"Food Mountains and Famines: The Economics of Agricultural Policies."

Inaugural Lecture at the University of Newcastle upon Tyne

by

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The following paper was prepared for this inaugural lecture, and elaborates the arguments discussed during the lecture. The presentation did not follow all of the detail set out in this paper, which is intended as a background paper for those whose appetite was whetted by the lecture. *The author is indebted to his colleagues, especially M.C. Whitby, J. Lingard and C. Ritson for their helpful comnments and criticisms of earlier drafts of this paper. Any remaining errors and ommisssions remain, as usual, the responsibility of the author.*

PREFACE

The brief for an inaugural lecture is both undefined and extremely wide. There are a number of possible audiences and objectives for these occasions, which usually happen as a single event in anyone's career. I give lectures and papers to all sorts of different audiences, including undergraduate and postgraduate students, professional associations and industry meetings. It might be thought, therefore, that the prospect of speaking for an hour in front of a general university audience would be a simple matter. However, I found that in preparing this lecture, I became concerned about what to say and how to say it. It is often remarked among university staff that the most testing examination question would be "set yourself the question and then answer it". That is exactly the situation I now find myself in. Perhaps I should have declined the University's invitation to give such a lecture. However, having been elevated to the supposed exalted ranks of the University professoriat, I owe it to the University and its friends to try and explain what I do and how the discipline of agricultural economics sheds some light on present problems.

There is at present a wide choice of issues which are both of considerable public interest and about which agricultural economists might be expected to have something to say. Within the UK, there is the apparently increasing concern and conflict between commercial/intensive agriculture and the countryside - the destruction of landscapes and habitats, the pollution of water sources and aquifers, the health and welfare considerations of chemical residues in food products and the animal welfare issues of intensive livestock production. Within Europe, there is the seemingly never-ending saga of the CAP. This policy costs increasing amounts of public money through the European budget and generates surpluses of unsaleable foodstuffs. In addition, as a less remarked effect, it costs the European food consumer between 10% and 15% of total food expenditure compared with the alternative of buying food from third countries. All this is to support farmers on the basis of their production, so that the bigger farmers get most of the support and the income disparities of the industry become wider rather than narrower. The issue is lent further topicality by the agreements on the policy reached at the recent summit meeting in Brussels (February, 1988), and confirmed by the Foreign ministers only last week. Closer to the universities' direct interests, the rationality of spending £100m./year on agricultural research so as to grow more milk and cereals which have no (unsubsidised) market needs some defence, a topic which a close friend and former colleague, Professor Allan Buckwell, has recently addressed in his own inaugural lecture at Wye College. I and my colleagues have done some work on all these topics, and any one of them would have made an appropriate subject for this evening's lecture.

However, I have chosen to speak on the broader issue: the moral obscenity of developed country surpluses, which are not confined to the European Community, compared with chronic and acute famines in parts of the developing world. In part, I make this choice because I speak on the other issues in many other places, and do not choose to repeat myself here. But the major reason is that the global imbalance of food production and consumption is of more fundamental importance to the future of the planet than the other issues, while its resolution is intricately tied up with putting our own house in order. Not as an economist, but simply as a human being, I suggest that the outrage of famine amidst plenty is a grave indictment of the human race, and presents a more serious threat to the sustainability of human life on this planet than the threat of nuclear war or explosion. To anticipate the major message of this lecture, it is almost certain that the human race will run out of good will before it runs out of food, in contrast to the Malthusian prediction. The tensions caused by a mal-distribution of production, and of the income with which to purchase it, are enough to test the good-will of nations and their peoples to its limits.

My predecessor in this chair, the late Professor John Ashton, said in his inaugural lecture 23 years ago: "Not only are (agricultural economists) concerned with local and national issues but also with many aspects of the trading relations between countries, and with the special and acute problems presented by the process of economic development. This latter subject is of very special importance." I owe Professor Ashton a considerable debt, since it

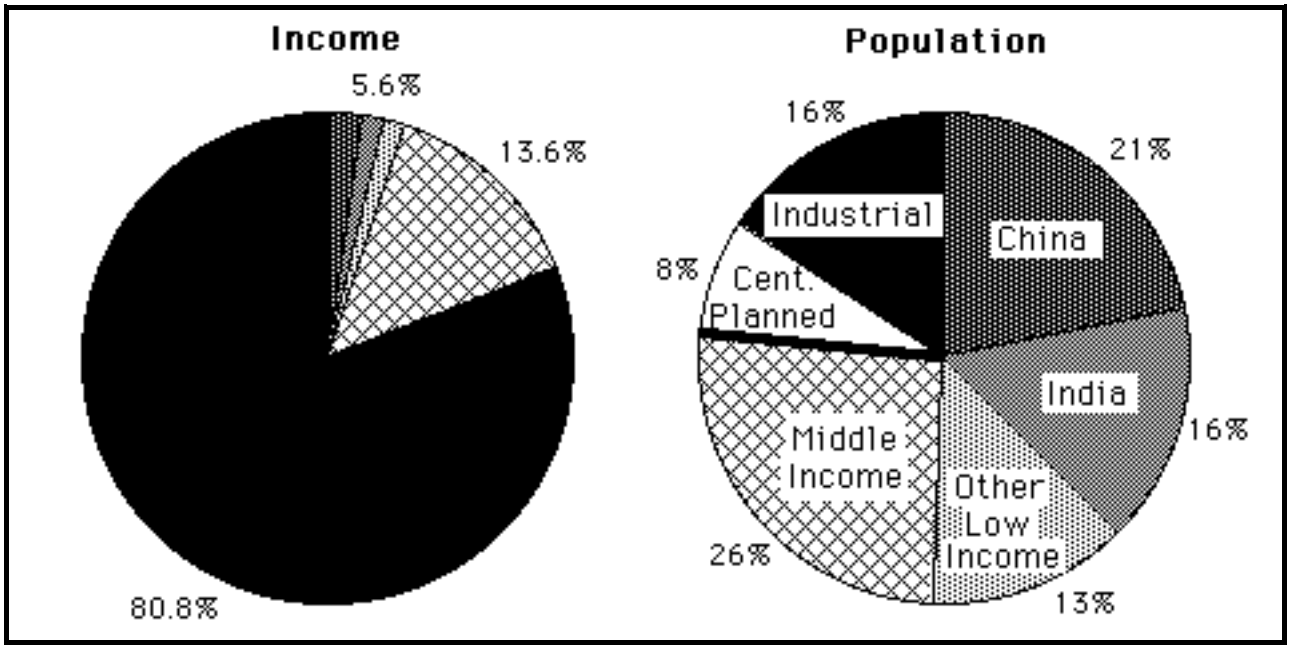
was he who introduced me to the merits of agricultural economics and watched over the subsequent development of my career. I consider it a special honour to follow him into this chair. It is therefore appropriate that I should address this question, which he precluded from his lecture as meriting special and separate attention. It is a subject about which agricultural economists should be expected to make a serious contribution.

The subject area is extremely wide, and I can do no more than outline the major issues and linkages here. The lecture is divided into five parts: the first sets the scene, illustrating the dimensions of the planet in economic and agricultural terms; the second defines the issue as the contrast between the food needs of the developing world and the surpluses of the industrial world; the third outlines the policies pursued in the industrial and developing parts of the world and identifies their major domestic consequences; the fourth illustrates the international effects of these policies and the imbalances which they encourage. The final part of the lecture draws conclusions from this outline about the appropriate focus of attention for agricultural economists in considering possible policy options, particularly for developed countries, including the European Community.

1. SETTING THE SCENE

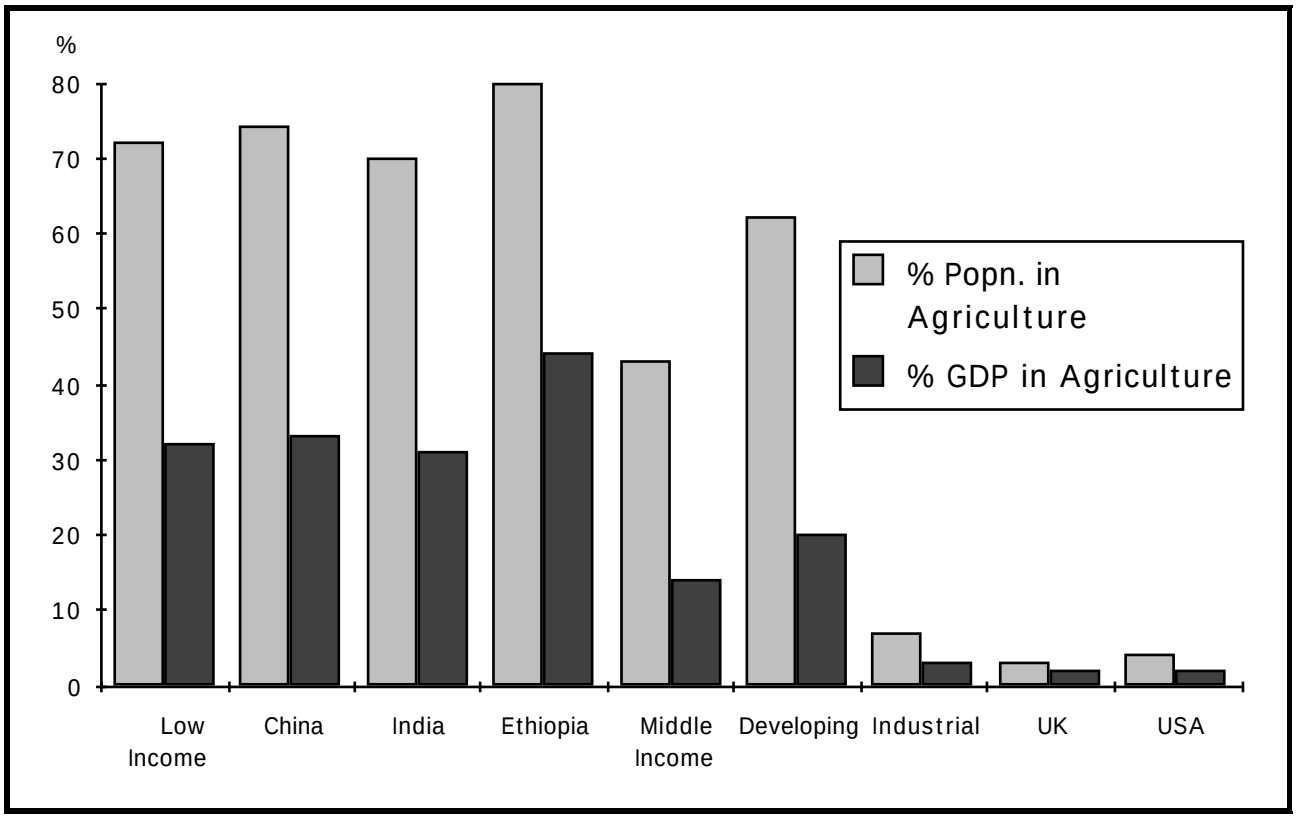
Figure 1 shows the dramatic differences between the distributions of income (measured as Gross Domestic Product) and population over the planet. Three-quarters of the planet's population lives (if that is the right word) in developing countries, divided by the World Bank into low and middle income groups. The low income countries account for half the world's population, but less than 6% of the world's income (the income of the European centrally planned economies is not recorded in comparable form, so that this estimate is rather high). The industrial economies, on the other hand, account for a mere 16% of the population, but 80% of the world's income. In other words, the residents of the industrial countries are, on average, 20 times as rich in income terms as those in the developing countries. At low income levels, food represents a major expenditure, but as incomes improve, so the proportion of income spent on food declines, following Engel's Law (named after a classical economist who first drew attention to the relationship). It follows that food availabilities and prices are likely to come higher on the agenda for the people of the developing world, if not for their governments, than in the industrialised world.

Figure 1. The Distribution of the World's Income and Population.



Source: World Bank Development Report, 1987.

Figure 2. The Importance of Agriculture in the world.



Source: World Bank Development Report, 1987.

Figure 2 shows the relationships between the agricultural sectors of the world's economies and the total economy, in both population and income terms. Agriculture is far more important to the developing world than to the industrial world. A major characteristic of the development process is the improvement of agriculture so that a smaller proportion of the population is able to feed the rest, thus releasing labour for other purposes. Increasing incomes reduce the share of the total economy devoted to agriculture, as increases in incomes are spent on goods and services other than food.

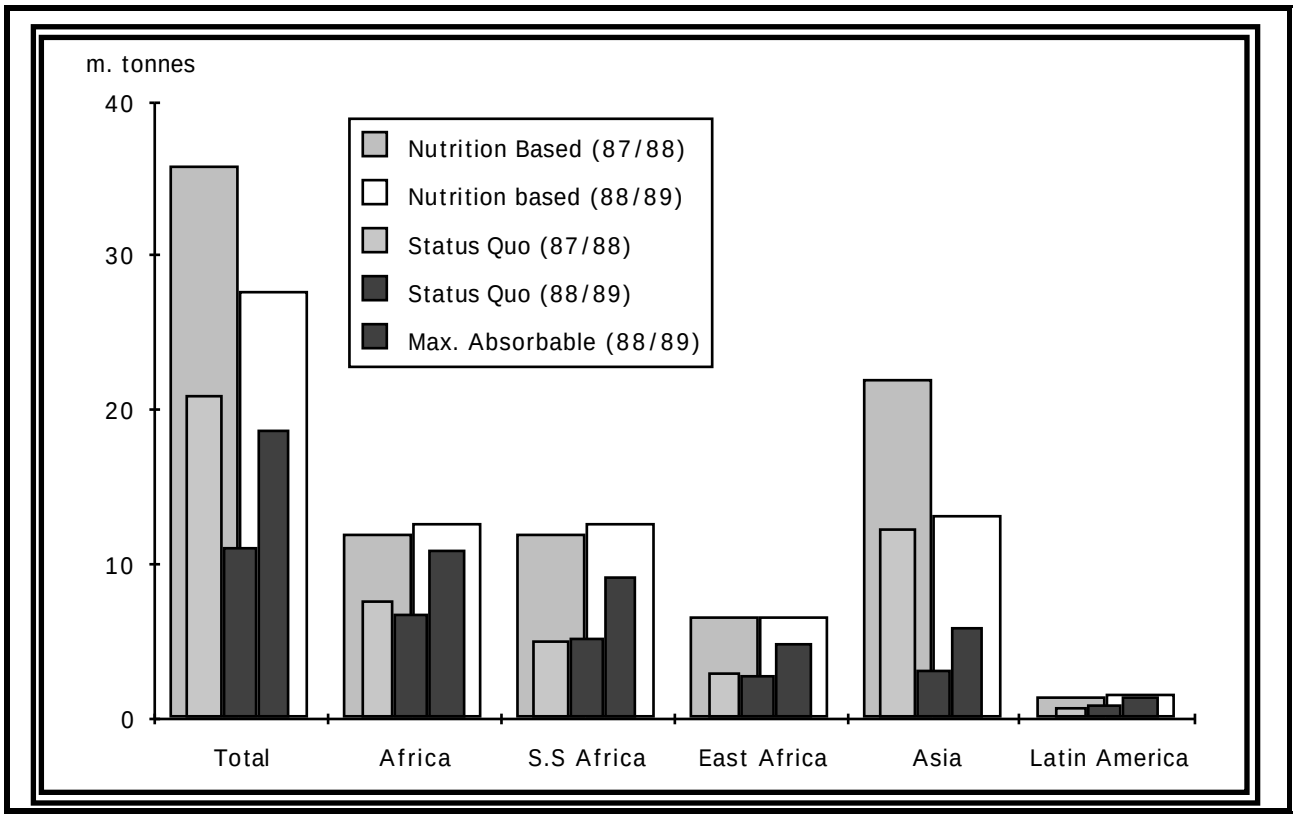
This figure also shows, through a comparison between the shares of income and populations engaged in agriculture, that those involved in agriculture are substantially poorer (by about 50%) than the general population, and that this relationship appears to hold even for the industrial world, though is not significant in the UK. The development of agriculture is clearly not necessarily synonymous with the improvement of agricultural incomes relative to the rest of the population.

2. THE PROBLEM.

The USDA regularly provides estimates of World Food Availabilities and Needs, and the latest issue (November, 1987) does not make happy reading. These requirements are estimated in terms of cereals because cereals are fundamental to the food chain, both as basic food and as livestock feed, and because cereals are by far the most important food aid commodity. Food requirements, in addition to the commercial import capacity of the developing world, are currently estimated at 21 m. tonnes of cereals, simply to maintain the "status quo" of current levels of food consumption in these countries, which continues to be well below commonly accepted nutritional standards. To satisfy these standards, an

extra 10 million tonnes would be required.

Figure 3. Estimated Additional Cereal Needs: total and selected countries.



Source: USDA, World Food Needs &Availabilities, 1987/88: Fall Update, November, 1987.

These estimates have been revised substantially upwards since June 87 because of sharply lower cereal production in Asia, following the worst Indian monsoon for decades. The "status quo" needs would be higher, at 26m.tonnes, were it not for the healthy cereals stock position in India. As it is, the revised estimates are three times the June, 1987 estimates and more than double the record 1984/85 assessments.

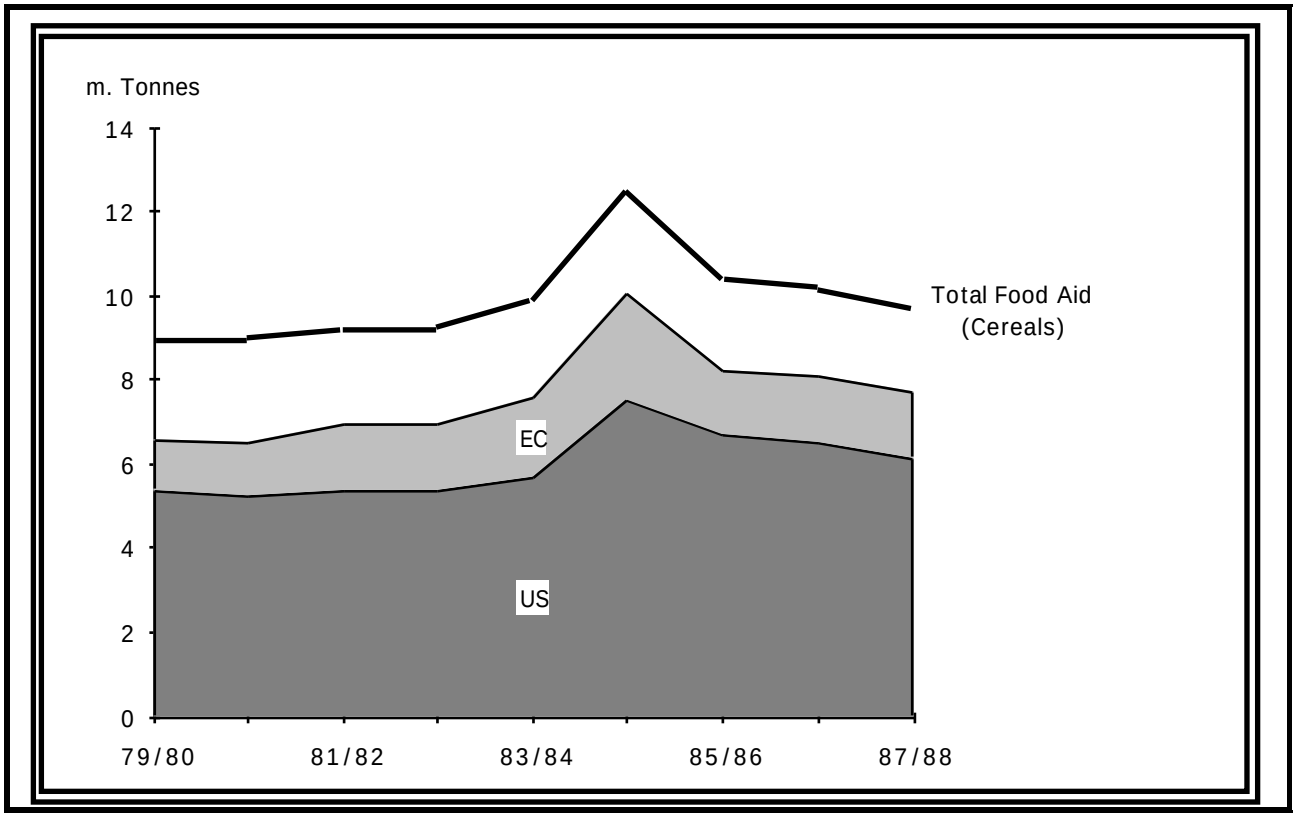
The "maximum absorbable" quantities illustrated in Figure 3 take account of the ability of the countries to distribute food within the country, both in terms of the administration and the physical difficulties of the transportation and distribution systems. It is clear that the lack of adequate nutrition in the developing world is not simply a matter of insufficient food, but also of inadequate infrastructure.

It has become accepted in recent years that Africa, particularly East Africa and especially Ethiopia, are now the famine stricken regions of the world, in contrast to the situation 15 years ago. Then, India (and as we now know) China dominated the famine headlines - 1.5 million starved in Bangladesh in 1974, an estimated 16 to 64 million perished in the most horrific famine of the 20th century in China in 1959-61. In contrast, the death toll in Africa, horrific though it is, could be taken as an indication of improvement, although it takes a particularly clinical calculus to weigh an estimated 1 million deaths in Ethiopia and Sudan as a result of the 1983 famine, to say nothing of the 11 million people displaced and the annihilation of livestock herds.

The developed world has not yet caught up with these dramatic increases in world food needs, as illustrated by recent data on the level of food aid (Figure 4). However, we may expect that this situation will be resolved in the near future, and indeed the world grain trade is already expecting increased shipments of food aid which will reduce world cereal stocks and lead to a firmer world market. The discomfort that any thinking person must feel with

the idea that the rich and well fed people of the world can derive comfort from others terrible misfortune is cause for a great deal more effort than we are currently giving to the problem.

Figure 4. World Food Aid Contributions (Grain Equivalent)

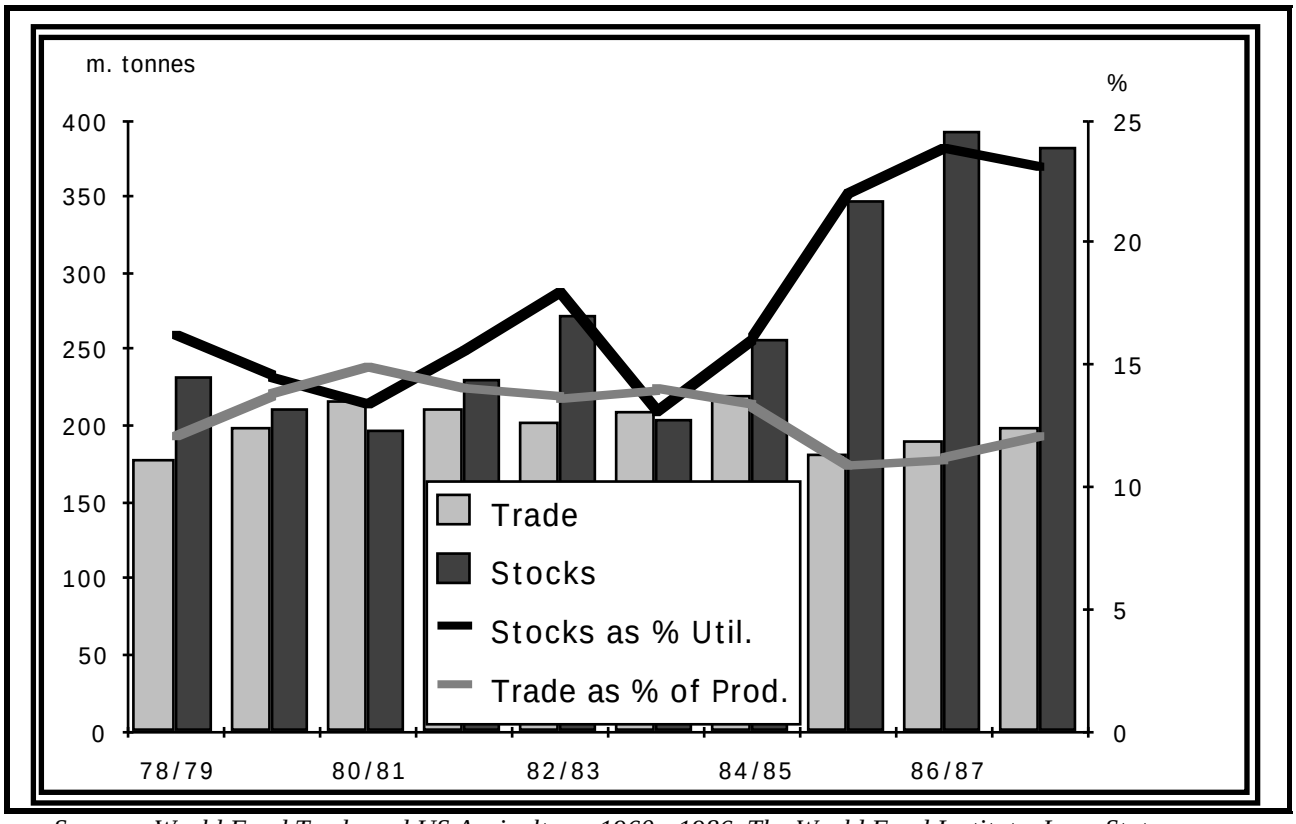


Source: USDA, World Food Needs &Availabilities, 1987/88: July, 1987.

Massive though these quantities appear to be, they are trivial in comparison to world production levels of over 1,600 million tonnes and are insubstantial even in comparison with total cereal exports of 175 m. tonnes (Figure 5) In spite of an increase in world food requirements over the last few years, cereal trade has remained relatively stagnant, and has been declining as a proportion of total cereal production. Cereal stocks, on the other hand, have been growing, and are now more than ten times the additional requirements of the developing world.

In the light of these figures, it is clear that there is not a food problem for the planet as a whole, especially when it is remembered that many of the developed countries, especially the US, have been cutting back production in an effort to improve the prices of cereals. The world can produce enough grain (and other foods) to feed the starving, so what is the problem? How come the rich of the world are burdened by surpluses and making every attempt to cut them back, while the poor are afflicted with shortages and regular famines? Does it make sense to cut back production in the developed world, including the EC which is now taking steps to pay farmers not to grow cereals through the set-aside scheme, when the developing world is chronically short of grain? If not, then what are the effects of continued high support levels in the developed world for farmers, and what are the consequences for those who are chronically poor and often starving? To answer these questions, we need to look at the reasons and effects of agricultural support in the developed world and then turn to the policies and consequences in the developing countries.

Figure 5. World Cereal Trade and Stocks.



Source: World Food Trade and US Agriculture, 1960 - 1986, The World Food Institute, Iowa State University, October, 1987.

3. THE DISEASE: AGRICULTURAL POLICIES.

a). The Industrialised World.

In the last resort, society develops agricultural policies because it does not agree with economists that the just and fair price, the efficient price and the equilibrium price are all the same thing. At least two important agricultural policy analysts (Josling, and Tracy) have noted the distinctions between these concepts, which are also noted in the macro-economic context by Winch. The "just" price can be defined as the socially and politically acceptable price in determining earnings, receipts and expenditures, which leads to setting agricultural prices to achieve income parity between the agricultural sector and the rest of the economy. The "equilibrium" price is the market clearing price which equates supply and demand, and is the price which is of concern when considering market balance. The "efficient" price equates marginal social costs with marginal social benefits. It is the appropriate price for efficient resource allocation and , in a wider social as opposed to private context, for preservation of environment and the rural/urban balance. It has also been widely noted that the same price cannot always fill all three objectives simultaneously, and that many of the instruments used to try to achieve these objectives are internally inconsistent and mutually incompatible. The fundamental point of controversy over the appropriate reform of the Common Agricultural Policy is essentially about which of these objectives should be followed.

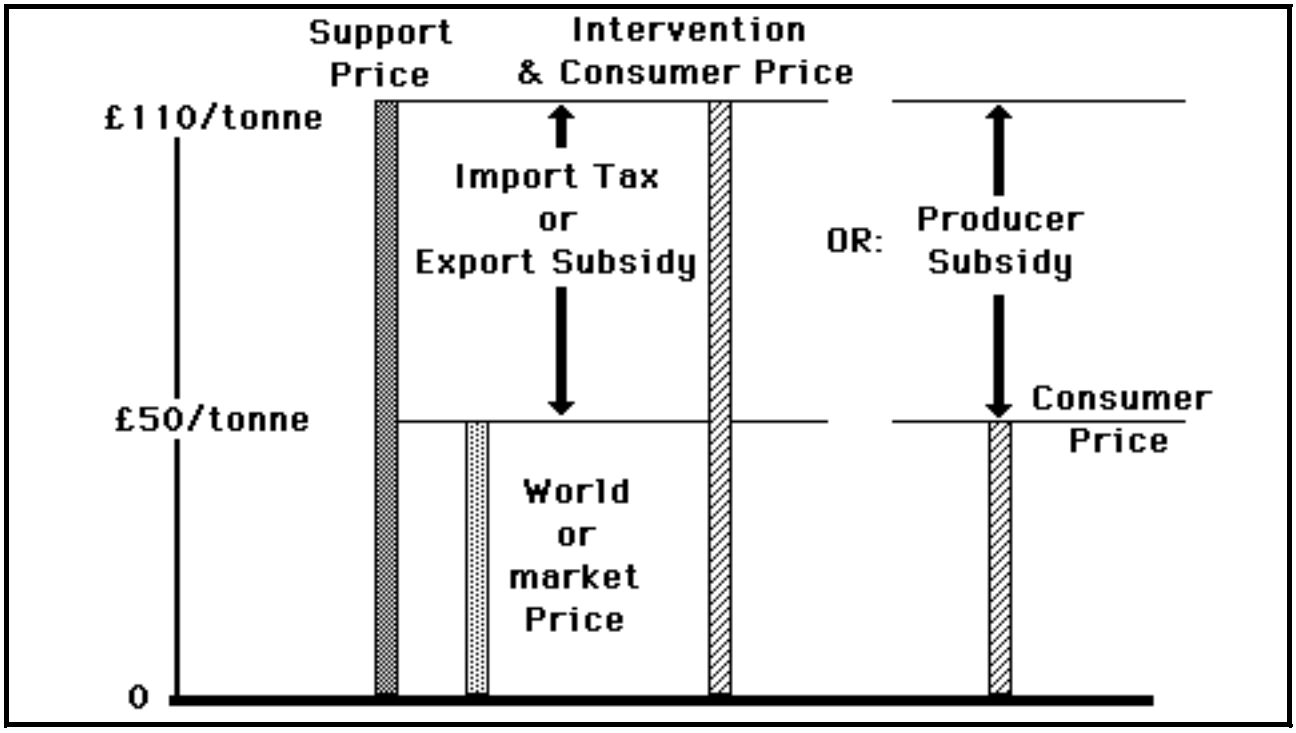
Only in the abstract world of the neo-classical perfectly competitive economy, without any externalities or public goods, are the three concepts simultaneously achieved with one single market price, and even then one has to accept the distribution of the ownership of property rights as being socially just and also accept the distribution rule that each factor should receive the value of the marginal product as the just reward for effort. Leaving on

one side the substantial criticism of this theory based on its inability to uniquely determine the returns to all factors simultaneously (the Cambridge controversy) , in the real world no single price will achieve all three objectives simultaneously.

In any event, all industrialised societies seem to agree that the freely determined market price for agricultural products is inappropriate, and they seek to adjust and support this price in a variety of different ways. This lecture is concerned with the effects of this support, rather than with the reasons for it, though the implications will be returned to in the conclusions. A gross but useful simplification of the instruments of support which are used is shown in Figure 6.

The figure illustrates the support alternatives with a world market price of £50/tonne and a domestic target price for producers of £110/tonne. (These illustrative figures are broadly in line with existing prices for cereals on the world market and within the UK, though as recently as 1985 the two prices were practically identical. The world price has fallen since then partly because of excess world supplies and partly because of the fall in the value of the $, in which the bulk of world trade is conducted). An importing country can impose a border tax on the imports (usually called a tariff or import levy), in this case of £60/tonne. This raises the effective market price in the country to the support price, since users and consumers cannot obtain cereals without paying the world price plus the import levy. In this case, users and consumers pay the extra cost of supporting farm prices at £110/tonne rather than allowing market prices to be £50/tonne, while the exchequer collects the tax of £60/tonne, and can thus spend more on other things or reduce other taxes.

Figure 6. The instruments of farm market support.



In the event that the country produces more than is required by the domestic market at this price, then the market price would fall to equate available supplies to the effective demand. In this case, the country must introduce some other policy instrument than the import levy if it wishes to maintain the supported market price. Either the authorities must purchase some of the supplies and dispose of them elsewhere, or they must provide an export subsidy of £60/tonne to enable domestic producers to get rid of some of their supplies on the world market. In practice in the European Community, both methods are used: cereals are

purchased by the intervention authorities and put into intervention stores at the intervention price (£110/tonne), and export subsidies (called export refunds) of £60/tonne are provided to exporters to allow them to compete on the world market. In each case, it is the exchequers or taxpayers who foot the bill for the disposal of cereals which are surplus to domestic requirements at the supported price of £110/tonne. However, the domestic users still pay the support price rather than the market price for their own use, so that they are in effect paying for the support on the domestic utilisation of cereals.

The alternative method of support is to allow the domestic market price to be £50/tonne, with no taxes or subsidies on traded quantities, but to provide a subsidy direct to farmers of £60/tonne. In this case, shown on the irght hand side of Figure 6, the taxpayer foots the total bill for the support of farm prices, while the consumer takes advantage of the freely-determined market price.

The agricultural policy history of the UK illustrates a progression through the range of these instruments. The Corn Laws of the last century effectively used import taxes to prevent imports and raise the domestic price. After extensive political lobbying by the growing industrial sector, aided by the enfranchising of the landless class through the Great (electoral) Reform Act commemorated by Grey's Monument in this city, and the last great famine to afflict these islands (the Potato Famine of 1845/46), the Corn Laws were repealed. This allowed the 'new world' to sell us first grain (from the US and Canada) and then meats and dairy products (from Australia and New Zealand as refrigerated transport became available) in return for the railways, ships and industrial goods being produced in increasing quantities by the UK as the industrial revolution gathered steam. It also eventually resulted in a major agricultural depression at home as the cheaper supplies from the New World became available. This depression was relieved only by a major reconstruction of the industry involving the release of large numbers of people to other sectors of the economy and to other countries, and eventually by World War I.

During the Great Depression of the 30s, much of the world moved to protectionism. Agriculture suffered as the rest of the economy, and some agricultural support was introduced around the world. In most developed countries, including Europe and North America, modern agricultural policy stems from this era. World War II forced the issue of food self-sufficiency and assistance to agriculture, particularly in Europe and Japan, to the top of the agenda. The 1947 Agricultural Act, introduced to formalise the support system for UK agriculture after the war, provided subsidies (called deficiency payments) which supported farm prices while leaving consumer prices to be determined by world markets. The increasing cost to the exchequer of the subsidies as production increased forced the introduction of limits to the amounts covered by the subsidies - Standard Quantities - and also led to some import quotas (raising domestic prices, but paying the foreign sellers more).

Entry to the EC and the CAP moved the UK to the European system of support of import taxes, intervention purchases and, eventually, export refunds, in effect returning the UK to the Corn Laws. Entry to the EC also raised the overall level of support to farmers, at a time when world market prices were rising rapidly because of the large Russian grain purchases (the great grain robbery) and the world commodity crisis of 1972/73. These increases, coupled with high domestic rates of inflation and oil price increases following the establishment of OPEC, were confused with the shift in policy towards agriculture and produced an even more remarkable response than could have been expected simply as a result of entry to the EC.

Entry to the EC and accession to the CAP shifted the burden of farm support from the taxpayers to consumers. The latter bear the cost in proportion to their food spending, which is a higher fraction of total spending for the poorer people than for the rich. Estimates of the consumer cost of the CAP put the burden at about 12 - 15% of final food expenditure, equivalent to VAT on food. The taxpayer benefits from the policy, at least as long as the EC remains a net-importer. UK entry helped to maintain this position for the EC during the 70s. But by the 80s, the EC had become a net-exporter of cereals and has

since become a major world exporter, on the back of substantial export subsidies. From being a net contributor to the EC budget, through import levies, the CAP has turned into the major spender of EC taxpayers' money through export refunds and intervention storage payments - buying butter and grain that no-one wants and having to dump them on world markets, annoying our trading partners and causing regular and apparently insoluble budgetary crises.

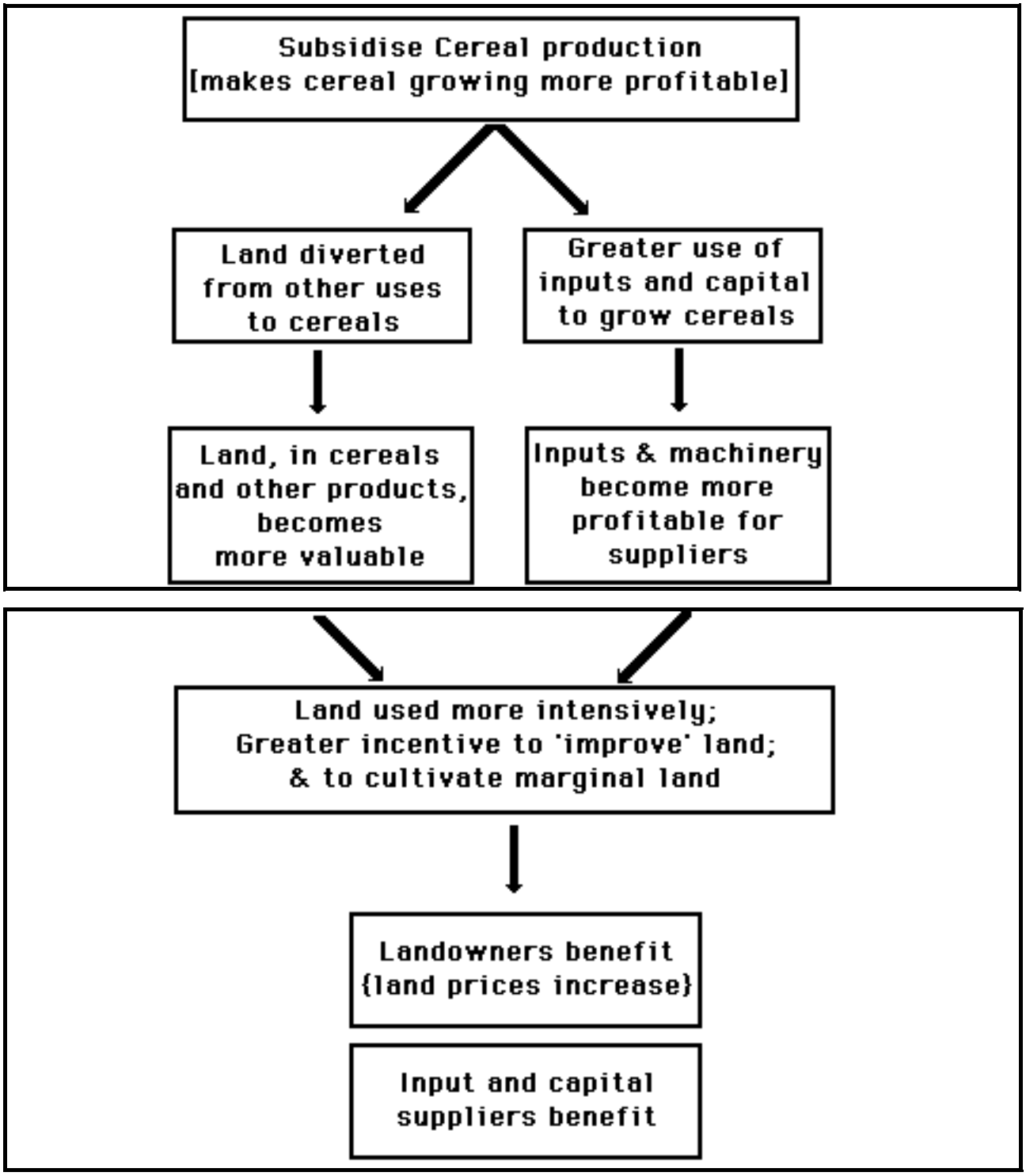
The effects of farm support on supply of farm products are illustrated in Figure 7. High support prices encourage greater production and lead to increased costs of production. Support through increased market prices helps farmers in proportion to their output, the larger and richer ones get the most. It also drags up production costs (input prices and the values of land and capital). More people try to earn a living from agriculture - many of them in the upstream industries and services, including the banks. The encouragement that high prices give to the agricultural sector leads to greater investment in plant and equipment, and more frequent replacement of this equipment. Technological change is thus likely to be adopted more rapidly than otherwise, since much of the new technology is embodied in new equipment, and is adopted so as to increase output rather than reduce costs, since the output price is supported. Input supply industries can afford to spend more on Research and Development with a growing and supported market to sell into, and the pace of output growth is increased as a result.

The increased certainty provided by policy support further encourages expansion and intensification of agricultural production, and increased capital investment in the industry, often with borrowed funds. In the UK case, this was encouraged by the two major agricultural White Papers of the 70s - "Food from our Own Resources" and "Farming and the Nation", both of which spelt out the Government's view that expansion of the domestic agricultural sector was in the national interest.

However, support for agriculture does not repeal the laws of supply and demand, it simply forces these laws to operate in different ways. Without support, improved farm technology increases supplies and drives product prices down, limiting the expansion of the industry and passing on the benefits of improvements in productivity to consumers and users of farm products. Farm incomes and profits rise only so far as is necessary to persuade people to be farmers and to accept the associated risks rather than do other things. Under market support, either through deficiency payments or border taxes and subsidies, output prices are prevented from falling (at least by as much as they otherwise would have). The resulting queue of people wishing to be farmers and wishing to expand can only be choked-off through costs rising to meet prices. Land prices, in particular, will increase, deterring people from entering the industry or expanding and imposing higher actual or opportunity costs on those people in the industry. Farm incomes and profits will continue to be determined, as before, as the amounts necessary to persuade people to stay in farming rather than do other things.

In other words, the major determinants of farming incomes are the opportunities for earning a reasonable living elsewhere in the economy, and these opportunities are not altered by the existence of farm market support. Farmers become wealthy through support not in their capacity as farmers but in their good fortune as being land owners. Existing farmers find that their incomes improve, but also that the costs of production rise and the opportunity cost of continuing to own land and other assets rise. Their incomes are high because they are, in effect, living on the rising capital values of their investments in agriculture.

Figure 7. The effects of Farm Support on Supply.

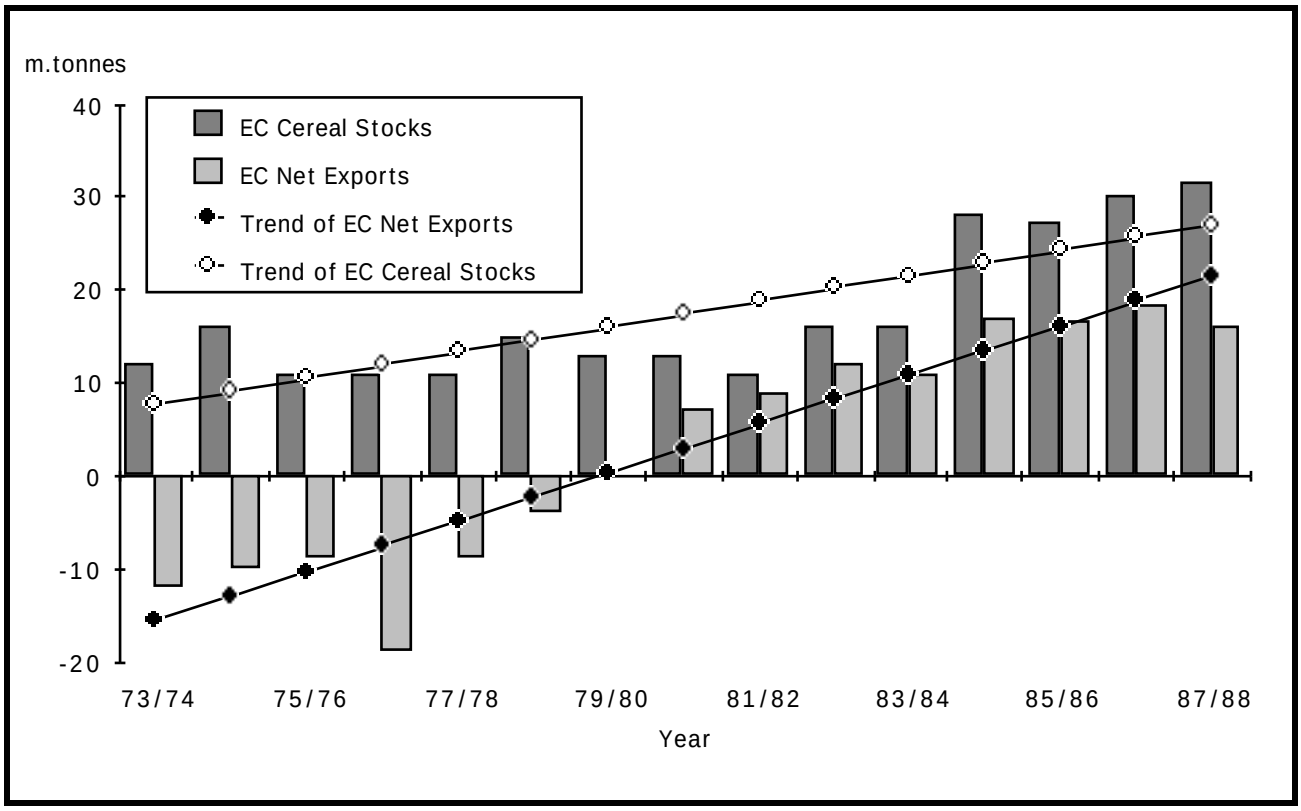


Figures 8 and 9 illustrate two different perspectives of the effects of farm support systems in the industrialised world. Figure 8 shows the recent history of the European cereals sector in terms of net exports and cereal stocks. Both exports and, particularly, stocks show strong upward trends, with the current level of cereal stocks in the EC alone enough to satisfy this year's record cereal requirements in the developing world. The EC became a net-exporter of cereals in 1979/80. From this date onwards, the cereals regime under the

CAP has become an increasing burden on the European taxpayer, through intervention purchases and export subsidies. The present European decision to pay farmers not to grow cereals, through "set-aside" payments for land not planted to cereals, amounts to paying farmers on the one hand a high price to grow grains and on the other an equally high price not to. This rather ridiculous state of affairs is not a result of economic advice, it is a reflection of the political pressures on budgetary cost to which an expanding and highly subsidised level of exports leads. The same response has been evident on the other side of the Atlantic for decades, as illustrated in Figure 9.

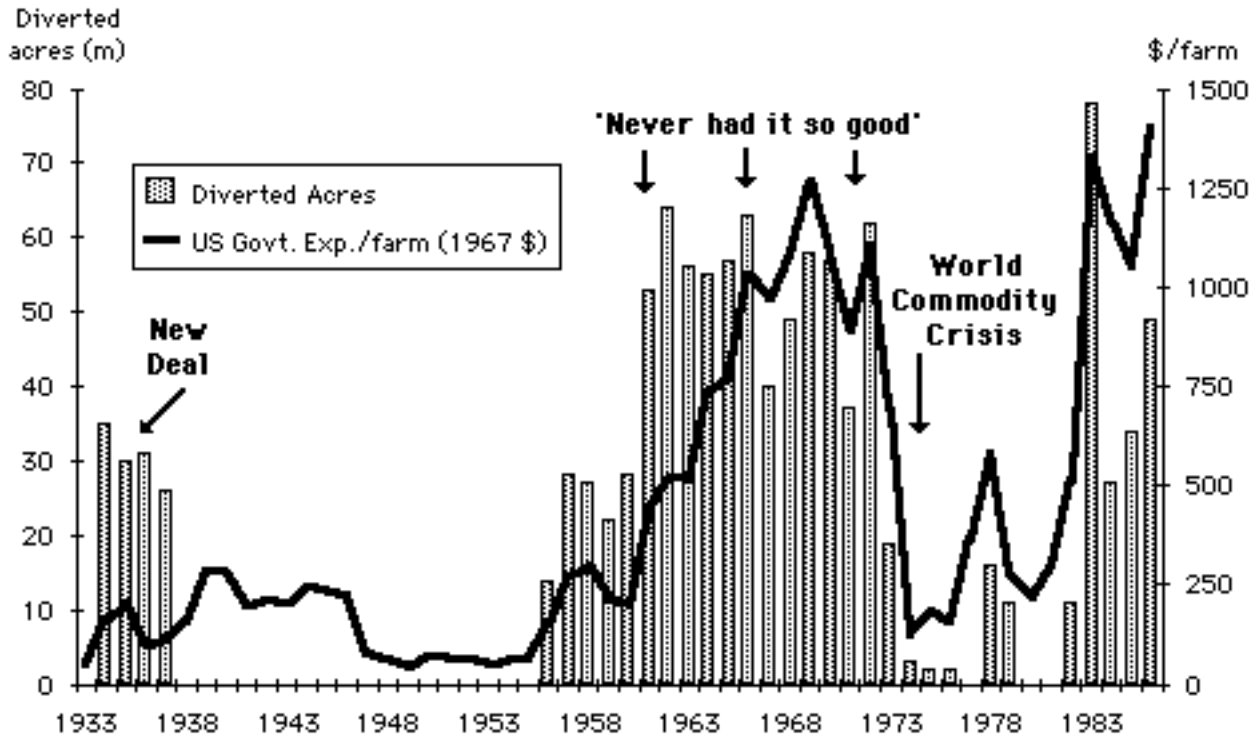
The policy promise of supported prices on unlimited quantities of production undoubtedly encourages capital investment and the adoption of new technologies to take advantage of high and guaranteed prices, which also increases productive capacity beyond what the market will bear. The rising cost of the CAP and the crisis which it is currently facing are too well known to dwell on here. The production and budgetary consequences are not confined to the EC. The policy development of the CAP is now likely to follow the US pattern, since like the US, the EC is now a substantial exporter of cereals. Set-asides and large domestic support payments from the taxpayer appear an almost "natural" consequence.

Figure 8. EC Net Cereal Trade and Stocks



Source: HGCA market reports and USDA World Agricultural Supply and Demand Estimates.

Figure 9. US Farm policy: spending per farm (constant $) and set-aside acreages.



Source: B. Gardner, (1987)

This figure mirrors the movements in world cereal prices. As world cereal prices decline, the US farm support system pays increasing amounts of money to persuade farmers to set-aside more and more cereal land and produce less cereals. The logic is that the less the US produces and the lower are the resulting stocks of grain in the US, the higher the world price will be. It also pays greater amounts of money as deficiency payments to make up the difference between the low world prices and the target support prices.

The dramatic increase in US costs of farm support, dominated by the cereal grains policies, mirrored the increase in production during the 50s and 60s. Grain stocks built up, in an attempt to support market prices, and cereal land was set-aside to reduce the levels of production, while subsidies were paid to farmers to supplement the market prices and encourage farmers to fallow their cereal land. The Russians provided temporary relief (through their change in policy) in the 70s, but the depressed world market has returned in the 80s to increase the US costs and encourage set-aside again.

The consequences are falling world prices, and increasing budgetary costs on both sides of the Atlantic - to the benefit of the Centrally Planned Economies which are able to buy very cheap cereals,(and butter) at well below the cost of production. Increasing budgetary deficits, caused partly by the cost of the farm programmes, have resulted in a dramatic fall in the value of the $, which rebounds on the EC since the world price for grains is established in $, and increases the gap which the EC must cover through its export refunds to get rid of surplus grain. If everyone tries to stand on tip-toe, no-one sees any better.

b). The Opposite side of the coin - the underdeveloped world:

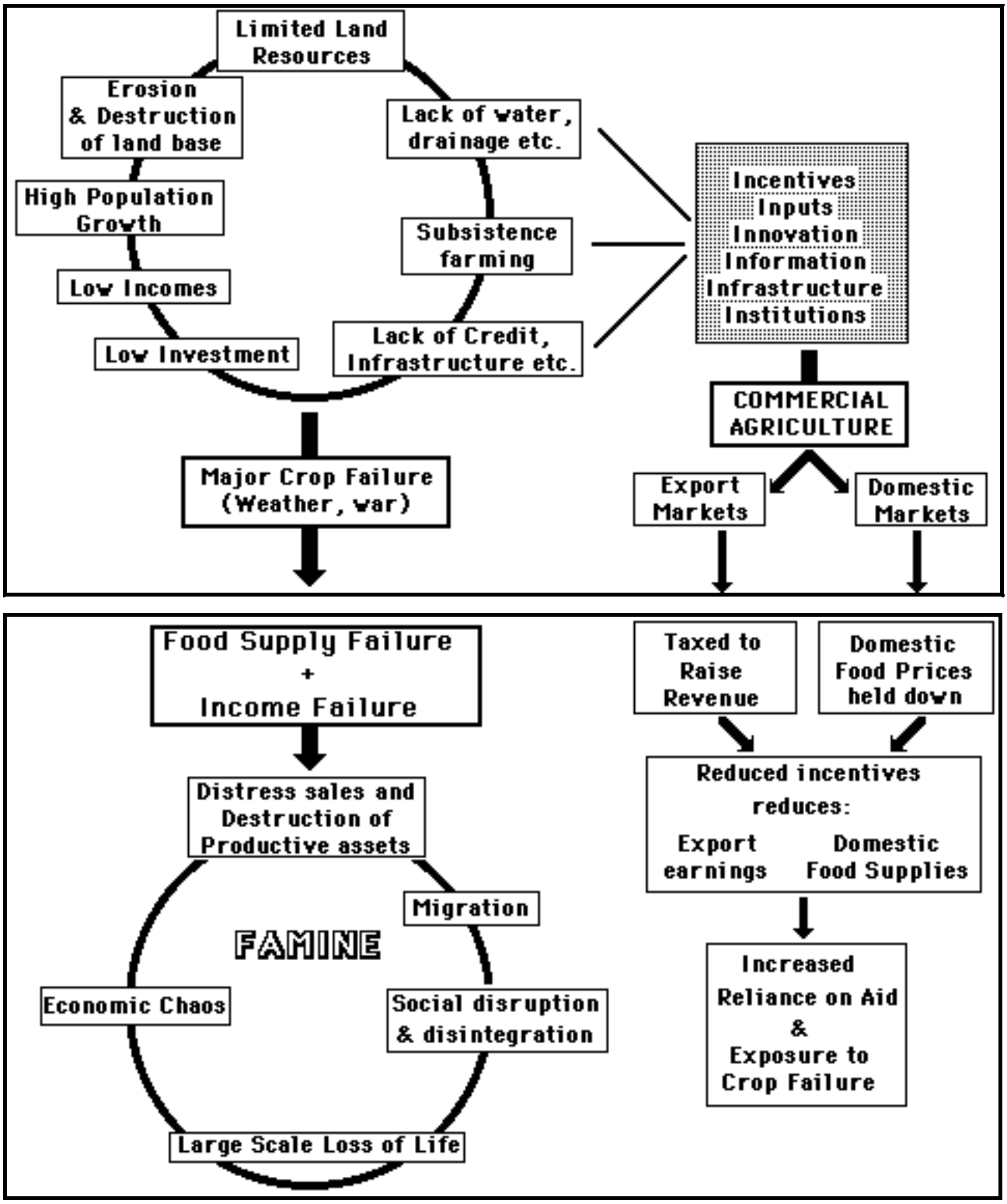
Figure 10 is an illustration of the major elements of the agricultural system in the developing world, which as we have already seen is inextricably linked to the poorest people of the world. There is no simple answer to the problems illustrated in this diagram, and there are a number of theories prescribing the most effective policies to pursue. Streeten argues that six important factors need to be "got right" : Incentives (prices); Inputs; Innovation; Information; Infrastructure; Institutions. The World Bank - the most influential world development agency - has been through several phases from concentration on the large scale infrastructure projects (dams and irrigation projects) to the current emphasis on efficient pricing policies, recently resulting, in conjunction with the EC, in significant changes in Ethiopian farm and food policies in return for additional aid payments.

The critical point in this cycle is the subsistence agriculture. Until the farm sector produces a saleable surplus over and above its own needs, it cannot earn additional income with which to purchase inputs, invest in productive resources, climb out of the poverty trap, and secure its peoples' future and old age without relying on producing children. The crude relationship between poverty and population growth has been suggested that, without sufficient income to save for old age, people need the guaranteed support of large families. In fact, the relationship is likely to be considerably more sophisticated than this, but the correlation between poverty and high population growth cannot be denied.

However, once a developing country's agriculture becomes sufficiently productive to sell some production rather than consume it all themselves, this enables some people to leave the land and do other things. Other sectors of the economy can then begin to develop. As development continues, agriculture can be seen as a reservoir from which both 'surplus' labour is released to other sectors of the economy and 'surplus' food is sold on domestic and overseas markets. Exports of food are often critical to the development process - providing the export earnings with which to purchase needed imports (capital investment and consumption goods). Without food exports, developing countries must rely on exports of raw materials of manufactured goods in order to purchase supplies from elsewhere. Much of the promotion effort towards developing countries agriculture has been towards the development of the export food sector, leaving the subsistence and domestic food

production system largely unsupported.

Figure 10. The Poverty Cycle and the Escape Routes.



What is clear is that this cycle on its own, does not necessarily lead to famines. The underlying cause of famines is succession of crop failures (it almost always takes more than one) which undermine the incomes of the already very poor. Most obviously, the causes

are bad weather or civil disruption, or (in the case of Ethiopia) a catastrophic coincidence of both. Subsistence farmers cannot survive a crop failure: both income and food are denied. Landless labourers, wage earners and pastoralists face increased prices for food and no work with which to pay for it. Market disruptions, hoarding, profiteering, and high prices are all likely consequences which make a bad situation worse. Whatever the case, the failure of agricultural production in the first place is critical.

The chronic cycle of poverty gives way to the vicious circle of famine. Reserves of seed and breeding stock are either eaten or sold to get money to buy food. Food is catastrophically scarce and prices rise dramatically. Survival requires that people move to areas with greater availabilities of food, and the problem escalates as homes, rudimentary markets and social systems are uprooted in the frantic struggle for survival. Clearly, in the short term, there is little alternative to large scale famine relief programmes of the sort amply illustrated on the world's television screens. In these terms, it is fortunate that there are intervention stores sufficiently full of grain to supply these needs.

However, the vast majority of food aid is not directed towards famine relief. This only accounts for about 15% of the total food aid. 55% is provided for Programme aid, which relieves developing countries from the necessity of using hard earned foreign exchange to buy food through commercial channels, and thus allows the use of foreign exchange for the purchase of capital plant and equipment necessary for development. The balance, 30% of the total, is used for project aid purposes, through which the food supplies are directly linked to specific projects (road construction, dams, irrigation systems etc.) and are used to pay labourers on these projects, releasing government funds for other purposes and also relieving the pressure on local food supplies to support these projects.

If food aid is not required for famine relief, why is it necessary? The cynical answer is that it is not, it is simply a convenient way of getting rid of unwanted surpluses from the industrialised countries intervention stores. While there is some truth in this, the policies followed by the developing world also tend to contribute to food shortages and incapacity to import food in the face of domestic shortfalls in production, for two major reasons. First, we have already seen that agriculture is the dominant sector of developing countries. As soon as it develops into a commercial sector, it becomes a major source of government revenue. Tax raising is generally a costly and expensive business, but taxes can be raised relatively cheaply by taxing exports of food, especially if, as often is the case, these exports are organised through state-trading bodies. These export taxes (or, equivalently, the profits of the exporting agencies) reduce the prices paid to the producers, and discourage production.

Second, food is an over-riding consumption necessity, and the development process involves the release of labour from the agricultural sector to the rest of the economy, which prevents them from producing their own food and obliges them to buy food from the commercial agricultural sector. Domestic food prices thus become a matter of key importance. Low incomes and poverty cannot be dealt with by income transfers and welfare payments; there is insufficient national or government income to support such industrialised solutions. The obvious answer is to keep food prices down. This can be, and is done through government control over domestic food markets, again reducing the incentives to farmers to produce food for the commercial market.

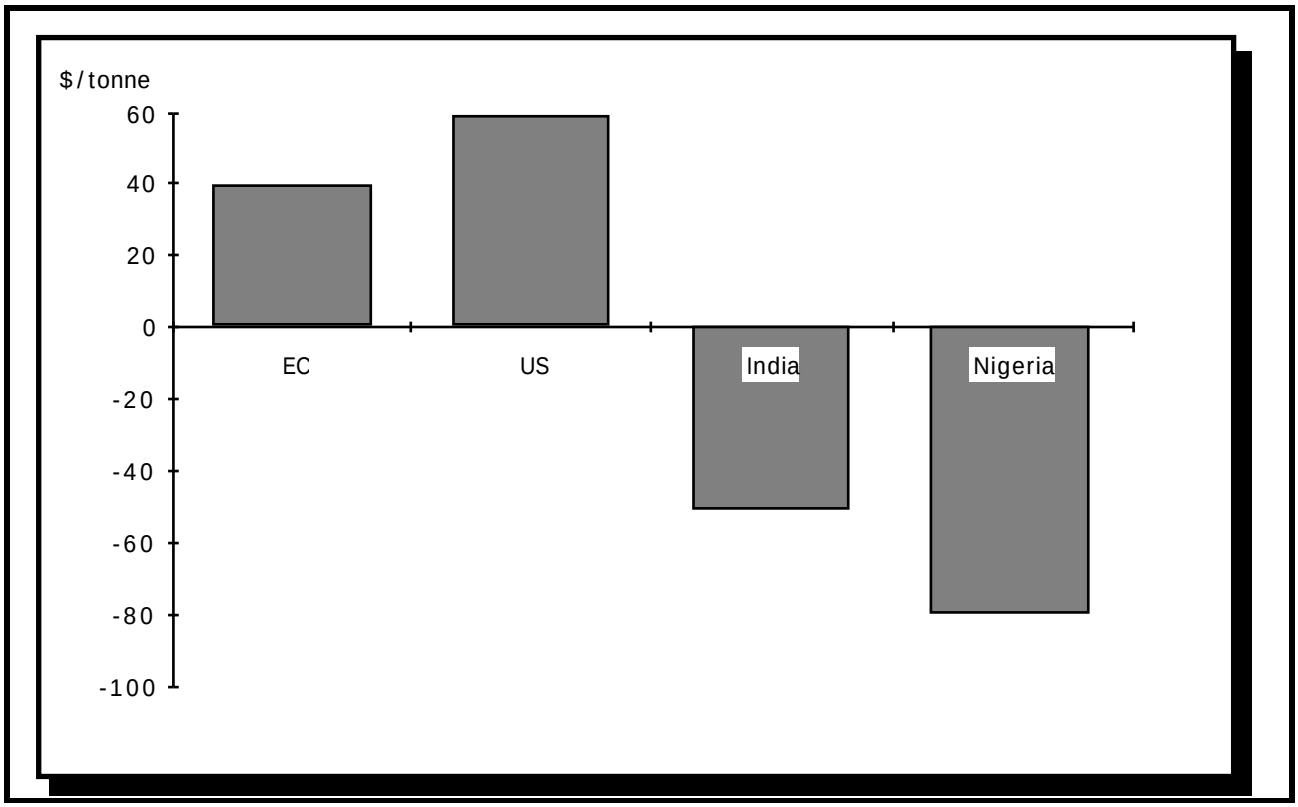
As a result, commercial production is discouraged by the prices received by developing country farmers. Export earnings are lower than they would otherwise be, and the capacity to import food in times of need is correspondingly reduced. Food production for the domestic market is also lower than would otherwise be the case Crop failures leave the non-agricultural population short of food and without the resources to make good the shortfall since, government controls or no, food prices are forced up. Famines need not necessarily result, but the ability of the people to meet their food requirements through commercial channels is restricted.

4.THE SYMPTOMS OF AGRICULTURAL POLICIES

a). Levels of protection around the world.

The EC is not alone in supporting agriculture. All industrialised countries think it worthwhile to protect their domestic agricultural industries through a large variety of instruments and methods. Comparisons of different methods of farm support are difficult, but it is possible to convert the wide range of methods to their "subsidy equivalent" as the "payment which would be required to compensate farmers for the loss of income from the removal of a given policy measure" (OECD,1987, p 100) - the Producer Subsidy Equivalent or PSE, shown here in Figure 11 for wheat in $/tonne terms, and in Figures 12 and 13 as a % of total producer returns. These figures are from an internal USDA report (1987), updating the OECD estimates.

Figure 11. Wheat Producer Subsidy Equivalents (US$/tonne), 1982-86

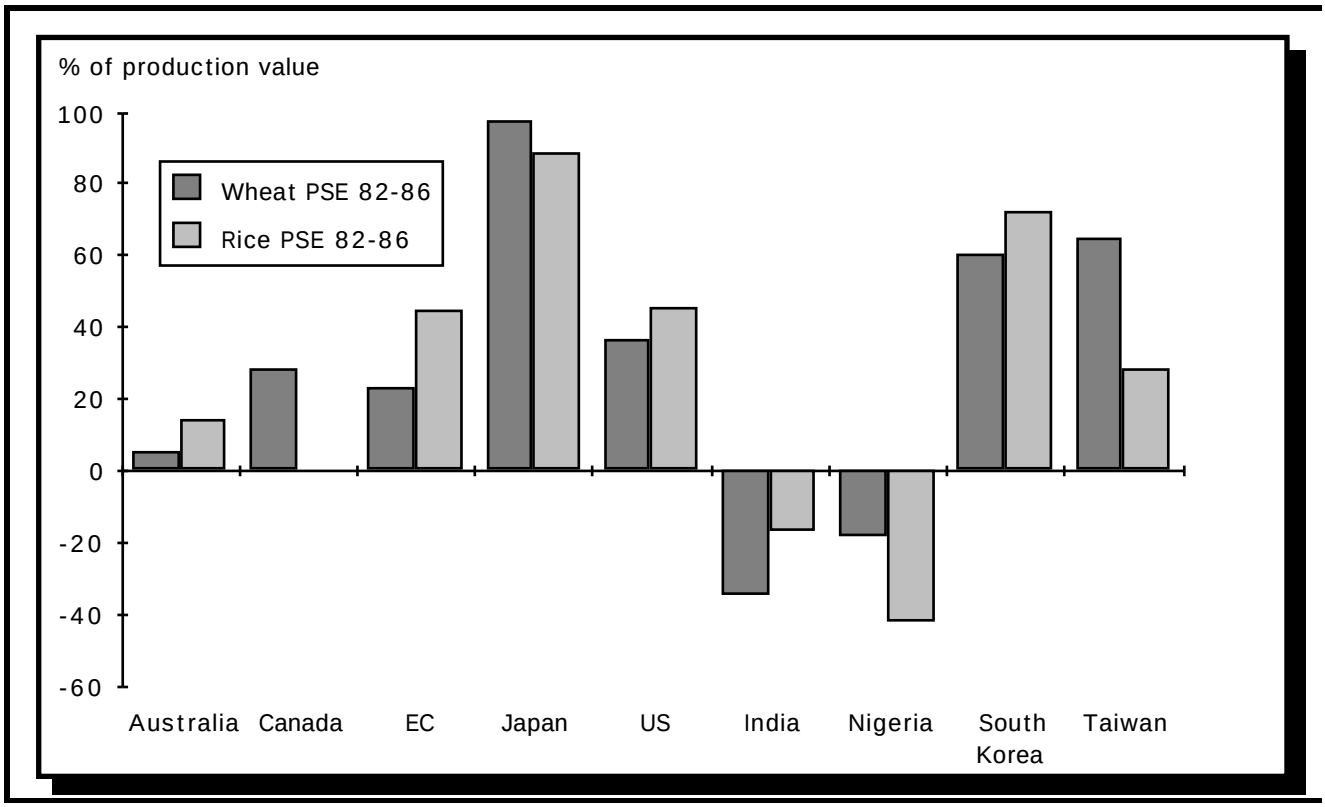


Source: USDA (1987)

The suggestion in the previous section of this paper, that developing countries tend to work their agricultural policies in the opposite direction to developed (industrialised) countries - is well illustrated here by India and Nigeria. These two countries, in common with many other developing countries, organise their marketing of exportable crops through state marketing boards, which set the buying prices paid to farmers so as to make profits which are used as government revenue - in effect taxing the farmer on the basis of production. The agricultural sectors are more important to the whole economy in the developing world, and provide a ready source of tax revenue, most easily collected by taxing commodity exports, which reduces the farm price for the export goods and costs the farmers money rather than raising their incomes - hence the negative PSE (which means that the PSE is in fact a Producer Tax Equivalent in these countries). This is fairly general phenomenon

(Valdes and Zeitz, 1980, Bale & Lutz, 1978, Tyres and Anderson, 1986). The levels of protection shown for the Newly Industrialising Countries (NICs) - South Korea and Taiwan, are relatively recent phenomena - apparently confirming the hypothesis that countries are more willing and able to support their agricultural industries as they get richer.

Figure 12. Wheat and Rice PSEs, (% of producer receipts) 1982 - 86



Source: USDA (1987)

The pattern of support between the various agricultural commodities is by no means uniform, and the EC, according to these measures, is not the worst offender (Figure 13). Almost all developed countries (with the single exception of New Zealand) protect their dairy industries to a very substantial degree, presumably on the twin grounds that milk is a 'vital' food and that many farmers, especially the smaller ones, rely on milk production as a way of starting farming and of staying in business, since it is the one agricultural product which provides a regular income. Although pigs and poultry also have relatively short production cycles, they don't approach milk, which provides a daily output and regular revenue throughout the year. Sugar is also very heavily protected, as a result of the self-sufficiency arguments coupled with the technology of growing and extracting sugar from beets instead of cane[1].

Japan is the most highly supported agriculture (though Austria and the Nordic countries also have highly supported farm sectors) - once again bearing out the proposition that it is the richer countries which protect their agricultural sector the most, particularly if they are importers of food.

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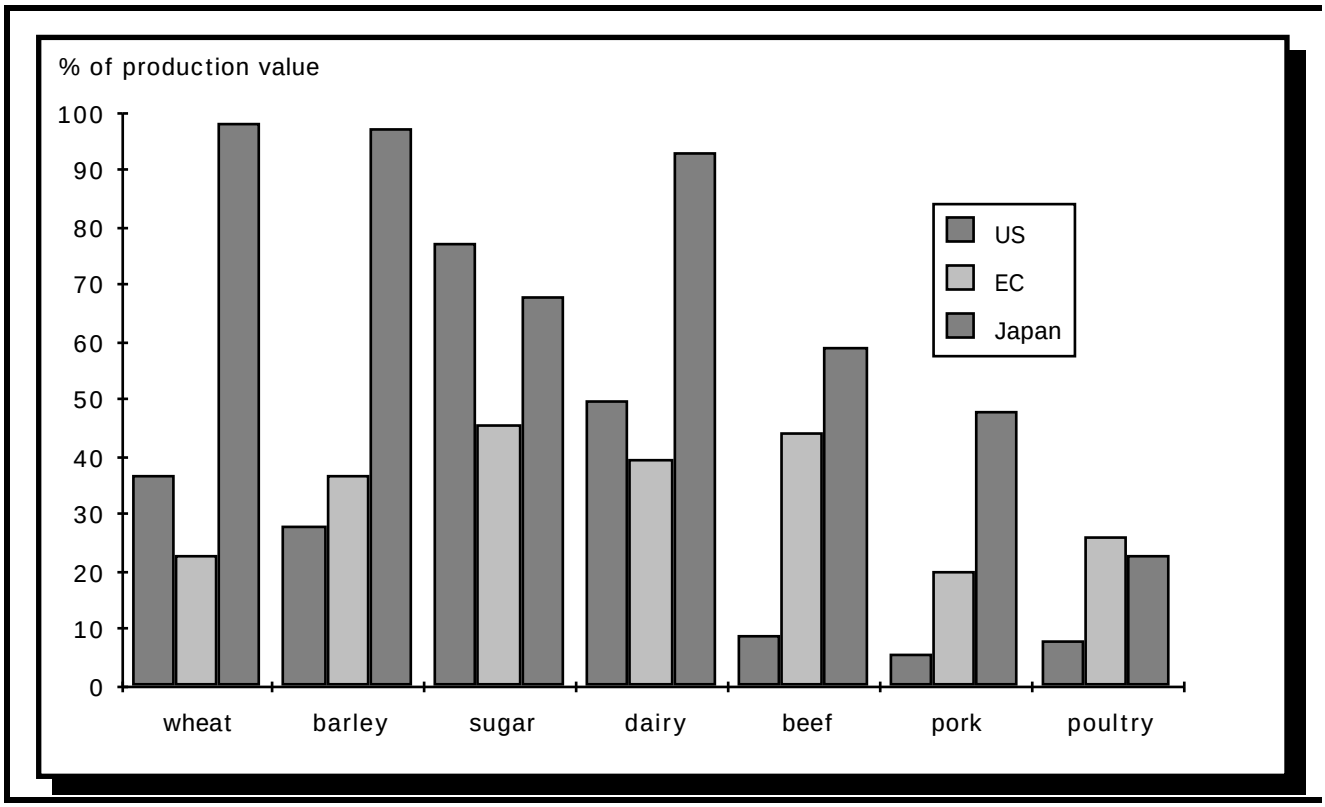
[1] Given the medical advice about the levels of sugar and animal fats in modern diets, it is perhaps in the public interest that these products be taxed to the consumer, so discouraging consumption. However, it makes little sense to pass the corresponding price increase on to producers to encourage production.

Figure 13. Commodity Comparisons of PSEs (% producer receipts) 82/86



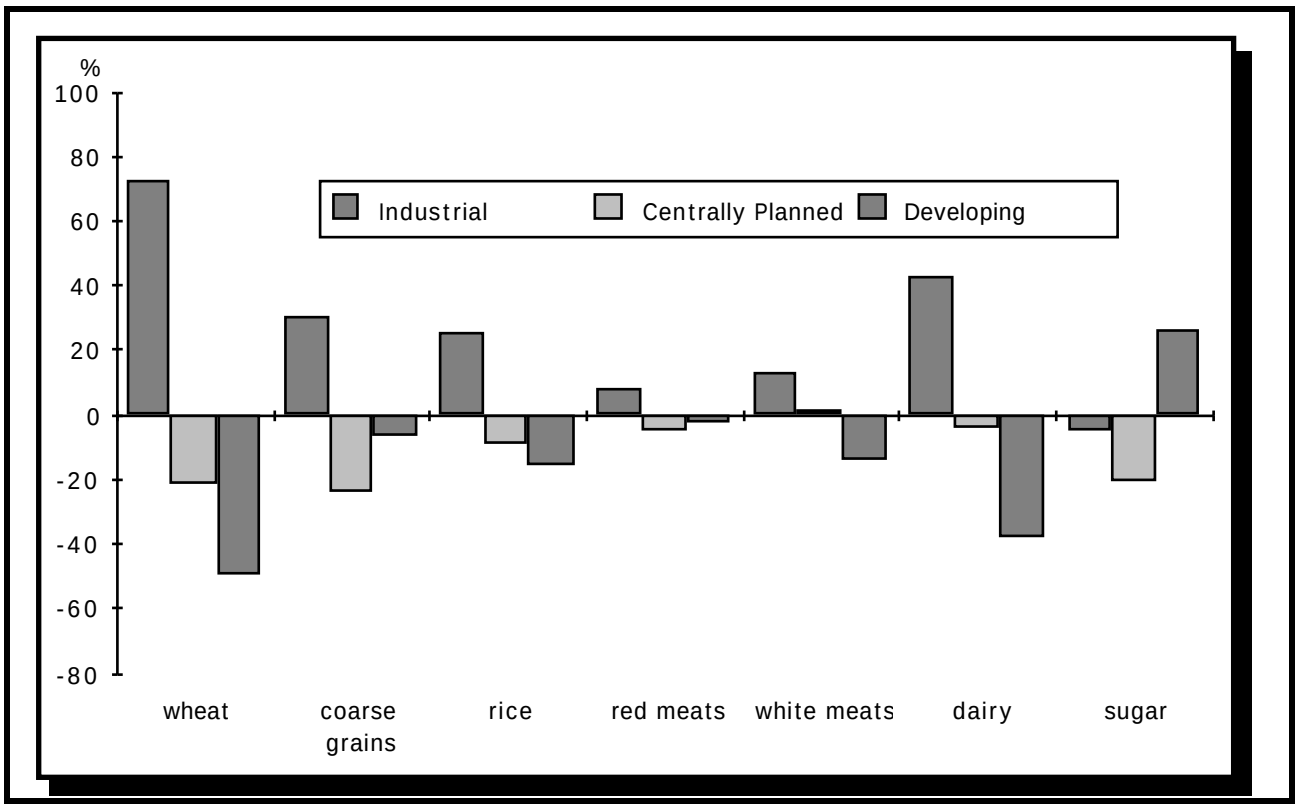
Source: USDA (1987)

b).Effects on World Trade and Consequences of Liberalisation of Agriculture:

Figure 14 shows the trade flows between the industrialised world, the centrally planned (European) world (CPE) and the developing world. (The balance of total trade takes place within rather than between these country blocks). Partly as a consequence of the policies pursued by both industrialised and developing countries, world trade is dominated by exports from these industrialised countries to the developing world and to the CPEs. Only in the case of sugar is the developing world as a block an exporter on world markets, and even then has to face the heavy protection we have already seen in the industrialised world.

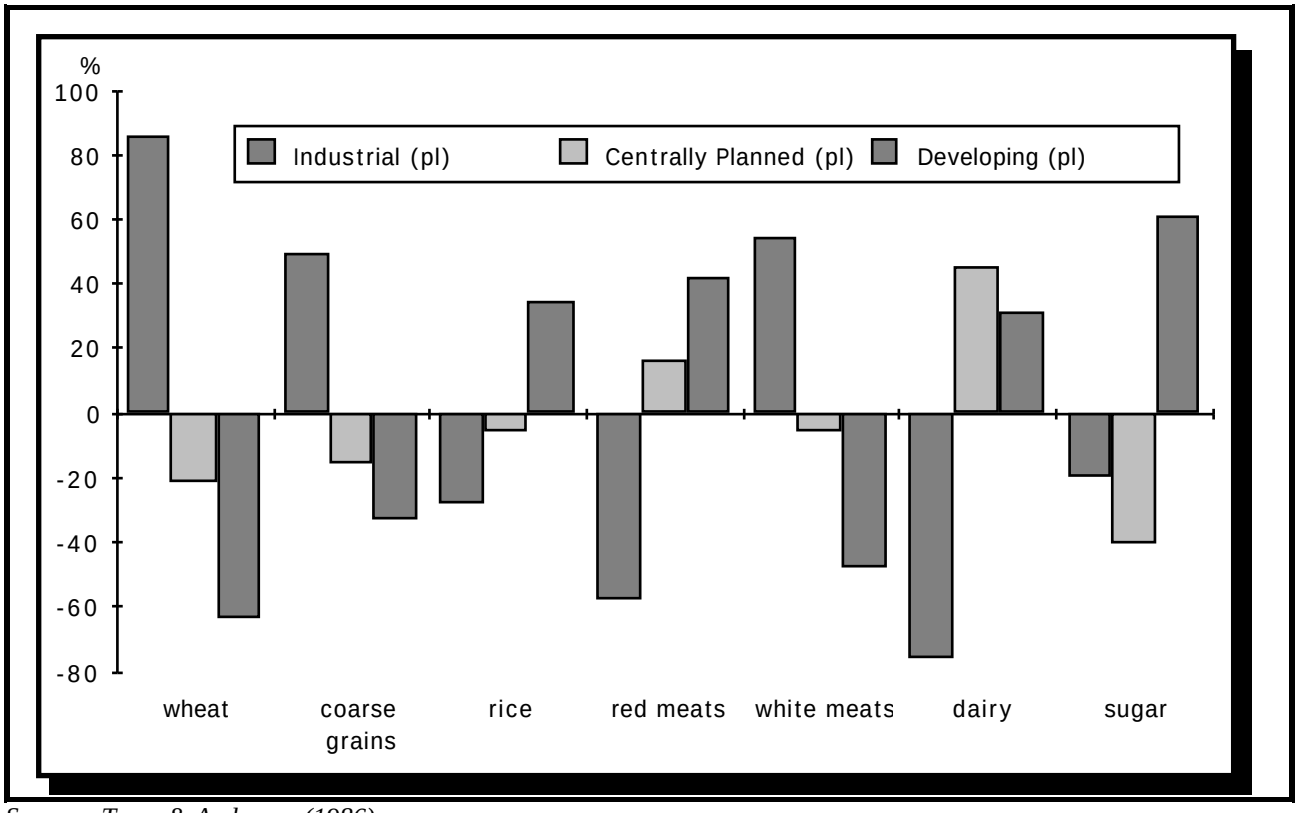
What would be the effect of reducing or eliminating the distorting agricultural policies? To answer this question, it is necessary to estimate the production and consumption responses of farmers and consumers in different countries to the prices they receive and pay, and to use these estimates to construct a model of world agriculture by country and country block. This model can then be used to test the consequences of eliminating the support provided to the the industrialised countries, and removing the price reduction policies followed by the developing world. This sort of policy analysis has recently become possible as a result of continuing research around the world on producer and consumer responses to price changes and the resulting behaviour of agricultural markets as prices and other factors change, and also by the increasing power and convenience of modern computers and their software to handle these relationships. An earlier example of this approach was the work I and my colleagues carried out on the costs and benefits of the Common Agricultural Policy (Buckwell, et. al. 1982, Harvey and Thomson, 1985).

Figure 14. Current Agricultural Trade Patterns.
(Exports (+) and Imports (-) as % of total world trade)



Source: Tyres and Anderson (1986)

Figure 15. Trade patterns following complete elimination of agricultural protection by industrialised countries



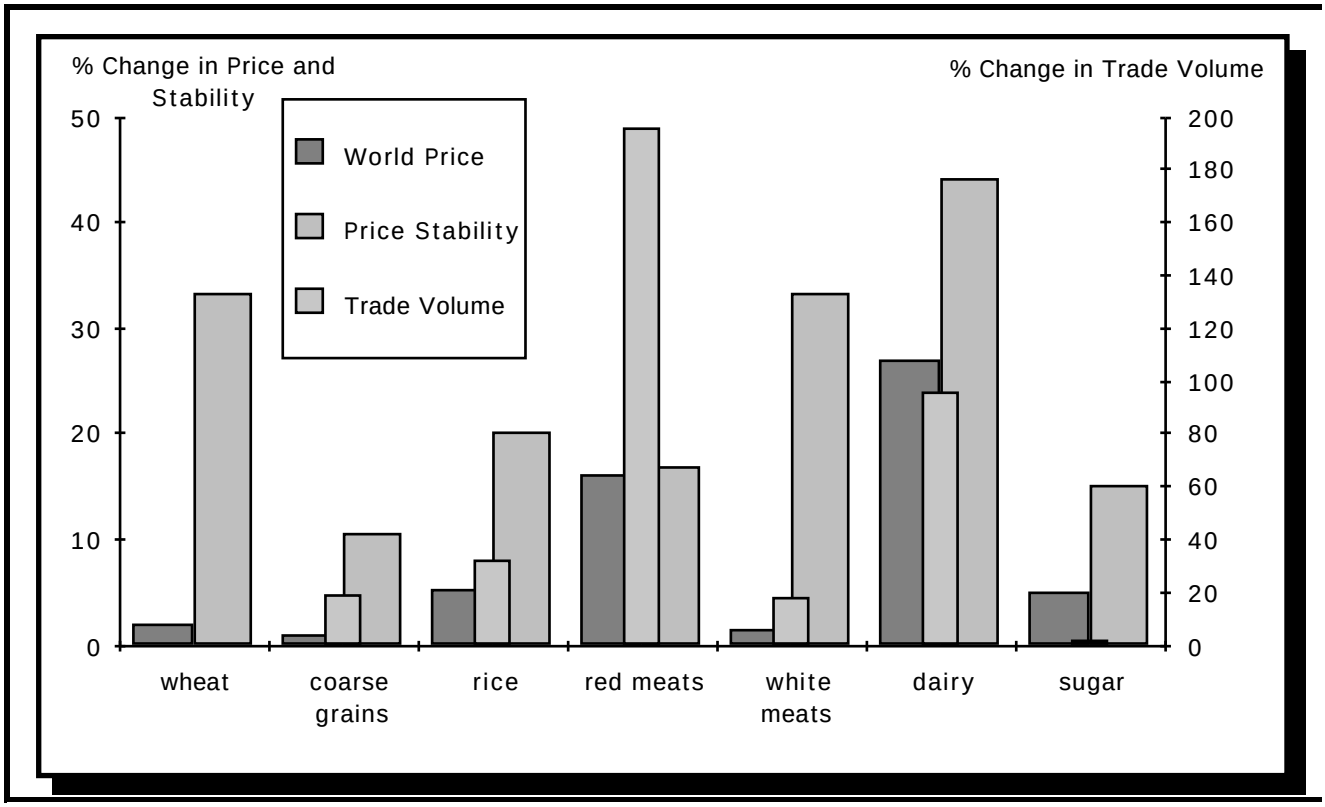
Source: Tyres & Anderson (1986)

Tyres and Anderson (1986) and the OECD (1987) have both used the same approach on a world level, in the OECD case restricted to the industrialised countries. Although the details of the estimates differ, and the extent of the liberalisation of agricultural policies which they envisage are different, the two sets of estimates are remarkably similar. Figure 15 shows the results of complete liberalisation by the industrialised countries, taken from Tyres and Anderson, whose estimates are more completely reported than those of the OECD and include the effects on the developing world.

It can be seen that the balance of trade shifts markedly in favour of the developing countries (and the centrally planned countries) under this scenario. The industrial countries become marked net importers of rice, red meats and dairy products, while the developing world exports these commodities. Liberalisation by the other country blocks, as well as the industrialised countries, alters these results somewhat, in particular for dairy products. Total world liberalisation, according to these estimates, results in the industrialised countries reverting to their present situation of exporters to the other two country blocks. Directions of change for the remaining commodities remain substantially the same, however.

The industrialised countries increase their share of world cereal trade, and export these to the developing (and centrally planned) countries as feed for the livestock as well as food, in addition to using grain for the production and export of the white meats which tend to be grain intensive.

Figure 16. World Price, Stability and trade volume changes from industrial liberalisation



Source: Tyres & Anderson (1986)

These projections of changes in world trade consequent on elimination of protection in the industrialised countries also result in improvements in the level and stability of world prices, illustrated in Figure 16. The improvements in stability and levels of trade are more marked than the increases in world prices, though both red meats and dairy show substantial improvements in price as a result of the liberalisation of industrial agriculture. It is these two commodities which also show the most improvement in the levels of world trade. The result is a substantial improvement in developing countries export earnings.

The OECD estimates of the effects of trade liberalisation by the OECD countries (broadly the same as the Tyres and Anderson definition of industrialised countries) refer to a 10% reduction in protection (ie a 10% reduction in PSEs) rather than to complete elimination. While not strictly comparable, the results are in close agreement with the Anderson & Tyres results, though the implied response of the world prices of dairy products and red meats in the OECD estimates is more pronounced than those shown above, while cereal prices actually decline marginally (by between 1 and 3% for complete elimination of protection) in the OECD estimates (Table 1)

Table 1. OECD estimates of world price effects of liberalisation
(converted to a complete elimination of protection basis)

Commodity	% change in world price
wheat	-1.1
coarse grains	-3.1
rice	0.5
red meats	16.0
white meats	3.0
dairy	44.2
sugar	9.9

Source: OECD, 1987, p 32.

It would be a mistake to take these results as the last word. More work is needed to confirm the tendencies and to explore the range of conditions under which they represent a reliable estimate of the effects of changing agricultural policies around the world. However, their consistency with previous research, both at the theoretical and applied level, leads to the conclusion that they are likely to be broadly correct. Although there are considerable areas for disagreement in the specification and estimates of production and consumption effects of changing support levels, on which these results are based, there is a consensus about the directions of change which would follow from liberalisation of agricultural trade.

However, not all the effects are unambiguously good for the developing world. The increases in world prices for the major food commodities means that those developing countries which are net importers of agricultural products generally lose from freer trade, since their consumption outweighs their production. There is considerable dispute in the literature about the overall effect of liberalisation on the developing world, and it is not possible to be categorical that freer trade would necessarily benefit all developing countries in all their areas of interest (trade revenues and expenditure, producer returns and consumer costs)2. However, to the extent that liberalisation of agricultural trade improves the fortunes of the major agricultural trading nations, it will improve these countries purchasing

[2] Stevens and Veloran van Themaat (1985) provide a review of the various analyses of the impact of the CAP alone on developing countries.

power for other (non-agricultural) commodities which in turn opens opportunities for growth in world trade in total. No-one has yet included these wider ramifications into projections and estimates of the overall effects of agricultural trade liberalisation, but it seems likely and logical that this extension would favour the developing world, if only as suppliers of raw materials and semi-finished products.

5. THE CURE? - SOME CONCLUSIONS

The argument of this lecture has been that food mountains and famines are man-made, not naturally inevitable. They are caused by agricultural policies around the world, with the industrialised world following policies which encourage surplus production and the developing world pursuing policies which discourage the production of food and make them more vulnerable to food shortages and famines. None of these conclusions are new. Economists and agricultural economists have been arguing them for years. The cure, then, would seem to be simple: eliminate the market support policies of the industrialised world, and stop underpricing food in the developing world.

I have concentrated on the effects of reducing (in the limit, eliminating) protection in the industrialised world rather than the effects of a universal elimination of distorting agricultural policies, for two main reasons. Firstly, I specialise in developed country agricultural policy and I am convinced that there are ways and means by which these policies can be effectively reformed to reduce and eventually eliminate the negative effects illustrated in this lecture. I do not, though, know enough about the developing world to be certain that their policy reforms are necessarily either possible or desirable. The second reason is a simple value judgement: the industrialised world, with limited dependence on agriculture and with ample income and resources, is better placed to cope with the consequences of agricultural policy reform than is the developing world, with a near total dependence on the farm sector and with very limited incomes and resources. The industrialised world both can and should reform its agricultural support systems; the developing world probably should, but perhaps cannot.

Elaboration of the ways in which policies could be reformed is a subject which warrants at least another lecture. It is a subject on which I and my colleagues have been working for some time. The central problem is as follows. As we have seen, farm market support policies are capitalised into the value of agricultural assets, especially land. Removal of this support with no compensation to the owners of these assets will result in a substantial capital loss for these owners. Since agriculture is essentially an unincorporated family business, the asset value for a farm business represents the family's pension fund - it is this capital which has to be realised for the farmer to be able to retire. Removal of support will substantially reduce this pension fund, and it is to be expected that the agricultural constituency will struggle to protect it. Estimates made through the Newcastle model of the CAP (Buckwell et. al. 1982), for instance, suggest that the value of support to the agricultural industry amounts to an average of £1,700 per year per head of the agricultural population in the European Community. It transfers £16,000 a year to each farm in the UK on average. The effect of this transfer on asset prices is very substantial. In contrast, the cost to the consumer of the CAP is of the order of £200/year per head of the total population.

It is possible to demonstrate that the CAP is economically unsound at the national and European level, in the sense that its elimination would enable everyone to be better off, although this conclusion requires that the farming population be properly compensated. This is far from demonstrating that the political process by which policy reforms will be carried out is likely to arrive at this conclusion. The effects of the policy at the individual level are so far weighted in favour of the support that the political market place, which counts millions of votes not millions of pounds, is quite likely to continue present policies. Those who benefit from the support find it in their interests to defend their position, while

those who are damaged are not penalised sufficiently to make much protest.

Some way has to be found to maintain the support but eliminate the market distortion and protection; to "de-couple" support from market prices and commercial decisions. Preliminary analysis suggests that quotas, as limits on the rights to support at the farm level, with production over and above some minimum level per farm being produced and traded at free (unsupported) market prices, provide some of the de-coupling between support and market behaviour which is required to limit the distortion of the support system. While the traditional economic theory castigates quotas as inefficient and not to be recommended, more careful analysis suggests that they may provide the means by which support can be progressively decoupled form market prices, while at the same time providing the necessary compensation to deserving farmers (as defined through the political process).

If the GATT negotiations, currently seriously concentrating on the agricultural sector for the first time, insist on treating protection (support) as identical to market distortion, regardless of the means and instruments used to provide the support and protection, then the prospects for a successful outcome to the negotiations are slim indeed. However, there is some debate about how to 'adjust' measures of PSEs associated with different support instruments so as to more exactly identify the distorting elements of the present support levels, and to be able to concentrate on distortions while leaving protection and support as matters for domestic concern. The US is providing a lead in these negotiations by proposing a complete elimination of distortions. The work of agricultural policy analysts needs now to be directed towards the ways and means by which this can be achieved and be politically acceptable to the negotiators.

There are a number of other issues which require attention from agricultural economists and others in this context. In particular, I have barely touched on the matter of stability in world and domestic food markets, and the associated problem of ensuring food security, both for individual nations and for the planet as a whole. Freer trade will not prevent chronic and acute food shortages occurring from time to time around the world, particularly in parts of the developing world. It is hardly accidental that the industrialised world also includes those areas of the planet which are more suitable for reliable food production without large scale irrigation or drainage requirements. The twin problems of providing improved stability of world prices and increased food security for the planet are essentially international problems. The system by which any international agreements reached on agriculture could and should be policed and enforced is also an area which requires urgent attention. Each of these issues on their own warrant additional lectures.

I would like to end on a philosophical note. The arguments of this lecture imply that free markets are superior to the current highly protected and distorted system of agriculture in the world. However, the predominantly market and capitalist economies have clearly ignored the potential benefits of trade as far as agriculture is concerned. Why is this, and what are the implications for the sustainability of the freer trade environment? The driving force behind markets is the pursuit of self-interest. Given the inevitability of governments in this system, it makes sense for individuals and groups to pursue their own self-interest through government action, even at the expense of others, and there is no guarantee that "competitive capitalism" will result in the greatest good for the greatest number unless no-one has any economic or political power. Yet the market system inevitably gives some groups more political power (willingness, ability and resources to influence decisions). In other words, there appears to be an inbuilt tendency for the market system, when coupled with the inevitable and necessary democratic government, to exhibit market and political failure and to produce less than either perfectly competitive or socially preferable outcomes. This implies that the "science" of economics has to embrace the allocation and distribution systems which are executed through the political process in order to explain such phenomena as agricultural policies. A promising avenue through which to begin this exploration is to return to the classical notions of the differences between the just price, the efficient price and the equilibrium price hinted at in the opening section of this paper.

In passing, it might be noted that the logic outlined very briefly above also provides some link with the two major schools of economic analysis - the neoclassical and the marxist, since the stability of the neoclassical market system is at the heart of the first paradigm while the inherent conflict and inevitable collapse of the system are significant parts of the latter. At a more pragmatic level, there are ways in which support systems can be designed which minimise the distortions of domestic and world markets. In designing these systems, the principles of "decoupling" will become more apparent and our understanding of the differences between justice, efficiency and equilibrium should be improved. At least through this approach, agricultural economists have a chance of providing a socially useful service at the same time as exploring the theoretical and philosophical limits of the discipline.

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