	36	20.2	21.8	21.7	8.6	13.9	6.8	183
	2. Natural increase in population (%/o per year)	2.1	4.1	2.9	3.5	3.5	2.8	3.3	3.0
	3. Urban population (%/o)	15	16	21	14	24	13	43	17
	4. Per capita income, 1983 (US$ per capita)	120	340	400	240	740	..	580	291
	5. Growth rate per capita income, 1965 to 1983 (%/o per year)	0.5	2.3	1.3	0.9	1.5	..	-1.3	0.4
	6. Per capita cereal production, 1981-83 (kg per year)	186	156	154	147	281	31	150	149
	7. Growth rate per capita cereal production, 1961-65 to 1981-83 (%/o per year)	0	-1.3	0.7	1.9	0.1	-2.6	-2.5	-0.4
Wheat Production	8. Area, 1984 (1000 ha)	594	110	140	60	17	4	4	975
	9. Yield, 1984 (ton/ha)	1.1	0.9	1.2	1.3	5.9	1.5	2.8	1.2
	10. Production, 1984 (1000 ton)	675	100	162	80	100	6	11	1171
	11. Area, 1984, as percent of 1979-81	106	105	68	106	45	109	148	95
	12. Yield, 1984, as percent of 1979-81	104	45	116	95	119	106	82	90
	13. Production, 1984, as percent of 1979-81	109	47	78	100	54	116	120	86
	14. Growth rate area, 1961-65 to 1982-84 (%/o per year)	-1.5	0.5	8.2	5.2	15.9	-5	12.9	-0.4
	15. Growth rate yield, 1961-65 to 1982-84 (%/o per year)	2.9	1.8	0.1	1.2	4.8	3.3	3.8	3
	16. Growth rate production, 1961-65 to 1982-84 (%/o per year)	1.3	2.3	8.3	6.4	20.8	-1.7	16.7	2.5
	17. Growth rate production, 1970-72 to 1982-84 (%/o per year)	1.9	-0.2	2.2	-6	5.6	-3.9	41.9	1.6
	18. Per capita wheat production, 1983 (kg per year)	27	13	7	3.5	15.1	0.5	3.2	10
	19. Growth rate per capita wheat production, 1961-65 to 1981-83 (%/o per year)	-0.8	-0.4	8.5	5.8	19.9	-1.9	13.6	0.6
Wheat Imports	20. Net imports, 1983 (1000 ton)	278	110	425	49	40	117	100	1468
	21. Net imports, 1983, as percent of 1978-80	104	204	209	95	-685	87	80	124
	22. Net imports per capita, 1961-65 (kg per year)	0	-3	8	4	22	6	6	4
	23. Net imports per capita, 1981-83 (kg per year)	7	5	19	3	2	11	21	9
	24. Imports of wheat as %/o of total food grain imports, 1980-82	98	34	6	41	72	49	59	20
Consumption	25. Per capita total wheat utilization, 1982-84 (kg per year)	27	18	34	7	28	11	17	17
	26. Growth rate per capita wheat food supply, 1961-65 to 1979-81 (%/o per year)	..	3.3	3.8	1.8	1.3	5.1	7.8	3.6
	27. Growth rate per capita rice food supply, 1961-65 to 1979-81 (%/o per year)	..	2.7	4.1	2.4	-3	2.1	4.6	0.8
	28. Growth rate per capita coarse grains food supply, 1961-65 to 1979-81 (%/o per year)	..	-1.4	0.6	-1	-2.2	-2.6	0	-0.3
	29. Growth rate per capita roots and tubers food supply, 1961-65 to 1979-81 (%/o per year)	..	-1.3	-4.2	0	6.2	-0.5	-1.2	-0.2
	30. Wheat as percent of staple calories, 1961-65	..	5	9	3	8	3	4	4
	31. Wheat as percent of staple calories, 1979-81	..	10	15	4	14	9	13	8
Consumer Prices	32. Bread retail price, 1983-84 (US cents per kg)	..	43	92	..	64	..	111	nc
	33. Flour retail price, 1983-84 (US cents per kg)	..	35	153	..	96	..	95	nc
	34. Ratio bread price to rice price, 1983-84	..	0.8	0.6	..	0.4	..	0.3	nc
Producer Prices	35. Farm price of wheat, 1984 (US$ per ton)	188	153	400	257	155	..	..	nc
	36. Farm price of nitrogen, 1984 (US$ per ton)	748	800	435	863	579	..	..	nc
	37. Ratio of farm level nitrogen price to wheat price, 1984	3.9	5.2	1.1	3.4	3.7	..	..	nc
	38. Farm wage rate in kg of wheat per day, 1984	5.1	6.5	3.5	6	13	..	..	nc

nc Indicates not calculated because of special case
.. Indicates missing data

Western Africa

		Consumers							Regional Total or Average
		Angola	Cameroon	Ghana	Ivory Coast	Nigeria	Senegal	Zaire	
General Indicators	1. Population, 1985 (millions)	7.9	9.7	14.3	10.1	91.2	6.7	38.1	235
	2. Natural increase in population (o/o per year)	2.5	2.6	3.2	2.8	3.1	3.1	2.9	2.9
	3. Urban population (o/o)	24	42	40	42	28	42	34	30
	4. Per capita income, 1983 (US$ per capita)	..	820	310	710	770	440	170	529
	5. Growth rate per capita income, 1965 to 1983 (o/o per year)	..	2.7	-2.1	1	3.2	-0.5	-1.3	-2.5
	6. Per capita cereal production, 1981-83 (kg per year)	45	97	42	100	112	122	32	99
	7. Growth rate per capita cereal production, 1961-65 to 1981-83 (o/o per year)	-4.6	-1.2	-1.4	-0.5	-2.3	-2.1	1.7	-1.5
Wheat Production	8. Area, 1984 (1000 ha)	16	1	0	0	16	0	9	56
	9. Yield, 1984 (ton/ha)	0.6	0.7	nc	na	2.8	nc	1.2	1.4
	10. Production, 1984 (1000 ton)	10	1	0	0	45	0	10	81
	11. Area, 1984, as percent of 1979-81	143	37	nc	nc	160	nc	196	143
	12. Yield, 1984, as percent of 1979-81	100	89	nc	nc	117	nc	122	112
	13. Production, 1984, as percent of 1979-81	100	32	nc	nc	187	nc	239	160
	14. Growth rate area, 1961-65 to 1982-84 (o/o per year)	-0.4	nc	nc	nc	1.5	nc	4.6	1.7
	15. Growth rate yield, 1961-65 to 1982-84 (o/o per year)	-2.7	nc	nc	nc	2.1	nc	1	0.3
	16. Growth rate production, 1961-65 to 1982-84 (o/o per year)	-3.1	nc	nc	nc	3.7	nc	5.6	2
	17. Growth rate production, 1970-72 to 1982-84 (o/o per year)	-2.4	nc	nc	nc	5.2	nc	10.9	3.4
	18. Per capita wheat production, 1983 (kg per year)	1.3	nc	nc	nc	0.4	nc	0.3	0.5
	19. Growth rate per capita wheat production, 1961-65 to 1981-83 (o/o per year)	-5.8	nc	nc	nc	0	nc	1.9	0
Wheat Imports	20. Net imports, 1983 (1000 ton)	158	120	156	197	1498	144	189	3127
	21. Net imports, 1983, as percent of 1978-80	97	106	110	114	129	134	141	130
	22. Net imports per capita, 1961-65 (kg per year)	8	5	8	9	2	12	4	4
	23. Net imports per capita, 1981-83 (kg per year)	19	11	11	22	18	21	6	14
	24. Imports of wheat as o/o of total food grain imports, 1980-82	53	86	68	38	69	25	46	55
Consumption	25. Per capita total wheat utilization, 1982-84 (kg per year)	18	17	9	23	19	17	5	15
	26. Growth rate per capita wheat food supply, 1961-65 to 1979-81 (o/o per year)	..	7.1	2	5.2	13	3.5	2.7	7.7
	27. Growth rate per capita rice food supply, 1961-65 to 1979-81 (o/o per year)	..	6.7	0.7	2.6	9.6	1.3	3.8	3.5
	28. Growth rate per capita coarse grains food supply, 1961-65 to 1979-81 (o/o per year)	..	-0.9	1	-2.3	-1.5	-0.1	0.9	-0.5
	29. Growth rate per capita roots and tubers food supply, 1961-65 to 1979-81 (o/o per year)	..	0.5	-1.7	-1.3	-0.3	-11.7	-0.6	-1.5
	30. Wheat as percent of staple calories, 1961-65	..	2	4	4	0.8	6	2	2
	31. Wheat as percent of staple calories, 1979-81	..	8	7	10	7	10	3	7
Consumer Prices	32. Bread retail price, 1983-84 (US cents per kg)	..	..	..	..	119	..	..	nc
	33. Flour retail price, 1983-84 (US cents per kg)	..	..	..	..	88	56	..	nc
	34. Ratio bread price to rice price, 1983-84	..	..	..	..	0.9	..	..	nc
Producer Prices	35. Farm price of wheat, 1984 (US$ per ton)	..	..	..	..	..	..	..	nc
	36. Farm price of nitrogen, 1984 (US$ per ton)	..	..	..	..	..	..	..	nc
	37. Ratio of farm level nitrogen price to wheat price, 1984	..	..	..	..	..	..	..	nc
	38. Farm wage rate in kg of wheat per day, 1984	..	..	..	..	..	..	..	nc

nc Indicates not calculated because of special case
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North Africa

		Producers					Regional Total or Average
		Algeria	Egypt	Libya	Morocco	Tunisia	
General Indicators	1. Population, 1985 (millions)	22.2	48.3	4	24.3	7.2	106
	2. Natural increase in population (%/o per year)	3.3	2.7	3.5	2.9	2.3	2.9
	3. Urban population (%/o)	52	44	64	42	52	47
	4. Per capita income, 1983 (US$ per capita)	2320	700	8480	760	1290	1366
	5. Growth rate per capita income, 1965 to 1983 (%/o per year)	3.6	4.2	-0.9	2.9	5	2.8
	6. Per capita cereal production, 1981-83 (kg per year)	81	192	76	163	175	157
	7. Growth rate per capita cereal production, 1961-65 to 1981-83 (%/o per year)	-3.4	-0.6	-0.5	-2.2	-0.9	-1.5
Wheat Production	8. Area, 1984 (1000 ha)	1970	550	260	1856	756	5392
	9. Yield, 1984 (ton/ha)	0.6	3.4	0.6	1.1	0.9	1.1
	10. Production, 1984 (1000 ton)	1200	1815	150	1989	711	5865
	11. Area, 1984, as percent of 1979-81	101	95	104	111	85	101
	12. Yield, 1984, as percent of 1979-81	93	102	116	120	100	104
	13. Production, 1984, as percent of 1979-81	94	97	120	132	84	104
	14. Growth rate area, 1961-65 to 1982-84 (%/o per year)	-0.8	0.1	2.6	0.8	-0.6	0
	15. Growth rate yield, 1961-65 to 1982-84 (%/o per year)	-0.4	1.4	4.3	1.4	1.1	1.1
	16. Growth rate production, 1961-65 to 1982-84 (%/o per year)	-1.2	1.4	6.9	2.1	0.5	1
	17. Growth rate production, 1970-72 to 1982-84 (%/o per year)	-3.3	1.5	13.5	0	0.4	0
	18. Per capita wheat production, 1983 (kg per year)	37.6	44	43	88	91	56
	19. Growth rate per capita wheat production, 1961-65 to 1981-83 (%/o per year)	-4.3	-0.8	2.9	-1.7	-1.1	-1.8
Wheat Imports	20. Net imports, 1983 (1000 ton)	2962	6591	594	1721	901	12769
	21. Net imports, 1983, as percent of 1978-80	113	127	108	106	141	120
	22. Net imports per capita, 1961-65 (kg per year)	32	59	70	22	34	44
	23. Net imports per capita, 1981-83 (kg per year)	140	135	181	87	101	125
	24. Imports of wheat as %/o of total food grain imports, 1980-82	97	100	91	98	99	98
Consumption	25. Per capita total wheat utilization, 1982-84 (kg per year)	173	176	185	169	248	179
	26. Growth rate per capita wheat food supply, 1961-65 to 1979-81 (%/o per year)	1.8	2.1	3.3	1.3	2.9	2
	27. Growth rate per capita rice food supply, 1961-65 to 1979-81 (%/o per year)	3	0.4	5.2	1.5	1.1	0.3
	28. Growth rate per capita coarse grains food supply, 1961-65 to 1979-81 (%/o per year)	-2.4	-1.7	-4.8	-1	-5.7	-1.8
	29. Growth rate per capita roots and tubers food supply, 1961-65 to 1979-81 (%/o per year)	1.3	4.1	8.3	4.6	2.7	3.4
	30. Wheat as percent of staple calories, 1961-65	81	88	70	58	80	55
	31. Wheat as percent of staple calories, 1979-81	44	56	81	67	93	67
Consumer Prices	32. Bread retail price, 1983-84 (US cents per kg)	52	..	..	..	..	nc
	33. Flour retail price, 1983-84 (US cents per kg)	49	..	..	..	..	nc
	34. Ratio bread price to rice price, 1983-84	0.7	..	..	..	..	nc
Producer Prices	35. Farm price of wheat, 1984 (US$ per ton)	326	..	..	180	155	nc
	36. Farm price of nitrogen, 1984 (US$ per ton)	..	..	..	230	..	nc
	37. Ratio of farm level nitrogen price to wheat price, 1984	..	..	..	1.3	..	nc
	38. Farm wage rate in kg of wheat per day, 1984	..	..	..	13	17	nc

nc Indicates not calculated because of special case

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Middle Eastern Countries of Asia
(continued next page)

		Producers					
		Afghanistan	Iran	Iraq	Saudi Arabia	Syria	Turkey
General Indicators	1. Population, 1985 (millions)	14.7	45.1	15.5	11.2	10.6	52.1
	2. Natural increase in population (o/o per year)	2.5	3	3.3	3	3.9	2.5
	3. Urban population (o/o)	16	50	68	70	47	45
	4. Per capita income, 1983 (US$ per capita)	..	..	..	12230	1760	1240
	5. Growth rate per capita income, 1965 to 1983 (o/o per year)	0.5	..	..	6.7	4.9	3
	6. Per capita cereal production, 1981-83 (kg per year)	270	243	141	60	293	536
	7. Growth rate per capita cereal production, 1961-65 to 1981-83 (o/o per year)	-1.3	1.2	-2.9	1.8	-1.1	0.4
Wheat Production	8. Area, 1984 (1000 ha)	2310	5800	650	480	1099	9026
	9. Yield, 1984 (ton/ha)	1.2	0.9	0.5	2.7	1	1.9
	10. Production, 1984 (1000 ton)	2850	5500	300	1300	1051	17235
	11. Area, 1984, as percent of 1979-81	104	98	54	677	79	98
	12. Yield, 1984, as percent of 1979-81	100	92	66	120	70	103
	13. Production, 1984, as percent of 1979-81	103	90	35	813	55	101
	14. Growth rate area, 1961-65 to 1982-84 (o/o per year)	0	2.3	-0.9	5.7	-0.7	0.7
	15. Growth rate yield, 1961-65 to 1982-84 (o/o per year)	1.3	1.4	0	3.8	2	2.8
	16. Growth rate production, 1961-65 to 1982-84 (o/o per year)	1.3	3.7	-0.9	9.4	1.3	3.4
	17. Growth rate production, 1970-72 to 1982-84 (o/o per year)	2.4	3.2	-6.7	20.8	2.1	2.9
	18. Per capita wheat production, 1983 (kg per year)	169	143	58	-88	160	338
	19. Growth rate per capita wheat production, 1961-65 to 1981-83 (o/o per year)	-1.1	3.6	-3	2.9	-1	1.1
Wheat Imports	20. Net imports, 1983 (1000 ton)	146	2500	2627	747	1242	-721
	21. Net imports, 1983, as percent of 1978-80	210	303	152	100	431	64
	22. Net imports per capita, 1961-65 (kg per year)	6	10	18	69	-5	19
	23. Net imports per capita, 1981-83 (kg per year)	5	48	161	74	65	-6
	24. Imports of wheat as o/o of total food grain imports, 1980-82	82	65	85	57	73	94
Consumption	25. Per capita total wheat utilization, 1982-84 (kg per year)	200	180	226	107	244	285
	26. Growth rate per capita wheat food supply, 1961-65 to 1979-81 (o/o per year)	..	..	..	3.7	0	0.1
	27. Growth rate per capita rice food supply, 1961-65 to 1979-81 (o/o per year)	..	..	..	2.2	2.2	-0.3
	28. Growth rate per capita coarse grains food supply, 1961-65 to 1979-81 (o/o per year)	..	..	..	-7.6	2.4	-1.9
	29. Growth rate per capita roots and tubers food supply, 1961-65 to 1979-81 (o/o per year)	..	..	..	9.5	6.8	1.6
	30. Wheat as percent of staple calories, 1961-65	..	..	..	28	89	80
	31. Wheat as percent of staple calories, 1979-81	..	..	..	54	84	82
Consumer Prices	32. Bread retail price, 1983-84 (US cents per kg)	..	..	..	28	..	..
	33. Flour retail price, 1983-84 (US cents per kg)	..	..	..	69	..	..
	34. Ratio bread price to rice price, 1983-84	..	..	..	0.6	..	..
Producer Prices	35. Farm price of wheat, 1984 (US$ per ton)	..	421	210	..	385	102
	36. Farm price of nitrogen, 1984 (US$ per ton)	..	206	435	..	530	235
	37. Ratio of farm level nitrogen price to wheat price, 1984	..	0.5	2.1	..	1.4	2.3
	38. Farm wage rate in kg of wheat per day, 1984	..	34	24	..	..	22

nc Indicates not calculated because of special case
.. Indicates missing data

Middle Eastern Countries of Asia (continued)

		Consumers					Regional Total or Average
		Lebanon	Kuwait	Jordan	Yemen Arab	Yemen Dem.	
General Indicators	1. Population, 1985 (millions)	2.6	1.9	3.6	6.1	2.1	169
	2. Natural increase in population (%/o per year)	2.1	3.2	3.8	2.7	2.9	2.9
	3. Urban population (%/o)	76	90	60	15	37	48
	4. Per capita income, 1983 (US$ per capita)	..	17880	1640	550	520	3231
	5. Growth rate per capita income, 1965 to 1983 (%/o per year)	..	0.2	6.9	5.7	0	6.3
	6. Per capita cereal production, 1981-83 (kg per year)	10	0.1	35	206	58	291
	7. Growth rete per capita cereal production, 1961-65 to 1981-83 (%/o per year)	-7.9	0	-7.3	0	0.5	-0.2
Wheat Production	8. Area, 1984 (1000 ha)	15	0	18	50	15	19428
	9. Yield, 1984 (ton/ha)	1.2	nc	0.8	1	1	1.5
	10. Production, 1984 (1000 ton)	18	nc	15	50	15	28305
	11. Area, 1984, as percent of 1979-81	58	nc	16	77	100	96
	12. Yield, 1984, as percent of 1979-81	95	nc	140	99	110	101
	13. Production, 1984, as percent of 1979-81	55	nc	22	77	109	97
	14. Growth rate area, 1961-65 to 1982-84 (%/o per year)	-7	nc	-6.2	4.1	3.6	0.8
	15. Growth rate yield, 1961-65 to 1982-84 (%/o per year)	1.3	nc	0.8	0	-3.5	2.2
	16. Growth rate production, 1961-65 to 1982-84 (%/o per year)	-5.7	nc	-5.4	4.1	0.1	3
	17. Growth rate production, 1970-72 to 1982-84 (%/o per year)	-7.4	nc	-7.2	3.7	0.9	2.6
	18. Per capita wheat production, 1983 (kg per year)	7.1	nc	32	5	7.5	190.2
	19. Growth rate per capita wheat production, 1961-65 to 1981-83 (%/o per year)	7.8	nc	-71	0	-2.4	0.4
Wheat Imports	20. Net imports, 1983 (1000 ton)	197	263	347	517	164	7883
	21. Net imports, 1983, as percent of 1978-80	58	178	115	126	131	214
	22. Net imports per capita, 1961-65 (kg per year)	106	146	69	1	46	17
	23. Net imports per capita, 1981-83 (kg per year)	123	124	124	83	92	43
	24. Imports of wheat as %/o of total food grain imports, 1980-82	85	72	85	94	82	73
Consumption	25. Per capita total wheat utilization, 1982-84 (kg per year)	137	146	106	83	..	211
	26. Growth rate per capita wheat food supply, 1961-65 to 1979-81 (%/o per year)	..	..	..	16.4	2.1	-0.1
	27. Growth rate per capita rice food supply, 1961-65 to 1979-81 (%/o per year)	..	..	..	10.5	6.6	4.3
	28. Growth rate per capita coarse grains food supply, 1961-65 to 1979-81 (%/o per year)	..	..	..	-2.7	0.2	-2.2
	29. Growth rate per capita roots and tubers food supply, 1961-65 to 1979-81 (%/o per year)	..	..	..	5.7	-6	0.5
	30. Wheat as percent of staple calories, 1961-65	..	..	..	2	51	68
	31. Wheat as percent of staple calories, 1979-81	..	..	..	35	52	70
Consumer Prices	32. Bread retail price, 1983-84 (US cents per kg)	..	..	..	..	..	nc
	33. Flour retail price, 1983-84 (US cents per kg)	..	..	..	..	..	nc
	34. Ratio bread price to rice price, 1983-84	..	..	..	..	..	nc
Producer Prices	35. Farm price of wheat, 1984 (US$ per ton)	..	..	245	..	..	nc
	36. Farm price of nitrogen, 1984 (US$ per ton)	..	..	337	..	..	nc
	37. Ratio of farm level nitrogen price to wheat price, 1984	..	..	1.4	..	..	nc
	38. Farm wage rate in kg of wheat per day, 1984	..	..	41	..	..	nc

nc Indicates not calculated because of special case
.. Indicates missing data

South Asia

		Producers					Consumer	Regional Total or Average
		Bangladesh	Burma	India	Nepal	Pakistan	Sri Lanka	
General Indicators	1. Population, 1985 (millions)	101.5	36.9	762.2	17	99.2	16.4	1034
	2. Natural increase in population (%/o per year)	2.8	2.2	2.2	2.4	2.7	2.1	2.3
	3. Urban population (%/o)	15	24	23	6	29	22	23
	4. Per capita income, 1983 (US$ per capita)	130	180	260	160	390	330	256
	5. Growth rate per capita income, 1965 to 1983 (%/o per year)	0.5	2.2	1.5	1	2.5	2.9	1.5
	6. Per capita cereal production, 1981-83 (kg per year)	238	397	210	255	201	136	220
	7. Growth rate per capita cereal production, 1961-65 to 1981-83 (%/o per year)	-0.7	0.9	0.6	-1.3	2.2	2.2	0.6
Wheat Production	8. Area, 1984 (1000 ha)	526	135	24395	472	7322	0	32860
	9. Yield, 1984 (ton/ha)	2.3	1.4	1.9	1.3	1.5	nc	1.8
	10. Production, 1984 (1000 ton)	1200	191	45148	634	11053	0	58236
	11. Area, 1984, as percent of 1979-81	122	150	109	127	107	nc	109
	12. Yield, 1984, as percent of 1979-81	122	153	120	112	96	nc	115
	13. Production, 1984, as percent of 1979-81	149	229	130	142	102	nc	124
	14. Growth rate area, 1961-65 to 1982-84 (%/o per year)	10.9	2.9	2.8	7.1	1.9	nc	2.7
	15. Growth rate yield, 1961-65 to 1982-84 (%/o per year)	6	4.1	3.8	0.4	3.2	nc	3.7
	16. Growth rate production, 1961-65 to 1982-84 (%/o per year)	16.9	6.9	6.6	7.5	5.1	nc	6.3
	17. Growth rate production, 1970-72 to 1982-84 (%/o per year)	19.1	12.4	4.8	8.2	4.3	nc	4.9
	18. Per capita wheat production, 1983 (kg per year)	11.4	3.4	59	42.9	131	nc	59
	19. Growth rate per capita wheat production, 1961-65 to 1981-83 (%/o per year)	15.3	3.6	4.5	5.4	2.7	nc	4.1
Wheat Imports	20. Net imports, 1983 (1000 ton)	1527	7	3982	43	297	598	6465
	21. Net imports, 1983, as percent of 1978-80	115	69	-3602	201	22	72	191
	22. Net imports per capita, 1961-65 (kg per year)	8	1	10	0	20	26	10
	23. Net imports per capita, 1981-83 (kg per year)	14	0.2	3	2	3	..	4
	24. Imports of wheat as %/o of total food grain imports, 1980-82	82	1.7	98	27	100	80	69
Consumption	25. Per capita total wheat utilization, 1982-84 (kg per year)	27	4	54	41	126	36	56
	26. Growth rate per capita wheat food supply, 1961-65 to 1979-81 (%/o per year)	4.9	0	2.5	4.8	1.8	3.2	2.9
	27. Growth rate per capita rice food supply, 1961-65 to 1979-81 (%/o per year)	-0.7	1.8	-0.1	0.3	1.5	-0.4	-0.5
	28. Growth rate per capita coarse grains food supply, 1961-65 to 1979-81 (%/o per year)	-2	1.8	-1.1	-3	-2.5	-1.5	-0.8
	29. Growth rate per capita roots and tubers food supply, 1961-65 to 1979-81 (%/o per year)	1.9	4.1	3.5	-1.4	0.5	0.2	2.9
	30. Wheat as percent of staple calories, 1961-65	4	1	19	5	67	14	19
	31. Wheat as percent of staple calories, 1979-81	10	1	27	13	74	23	30
Consumer Prices	32. Bread retail price, 1983-84 (US cents per kg)	32	..	21	..	35	26	nc
	33. Flour retail price, 1983-84 (US cents per kg)	31	..	..	..	17	29	nc
	34. Ratio bread price to rice price, 1983-84	1	2	0.7	..	0.7	0.9	nc
Producer Prices	35. Farm price of wheat, 1984 (US$ per ton)	154	..	128	..	108	..	nc
	36. Farm price of nitrogen, 1984 (US$ per ton)	362	..	380	..	398	..	nc
	37. Ratio of farm level nitrogen price to wheat price, 1984	2.4	..	3	..	3.7	..	nc
	38. Farm wage rate in kg of wheat per day, 1984	..	..	13	..	19.6	..	nc

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Southeast Asia and Pacific

		Consumers							Regional Total or Average
		Hong Kong	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam	
General Indicators	1. Population, 1985 (millions)	5.5	168.4	15.7	56.8	2.6	52.7	60.5	378
	2. Natural increase in population (%/o per year)	1	2.2	2.2	2.5	1.1	1.9	2.5	2.2
	3. Urban population (%/o)	92	22	32	37	100	17	19	25
	4. Per capita income, 1983 (US$ per capita)	6000	560	1860	760	6620	820	..	871
	5. Growth rate per capita income, 1965 to 1983 (%/o per year)	6.2	5	4.5	2.9	7.8	4.3	..	4.8
	6. Per capita cereal production, 1981-83 (kg per year)	..	249	132	217	..	433	254	260
	7. Growth rate per capita cereal production, 1961-65 to 1981-83 (%/o per year)	..	2.8	0.1	2.3	..	0.3	-0.2	1.3
Wheat Production	8. Area, 1984 (1000 ha)	0	0	0	0	0	0	0	0
	9. Yield, 1984 (ton/ha)	nc	nc	nc	nc	nc	nc	nc	nc
	10. Production, 1984 (1000 ton)	0	0	0	0	0	0	0	0
	11. Area, 1984, as percent of 1979-81	nc	nc	nc	nc	nc	nc	nc	nc
	12. Yield, 1984, as percent of 1979-81	nc	nc	nc	nc	nc	nc	nc	nc
	13. Production, 1984, as percent of 1979-81	nc	nc	nc	nc	nc	nc	nc	nc
	14. Growth rate area, 1961-65 to 1982-84 (%/o per year)	nc	nc	nc	nc	nc	nc	nc	nc
	15. Growth rate yield, 1961-65 to 1982-84 (%/o per year)	nc	nc	nc	nc	nc	nc	nc	nc
	16. Growth rate production, 1961-65 to 1982-84 (%/o per year)	nc	nc	nc	nc	nc	nc	nc	nc
	17. Growth rate production, 1970-72 to 1982-84 (%/o per year)	nc	nc	nc	nc	nc	nc	nc	nc
	18. Per capita wheat production, 1983 (kg per year)	nc	nc	nc	nc	nc	nc	nc	nc
	19. Growth rate per capita wheat production, 1961-65 to 1981-83 (%/o per year)	nc	nc	nc	nc	nc	nc	nc	nc
Wheat Imports	20. Net imports, 1983 (1000 ton)	189	1757	538	811	149	203	228	4041
	21. Net imports, 1983, as percent of 1978-80	108	172	108	304	143	122	16	107
	22. Net imports per capita, 1961-65 (kg per year)	33	1	28	14	41	1	4	6
	23. Net imports per capita, 1981-83 (kg per year)	..	10	34	16	50	3	9	11
	24. Imports of wheat as %/o of total food grain imports, 1980-82	32	61	41	82	63	68	93	60
Consumption	25. Per capita total wheat utilization, 1982-84 (kg per year)	45	10	36	16	56	4	10	12
	26. Growth rate per capita wheat food supply, 1961-65 to 1979-81 (%/o per year)	1.3	15.9	0.7	1.2	-0.2	6.5	nc	nc
	27. Growth rate per capita rice food supply, 1961-65 to 1979-81 (%/o per year)	0.6	2.6	-0.4	0.5	-0.7	-0.2	nc	nc
	28. Growth rate per capita coarse grains food supply, 1961-65 to 1979-81 (%/o per year)	-14.5	-0.9	-0.2	3	12.3	9.3	nc	nc
	29. Growth rate per capita roots and tubers food supply, 1961-65 to 1979-81 (%/o per year)	-0.5	-2	3.3	2.5	7.1	2.5	nc	nc
	30. Wheat as percent of staple calories, 1961-65	18	0.3	16	7	29	0.6	nc	nc
	31. Wheat as percent of staple calories, 1979-81	29	3	18	7	22	2	nc	nc
Consumer Prices	32. Bread retail price, 1983-84 (US cents per kg)	..	..	124	85	..	..	..	nc
	33. Flour retail price, 1983-84 (US cents per kg)	..	..	40	89	..	..	..	nc
	34. Ratio bread price to rice price, 1983-84	..	..	2.6	2.1	..	..	..	nc
Producer Prices	35. Farm price of wheat, 1984 (US$ per ton)	..	..	..	..	..	..	..	nc
	36. Farm price of nitrogen, 1984 (US$ per ton)	..	..	..	..	..	..	..	nc
	37. Ratio of farm level nitrogen price to wheat price, 1984	..	..	..	..	..	..	..	nc
	38. Farm wage rate in kg of wheat per day, 1984	..	..	..	..	..	..	..	nc

nc Indicates not calculated because of special case
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East Asia

		Producers			Consumers		Regional Total or Average
		China	Korea D.P.R.	Mongolia	Korea Rep.	Taiwan	
General Indicators	1. Population, 1985 (millions)	1042	20.1	1.9	42.7	19.2	1107
	2. Natural increase in population (o/o per year)	1.1	2.3	2.7	1.7	1.6	1.1
	3. Urban population (o/o)	29	64	51	57	71	31
	4. Per capita income, 1983 (US$ per capita)	300	..	..	2010	..	364
	5. Growth rate per capita income, 1965 to 1983 (o/o per year)	4.4	..	..	6.7	..	-0.8
	6. Per capita cereal production, 1981-83 (kg per year)	315	483	322	210	..	314
	7. Growth rate per capita cereal production, 1961-65 to 1981-83 (o/o per year)	2.6	1.6	0.6	-0.5	..	2.5
Wheat Production	8. Area, 1984 (1000 ha)	29468	185	461	6	1	30121
	9. Yield, 1984 (ton/ha)	3.00	3.20	1.00	2.70	2	2.9
	10. Production, 1984 (1000 ton)	87682	600	459	17	2	88760
	11. Area, 1984, as percent of 1979-81	101	119	111	31	103	102
	12. Yield, 1984, as percent of 1979-81	145	130	166	85	77	145
	13. Production, 1984, as percent of 1979-81	148	155	185	27	79	148
	14. Growth rate area, 1961-65 to 1982-84 (o/o per year)	0.8	2.8	1.5	-7.9	-13.3	0.8
	15. Growth rate yield, 1961-65 to 1982-84 (o/o per year)	6.3	2.5	1.9	3.1	0.2	6.2
	16. Growth rate production, 1961-65 to 1982-84 (o/o per year)	7.1	5.4	3.4	-4.8	-1.3	7
	17. Growth rate production, 1970-72 to 1982-84 (o/o per year)	7.4	5.6	6.2	-8.9	-1.9	7.3
	18. Per capita wheat production, 1983 (kg per year)	80	26	357	2.8	0.1	77
	19. Growth rate per capita wheat production, 1961-65 to 1981-83 (o/o per year)	5.1	2.5	0.1	-6.1	-0.1	4.9
Wheat Imports	20. Net imports, 1983 (1000 ton)	12265	350	83	1854	737	15289
	21. Net imports, 1983, as percent of 1978-80	125	78	107	105	110	120
	22. Net imports per capita, 1961-65 (kg per year)	7	13	-20	20	..	107
	23. Net imports per capita, 1981-83 (kg per year)	13	29	60	48	..	15
	24. Imports of wheat as o/o of total food grain imports, 1980-82	79	100	66	52	..	75
Consumption	25. Per capita total wheat utilization, 1982-84 (kg per year)	80	40	192	52	38	79
	26. Growth rate per capita wheat food supply, 1961-65 to 1979-81 (o/o per year)	4	3.1	2.1	4.6	..	nc
	27. Growth rate per capita rice food supply, 1961-65 to 1979-81 (o/o per year)	1.5	2.7	5.6	1.1	..	nc
	28. Growth rate per capita coarse grains food supply, 1961-65 to 1979-81 (o/o per year)	-1.7	-2.3	..	-2.1	..	nc
	29. Growth rate per capita roots and tubers food supply, 1961-65 to 1979-81 (o/o per year)	0.1	1.3	2.2	-5.4	..	nc
	30. Wheat as percent of staple calories, 1961-65	14	11	95	7	..	nc
	31. Wheat as percent of staple calories, 1979-81	24	15	91	14	..	nc
Consumer Prices	32. Bread retail price, 1983-84 (US cents per kg)	..	..	..	96	..	nc
	33. Flour retail price, 1983-84 (US cents per kg)	..	..	..	29	..	nc
	34. Ratio bread price to rice price, 1983-84	..	..	..	1	..	nc
Producer Prices	35. Farm price of wheat, 1984 (US$ per ton)	158	..	..	346	..	nc
	36. Farm price of nitrogen, 1984 (US$ per ton)	267	..	..	647	..	nc
	37. Ratio of farm level nitrogen price to wheat price, 1984	1.7	..	..	1.9	..	nc
	38. Farm wage rate in kg of wheat per day, 1984	2.4	..	..	30	..	nc

nc Indicates not calculated because of special case
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Mexico, Central America and Caribbean (continued next page)

		Producers	Consumers					
		Mexico	Costa Rica	Cuba	Dominican Republic	El Salvador	Guatemala	Haiti
General Indicators	1. Population, 1985 (millions)	79.7	2.6	10.1	6.2	5.1	8	5.8
	2. Natural increase in population (%/o per year)	2.6	2.7	1.1	2.5	2.1	3.5	2.3
	3. Urban population (%/o)	70	48	70	52	39	39	28
	4. Per capita income, 1983 (US$ per capita)	2240	1020	..	1370	710	1120	300
	5. Growth rate per capita income, 1965 to 1983 (%/o per year)	3.2	2.1	..	3.9	-0.2	2.1	1.1
	6. Per capita cereal production, 1981-83 (kg per year)	307	140	60	74	122	158	66
	7. Growth rate per capita cereal production, 1961-65 to 1981-83 (%/o per year)	1.1	1.7	2.8	2.2	0.5	0.2	-3.1
Wheat Production	8. Area, 1984 (1000 ha)	1089	0	0	0	0	36	0
	9. Yield, 1984 (ton/ha)	3.90	nc	nc	nc	nc	0.90	nc
	10. Production, 1984 (1000 ton)	4262	0	0	0	0	32	0
	11. Area, 1984, as percent of 1979-81	150	nc	nc	nc	nc	77	nc
	12. Yield, 1984, as percent of 1979-81	103	nc	nc	nc	nc	73	nc
	13. Production, 1984, as percent of 1979-81	154	nc	nc	nc	nc	55	nc
	14. Growth rate area, 1961-65 to 1982-84 (%/o per year)	0.9	nc	nc	nc	nc	0.4	nc
	15. Growth rate yield, 1961-65 to 1982-84 (%/o per year)	3.2	nc	nc	nc	nc	0.5	nc
	16. Growth rate production, 1961-65 to 1982-84 (%/o per year)	4.1	nc	nc	nc	nc	0.9	nc
	17. Growth rate production, 1970-72 to 1982-84 (%/o per year)	5.5	nc	nc	nc	nc	-0.7	nc
	18. Per capita wheat production, 1983 (kg per year)	46	nc	nc	nc	nc	3.9	nc
	19. Growth rate per capita wheat production, 1961-65 to 1981-83 (%/o per year)	0.8	nc	nc	nc	nc	-1.8	nc
Wheat Imports	20. Net imports, 1983 (1000 ton)	423	110	1442	195	129	117	185
	21. Net imports, 1983, as percent of 1978-80	52	119	118	126	115	107	135
	22. Net imports per capita, 1961-65 (kg per year)	-6	41	70	16	15	14	11
	23. Net imports per capita, 1981-83 (kg per year)	8	42	137	27	26	13	27
	24. Imports of wheat as %/o of total food grain imports, 1980-82	88	100	86	83	96	98	90
Consumption	25. Per capita total wheat utilization, 1982-84 (kg per year)	55	41	127	30	23	18	26
	26. Growth rate per capita wheat food supply, 1961-65 to 1979-81 (%/o per year)	2	0.3	1.8	3.1	..	2.2	5
	27. Growth rate per capita rice food supply, 1961-65 to 1979-81 (%/o per year)	2.1	1.4	1	2.5	..	5.1	2.4
	28. Growth rate per capita coarse grains food supply, 1961-65 to 1979-81 (%/o per year)	0.1	-0.4	-15	-1.6	..	-0.7	-3.8
	29. Growth rate per capita roots and tubers food supply, 1961-65 to 1979-81 (%/o per year)	1	-2.2	1.5	-5.2	..	3.6	2.9
	30. Wheat as percent of staple calories, 1961-65	17	33	41	17	..	11	9
	31. Wheat as percent of staple calories, 1979-81	22	32	46	25	..	16	22
Consumer Prices	32. Bread retail price, 1983-84 (US cents per kg)	22	84	..	127	..	..	109
	33. Flour retail price, 1983-84 (US cents per kg)	42	..	..	115	..	..	54
	34. Ratio bread price to rice price, 1983-84	0.6	1.4	..	1	..	..	1
Producer Prices	35. Farm price of wheat, 1984 (US$ per ton)	121	..	..	..	..	..	..
	36. Farm price of nitrogen, 1984 (US$ per ton)	213	..	..	..	..	..	..
	37. Ratio of farm level nitrogen price to wheat price, 1984	1.8	..	..	..	..	..	..
	38. Farm wage rate in kg of wheat per day, 1984	24.3	..	..	..	..	..	..

nc Indicates not calculated because of special case
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Mexico, Central America and Caribbean (continued)

		Consumers			Regional Total or Average
		Honduras	Jamaica	Trinidad & Tobago	
General Indicators	1. Population, 1985 (millions)	4.4	2.3	1.2	133
	2. Natural increase in population (%/o per year)	3.4	2.2	1.9	2.5
	3. Urban population (%/o)	37	54	23	61
	4. Per capita income, 1983 (US$ per capita)	670	1300	6850	1857
	5. Growth rate per capita income, 1965 to 1983 (%/o per year)	0.6	-0.5	3.4	2.8
	6. Per capita cereal production, 1981-83 (kg per year)	133	2	16	219
	7. Growth rate per capita cereal production, 1961-65 to 1981-83 (%/o per year)	-1.2	-3.6	1.1	1.2
Wheat Production	8. Area, 1984 (1000 ha)	1	0	0	1126
	9. Yield, 1984 (ton/ha)	0.70	nc	nc	3.8
	10. Production, 1984 (1000 ton)	1	0	0	4294
	11. Area, 1984, as percent of 1979-81	114	nc	nc	146
	12. Yield, 1984, as percent of 1979-81	94	nc	nc	105
	13. Production, 1984, as percent of 1979-81	107	nc	nc	152
	14. Growth rate area, 1961-65 to 1982-84 (%/o per year)	1.5	nc	nc	0.9
	15. Growth rate yield, 1961-65 to 1982-84 (%/o per year)	-1.1	nc	nc	3.1
	16. Growth rate production, 1961-65 to 1982-84 (%/o per year)	0.4	nc	nc	4.1
	17. Growth rate production, 1970-72 to 1982-84 (%/o per year)	0.3	nc	nc	5.4
	18. Per capita wheat production, 1983 (kg per year)	0.2	nc	nc	39.6
	19. Growth rate per capita wheat production, 1961-65 to 1981-83 (%/o per year)	-3	nc	nc	0.7
Wheat Imports	20. Net imports, 1983 (1000 ton)	67	176	116	3224
	21. Net imports, 1983, as percent of 1978-80	101	109	111	100
	22. Net imports per capita, 1961-65 (kg per year)	13	78	93	13
	23. Net imports per capita, 1981-83 (kg per year)	17	77	89	26
	24. Imports of wheat as %/o of total food grain imports, 1980-82	94	68	70	85
Consumption	25. Per capita total wheat utilization, 1982-84 (kg per year)	24	80	95	53
	26. Growth rate per capita wheat food supply, 1961-65 to 1979-81 (%/o per year)	1.1	na	-0.3	1.5
	27. Growth rate per capita rice food supply, 1961-65 to 1979-81 (%/o per year)	4.3	1.7	0.9	1
	28. Growth rate per capita coarse grains food supply, 1961-65 to 1979-81 (%/o per year)	-0.3	2.3	-0.2	0.1
	29. Growth rate per capita roots and tubers food supply, 1961-65 to 1979-81 (%/o per year)	-5.1	3.6	2.3	0.1
	30. Wheat as percent of staple calories, 1961-65	9	61	58	20
	31. Wheat as percent of staple calories, 1979-81	11	51	53	25
Consumer Prices	32. Bread retail price, 1983-84 (US cents per kg)	..	85	..	nc
	33. Flour retail price, 1983-84 (US cents per kg)	56	92	..	nc
	34. Ratio bread price to rice price, 1983-84	..	1	..	nc
Producer Prices	35. Farm price of wheat, 1984 (US$ per ton)	..	..	..	nc
	36. Farm price of nitrogen, 1984 (US$ per ton)	..	..	..	nc
	37. Ratio of farm level nitrogen price to wheat price, 1984	..	..	..	nc
	38. Farm wage rate in kg of wheat per day, 1984	..	..	..	nc

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Andean Region, South America

		Producer	Consumers				Regional Total or Average
		Peru	Bolivia	Colombia	Ecuador	Venezuela	
General Indicators	1. Population, 1985 (millions)	19.5	6.2	29.4	8.9	17.3	82.5
	2. Natural increase in population (%/o per year)	2.5	2.7	2.1	2.7	2.7	2.4
	3. Urban population (%/o)	65	46	67	45	76	64
	4. Per capita income, 1983 (US$ per capita)	1040	510	1430	1420	3840	1791
	5. Growth rate per capita income, 1965 to 1983 (%/o per year)	0.1	0.6	3.2	4.6	1.5	2.1
	6. Per capita cereal production, 1981-83 (kg per year)	86	108	127	83	85	107
	7. Growth rate per capita cereal production, 1961-65 to 1981-83 (%/o per year)	-1	-0.1	1.4	-1.6	0.9	0.3
Wheat Production	8. Area, 1984 (1000 ha)	78	89	43	23	1	234
	9. Yield, 1984 (ton/ha)	1	0.8	1.8	1	0.4	1.1
	10. Production, 1984 (1000 ton)	88	69	76	24	0	257
	11. Area, 1984, as percent of 1979-81	88	90	120	74	74	91
	12. Yield, 1984, as percent of 1979-81	101	117	126	94	93	113
	13. Production, 1984, as percent of 1979-81	88	105	152	69	68	103
	14. Growth rate area, 1961-65 to 1982-84 (%/o per year)	-3.1	0	-5.3	-5	-4.3	-3.1
	15. Growth rate yield, 1961-65 to 1982-84 (%/o per year)	0.5	0.9	3	1.4	-1.9	1
	16. Growth rate production, 1961-65 to 1982-84 (%/o per year)	-2.6	0.9	-2.3	-3.6	-6.2	-2
	17. Growth rate production, 1970-72 to 1982-84 (%/o per year)	-2.7	1.6	2	-6.7	-5.2	-1.4
	18. Per capita wheat production, 1983 (kg per year)	4	6.7	2.8	3.1	0	2.8
	19. Growth rate per capita wheat production, 1961-65 to 1981-83 (%/o per year)	-5	-1.9	-5.8	-5.8	-8.5	-5.2
Wheat Imports	20. Net imports, 1983 (1000 ton)	1048	363	687	281	875	3293
	21. Net imports, 1983, as percent of 1978-80	139	117	140	119	113	125
	22. Net imports per capita, 1961-65 (kg per year)	38	41	10	10	49	28
	23. Net imports per capita, 1981-83 (kg per year)	50	53	19	33	50	37
	24. Imports of wheat as %/o of total food grain imports, 1980-82	88	100	96	96	86	91
Consumption	25. Per capita total wheat utilization, 1982-84 (kg per year)	56	40	22	41	51	40
	26. Growth rate per capita wheat food supply, 1961-65 to 1979-81 (%/o per year)	0.2	..	1.2	1.2	0.7	0.4
	27. Growth rate per capita rice food supply, 1961-65 to 1979-81 (%/o per year)	2	..	3.8	3	8	3.7
	28. Growth rate per capita coarse grains food supply, 1961-65 to 1979-81 (%/o per year)	-0.8	..	-1.3	-1.6	-0.4	-1.4
	29. Growth rate per capita roots and tubers food supply, 1961-65 to 1979-81 (%/o per year)	-2.5	..	2.3	-2.8	-3.6	0.1
	30. Wheat as percent of staple calories, 1961-65	30	..	13	21	35	25
	31. Wheat as percent of staple calories, 1979-81	33	..	13	26	34	25
Consumer Prices	32. Bread retail price, 1983-84 (US cents per kg)	48	..	129	99	..	nc
	33. Flour retail price, 1983-84 (US cents per kg)	..	..	28	60	..	nc
	34. Ratio bread price to rice price, 1983-84	1	..	2	1	..	nc
Producer Prices	35. Farm price of wheat, 1984 (US$ per ton)	191	..	..	..	..	nc
	36. Farm price of nitrogen, 1984 (US$ per ton)	453	..	..	..	..	nc
	37. Ratio of farm level nitrogen price to wheat price, 1984	2.4	..	..	..	..	nc
	38. Farm wage rate in kg of wheat per day, 1984	8.4	..	..	..	..	nc

nc Indicates not calculated because of special case
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Southern Cone, South America

		Producers				Consumer	Regional Total or Average
		Argentina	Brazil	Chile	Uruguay	Paraguay	
General Indicators	1. Population, 1985 (millions)	30.6	138.4	12	3	3.6	187.6
	2. Natural increase in population (%/o per year)	1.6	2.3	1.8	0.9	2.8	2.1
	3. Urban population (%/o)	83	68	83	84	39	71
	4. Per capita income, 1983 (US$ per capita)	2070	1880	1870	2490	1410	1910
	5. Growth rate per capita income, 1965 to 1983 (%/o per year)	0.5	5	-0.1	2	4.5	3.1
	6. Per capita cereal production, 1981-83 (kg per year)	1142	247	128	380	188	383
	7. Growth rate per capita cereal production, 1961-65 to 1981-83 (%/o per year)	2.3	0.7	-2.1	1.3	3.6	1
Wheat Production	8. Area, 1984 (1000 ha)	6120	1736	471	270	80	8677
	9. Yield, 1984 (ton/ha)	2.1	1.1	2.1	1.7	1.3	1.9
	10. Production, 1984 (1000 ton)	13000	1830	988	450	100	16368
	11. Area, 1984, as percent of 1979-81	117	59	92	96	162	95
	12. Yield, 1984, as percent of 1979-81	138	119	122	124	114	142
	13. Production, 1984, as percent of 1979-81	161	70	112	119	185	136
	14. Growth rate area, 1961-65 to 1982-84 (%/o per year)	1.6	4.9	-3.1	-2.8	10.3	1.6
	15. Growth rate yield, 1961-65 to 1982-84 (%/o per year)	1.3	1.3	1.3	2.3	2.2	1.1
	16. Growth rate production, 1961-65 to 1982-84 (%/o per year)	2.9	6.1	-1.9	-0.5	12.5	2.7
	17. Growth rate production, 1970-72 to 1982-84 (%/o per year)	6.5	1.6	-4.6	3	7.9	4.8
	18. Per capita wheat production, 1983 (kg per year)	439	17	50.2	151	31	88
	19. Growth rate per capita wheat production, 1961-65 to 1981-83 (%/o per year)	1.1	4.4	-4.6	-1.4	9.5	0.1
Wheat Imports	20. Net imports, 1983 (1000 ton)	-10232	4182	1177	-63	93	-4844
	21. Net imports, 1983, as percent of 1978-80	287	98	138	-80	147	-288
	22. Net imports per capita, 1961-65 (kg per year)	-148	28	31	-3	43	-7
	23. Net imports per capita, 1981-83 (kg per year)	-214	33	93	-35	19	-3
	24. Imports of wheat as %/o of total food grain imports, 1980-82	nc	96	98	nc	100	97
Consumption	25. Per capita total wheat utilization, 1982-84 (kg per year)	162	50	158	138	49	76
	26. Growth rate per capita wheat food supply, 1961-65 to 1979-81 (%/o per year)	-0.5	2.4	0.5	-0.3	-1.3	0.6
	27. Growth rate per capita rice food supply, 1961-65 to 1979-81 (%/o per year)	-2.6	0.1	0.6	1	4.5	0.3
	28. Growth rate per capita coarse grains food supply, 1961-65 to 1979-81 (%/o per year)	2.4	-0.4	2.5	5.7	1.7	0.2
	29. Growth rate per capita roots and tubers food supply, 1961-65 to 1979-81 (%/o per year)	-1	-1.8	-1.4	-0.5	-0.9	-1.5
	30. Wheat as percent of staple calories, 1961-65	80	20	82	79	28	38
	31. Wheat as percent of staple calories, 1979-81	80	29	83	73	21	42
Consumer Prices	32. Bread retail price, 1983-84 (US cents per kg)	56	..	58	..	..	nc
	33. Flour retail price, 1983-84 (US cents per kg)	22	..	71	..	..	nc
	34. Ratio bread price to rice price, 1983-84	0.7	..	1	..	..	nc
Producer Prices	35. Farm price of wheat, 1984 (US$ per ton)	80	214	198	126	..	nc
	36. Farm price of nitrogen, 1984 (US$ per ton)	400	437	649	559	..	nc
	37. Ratio of farm level nitrogen price to wheat price, 1984	5	2	3.3	4.4	..	nc
	38. Farm wage rate in kg of wheat per day, 1984	94	5.6	14.3	23	..	nc

nc Indicates not calculated because of special case
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Eastern Europe and USSR

		Producers							Regional Total or Average
		Bulgaria	Czechoslovakia	German Dem. Rep.	Hungary	Poland	Romania	USSR	
General Indicators	1. Population, 1985 (millions)	8.9	15.5	16.7	10.7	37.3	22.8	278	393
	2. Natural increase in population (o/o per year)	0.2	0.3	0.1	-0.2	1	0.5	1	0.9
	3. Urban population (o/o)	65	74	77	54	59	49	64	63
	4. Per capita income, 1983 (US$ per capita)	..	..	..	2150	..	..	..	2150
	5. Growth rate per capita income, 1965 to 1983 (o/o per year)	..	..	..	6.4	..	..	..	6.4
	6. Per capita cereal production, 1981-83 (kg per year)	984	666	577	1295	579	917	633	668
	7. Growth rate per capita cereal production, 1961-65 to 1981-83 (o/o per year)	2.7	2.7	2.8	3.5	0.9	2.4	0.8	1.2
Wheat Production	8. Area, 1984 (1000 ha)	1040	1201	750	1400	1706	2350	51061	59699
	9. Yield, 1984 (ton/ha)	3.5	5.1	5.5	5.2	3.5	3.4	1.5	1.9
	10. Production, 1984 (1000 ton)	3600	6170	4100	7300	6010	7900	76000	111680
	11. Area, 1984, as percent of 1979-81	105	107	107	118	112	109	86	88
	12. Yield, 1984, as percent of 1979-81	88	128	125	129	128	132	99	109
	13. Production, 1984, as percent of 1979-81	92	137	134	152	143	144	84	96
	14. Growth rate area, 1961-65 to 1982-84 (o/o per year)	-0.6	2.3	2.4	1.1	0.2	-1.4	-1.1	-1
	15. Growth rate yield, 1961-65 to 1982-84 (o/o per year)	3.6	3.4	2.3	4.6	2.6	3.5	2.3	2.7
	16. Growth rate production, 1961-65 to 1982-84 (o/o per year)	3	5.7	4.7	5.7	2.8	2.1	1.1	1.8
	17. Growth rate production, 1970-72 to 1982-84 (o/o per year)	1.8	3.4	2.9	4.8	0.2	2.2	-1.4	-0.4
	18. Per capita wheat production, 1983 (kg per year)	403	378	213	560	141	230	288	281
	19. Growth rate per capita wheat production, 1961-65 to 1981-83 (o/o per year)	3	4.9	4.4	4.9	1.4	0.5	0.3	0.9
Wheat Imports	20. Net imports, 1983 (1000 ton)	-520	122	505	-1132	2418	250	20156	21799
	21. Net imports, 1983, as percent of 1978-80	234	19	83	175	84	10485	217	174
	22. Net imports per capita, 1961-65 (kg per year)	20	86	75	26	55	-9	nc	14
	23. Net imports per capita, 1981-83 (kg per year)	-67	5	37	-109	88	15	69	55
	24. Imports of wheat as o/o of total food grain imports, 1980-82	nc	85	75	nc	96	92	95	94
Consumption	25. Per capita total wheat utilization, 1982-84 (kg per year)	428	341	252	394	212	257	373	345
	26. Growth rate per capita wheat food supply, 1961-65 to 1979-81 (o/o per year)	-0.6	-0.7	1	-0.6	1	0	-1.3	-1.2
	27. Growth rate per capita rice food supply, 1961-65 to 1979-81 (o/o per year)	0.7	-0.3	1	-0.3	2.5	1.2	8.6	3.4
	28. Growth rate per capita coarse grains food supply, 1961-65 to 1979-81 (o/o per year)	-6.3	-2.5	-1.9	-10.9	-3.7	-2.4	-1.9	-1.5
	29. Growth rate per capita roots and tubers food supply, 1961-65 to 1979-81 (o/o per year)	0.5	-1.7	-0.6	-2.5	-3.6	-0.3	-1.5	-2.1
	30. Wheat as percent of staple calories, 1961-65	84	60	37	80	39	58	67	63
	31. Wheat as percent of staple calories, 1979-81	89	65	47	87	58	65	66	65
Consumer Prices	32. Bread retail price, 1983-84 (US cents per kg)	..	..	..	..	..	..	..	nc
	33. Flour retail price, 1983-84 (US cents per kg)	..	..	..	..	..	..	..	nc
	34. Ratio bread price to rice price, 1983-84	..	..	..	..	..	..	..	nc
Producer Prices	35. Farm price of wheat, 1984 (US$ per ton)	..	..	184	72	161	..	113	nc
	36. Farm price of nitrogen, 1984 (US$ per ton)	..	..	630	300	99	..	..	nc
	37. Ratio of farm level nitrogen price to wheat price, 1984	..	..	3.4	4.2	0.6	..	..	nc
	38. Farm wage rate in kg of wheat per day, 1984	..	..	55	63	27.3	..	64	nc

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Western Europe and Japan
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		Producers						
		Belgium-Luxembourg	France	Germany Fed. Rep.	Greece	Italy	Netherlands	Portugal
General Indicators	1. Population, 1985 (millions)	9.9	55	61	10.1	57.4	14.5	10.3
	2. Natural increase in population (o/o per year)	0.1	0.4	-0.2	0.5	0.1	0.4	0.5
	3. Urban population (o/o)	95	73	94	70	72	88	30
	4. Per capita income, 1983 (US$ per capita)	9150	10500	11430	3920	6400	..	2230
	5. Growth rate per capita income, 1965 to 1983 (o/o per year)	3.1	3.1	2.8	4	2.8	..	3.7
	6. Per capita cereal production, 1981-83 (kg per year)	199	867	381	521	317	92	119
	7. Growth rate per capita cereal production, 1961-65 to 1981-83 (o/o per year)	-0.1	2.6	2.1	3	0.8	-3.1	-2.1
Wheat Production	8. Area, 1984 (1000 ha)	194	5095	1634	924	3280	145	344
	9. Yield, 1984 (ton/ha)	6.9	6.5	6.3	2.9	3.1	7.8	1.4
	10. Production, 1984 (1000 ton)	1330	32884	10223	2646	10005	1133	475
	11. Area, 1984, as percent of 1979-81	103	114	100	90	97	105	105
	12. Yield, 1984, as percent of 1979-81	137	129	126	106	114	125	135
	13. Production, 1984, as percent of 1979-81	140	147	125	95	111	130	142
	14. Growth rate area, 1961-65 to 1982-84 (o/o per year)	-0.5	0.7	0.8	-0.9	-1.4	0.1	-3.1
	15. Growth rate yield, 1961-65 to 1982-84 (o/o per year)	1.9	3.3	2.7	2.7	1.6	2.6	1.7
	16. Growth rate production, 1961-65 to 1982-84 (o/o per year)	1.4	4	3.5	1.9	0.2	2.7	-1.4
	17. Growth rate production, 1970-72 to 1982-84 (o/o per year)	2	4.9	3	2.6	-0.5	3.7	-3.9
	18. Per capita wheat production, 1983 (kg per year)	104	455	147	208	148	73	33
	19. Growth rate per capita wheat production, 1961-65 to 1981-83 (o/o per year)	0.5	2.9	3	1.4	-0.7	1.5	-2.7
Wheat Imports	20. Net imports, 1983 (1000 ton)	313	-14104	-322	-1267	1660	525	501
	21. Net imports, 1983, as percent of 1978-80	99	155	247	158	76	96	72
	22. Net imports per capita, 1961-65 (kg per year)	34	-49	23	6	15	61	71
	23. Net imports per capita, 1981-83 (kg per year)	37	-244	-1	-92	28	49	71
	24. Imports of wheat as o/o of total food grain imports, 1980-82	37	nc	nc	nc	94	57	90
Consumption	25. Per capita total wheat utilization, 1982-84 (kg per year)	150	222	134	172	173	116	103
	26. Growth rate per capita wheat food supply, 1961-65 to 1979-81 (o/o per year)	-1.3	-1.2	-0.3	-0.7	0.1	..	0.9
	27. Growth rate per capita rice food supply, 1961-65 to 1979-81 (o/o per year)	5.3	6.8	1	-2.4	0.6	..	1.1
	28. Growth rate per capita coarse grains food supply, 1961-65 to 1979-81 (o/o per year)	1.4	5.3	-0.9	-0.6	-1.9	..	-1.8
	29. Growth rate per capita roots and tubers food supply, 1961-65 to 1979-81 (o/o per year)	-1.5	-1.8	-2.5	4.1	-0.7	..	-0.2
	30. Wheat as percent of staple calories, 1961-65	73	79	53	89	86	..	46
	31. Wheat as percent of staple calories, 1979-81	72	77	58	85	87	..	53
Consumer Prices	32. Bread retail price, 1983-84 (US cents per kg)	69	102	145	39	..	85	..
	33. Flour retail price, 1983-84 (US cents per kg)	59	60	50	49	..	68	..
	34. Ratio bread price to rice price, 1983-84	0.5	1	1.1	0.5	..	0.8	..
Producer Prices	35. Farm price of wheat, 1984 (US$ per ton)	145	120	150	..	140	..	183
	36. Farm price of nitrogen, 1984 (US$ per ton)	440	409	532	..	404	..	404
	37. Ratio of farm level nitrogen price to wheat price, 1984	3	3.4	4	..	3	..	2.2
	38. Farm wage rate in kg of wheat per day, 1984	179	431	173	..	179	..	18

nc Indicates not calculated because of special case
.. Indicates missing data

Western Europe and Japan (continued)

		Producers				Regional Total or Average
		Spain	United Kingdom	Yugoslavia	Japan	
General Indicators	1. Population, 1985 (millions)	38.5	56.4	23.1	120.8	505
	2. Natural increase in population (o/o per year)	0.6	0.1	0.7	0.6	0.3
	3. Urban population (o/o)	91	76	46	76	76
	4. Per capita income, 1983 (US$ per capita)	4780	9200	2570	10120	8669
	5. Growth rate per capita income, 1965 to 1983 (o/o per year)	3	1.7	4.7	4.8	3.1
	6. Per capita cereal production, 1981-83 (kg per year)	338	372	734	117	377
	7. Growth rate per capita cereal production, 1961-65 to 1981-83 (o/o per year)	1	2.8	1.6	-2.8	1.3
Wheat Production	8. Area, 1984 (1000 ha)	2267	1939	1460	232	59699
	9. Yield, 1984 (ton/ha)	2.7	7.7	3.8	3.2	1.9
	10. Production, 1984 (1000 ton)	6044	14960	5596	741	111681
	11. Area, 1984, as percent of 1979-81	86	135	99	123	105
	12. Yield, 1984, as percent of 1979-81	155	136	122	105	134
	13. Production, 1984, as percent of 1979-81	133	184	121	129	141
	14. Growth rate area, 1961-65 to 1982-84 (o/o per year)	-2.5	3.5	-1.3	-4.6	-0.6
	15. Growth rate yield, 1961-65 to 1982-84 (o/o per year)	3.1	2.6	3.4	1.5	3.4
	16. Growth rate production, 1961-65 to 1982-84 (o/o per year)	0.6	6.1	2.1	-3	2.8
	17. Growth rate production, 1970-72 to 1982-84 (o/o per year)	0.3	8	1.1	5	3.4
	18. Per capita wheat production, 1983 (kg per year)	112	192	242	6	149
	19. Growth rate per capita wheat production, 1961-65 to 1981-83 (o/o per year)	-1.4	7.4	0.8	-5	1.8
Wheat Imports	20. Net imports, 1983 (1000 ton)	-442	-158	185	5522	-7353
	21. Net imports, 1983, as percent of 1978-80	-1133	-7	33	98	-240
	22. Net imports per capita, 1961-65 (kg per year)	14	83	52	32	26
	23. Net imports per capita, 1981-83 (kg per year)	-12	-5	20	46	-9
	24. Imports of wheat as o/o of total food grain imports, 1980-82	nc	51	96	68	69
Consumption	25. Per capita total wheat utilization, 1982-84 (kg per year)	122	169	244	52	136
	26. Growth rate per capita wheat food supply, 1961-65 to 1979-81 (o/o per year)	-1.4	-0.9	-0.5	1	-0.4
	27. Growth rate per capita rice food supply, 1961-65 to 1979-81 (o/o per year)	-0.6	1.8	-2.1	-2.2	-1.6
	28. Growth rate per capita coarse grains food supply, 1961-65 to 1979-81 (o/o per year)	2	3.9	-1.7	4.5	0.4
	29. Growth rate per capita roots and tubers food supply, 1961-65 to 1979-81 (o/o per year)	-0.2	0.1	-0.7	-3.8	-1.5
	30. Wheat as percent of staple calories, 1961-65	73	74	77	16	56
	31. Wheat as percent of staple calories, 1979-81	68	68	80	24	59
Consumer Prices	32. Bread retail price, 1983-84 (US cents per kg)	..	..	..	164	nc
	33. Flour retail price, 1983-84 (US cents per kg)	..	..	..	87	nc
	34. Ratio bread price to rice price, 1983-84	..	..	..	1.1	nc
Producer Prices	35. Farm price of wheat, 1984 (US$ per ton)	143	135	125	734	nc
	36. Farm price of nitrogen, 1984 (US$ per ton)	448	447	191	715	nc
	37. Ratio of farm level nitrogen price to wheat price, 1984	3.1	3.3	2	1	nc
	38. Farm wage rate in kg of wheat per day, 1984	92	214	64	43	nc

nc Indicates not calculated because of special case
.. Indicates missing data

USA, Canada, Australia and South Africa

		Producers				Regional Total or Average
		Australia	Canada	South Africa	United States	
General Indicators	1. Population, 1985 (millions)	15.8	25.4	32.5	238.9	312.6
	2. Natural increase in population (%/o per year)	0.9	0.8	2.1	0.7	0.9
	3. Urban population (%/o)	85	76	56	74	73
	4. Per capita income, 1983 (US$ per capita)	11490	12320	2490	14110	12624
	5. Growth rate per capita income, 1965 to 1983 (%/o per year)	1.7	2.5	1.6	1.7	1.6
	6. Per capita cereal production, 1981-83 (kg per year)	1551	2052	379	1251	1242
	7. Growth rate per capita cereal production, 1961-65 to 1981-83 (%/o per year)	2.3	1.7	0.4	1.8	1.7
Wheat Production	8. Area, 1984 (1000 ha)	12214	13158	1820	27085	54277
	9. Yield, 1984 (ton/ha)	1.5	1.6	1.2	2.6	2.1
	10. Production, 1984 (1000 ton)	18580	21199	2150	70638	112567
	11. Area, 1984, as percent of 1979-81	107	116	103	94	101
	12. Yield, 1984, as percent of 1979-81	120	90	106	114	108
	13. Production, 1984, as percent of 1979-81	128	103	109	106	109
	14. Growth rate area, 1961-65 to 1982-84 (%/o per year)	3	0.8	2.2	1.8	1.8
	15. Growth rate yield, 1961-65 to 1982-84 (%/o per year)	0.5	1.6	2.4	2	1.6
	16. Growth rate production, 1961-65 to 1982-84 (%/o per year)	3.5	2.4	4.6	3.8	3.4
	17. Growth rate production, 1970-72 to 1982-84 (%/o per year)	6.4	5.6	2.3	4.5	5
	18. Per capita wheat production, 1983 (kg per year)	1471	1068	56	281	380
	19. Growth rate per capita wheat production, 1961-65 to 1981-83 (%/o per year)	1.8	1.4	2.3	3.1	2.5
Wheat Imports	20. Net imports, 1983 (1000 ton)	-8311	-22228	-152	-41037	-71729
	21. Net imports, 1983, as percent of 1978-80	75	146	353	114	115
	22. Net imports per capita, 1961-65 (kg per year)	-555	-624	7	-105	-159
	23. Net imports per capita, 1981-83 (kg per year)	-673	-785	2	-183	-237
	24. Imports of wheat as %/o of total food grain imports, 1980-82	nc	nc	nc	nc	nc
Consumption	25. Per capita total wheat utilization, 1982-84 (kg per year)	221	219	69	112	122
	26. Growth rate per capita wheat food supply, 1961-65 to 1979-81 (%/o per year)	-0.5	-0.3	1	0.1	0.1
	27. Growth rate per capita rice food supply, 1961-65 to 1979-81 (%/o per year)	5.5	2.9	2.3	2.1	2.3
	28. Growth rate per capita coarse grains food supply, 1961-65 to 1979-81 (%/o per year)	0.3	0.9	-0.9	0.1	0.4
	29. Growth rate per capita roots and tubers food supply, 1961-65 to 1979-81 (%/o per year)	1.2	0.9	0.9	0.1	0.2
	30. Wheat as percent of staple calories, 1961-65	85	72	24	68	63
	31. Wheat as percent of staple calories, 1979-81	79	67	30	67	61
Consumer Prices	32. Bread retail price, 1983-84 (US cents per kg)	139	130	..	122	nc
	33. Flour retail price, 1983-84 (US cents per kg)	93	95	..	49	nc
	34. Ratio bread price to rice price, 1983-84	1.5	..	..	1.1	nc
Producer Prices	35. Farm price of wheat, 1984 (US$ per ton)	83	133	153	124	nc
	36. Farm price of nitrogen, 1984 (US$ per ton)	664	512	434	341	nc
	37. Ratio of farm level nitrogen price to wheat price, 1984	8	4	3	3	nc
	38. Farm wage rate in kg of wheat per day, 1984	288	266	17	263	nc

nc Indicates not calculated because of special case
.. Indicates missing data

Regional Aggregates

		Developing Countries	Developed Market Economies	Eastern Europe and USSR	World
General Indicators	1. Population, 1985 (millions)	3616	818	393	4827
	2. Natural increase in population (o/o per year)	2.1	0.5	0.8	1.7
	3. Urban population (o/o)	32	75	63	42
	4. Per capita income, 1983 (US$ per capita)	660	8177	2150	531
	5. Growth rate per capita income, 1965 to 1983 (o/o per year)	2.3	1.2	6.4	3.2
	6. Per capita cereal production, 1981-83 (kg per year)	250	703	668	359
	7. Growth rate per capita cereal production, 1961-65 to 1981-83 (o/o per year)	1.1	1.7	1.2	1.2
Wheat Production	8. Area, 1984 (millions ha)	98.9	73.3	59.7	231.8
	9. Yield, 1984 (ton/ha)	2.1	2.8	1.9	2.3
	10. Production, 1984 (millions ton)	208.3	206.6	111.9	521.6
	11. Area, 1984, as percent of 1979-81	102	102	88	98
	12. Yield, 1984, as percent of 1979-81	126	119	109	119
	13. Production, 1984, as percent of 1979-81	129	121	96	117
	14. Growth rate area, 1961-65 to 1982-84 (o/o per year)	1.3	1.1	-1	0.5
	15. Growth rate yield, 1961-65 to 1982-84 (o/o per year)	3.8	2.1	2.7	2.9
	16. Growth rate production, 1961-65 to 1982-84 (o/o per year)	5.1	3.2	1.8	3.4
	17. Growth rate production, 1970-72 to 1982-84 (o/o per year)	5.1	4.3	-0.4	3.2
	18. Per capita wheat production, 1983 (kg per year)	66	267	281	119
	19. Growth rate per capita wheat production, 1961-65 to 1981-83 (o/o per year)	2.8	2.5	0.9	1.6
Wheat Imports	20. Net imports, 1983 (1000 ton)	51998	-79082	21799	nc
	21. Net imports, 1983, as percent of 1978-80	116	134	174	nc
	22. Net imports per capita, 1961-65 (kg per year)	9	-39	14	nc
	23. Net imports per capita, 1981-83 (kg per year)	15	-95	55	nc
	24. Imports of wheat as o/o of total food grain imports, 1980-82	73	nc	94	nc
Consumption	25. Per capita total wheat utilization, 1982-84 (kg per year)	67	131	345	102
	26. Growth rate per capita wheat food supply, 1961-65 to 1979-81 (o/o per year)	2.8	-0.3	-1.2	0.5
	27. Growth rate per capita rice food supply, 1961-65 to 1979-81 (o/o per year)	0.7	-1.5	3.4	1.2
	28. Growth rate per capita coarse grains food supply, 1961-65 to 1979-81 (o/o per year)	-0.9	0.5	-1.5	-0.7
	29. Growth rate per capita roots and tubers food supply, 1961-65 to 1979-81 (o/o per year)	0.3	-1.1	-2.1	-0.7
	30. Wheat as percent of staple calories, 1961-65	18	58	64	31
	31. Wheat as percent of staple calories, 1979-81	26	60	65	32
Consumer Prices	32. Bread retail price, 1983-84 (US cents per kg)	..	..	..	nc
	33. Flour retail price, 1983-84 (US cents per kg)	..	..	..	nc
	34. Ratio bread price to rice price, 1983-84	..	..	..	nc
Producer Prices	35. Farm price of wheat, 1984 (US$ per ton)	..	..	..	nc
	36. Farm price of nitrogen, 1984 (US$ per ton)	..	..	..	nc
	37. Ratio of farm level nitrogen price to wheat price, 1984	..	..	..	nc
	38. Farm wage rate in kg of wheat per day, 1984	..	..	..	nc

nc Indicates not calculated because of special case
.. Indicates missing data

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Annex 2: Regions Delineated for this Study

Developing Countries:

Eastern and Southern Africa:
Botswana
Burundi
Comoros
Djibouti
Ethiopia
Kenya
Lesotho
Madagascar
Malawi
Mauritius
Mozambique
Rwanda
Seychelles
Somalia
Sudan
Swaziland
Tanzania
Uganda
Zambia
Zimbabwe

Western Africa:
Angola
Benin
Burkina Faso
Cameroon
Cape Verde
Central African Rep.
Chad
Congo
Equatorial Guinea
Gabon
Gambia
Ghana
Guinea
Guinea-Bissau
Ivory Coast
Liberia
Mali
Mauritania
Namibia
Niger
Nigeria
Reunion
Sao Tome
Senegal
Sierra Leone
St. Helena
Togo
Zaire

North Africa:
Algeria
Egypt
Libya
Morocco
Tunisia
Western Sahara

Middle Eastern Countries of Asia:
Afghanistan
Bahrain
Cyprus
Iran
Iraq
Jordan
Kuwait
Lebanon
Oman
Quatar
Saudi Arabia
Syria
Turkey
United Arab Emirates
Yemen Arab Rep.
Yemen Dem.

South Asia:
Bangladesh
Bhutan
Burma
India
Maldives
Nepal
Pakistan
Sri Lanka

Southeast Asia and Pacific:
Brunei
Fiji
French Polynesia
Hong Kong
Indonesia
Kampuchea
Laos
Macau
Malaysia
New Caledonia
Papua New Guinea
Philippines
Samoa
Singapore
Solomon Is.
Thailand
Tonga
Vanuatu
Vietnam

East Asia:
China
Korea D.P.R.
Korea Rep.
Mongolia
Taiwan

Mexico, Central America and Caribbean:
Bahamas
Barbados
Belize
Costa Rica
Cuba
Dominican Rep.
El Salvador
Grenada
Guadeloupe
Guatemala
Haiti
Honduras
Jamaica
Martinique
Mexico
Montserrat
Netherlands Antilles
Nicaragua
Panama
Trinidad and Tobago

Andean Region, South America:
Bolivia
Colombia
Ecuador
French Guiana
Guyana
Peru
Surinam
Venezuela

Southern Cone, South America:
Argentina
Brazil
Chile
Paraguay
Uruguay

Developed Countries:

Eastern Europe and USSR:
Albania
Bulgaria
Czechoslovakia
German Dem. Rep.
Hungary
Poland
Romania
USSR

Western Europe and Japan:
Austria
Belgium
Luxembourg
Denmark
Finland
France
Germany Fed. Rep.
Greece
Greenland
Iceland
Ireland
Israel
Italy
Japan
Malta
Netherlands
New Zealand
Norway
Portugal
Spain
Sweden
Switzerland
United Kingdom
Yugoslavia

USA, Canada, Australia and South Africa:
Australia
Canada
South Africa
USA