PROTECTING SMALL FARMERS AND THE RURAL POOR IN THE CONTEXT OF GLOBALIZATION

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Contents

1. Introduction

After two centuries of industrial revolution and half a century of aid to development, under-industrialization and poverty continue to prevail in more than half the world. After a quarter of a century of freedom of movement of capital and goods, if not people, regional financial crises continue to erupt in ever-closer succession. And after a century of agricultural revolution, half a century of green revolution and food aid, under-resourcing, extreme poverty and dietary inadequacies (undernutrition and nutrient deficiencies) continue to be the daily lot of most of the world's small farmers and rural poor.

It would therefore seem difficult to view the poorest regions of the world merely as residual pockets of underdevelopment that have been bypassed by advancing modernization. And if we wish to tackle and eliminate the root causes of these ills instead of constantly seeking to mitigate their fiercest symptoms by providing targeted aid that is always insufficient, then we must try to identify the organizational and operational features of the world economy that maintain, replicate, produce and sometimes even heighten the situation of extreme poverty and undernutrition. That is the objective of this paper.

We begin by briefly analysing how the present state of food and agriculture in the world is untenable and by summarizing the possible reasons for such a situation, before looking more closely at the following issues:

- How and why have we reached and maintained such a situation?
- What are the consequences of this situation for small farmers and the rural poor, developing countries and the world?
- How can the agricultural economy be organized and regulated in such a way as to reduce the causes of poverty and foster the development of the poorest segments of the world population?

2. The untenable state of food and agriculture

2.1 Agricultural inequalities and poverty of the rural masses

World agriculture has to feed the approximate 6 billion inhabitants of our planet and, more particularly, meet the needs of a total agricultural population of some 3 billion people - a function that is not performed very successfully. Yet, this agricultural sector, which still occupies an active population of 1.3 billion people, i.e. about half the world's active population, only has 28 million tractors at its disposal, a figure representing under 2 percent of the world's agricultural population. This means that the extensive motorization, complex mechanization, selection of crop varieties and animal breeds, fertilizers, concentrated feeds and plant and animal protection products that spearhead the contemporary agricultural revolution have only benefited a tiny minority of the world's farmers (in this paper, 'farmers', 'growers', 'cereal farmers', 'small farmers', 'the rural poor' mean both men and women). Some of these are well equipped and can cultivate more than 100 hectares of cereals and obtain yields close to 10 tonnes per hectare, which gives a gross productivity of some 1 000 tonnes per worker (100 hectares/worker x 10 tonnes/hectare).

At the same time, some two-thirds of the world's farmers have been affected by the green revolution: they also use selected varieties and breeds, fertilizers, and crop and livestock protection products, and they can also obtain yields close to 10 tonnes of grain per hectare. Half have animal traction which enables the better equipped to cultivate up to 5 hectares per worker and obtain a productivity of some 50 tonnes of grain per worker (5 hectares/worker x 10 tonnes/hectare or 2.5 hectares/worker x 10 tonnes/hectare x two harvests per year). But the other half only has manual tools that are barely enough to cultivate one hectare per worker, which gives a gross productivity of little more than 10 tonnes of grain per worker (1 hectare/worker x 10 tonnes/hectare or 0.5 hectare/worker x 10 tonnes/hectare x two harvests per year).

We can see therefore that about one-third of the world's farmers have not benefited from the agricultural revolution, green revolution, or animal traction - they only have manual farming implements, use no fertilizer or plant or livestock protection products, and grow varieties or raise breeds that have not been subject to conventional selection. This small farmer sector, which has been neglected by all research and projects, comprises some 450 million active persons, representing a total of 1 250 million people existing or scratching a living off agriculture. Their gross productivity can barely exceed 1 tonne of grain per worker per year (1 hectare/worker/year x 1 tonne/hectare under rainfed cultivation, or 0.5 hectare/worker x 2 tonnes/hectare under irrigated cultivation).

Moreover, most under-equipped small farmers, in many former colonial or communist countries without significant land reform, are deprived of land by the vast estates of several thousands or tens of thousands of hectares that relegate them to micro-holdings of only a few hundred square metres - far less than they could cultivate and well below the area needed to cover household food requirements. These poorly-equipped and landless or quasi-landless rural inhabitants therefore have to resort to casual labour on the large estates for wages of US$1 to 2 a day, which enables the more efficient and better equipped estates to produce 1 000 tonnes of grain per unit of labour per year and to produce 100 kg of grain at almost no labour cost (US$500/worker/year: 1 000 tonnes/worker/year = US$0.5 per tonne, equivalent to 0.5 thousandth of a dollar per kilogram).

The world agricultural situation is therefore one of stark contrast: a few million farmers benefiting from the agricultural revolution in developed countries and certain developing country regions, able to produce 1 000 tonnes of grain per worker per year; a few hundred million farmers benefiting from the green revolution in the more favourable regions of the developing world, able to produce between 10 and 50 tonnes of grain per worker, depending on the availability or not of animal traction; some hundreds of millions of small farmers with only basic hand tools and no selected seeds or fertilizer and little land, producing at the most 1 tonne of grain per worker per year.

The situation is therefore one of huge inequalities of equipment and productivity, and one of extreme poverty for hundreds of millions of under-equipped, poorly located and sometimes landless rural small farmers and inhabitants.

2.2 Rural poverty and nutritional inadequacies

At the beginning of the twenty-first century, more than one-third of the world's population is still affected by serious nutritional inadequacy. Some 2 billion people suffer *debilitating nutritional* deficiencies in proteins, iron, iodine, vitamin A and other vitamins, and some 800 million people suffer *undernutrition* or *chronic food insecurity*, which means that they do not have an assured intake of food sufficient to cover their basic energy needs (2 150 to 2 400 kcal per person per day, depending on age structure, level of fertility, activity, average size and weight of the population concerned).

FAO estimated in 1996-1998 that there were still 826 million people suffering from undernutrition (792 million in developing countries, 30 million in countries in transition and 8 million in developed countries). This compares to a roughly estimated 920 million in 1969-1971, a reduction of some 100 million in 27 years. The fact that the population not affected by undernutrition or food deficiencies has become a majority, and that world food supplies have slightly outpaced population growth suggests that the level of nutrition of this majority has significantly improved - a very positive result.

However, we can also see that over the course of 27 years the number of people suffering undernutrition has only fallen by an average of 3.7 million per year, and that at such a pace it will take more than two centuries to eliminate undernutrition. The Rome Declaration on World Food Security (1996) called for an acceleration of this pace and set the objective of reducing the number of undernourished by half by the year 2015 at the latest. This Declaration and its accompanying Plan of Action aimed to reduce the number of undernourished people in the world by 20 million per year. But the commitments of governments and international organizations to this effect have not been fully realized or as tangible as expected, and the results of the Plan of Action, though positive, have nevertheless been disappointing. The population suffering undernutrition has only fallen by about 8 million per year, which extends to 2035 the hope of halving their number and to 2095 the hope of eliminating undernutrition completely.

At the very least, this means that national policies and projects and bilateral and multilateral aid have been insufficient to eliminate chronic undernutrition in the short-term, let alone resolve the debilitating nutritional deficiencies that affect a population two to three times greater. We therefore (in my opinion) need to find other forms of analysis and other strategies, if we are to eliminate undernutrition and nutritional deficiencies in a morally acceptable and politically sustainable time frame.

Again, according to FAO, three-quarters of the approximately 800 million people living with chronic undernutrition are in the rural sector (i.e. 560 million people). They are extremely poor rural inhabitants, mainly comprising under-equipped, more or less landless small farmers living in difficult regions, underemployed and poorly paid agricultural labourers, and artisans and traders who rely on these two population groups for a living and are therefore scarcely better off themselves. As regards the 25 percent non-rural undernourished population (about 140 million people), most are members of small farming households who have recently had to migrate to urban slums where they have not yet found a proper means of survival. Thus a majority of the undernourished population are small farmers, and the extreme poverty and undernutrition of most of the others essentially results from the poverty and undernutrition of the small farming sector.

However, as this reservoir of rural poverty and undernutrition remains more or less constant when it is forever emptying in one direction through outmigration, there must be a compensating influx of new poor and undernourished in the other direction. We therefore have to conclude (and this has been confirmed by legions

of field studies) that the world's stock of poor and undernourished is not simply a legacy from the past that is diminishing too slowly, but rather the result of an ongoing process of extreme impoverishment, and even undernutrition, of ever-renewed strata of under-equipped, poorly located, land-deprived and relatively unproductive rural inhabitants and small farmers.

We now need to briefly determine the economic mechanism that fuels this process of impoverishment and to identify the economic and political conditions under which it can function.

2.3 The very contemporary reasons for the extreme impoverishment of hundreds of millions of rural inhabitants and small farmers

The increases in productivity and production from the agricultural and green revolutions that benefited the developed countries and favourable regions of the developing countries were so great that they triggered a sharp decline in real agricultural prices in these countries, and in some cases even produced significant surpluses for export. These low-cost surpluses stimulate international trade which has been greatly facilitated by lower transport and communication costs and the growing liberalization of trade. As a result, the prices paid to agricultural producers in most importing countries are closely aligned to the prices prevailing in the surplus producing countries.

While significant in terms of absolute value, the international trade of agricultural commodities often only accounts for a small proportion of world production and consumption: in the case of cereals, for example, only 10 percent. The international markets for agricultural commodities are therefore not global markets in the full sense of the term, but rather residual markets glutted with surpluses that are often difficult to sell; markets where even the producer-exporters assisted by the agricultural or green revolution can only gain an entry or maintain a presence if equipped with specific additional competitive advantages. Such is precisely the case with the well-equipped exporters of the large estates of South America, South Africa, Zimbabwe and perhaps tomorrow Russia, who have vast acreages of inexpensive land and access to some of the cheapest labour in the world. Such is also the case with producers in certain very high-income developed countries, such as the United States or the countries of the European Union, that have the budgetary resources to generously subsidize their farmers. In both cases, producers who already enjoy undeniable natural and technical advantages also benefit from a significant transfer of wealth (land and low wages, or subsidies) which reduces their *de facto* production costs and therefore raises their international competitiveness well beyond that of their intrinsic productivity.

Under such conditions, international agricultural commodity prices are only advantageous to the minority of farmers who can continue to invest, progress and gain market share. They are insufficient and disadvantageous for the majority of the world's farmers: generally insufficient for them to invest and progress; often insufficient for them to live from their work in dignity, renew their means of production and maintain their market share; and insufficient for the less equipped, land-deprived and poorly situated half of the small farming sector to feed itself properly.

This mechanism of extreme impoverishment, even undernutrition, affecting hundreds of millions of under-equipped small farmers, can best be illustrated by considering the case of a cereal farmer in the Sudan, Andes or Himalayas, who with only basic hand tools (machete, hoe, spade, etc.) worth some US$20 to 30 produces 1 tonne of grain per year (after subtracting seeds), without fertilizer and without phytosanitary products. Some 50 years ago, that cereal farmer received the equivalent of US$30 (at 2001 value) for 100 kg of grain; he therefore had to sell 200 kg to renew his hand tools, clothing, etc., leaving him 800 kg to cover the basic nutritional needs of four persons; depriving himself a little, he could even sell an extra 100 kg to buy a new and more effective farm implement. Some 20 years ago, he still received US$20 (2001 equivalent) for 100 kg, which meant selling 400 kg to renew his hand tools, leaving 600 kg to feed four persons, but this time inad-

equately and certainly with no possibility of buying new, more efficient farm implements. Today, he only receives US$10 for 100 kg of grain, which means that he has to sell 600 kg to renew his equipment, leaving only 400 kg to feed four persons, which is of course impossible. In short, he can no longer fully renew his work tools, modest though these are, or satisfy his hunger and restore his working energy, a situation that in effect condemns him to debt and migration to the under-equipped and under-industrialized urban slums notable for their unemployment and low wages.

Under such conditions, the current strategy to combat undernutrition and nutritional deficiencies which consists in lowering agricultural prices to facilitate access to food by poor consumers and purchasers appears to be singly misguided: firstly, because the majority of those suffering undernutrition are not purchasers and consumers of food, but rather producers and sellers of agricultural goods who have been reduced to extreme poverty through falling agricultural prices; secondly, because the poverty and undernutrition of non-farmers are indirectly but largely due to the impoverishment of under-equipped small farming communities.

We now need to try to understand how such an unacceptable state of food and agriculture in the world has come about and why it persists. We begin by looking at the two-stranded mechanism of unequal development of privileged agricultural holdings, on the one hand, and the non-renewal of disadvantaged holdings, on the other, during the contemporary agricultural revolution in the developed countries. We then examine how this dual mechanism severely restricts the impact of the agricultural and green revolutions in developing countries, and how it leads to the massive impoverishment and exclusion of the under-equipped small farming sector in these countries.

3. Origin and replication of agricultural inequalities, small farmer poverty and nutritional inadequacies

3.1 The triumph of the contemporary agricultural revolution in developed countries

Real but limited initial agricultural inequalities

In the mid-nineteenth century, most of the world's small farmers were engaged in strictly manual agriculture (hoe, spade, axe, machete, etc.). Each worker could tend to an area of about 1 hectare and produce grain-equivalent yields below 1 tonne per hectare, which meant labour productivity of less than 1 tonne per worker. However, heavy animal-drawn cultivation systems without fallow had been developed and perfected in Europe since the Middle Ages and were widespread: with a plough and cart, one worker could already cultivate 5 hectares which, with a yield of 1 tonne/hectare, gave a gross work productivity of 5 tonnes/person - a level only matched at the time by animal-drawn irrigated rice production systems with two harvests per year in certain deltas of Asia. At the time, all the world's farming systems (swing plough cultivation with fallow in the Mediterranean regions, hydro-agricultural systems with one or two harvests per year using manual or animal-drawn cultivation, etc.) were therefore placed within a productivity ratio of one to five (fig. 1).

Explosion of agricultural inequalities in the twentieth century

However, from the end of the nineteenth century, industry began to manufacture new animal-drawn machinery (one-way plough, tine cultivator, seed drill, hoeing machine, bedders, mowers, hay tedders, rakers, binders, steam-driven threshers, etc.) which were adopted by large agricultural holdings in European settlements in the temperate regions of North America, the Southern Cone of Latin America, South Africa, Australia, New Zealand, etc., and also, at a somewhat slower pace, in Europe. The better equipped farms could therefore have one worker to cover 10 hectares, but as the use of mineral fertilizer was still very limited, yields were still in the order of 1 tonne/hectare, meaning a maximum gross labour productivity of about 10 tonnes/worker (fig. 1).

In the twentieth century, the contemporary agricultural revolution *stricto sensu* (motorization, heavy mechanization, selection, chemical application, specialization) triumphed in the developed countries. During the course of a few decades, a limited number of farmers made huge progress; for example, large cereal farms with heavy motorization and mechanization (four-wheel drive tractors of over 120 horse power with cutter bars of 6 metres and more, etc.) can now apportion 200 hectares to each worker, while the massive use of fertilizer, phytosanitary products and selected varieties produces yields of more than 10 tonnes per hectare, meaning gross labour productivity of as much as 2 000 tonnes/worker and net productivity of nearly 1 000 tonnes/worker.

The difference in labour productivity between manual agriculture without chemical application and heavily motorized and chemical-assisted agriculture in the world is now at a ratio of 1 to 2 000 for gross productivity (fig. 2), and 1 to more than 500 for net productivity (fig. 3).

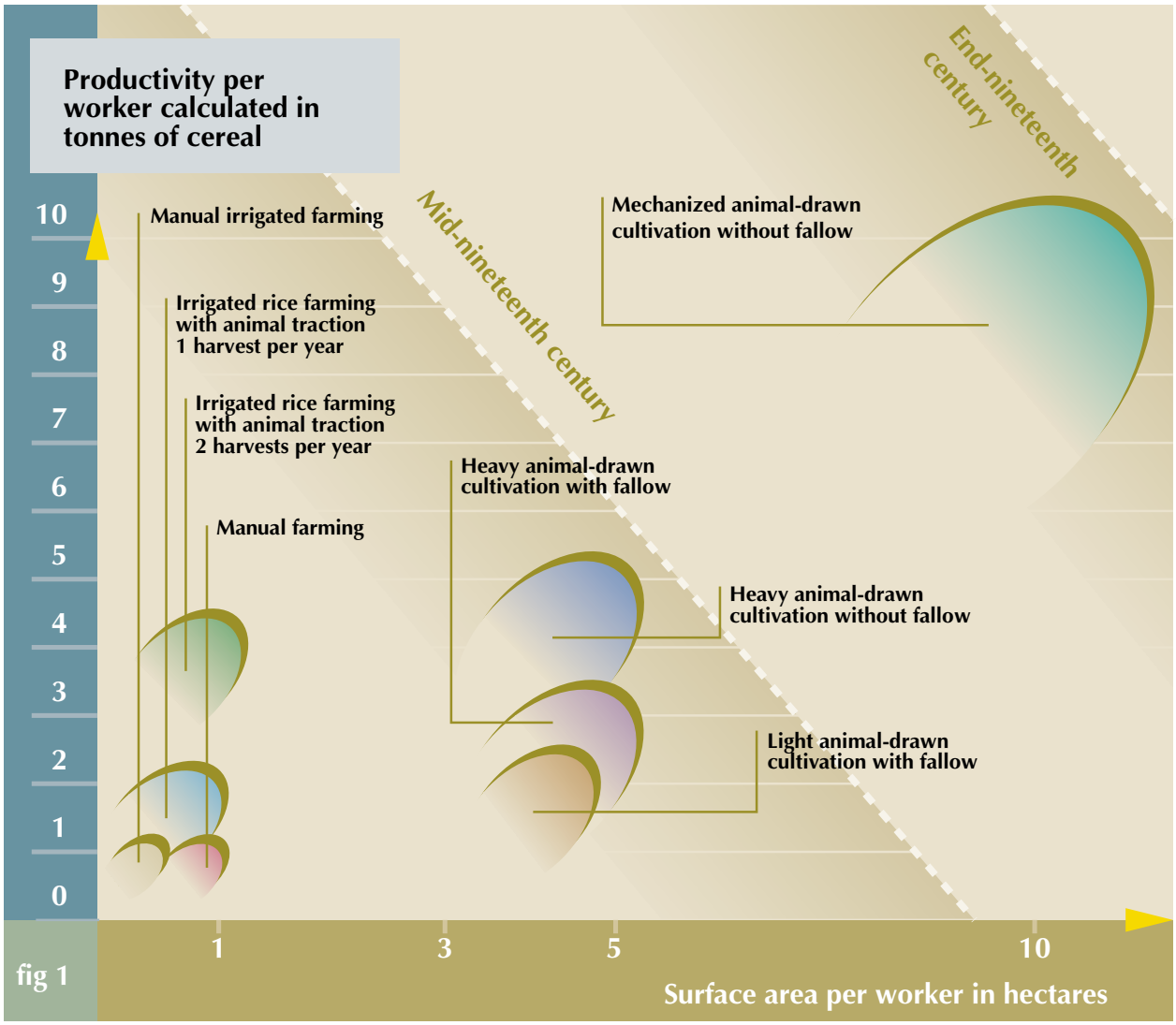

Figure 1
Comparative productivity of the world's major agricultural systems in the middle and at the end of the nineteenth century

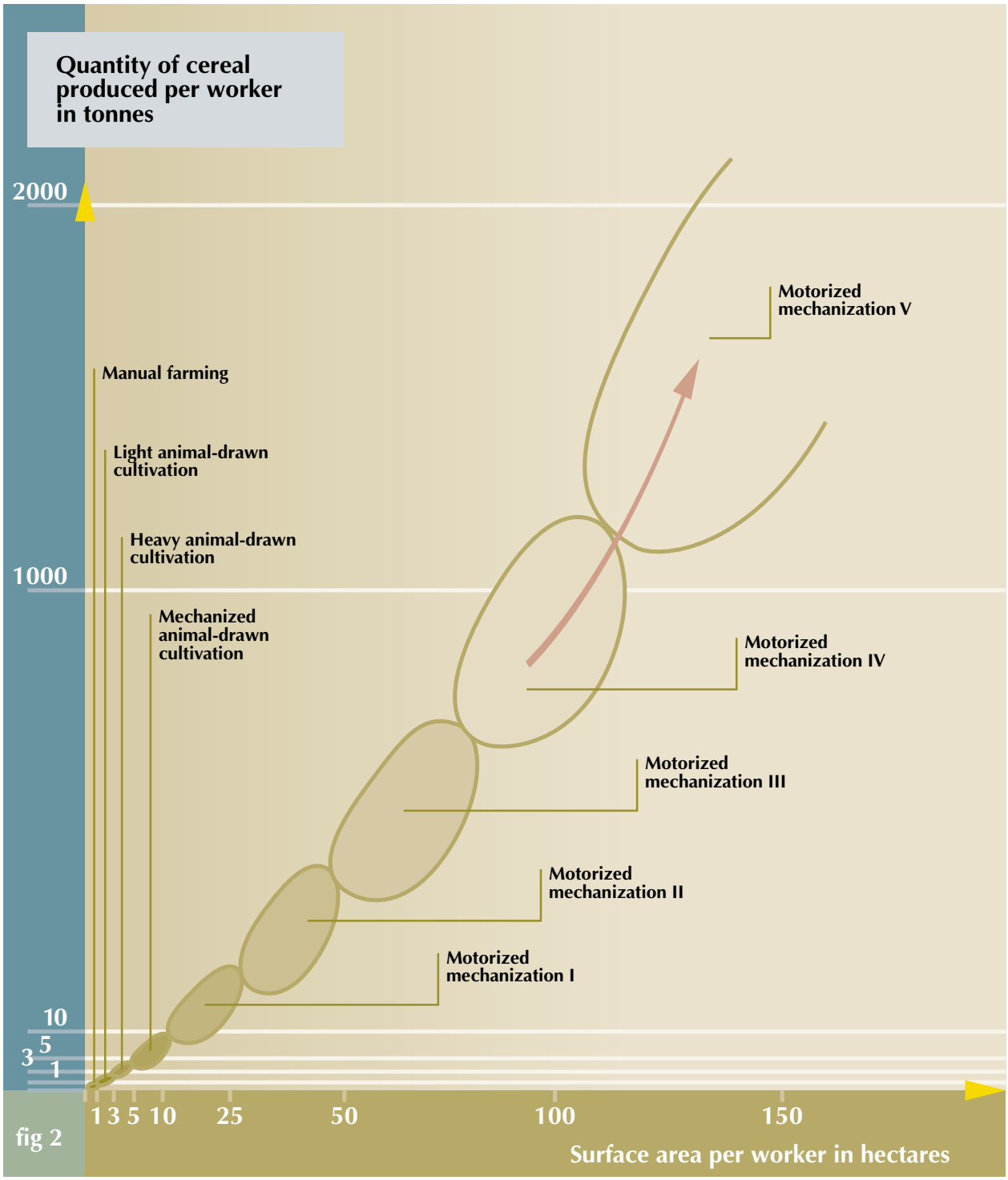

Figure 2
Stages of development of agricultural equipment and motorized mechanization in cereal cultivation

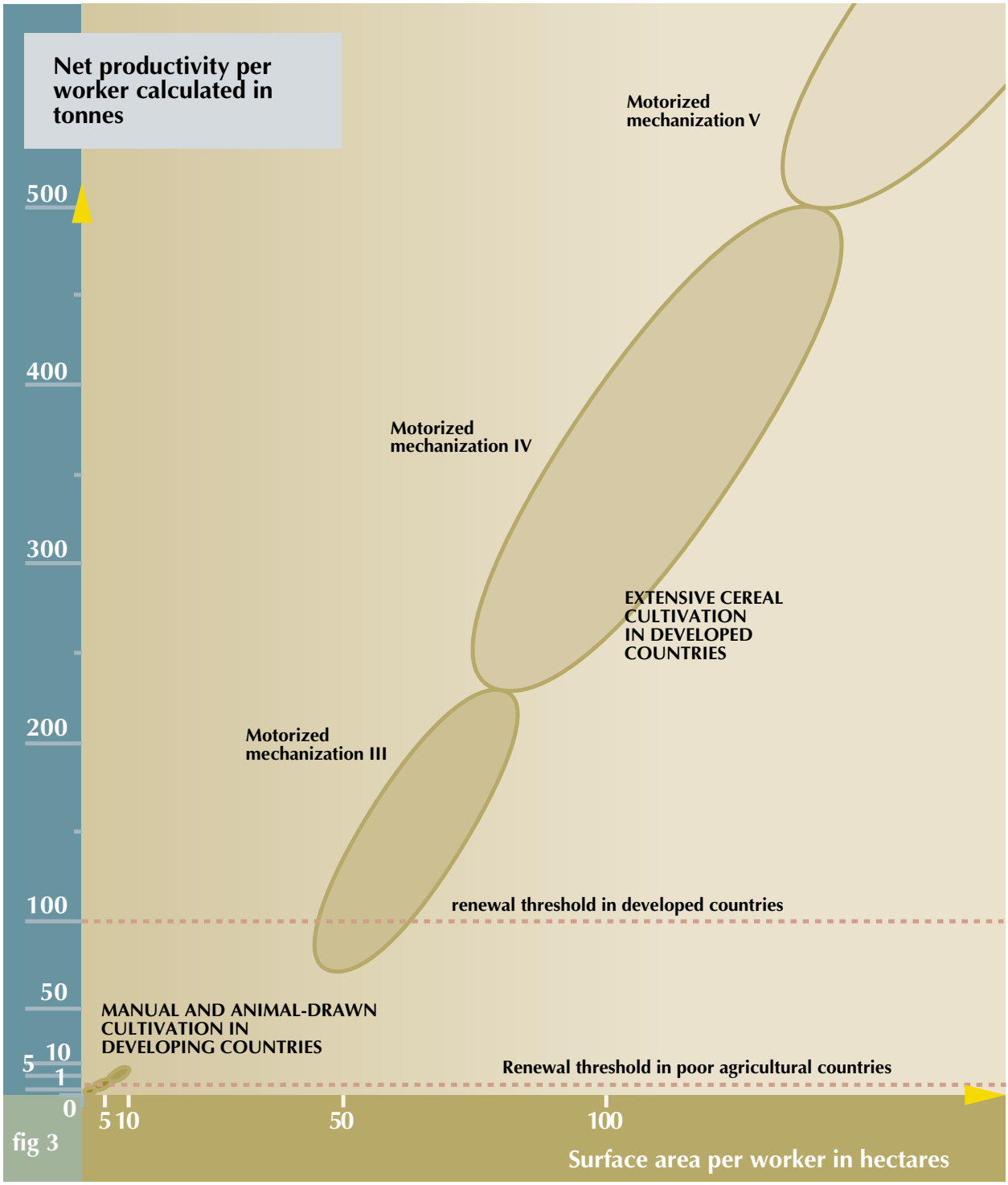

Figure 3
Productivity differences between cereal systems using motorized mechanization and chemicals, on the one hand, and manual or animal-drawn cultivation in developing countries, on the other

The mechanisms of unequal development of privileged holdings

Of course, such a leap was not immediate but occurred in stages, and was not accomplished by all agricultural holdings. Rather, it involved an ever-smaller minority, while the vast majority of farms existing at the beginning of the century disappeared in succession.

At each stage of this contradictory process, the only farms able to progress to the next stage were those located in favourable regions and endowed with sufficient equipment and land to reach a level of productivity that would provide an income higher than family needs, and thus sufficient self-investment and borrowing capacity to acquire further equipment and expand. And as the farms making the most progress each time were those with the highest investment capacity, those with an advantage at the start found themselves with an even greater advantage later.

Mechanisms of impoverishment and exclusion of disadvantaged holdings

On the other hand, small farms with less equipment and land, often poorly situated and less productive, and with household income below the renewal threshold, i.e. the socially acceptable income threshold close to the minimum wage, could neither invest, nor expand, nor even fully renew their means of production. Such farms generally tended to decapitalize and deteriorate, and were generally not taken over when the farmer retired: they were in fact in crisis and headed for elimination.

Lower real agricultural prices, higher wages and their consequences

But this mechanism producing cumulative unequal development for some and blocked development, crisis and exclusion for others was significantly amplified by the decline in real agricultural prices, on the one hand, and the increase in real minimum wages, on the other.

Indeed, productivity gains from the agricultural revolution in recent decades have been so high that they have easily outrun those of other sectors (industry and services), with the result that current agricultural commodity prices have increased less rapidly than prices of other products and real agricultural prices (allowing for inflation) have sharply fallen. Thus, in less than 50 years, the real price of wheat in the United States is down almost two-thirds, while the real price of maize and sugar has more than halved (fig. 4 and 5).

This fall in prices led firstly to a disproportionate fall in revenue for small farms, which exacerbated their impoverishment and accelerated their elimination; it also resulted in lower incomes for medium-size holdings that had not developed sufficiently to make up for their impact. And, as productivity gains in industry and the services had been sufficiently high to raise the real minimum wage and therefore the socially acceptable agricultural income, many medium-size farms also found themselves below the renewal threshold, and therefore in crisis and on the road to elimination.

Except in periods of crisis, industrial growth and expansion of the services sector have been able to absorb the workforce made redundant by agricultural productivity gains in the developed countries. However, the agricultural revolution has also encountered limits and drawbacks in these countries. It is difficult to exceed grain yields of 12 000 kg per hectare or milk yields of 12 000 litres per cow. There is also an increasing risk of environmental deterioration and endangered food quality and safety caused by excessive use of fertilizers and plant or animal protection products, and the recycling of dangerous waste products in fields or in animal feed. At the same time, the huge scale of mechanization, excessive specialization, extensive monocropping and the abandonment of entire agricultural regions, because of some minor comparative

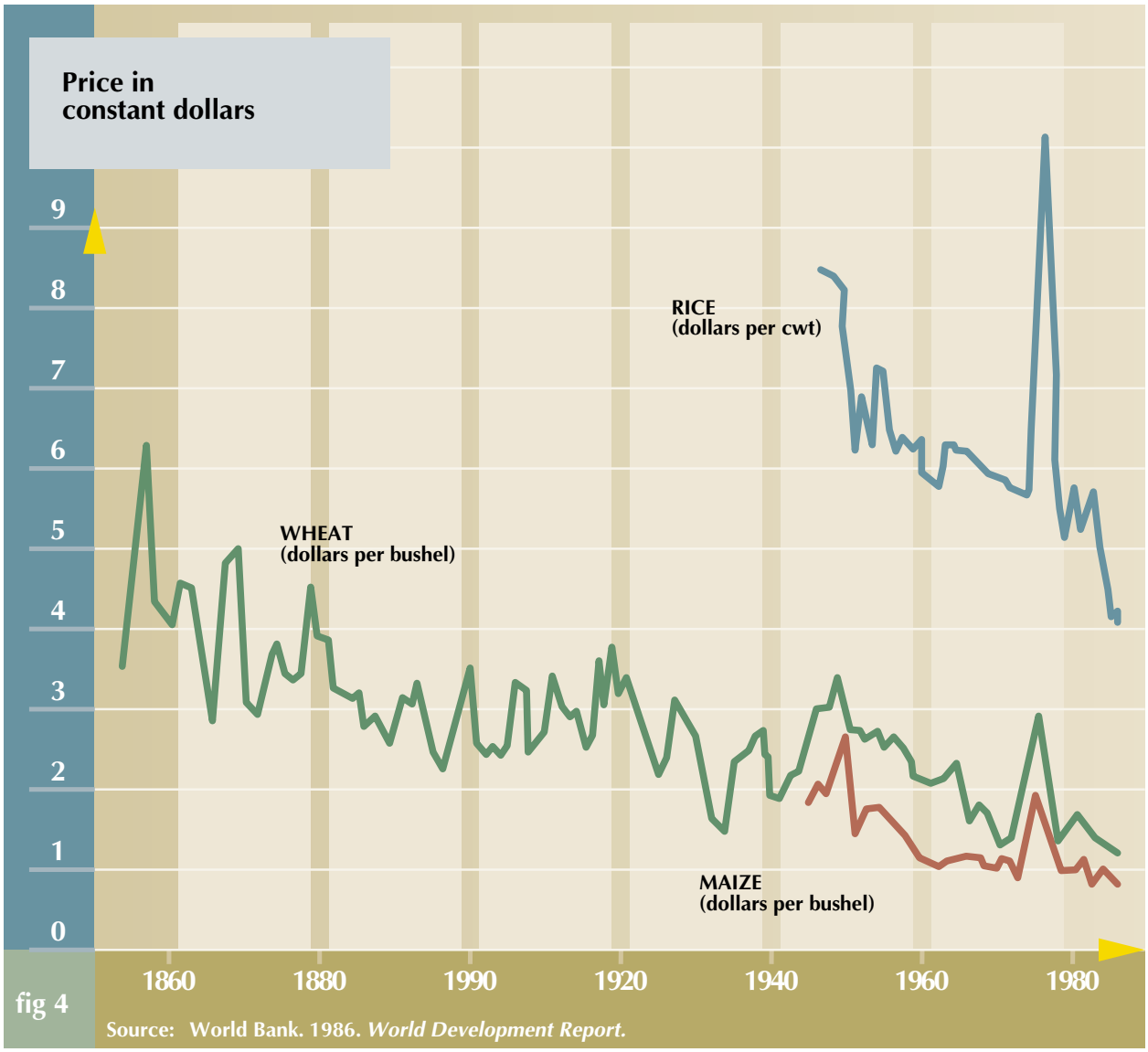

Figure 4
Downward trend and fluctuations of real prices of selected major agricultural commodities in the United States

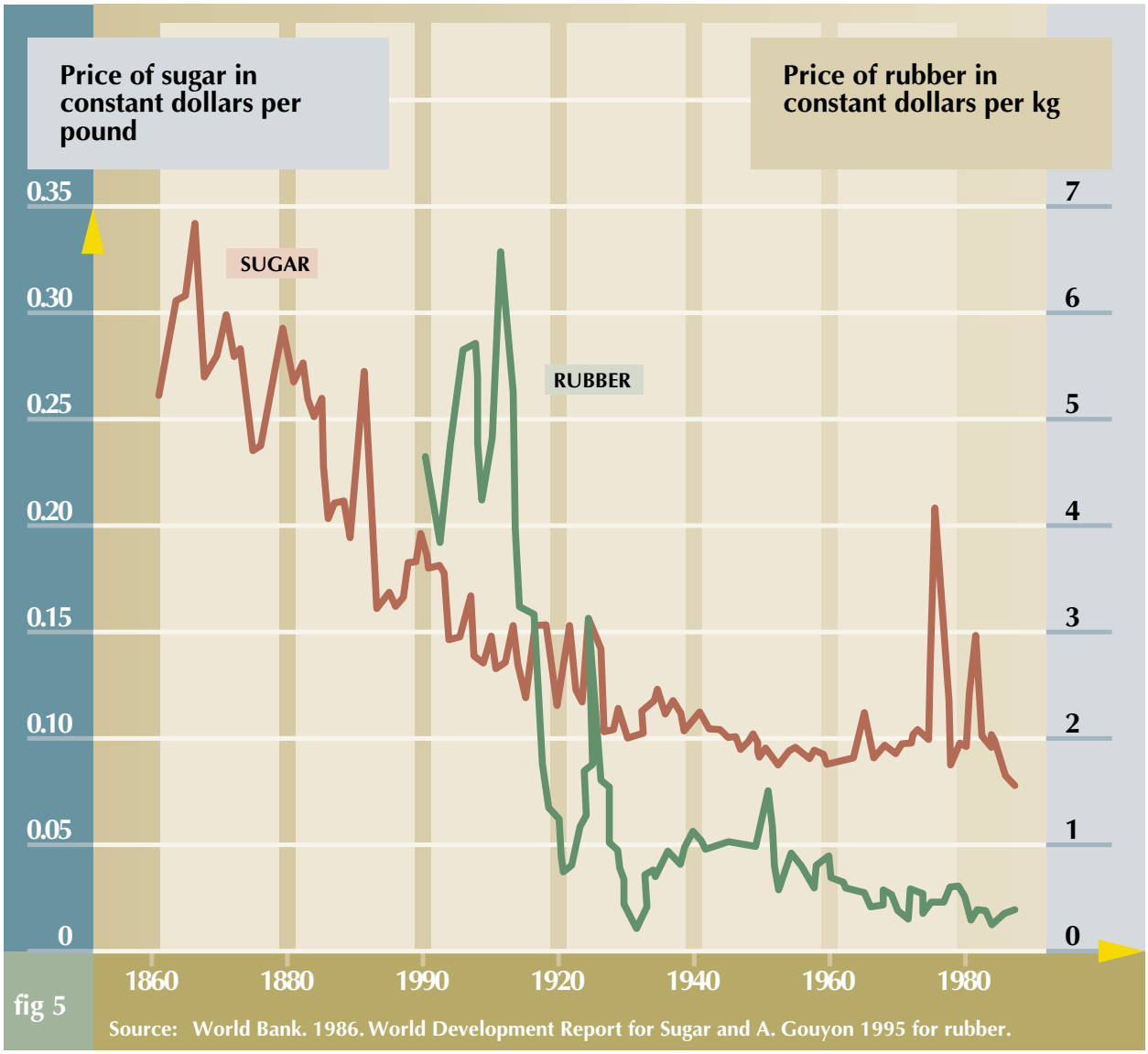

Figure 5 (Continued)
Downward trend and fluctuations of real prices of selected major agricultural commodities in the United States

disadvantage, are now posing increasingly acute problems of employment and land maintenance. These excesses have prompted the adoption of ecologically sound agriculture, able to improve quality of product and environment, and in tune with the aspirations of the public and most farmers. However, this is more costly than traditional agriculture and cannot be widely adopted under a regime of excessively low agricultural prices, unless subsidies are provided.

3.2 The limits of the agricultural revolution in developing countries

The shallow penetration of the agricultural revolution stricto sensu

The contemporary agricultural revolution with all its attributes, in particular its heavy and complex motorized mechanization, has only penetrated certain parts of the developing world in Latin America, the Middle East, Asia, North Africa and Southern Africa, and is virtually absent from intertropical Africa, the Andes and Central Asia. Even where it is present, this extremely expensive motorized mechanization has only been affordable to a minority of public or private, national or foreign agricultural estates that have the necessary capital or access to credit, while the vast majority of small and medium holdings continue to farm manually or using animal traction.

The green revolution and its limits

However, a relatively important section of non-motorized small farmers and the rural poor in the developing world has been able to benefit from a variant of the agricultural revolution that excludes the heavy motorized mechanization component. This variant, the *green revolution* (selection of potential high-yield varieties of maize, rice, wheat, soybean and other tropical export crops, use of fertilizer, protection products and irrigation) has produced impressive increases in yield, especially on large irrigated plains where good water control has permitted two or three harvests a year. Although well below the levels of extensive cultivation with heavy motorized mechanization, these production and productivity gains coupled with low local wages have enabled some countries to become rice exporters (Thailand and Viet Nam).

Orphan crops

Agricultural changes over the past half-century are not of course restricted to the agricultural and green revolutions. On closer inspection, we can see that agriculture does not stand still and even the smallest farmers of the African savannahs, the Andes and the high valleys of Asia routinely adopt new plants and new animals originating from other continents, which they then breed for adjustment to their new surroundings and, when they can afford it, adopt new hand tools or animal-drawn equipment. They continuously combine and recombine crops and livestock systems and new and old farm implements to adjust to ever changing economic, ecological and demographic conditions, creating production systems in which the less favourable the conditions, the greater the ingenuity.

But the fact remains that even in the regions of green revolution, and however determined their efforts and ingenuity to survive, many small farmers have not had the means to invest and develop. Above all, huge areas of rainfed or poorly irrigated agriculture have been largely bypassed, with little or no selection of prevalent species (millet, sorghum, taro, sweet potato, yam, plantain, cassava, etc.) or of local varieties of wheat, maize and rice adapted to difficult conditions (altitude, drought, salinization, aridity, waterlogging). For example, the average yield of millet in the world today is barely 0.8 tonne/hectare. These species and varieties, known as "orphans" because overlooked in the breeding process, often make the use of fertilizer and phytosanitary

inputs unprofitable, which only adds to the problems of the regions where they are grown. Thus, more than one-third of the world's small farmer population, i.e. nearly half a billion agricultural workers (or more than 1 billion people living off agriculture) are without any means of making significant progress.

3.3 The crisis of under-equipped small farmers and the rural poor in developing countries

The widespread fall in agricultural prices

The downward trend in real prices of exportable surpluses of wheat, maize, rice, soybean and animal products, resulting from the agricultural revolution and from facilitated transportation and the liberalization of international trade, has had an impact in virtually all countries. However, the fall in agricultural prices has affected not only these surplus products but also tropical export commodities faced with competition from the motorized and mechanized crops of developed countries (beet against sugar cane, soybean against groundnut and other tropical oilcrops, cotton from the south of the United States), or from substitute industrial products (synthetic rubber and textiles). For example, the real price of sugar has fallen by more than two-thirds in a century, while the price of rubber has plummeted almost tenfold (fig. 4 and 5).

Finally, the agricultural revolution has also been applied to other tropical crops (banana, pineapple, etc.) so the downward trend in real prices has gradually extended to virtually all agricultural commodities.

The blocking of development

The downward trend in real agricultural prices in the past 50 years has impacted primarily on the purchasing power of the mass of small farmers in developing countries engaged in manual cultivation. Most of these have eventually found themselves in a position where they are unable to invest in more effective farm implements and sometimes even to purchase selected seeds, mineral fertilizers and protection products. In other words, the first impact of falling agricultural prices was to block the development of the mass of the most poorly equipped and located small farmers.

Decapitalization and undernutrition

Then, with the continuing decline in prices, small farmers unable to invest and achieve significant productivity gains fall below the economic renewal threshold: their cash income is no longer sufficient to renew farm tools and inputs, to buy the few vital consumer goods they cannot produce themselves and, when necessary, to pay taxes.

Under such conditions, they then have to make all sorts of sacrifices to purchase the minimum equipment they need to continue working (e.g. selling their livestock, cutting purchases of consumer goods, etc.). They also have to extend their cash crop cultivation as much as possible, which means reducing the area given over to food crops for on-farm consumption because their rudimentary farm implements only allow them to work a limited fixed surface area.

In other words, the small farmer whose income has fallen below the renewal threshold can only survive at the price of *decapitalization* (sale of livestock, fewer and poorly maintained farm implements), *under-consumption* (farmers in rags and barefoot), *undernutrition* and soon outmigration. Unless they resort to illegal crops: coca, poppy, hemp, etc.

The ecological and health crisis

Because of their deteriorating equipment, diet and health, these farmers have less capacity for work and so have to concentrate on short-term returns and neglect maintenance of the cultivated ecosystem: the poorly maintained irrigation systems deteriorate; ever younger and closer-to-hand fallow is cleared under slash-and-burn cultivation to facilitate the land clearing work, but this only accelerates deforestation and depletion of soil fertility; in mixed crop and livestock systems, the reduction in animal numbers lowers the transfer of fertility to cropland. In general, insufficient weeding degrades the land under cultivation and the poorly maintained crops, lacking mineral nutrients, become increasingly prone to disease.

The degradation of the cultivated ecosystem, undernutrition and a reduced working capacity also lead small farmers to simplify their cropping systems. Preference is given to "poor" crops that require less mineral fertilizer, water and labour. This in turn leads to reduced diversity and quality of plant products consumed on the farm which, with the virtual disappearance of animal products, results in serious protein, mineral and vitamin deficiencies.

In this way the agricultural crisis extends to all elements of the production system: less equipment, degradation and loss of fertility of the ecosystem, plant, livestock and human malnutrition and general deterioration of health. *The economic unsustainability of the production system leads to the ecological unsustainability of the cultivated ecosystem, undernutrition and poor health.*

Indebtedness, outmigration and hunger

Impoverished, undernourished and working degraded land, these enfeebled small farmers come dangerously close to the survival threshold (below which they will no longer have the means to continue their activity). One poor harvest is then enough to drag them into debt, if only to eat during the lean months before the next harvest. So the indebted small farmer is at the mercy of a poor harvest and, if he has not already done so, is obliged to send the able-bodied members of his family in search of temporary or permanent work elsewhere, which only further weakens his production capacity. Finally, if external remittances are not enough to ensure the survival of the family, the only option is to migrate. But, in most developing countries, the industry and services sectors have few employment opportunities worthy of the term and rural poverty can only lead to unemployment and to a more or less comparable urban or peri-urban poverty.

While a small farm in surplus can get through one or even several poor harvests, a small farm chronically reduced to the limits of survival finds itself at the mercy of the slightest adversity reducing its harvest or earnings. Whether this be climatic (flooding, drought, etc.), biological (plant, animal or human disease, pest infestation, etc.), economic (products sold at a loss, falling prices, etc.) or political (civil war, passage of troops, etc.), such small farmers are thus condemned to famine or to refugee camps if these exist nearby.

This process of exclusion has, of course, not affected all small farmers who farm manually, but it has affected the most deprived who are especially numerous in the least privileged regions.

Circumstances aggravating impoverishment and undernutrition

Some regions, and some developing countries have also been saddled with particularly disadvantageous natural conditions (aridity, flooding, salinization, poor soils, etc.), infrastructure (lack of irrigation) and land distribution (micro-holdings resulting from large estates or agricultural overpopulation). Some countries have also pursued policies that have harmed agriculture and small farming communities (excessive expenditure on modernization and urbanization, subsidies for food imports, taxation on agricultural exports, lack of protec-

tion against fluctuating agricultural prices, overvalued currency, etc.). These unfavourable circumstances have only aggravated the impoverishment and under-consumption of small farmers, and the conjugation of several such circumstances has created genuine concentrations of hunger: Northeast Brazil with its combination of arid climate, vast estates alongside micro-holdings and predominance of one highly unstable crop, sugar cane; Bangladesh with its inadequate water control and micro-holdings resulting from unequal land distribution and overpopulation; and many countries of Sahel, Central and Eastern Africa.

Finally, in countries where no moderating action is taken, the very high fluctuations of agricultural prices that occur on unregulated international markets (fig. 4 and 5) strongly exacerbate the negative consequences of the long-term fall in real agricultural prices: periods of low prices lead to crisis, undernutrition and outmigration; periods of high prices mean that resource-poor importing countries, consumers and purchasers have difficulty procuring supplies, while food aid becomes scarce.

Unfavourable though these aggravating circumstances may be, and dramatic their consequences, the fact remains that the root cause of the massive crisis of small farming communities, of rural and urban poverty, and of hunger in poor agricultural countries lies basically elsewhere. Crisis and poverty were preordained the moment poorly equipped and unproductive small farming communities of these countries were exposed to *competition from other far more productive agricultural systems*, that had benefited from the agricultural or green revolutions and enjoyed other advantages of abundant land and low wages or subsidies, and the *resulting fall in real agricultural prices.* And there is no doubt that if the downward trend in real cereal prices (and therefore all agricultural commodity prices) continues, so will extreme poverty, undernutrition, hunger, massive rural outmigration and the escalation of urban slum dwellers.

4. The consequences of the impoverishment of under-equipped small farmers and the rural poor in the developing countries

The impossible development of poor agricultural countries

The crisis of deprived small farming communities in developing countries does not only produce a continuing renewal of rural and urban poverty. It also reduces the production capacities of poor agricultural countries and increases their food dependence (there are more than 80 low-income food-deficit countries). Above all, their serious lack of agricultural resources denies these countries a public budget and sufficient foreign currency to modernize, even by falling heavily into debt. They cannot therefore attract enough capital to absorb the build-up of urban unemployment and wages fail to rise much above the level of income of the poor small farming sector. Wages in different parts of the world closely reflect levels of small farmer income (fig. 6).

Insufficient effective demand and the slowing of the world economy

Half of humanity living in rural areas and urban slums finds itself with derisory purchasing power. The UNDP reports that 2.8 billion people live with under US$2 a day, and that 1.2 billion of these have less than US$1 a day. This desperate inability to meet social needs, this colossal under-consumption today constitutes the main factor holding back growth of the world economy.

World production already needs to increase by one-third to feed the current population of 6 billion people without undernutrition, while it will need to almost double to feed the 9 billion people projected in 50 years' time. There is therefore no global agricultural excess production, but rather a dramatic under-consumption that leads to the emergence of surpluses that are difficult to sell and that are in fact often sold at a loss, which only further discourages production.

The regulation of agricultural production through free international trade, which tends to align agricultural prices everywhere to the lowest existing level, is therefore doubly restrictive: on the one hand, it reduces production by eliminating ever-replenished strata of poorly-equipped small farmers and discouraging production by those that remain and, on the other hand, it reduces effective demand by lowering the income of small farmers, other rural inhabitants and rural migrants. Such a mode of regulation reduces both production and consumption and will fail to double production in 50 years or eliminate poverty and undernutrition.

These objectives can only be achieved by mobilizing the world's total land and human capacities. The agricultural revolution *stricto sensu* can be extended to certain parts of the developing world that have already experienced the green revolution and where motorized mechanization will help increase worker productivity and surface area, without necessarily boosting yields per hectare and production, but this will only reduce agricultural employment and therefore increase rural migration. The agricultural revolution can still enhance yields and production in some regions of the developed countries, but in other regions its excesses will need to be largely remedied. It could be adopted to recover millions of hectares of land that have been abandoned, because of falling real agricultural prices, in regions with some handicap (poor, high-lying, rough, stony, wet or dry terrain, etc.). However, this will only happen if agricultural prices are sufficiently high and if effective world demand actually corresponds to needs, meaning that world poverty is being effectively tackled. This will also only happen on the condition that research and development, which has so far prioritized the privileged regions, redirects a large proportion of its resources towards tailoring biological and mechanical progress to conditions in these regions.

Similarly, the green revolution in its classic form can still produce yield gains in some regions and penetrate further into a number of relatively favourable regions, but it will also have to rectify excesses in other regions. But all this will do nothing to resolve the problem of extreme impoverishment and undernutrition of hundreds of millions of rural inhabitants and small farmers. Not only will research and development need to be massively redirected towards disadvantaged regions and small farms but their economic viability will also need to be assured if they are to benefit from a "second green revolution". This presupposes significantly raising agricultural prices that are presently far too low to permit investment or progress, or simply to ensure survival beyond the duration of a project.

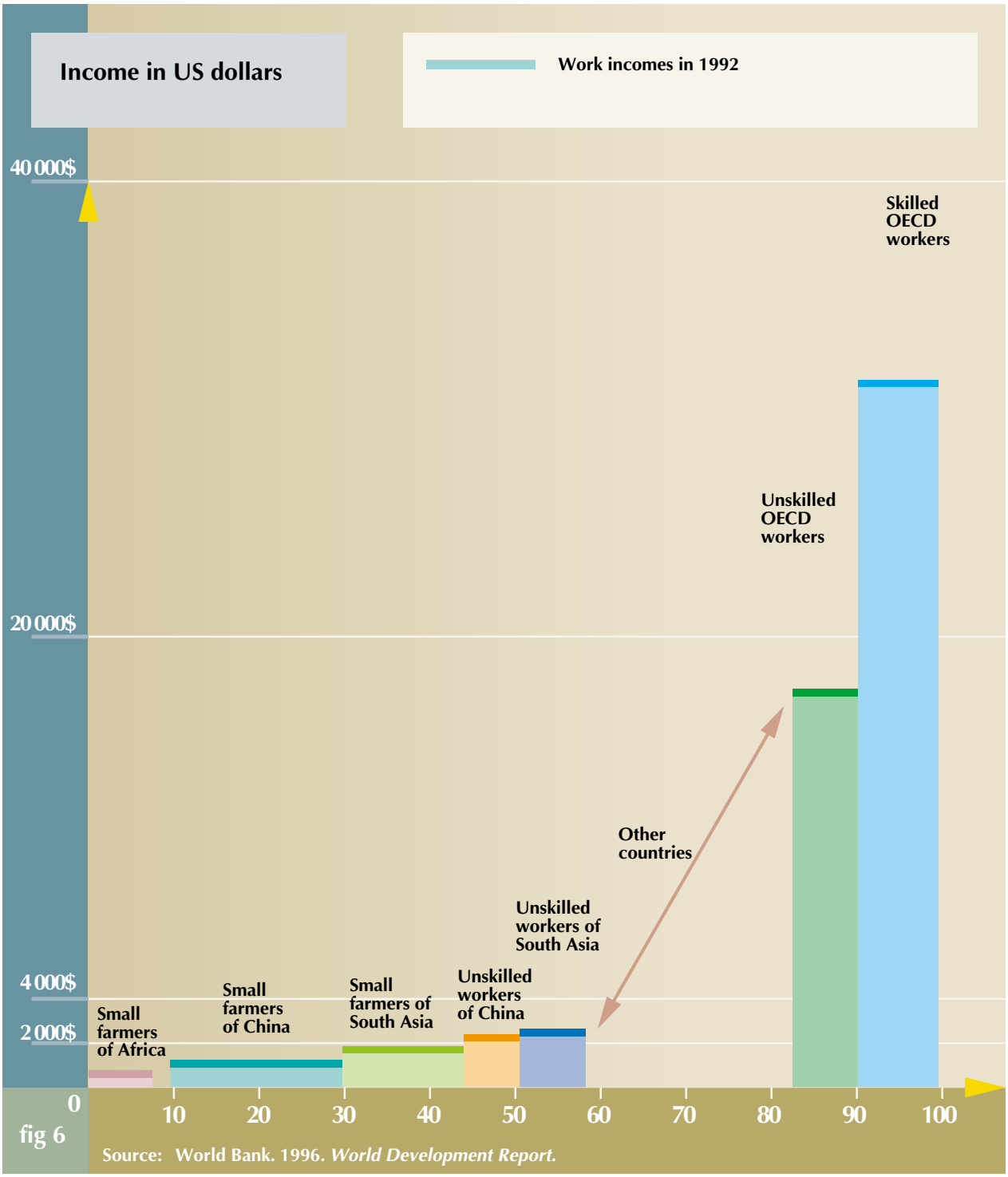

Figure 6
Scale of wages in the world in 1992

5. Proposals to effectively combat impoverishment, launch the development of the poorest sectors and revive the world economy

If our critical analysis is correct, one powerful mechanism to reduce the huge occurrence of rural and urban poverty, under-consumption and undernutrition that is slowing development of the world economy lies in a *gradual, significant and prolonged rise in agricultural commodity prices in developing countries*. This would serve to increase the earnings of under-equipped small farming communities and give them the means to survive, invest and develop; it would eliminate the source of extreme rural poverty and undernutrition; it would curb agricultural migration and curb urban unemployment and poverty; it would raise the general level of wages and other earnings; it would increase tax revenues and foreign currency earnings in the poorest developing countries, providing the means to invest in modernization and industrialization; finally, it would hugely expand effective global demand and broadly revive world growth.

Naturally, such a hike in prices should not be too sudden, as its positive impact on food production, poor farmer income and wages and other forms of earnings will not be very rapid, while the negative consequences of increased food prices for poor consumers and purchasers will be immediate. Any increase in staple food commodity price should therefore be sufficiently *gradual* for the positive impact on producers to always outweigh the negative impact on purchasers, and, if necessary, targeted food aid should be provided to the poorest consumer and purchaser groups.

Food aid cannot be in the form of low-cost food distribution, as this would only lower agricultural prices and therefore indirectly place the burden of such aid on agricultural producers and discourage production. However, it could be in the form of food stamps for the needy to enable them to buy food at normal prices, which should increase effective demand and encourage production. Such food stamps could be subsidized by government budgets, as in the United States, and/or by international aid.

If such a scenario is to be pursued, international trade in agricultural commodities needs to be reorganized and regulated along the following major lines that, once accepted in principle, will need to be defined in detail:

- Establish vast agricultural free trade zones grouping countries with relatively similar agricultural productivity (intertropical Africa, Europe, South Asia, etc.) and protect these *"large agricultural markets"* against cut-price surplus production imports by applying adjustable custom tariffs to obtain stable domestic prices that are sufficiently high for the less productive small farming communities of the less privileged regions to live off from their activity and even invest and develop.

- In order to avoid the accumulation of agricultural surpluses that are difficult to sell, negotiate commodity by commodity and periodically renegotiate international agreements fixing, as fairly as possible, an average export price, with export quotas and export prices assigned to each of these *large markets* and, if necessary, each country. Although setting remunerative agricultural prices might lead to exportable surpluses, as it happened in certain countries with an agricultural or green revolution, the advantage would be that reorganizing international trade would also curb rural migration, reduce unemployment, raise very low wages, increase food consumption of hundreds of millions of people and thus significantly increase effective demand for agricultural commodities.

- Establish a differential land tax that would be relatively high in the advantaged regions, but nil or negative in the disadvantaged regions, thus mitigating the inevitable differences in agricultural income that will occur among regions in each *large market*. The income differences that will nevertheless persist between well-equipped and less well-equipped farm holdings can be reduced by introducing graduated taxation on agricultural income, similar to that for other socio-professional categories, and by enacting legislation

against the accumulation of land whereby size of holding is limited to the area workable by two or three operatives, according to country and specialization.

- In most developing countries, this new organizational and regulatory framework for international trade in agriculture should put a stop to the extreme poverty and undernutrition of the poorest small farmers.

- In most countries, including developed countries, this new organizational and regulatory framework should help reduce the crisis of poorly productive small farming communities, curb rural migration and absorb unemployment. Once all small farmers can enjoy viable commodity prices, this new organization of international trade should withdraw the subsidies that high-income countries grant their farmers when these find themselves in difficulty from declining agricultural prices.

- However, this reorganization of agricultural trade will clearly not be sufficient in countries where the extreme poverty and undernutrition of vast numbers of small farmers and agricultural labourers are also the result of land scarcity and low wages imposed by the land-owning minority. Land reform will also be needed in these cases, as will legislation guaranteeing broad access to land and security of land tenure.

- Finally, restoration of national agricultural research and development services, which suffered from excessive austerity measures, and priority focus of national and international research on the needs of poorer regions and farms will be all the more justified by the fact that the new agricultural trade regime will guarantee success.

We need to add that the proposed organization and regulatory framework aim to safeguard the existence, independence and development possibilities of small farming communities and cannot be interpreted as a form of controlled economy intent on its elimination. We also need to note that while it might be difficult to establish and administer these *large regional markets* and *commodity agreements*, this will not be any more difficult than implementing the multiple subsidy systems that exist in the United States and European Union and that have become colossal headaches for farmers, their organizations and the administration, or any more complex than national protection systems such as those of Japan and Switzerland.

6. Conclusion

Experience in recent decades has shown that non-subsidized small farms need agricultural prices that are sufficiently high for them not only to survive but also to invest and develop, a situation that free trade in agriculture clearly cannot offer the vast majority of the world's small farmers. On the contrary, continued free trade with its downward trend in real agricultural prices and its price fluctuations will condemn further hundreds of millions of small farmers and agricultural workers to stagnation, impoverishment, migration and hence to unemployment and low wages, especially in developing countries but also to some extent in developed countries.

Small farmer holdings on the point of collapse or perhaps only in difficulty need to be protected. This means organizing and regulating a universally viable international agricultural trade regime, if poverty and undernutrition in the poorer agricultural developing countries are to be eradicated, if currently inadequate global demand is to be boosted, if the world economy is to be revived and if global unemployment is to be reduced.

It is not a question of choosing between globalization and non-globalization but of choosing between blinkered liberal globalization that blocks and excludes the poor and a carefully considered, organized and regulated globalization that is beneficial to all and should receive broad-based support.

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