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WORLD FOOD AND AGRICULTURE: OUTLOOK TO 2010

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Historical Evolution and Current Situation

In the last three decades the world as a whole made significant progress in the food and nutrition area. The world average per caput food availabilities for direct human consumption grew 19% between 1961/63 and 1993/95 to 2710 calories/day, while those of the developing countries grew 32% to 2550 calories (Figure 1). This happened while world population grew from 3.0 billion in 1960 to 5.7 billion in 1995. In parallel, the part of world population living in countries where per caput food supplies are very low (under 2200 calories) decreased considerably from 56% of world population in 1969/71 to only 10% in 92/94 (Figure 2). In the developing countries, part of the improvement depended on rising net food imports, particularly during the 1970s (Figure 10). However, progress has been very uneven and bypassed a large number of countries and population groups. There are currently still over 800 million persons undernourished, with high concentrations in Asia and sub-Saharan Africa (Figure 3).

In recent years, there has been a slowdown in the growth of world agricultural production. World cereals output stagnated and fluctuated widely in the first half of the 1990s. In per caput terms, it is now lower than in the mid-1980s (Figure 4). In parallel, production of marine capture fisheries seems to have hit a ceiling of about 80-90 m.tons and much of the increase in fish production is coming from aquaculture (Figure 5), a development likely to continue in the future. However, world average indicators have limited value for welfare analysis and the variables must be observed at a more disaggregated level. In practice, progress in food security need not manifest itself in rising world averages (i.e. with aggregate production /consumption rising faster than world population), but it is possible for progress to take place even if the world average stagnates or even falls². Thus, in the last ten years which witnessed the declines in the world averages, there has been no decline in the per caput production of cereals in the developing countries while that of all other food products (roots/tubers, pulses, bananas/plantains, livestock, sugar, oilseeds, fruit and vegetables, etc.) grew even faster than in the preceding ten years (Figure 6). The problem for the developing countries remains one of too low production and consumption per caput.

¹ Paper presented at the IFA Agro-Economics Committee Conference, Tours, France, on 23-25 June 1997. The views are the author's, not necessarily those of FAO.

² To understand how this is possible, consider the following example (based on approximate relative magnitudes for the developing and the developed countries): in a population of four persons, one is rich, consuming 625 kg of grain, and three are poor, each consuming 225 kg. Total consumption is 1,300 kg and the overall average is 325 kg. Thirty years later, the poor have increased to five persons (high population growth rate of the poor) but they have also increased consumption to 265 kg each. There is still only one rich person (zero population growth rate of the rich), who continues to consume 625 kg. Aggregate consumption is 1,950 kg and the average of all six persons works out to 325 kg, the same of 30 years earlier. Therefore, real progress has been made even though the average did not increase. Obviously, progress could have been made even if the world average had actually declined. Thus, if the consumption of the poor had increased to only 250 kg (rather than to 265), world aggregate consumption would have risen to 1875 kg but the world average would have fallen to 312.5 kg.

The declines in world cereals output per caput have been due, in the first place and up to quite recently, to policy reforms and supply controls³ coinciding with weather shocks in the main industrial exporting countries and, secondly in more recent years, to the collapse of production (as well as of consumption and net imports) in the countries of Eastern Europe and the former USSR following the drastic systemic reforms in their economies (Figure 7)⁴. Thus, the slowdown in world production in the first half of the 1990s may not be interpreted as ushering an era when the natural resource and technology constraints have become all of a sudden so much more binding to production growth (for this view, see Brown, 1996 and for discussion Alexandratos, 1996). What may prove to be a more permanent structural change in the world food system is the impact of policy reforms, in part linked to the new policy environment for international trade, mainly in the main western exporting countries, leading to the cessation of generation of quasi-permanent structural surpluses and the holding of large stocks by the public sector. This would enhance the risk over the medium term of higher variability in world market prices and reduced availabilities for food aid.

The persistence of significant undernutrition in the developing countries does not so much reflect a lack of capability of the world as a whole to produce the additional food required to eliminate undernutrition, which is a very small amount compared to current or future world food output (see FAO, 1996). It is rather due to the persistence of abject poverty, development failures (often linked to war and unsettled political conditions) and lack of appropriate social policies. In many low-income countries with high dependence on agriculture, overall development failures reflect, above all, failures of agricultural development. It follows that one of the main thrusts of national and international policies to solve the problem must be the promotion of local food production and broader rural development in these countries, so as to simultaneously increase food supplies and stimulate overall development. What are the prospects that progress may be made in the foreseeable future (to 2010)?

Prospects to 2010

We note that, in the first place, the growth rate of world population (including that of the developing countries) has been on the decline since the second half of the 1960s. However, the absolute increments in world population continue to be very high and are currently about 80 million persons p.a., over 90% of which in the developing countries). Such high annual increments may persist for another 15-20 years, but with declines in prospect for the longer term future, falling to some 40 million p.a. by 2050 (Figure 8, from the 1996 UN population projections, Medium variant). In parallel, the latest World Bank assessment indicates some improvement in the overall economic growth prospects of the developing countries for the next ten years compared with the preceding decade. Asia (both South and East) should continue to have fairly high GDP growth rates, while the prospects are for recovery in Latin America and a more modest one in Near East/North Africa.

³ Thus, the EU-15 production of cereals fell from 191 million tons in the 3-year average 89-91 to 178 million tons in 93-95, before growing again to 207 million tons in 1996 following the high world market prices and the relaxation of supply controls. Forecasts for 1997 indicate 202 million tons, while the latest EU-Commission Study (European Commission, 1997) foresees further growth (about 6% by 2005) under present CAP policies and 17.5% land set-aside. With the GATT limits for subsidized exports and minimum import access (implying net exports of 21.4 million tons after 2000) stocks would rise again rapidly to some 80 million tons by 2005 (currently: about 27 million tons). Other studies assume that there will be further CAP reforms and that the EU will eventually be exporting part of its surplus without subsidies, e.g. USDA (1997).

⁴ Some of the graphs in this note compare actual outcomes to the latest year for which data are available with projections made in 1986 for the period 1982/84-2000 (published in Alexandratos, 1988) and in 1992-93 for the period 88/90-2010 (published in Alexandratos, 1995).

Prospects are also better for sub-Saharan Africa, but only compared with the dismal past record of falling per caput incomes (Figure 9). Even so, the region's per caput income may not grow by more than 1% p.a., an outcome which does not augur well for the reduction of poverty and hence undernutrition.

These prospects indicate that further improvements may be expected in the world average indicators for the world and developing countries as a whole, but also that the food insecurity and undernutrition problems of many countries starting with very unfavourable initial conditions (mainly in sub-Saharan Africa and, to a smaller extent, in South Asia and selected countries in other regions) will persist, perhaps at slightly attenuated levels, in the medium term future and perhaps well beyond. For example, any country starting with per caput food supplies of 2000 calories/day (and some countries start with less) and a population growth rate of 3% p.a. would need a growth rate of aggregate food demand of 5-6% p.a. for 15 years if by 2010 it were to have 2700 calories/day, a level usually associated with significantly reduced undernutrition (provided inequality of distribution is not too high). Obviously, this kind of growth rates of aggregate demand for food can only occur in countries which "Asian-tiger" rates of economic growth and very low food consumption at present. Not many of the poorest countries of today face such prospects.

These overall economic and demographic prospects formed the basis for FAO's assessment of world food and agriculture prospects to 2010, with particular reference to the developing countries, in the study "World Agriculture: Towards 2010" (Alexandratos, 1995). The main findings may be summarized as follows:

- The per caput food availabilities of the developing countries as a whole will continue to increase from the current (1993/95) 2550 calories to 2700-2800 by 2010. However, there will be only very modest gains in the currently very low average of sub-Saharan Africa, while South Asia may still be in a middling position by 2010. The other developing regions, already starting from better levels now, are expected to be near, or above, 3000 calories (Figure 1).
- The incidence of undernutrition in the developing countries may decline in relative terms (as % of the population) but, given population growth, there will be only modest declines in the numbers undernourished from the current level of over 800 million persons. High incidence of undernutrition will persist in sub-Saharan Africa, and somewhat reduced one in South Asia (Figure 3).
- Local production increases will be by far the main source of the increases in the total food supplies of the developing countries, but their net food imports from the rest of the world should continue to grow, though not at very high growth rates. Net imports of cereals may grow from the 90 million tons of the base year of the study (1988-90) and the 100-110 m.tons of more recent years to about 160 million tons by 2010 (Figure 10). It will be necessary for part of these imports to be supplied as food aid if the modest additional imports of the very poor countries are to materialize.
- The rest of the world (mainly the main exporting OECD countries) should face no major constraints in generating this additional export surplus of cereals, given that (a) their own demand grows very slowly and below the potential of their agriculture to increase output, and (b) part of the additional import requirements of the developing countries are being offset by declining ones of the region of E. Europe / ex-USSR which was a heavy net importer in the pre-reform period (some 35 million tons in 1989-91), but may be a modest net exporter by 2010. The region's net imports had already been reduced to insignificant levels by the mid-1990s.

- As in the past, and more so in the future, the mainstay of production increases will be the intensification of agriculture in the form of higher yields and more multiple cropping, particularly in the countries with appropriate agroecological environments and little or no potential to expand land in cultivation. However, the growth of yields will be slower than in the past (Figure 11) and so will expansion of irrigation. Achievement of even this slower yield growth depends on continuing high priority to the agricultural research and technology diffusion effort, as well as better policies and a more active role of the state in the areas of infrastructure, education and the creation of conditions for markets to work.
- It is probable that some countries will derive part of their production increases from further land expansion. Overall, land expansion, mainly in Latin America and sub-Saharan Africa, may contribute about 20% of the increase in crop production. This increase (some 90 million ha, or 12%, in the developing countries as whole, excl. China) is a small proportion of the total unused land with rainfed crop potential (some 1.8 billion ha, Figure 12). Naturally such unused land should by no means be considered as a 'reserve' for agricultural expansion. Some 50% of it is under tropical forest and large tracts are environmentally fragile or suffer from other constraints, including lack of infrastructure, incidence of disease, etc.
- Concerning the environmental and sustainability dimensions of the expansion and further intensification of agriculture, we note that (a) the foreseen land expansion need not be associated with the rapid rates of tropical deforestation observed in the past, though there is no guarantee that this will be so; (b) there will be further increases in the use of agrochemicals (fertilizer, pesticides) in the developing countries, though at declining rates compared with the past; (c) increased use of fertilizer is often indispensable for sustainability (to prevent soil mining); and (d) the need to accept trade-offs between production increases and the environment will continue to exist in the foreseeable future and the policy problem is how to minimize them.
- This being an IFA Conference, it is worth looking at possible developments in fertilizer consumption. We first note the decline of world consumption in the last few years, which has been entirely due to the collapse of consumption in the former socialist countries (Figure 13). As noted, we expect consumption in the developing countries to continue to grow, albeit at lower rates than in the past (Figure 14). This trend towards slowdown in the growth rates is evident in the historical data. The data and methods for projecting fertilizer use as a function of economic factors and changes in volume, patterns and modalities of crop production, are in great need of improvement. We shall have an opportunity to review where we stand on this matter at the planned meeting of the Working Party on Fertilizer Demand tomorrow evening.

In conclusion, our findings leave no scope for complacency concerning the prospects that progress will be of a pace and pattern such as to eliminate, or significantly reduce, the food insecurity problems in the foreseeable future. This is a pragmatic and far from optimistic assessment, no matter that those who think that the world is going to end tomorrow will find as unduly optimistic any notion that further progress, slow and uneven as it may be can be made.

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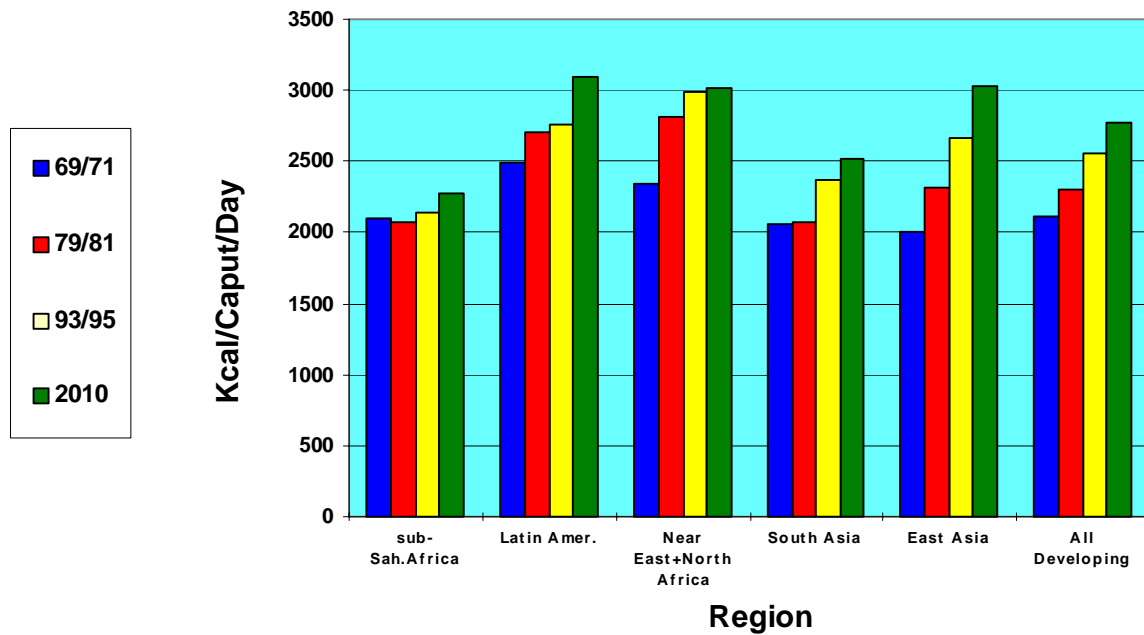
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Fig. 1. Per Caput Food Supplies, Developing Regions



Updated to 95, 16-6-97, data in File s/TCAL6195

Fig.2. World Population Living in Countries with Given Food Supplies (Kcal/Caput/Day)

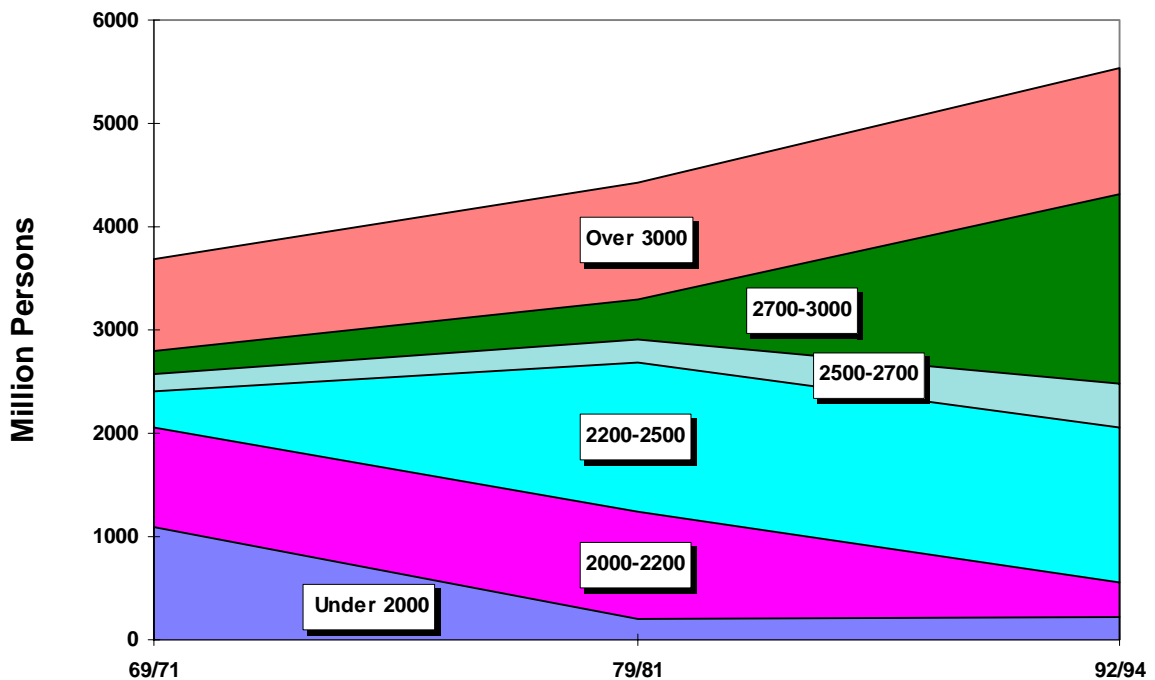


Fig.3. Incidence of Undernutrition

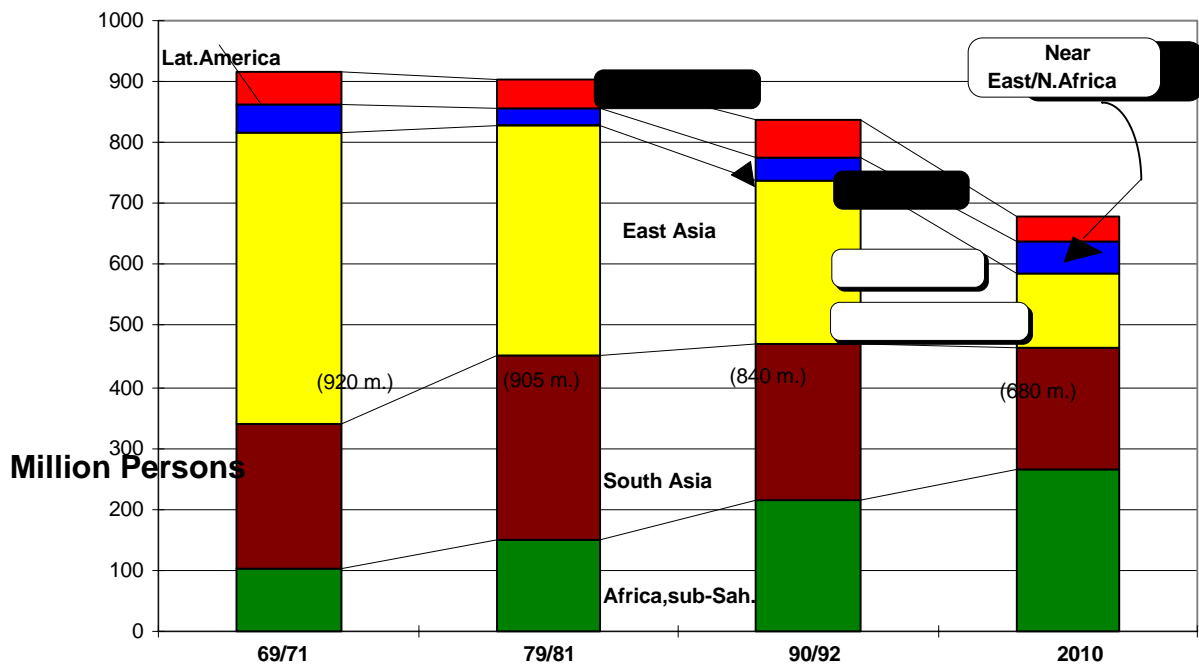
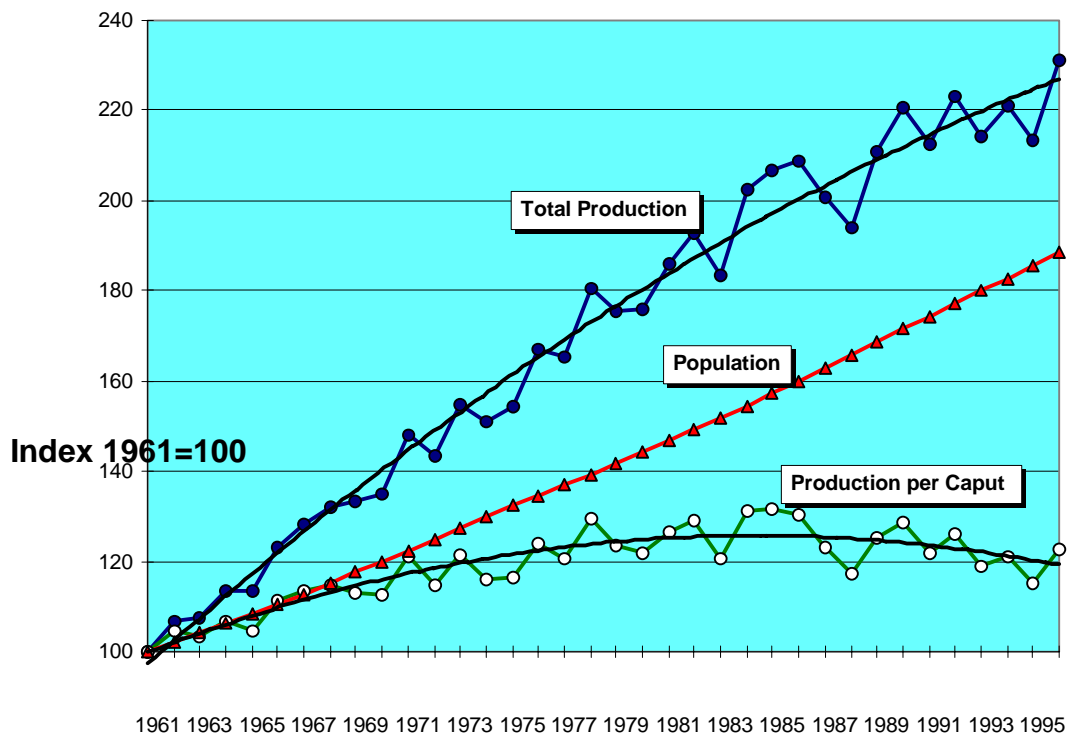
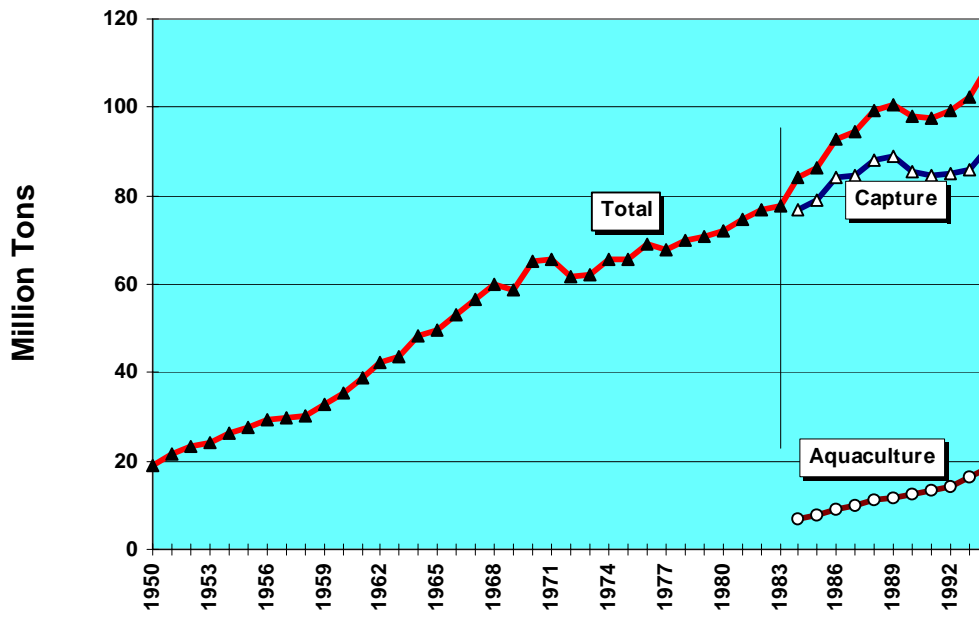


Fig. 4. WORLD CEREALS PRODUCTION 1961-96 (Indices)



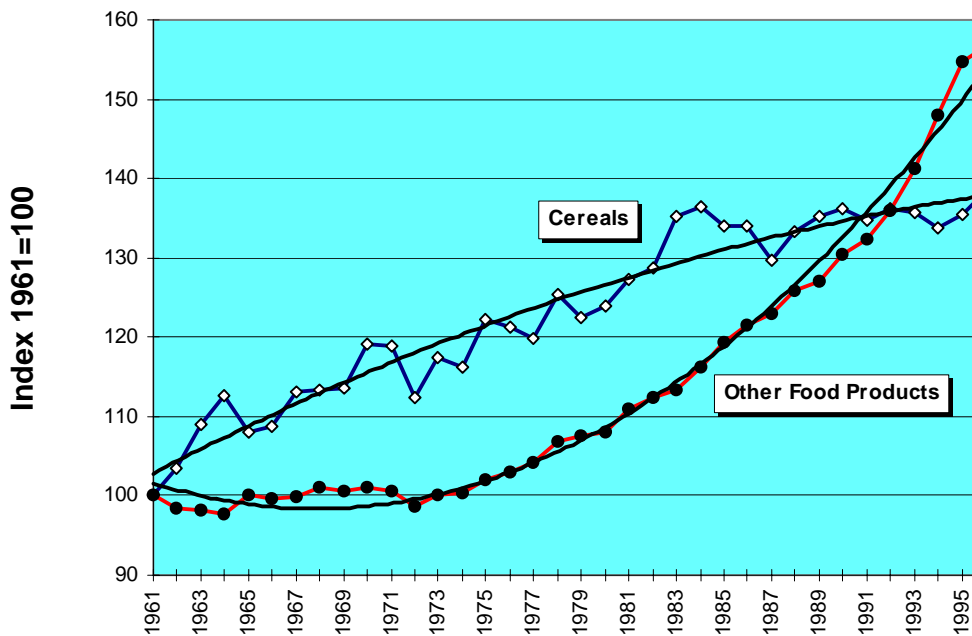
Updated Faostat data 12-6-97, File IFA-GRAF.Xls

Fig. 5. Production of Fish,Capture and Aquaculture,1950-94



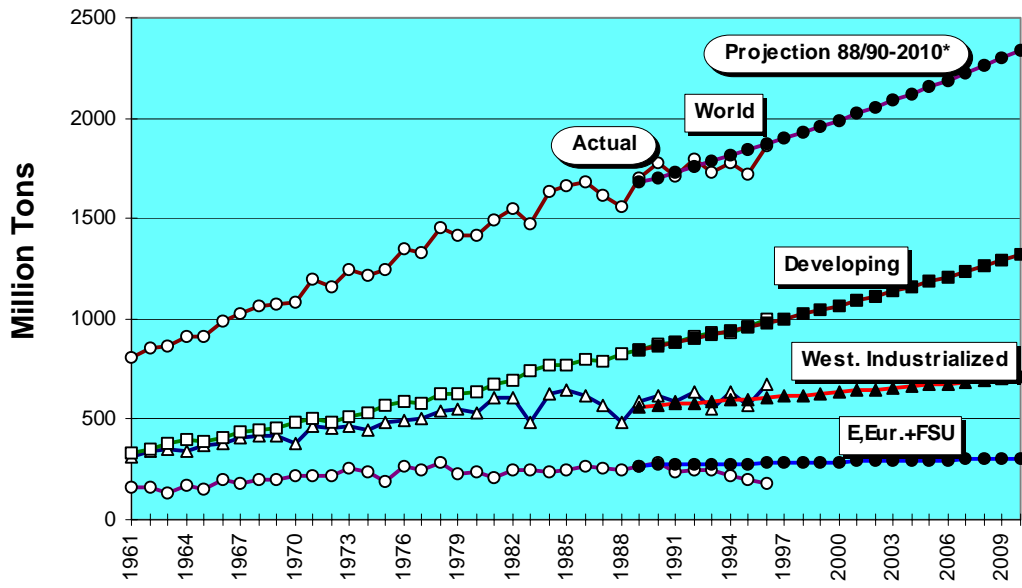
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Fig.6. Developing Countries: Per Caput Prod. Cereals Vs Other Food



FSTAT data 13-6-97,File IFA-GRAF.Xls

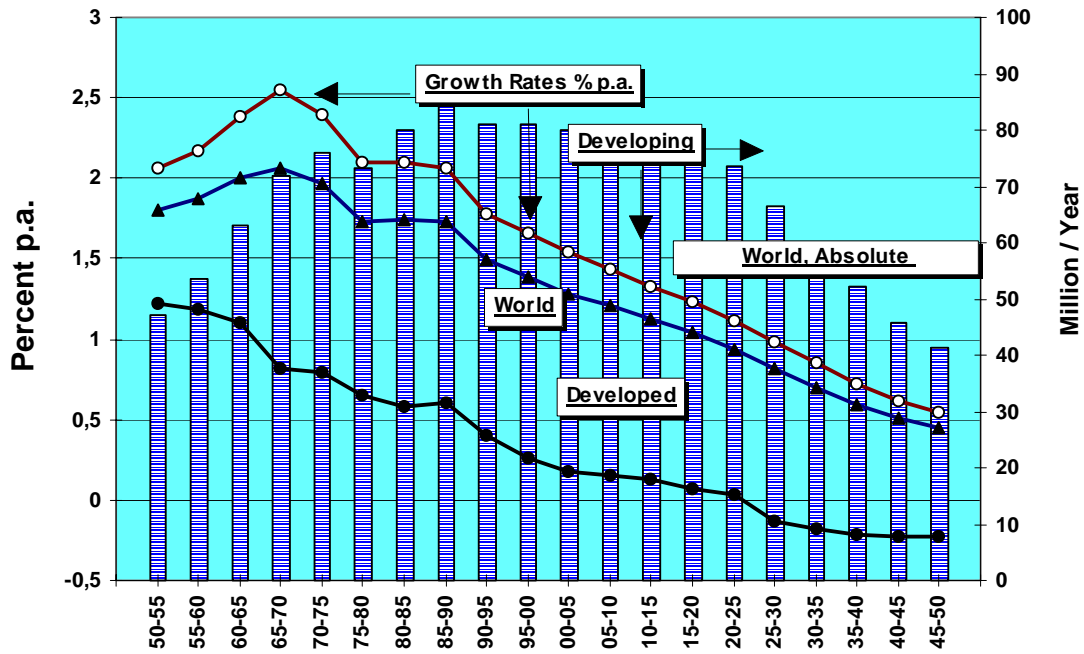
Fig. 7. Cereals Production (with Rice in milled)



Updated 16-6-97, File FGR24MAY.Xls

*Source: Alexandratos(1995):145-50

Fig.8. Population, Absolute Increments and Growth Rates 1950-2050



Source, UN(1996), Medium Variant Proj., File Pop96AT.Xls

Fig.9. Growth Rates of per Caput GDP

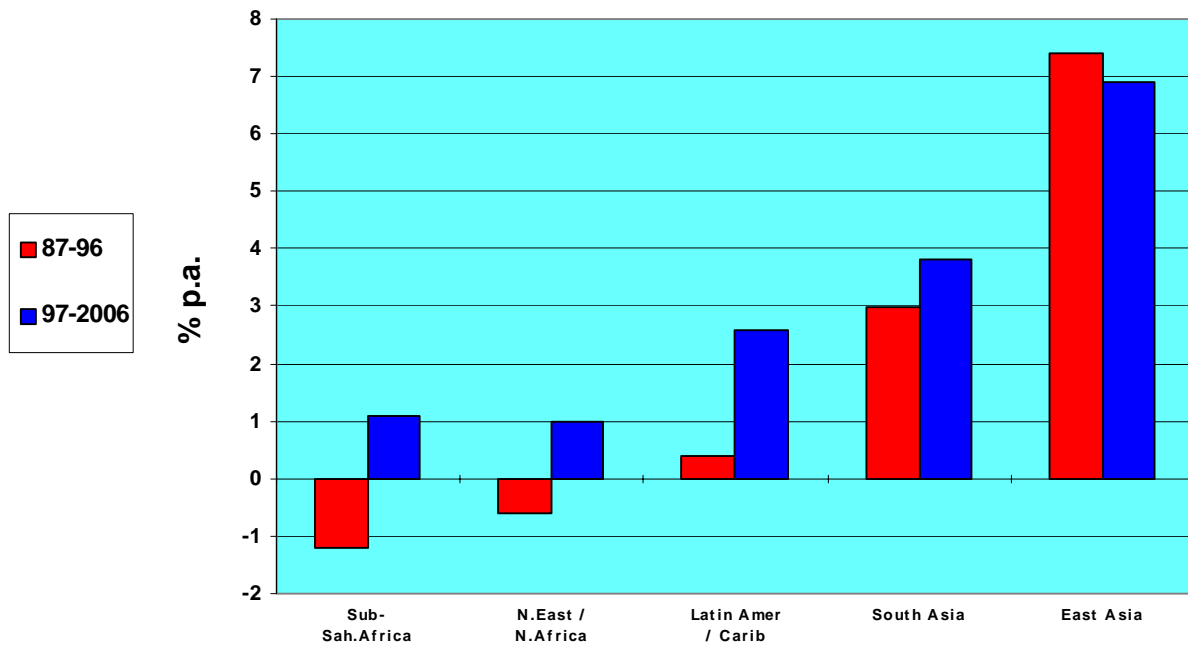
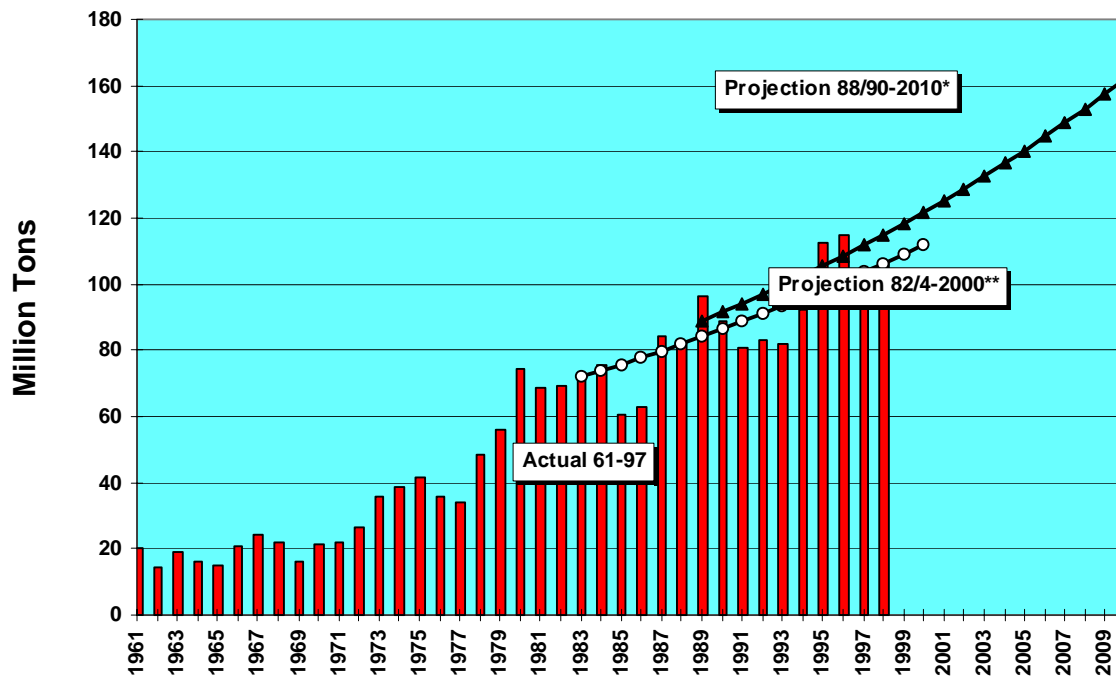


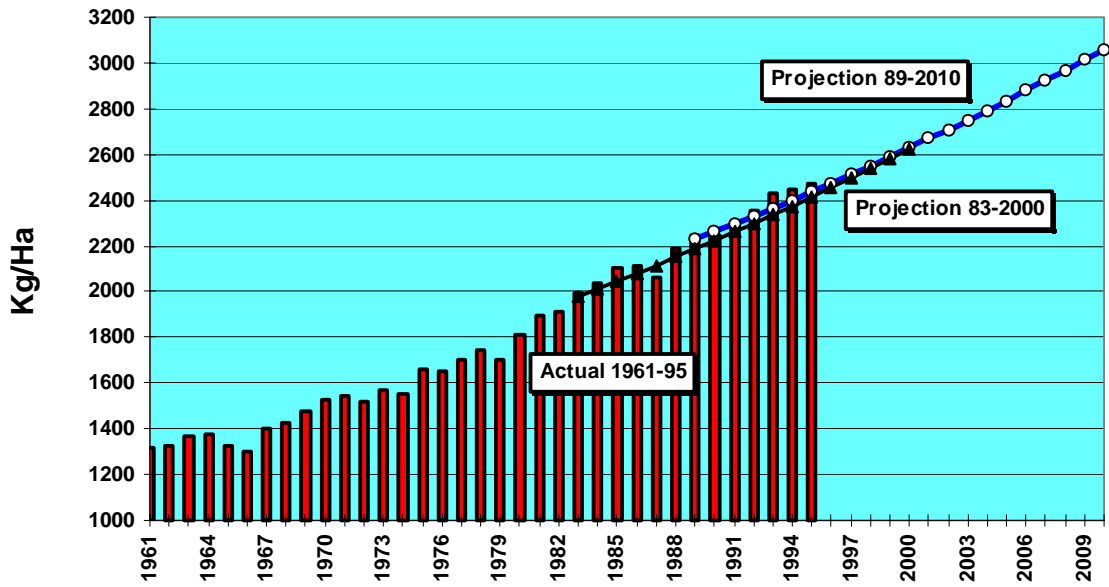
Fig. 10. Net Cereal Imports, Developing Countries



* Alexandratos(1995):145 **Alexandratos(1988):106

Data for the last three years refer to trade years (July/June):96/7 estimate,97/8 forecast (*Food Outlook* , 5-6/97, Upd.12-6-

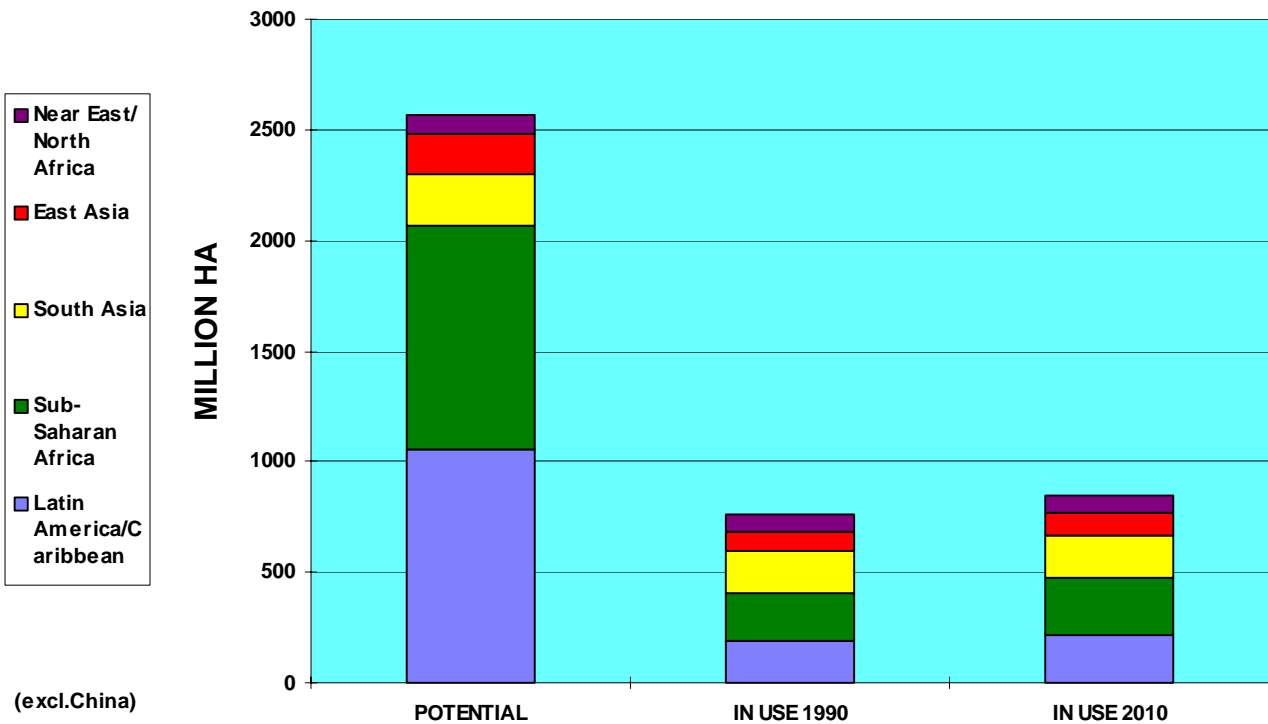
**Fig.11. Yield of Wheat, Rice (paddy) and Maize
Developing Countries, excl.China**



Projection 88/90-2010 from Alexandratos (1995),p.169;
Projection 82/4-2000 from Alexandratos(1988),p 123.

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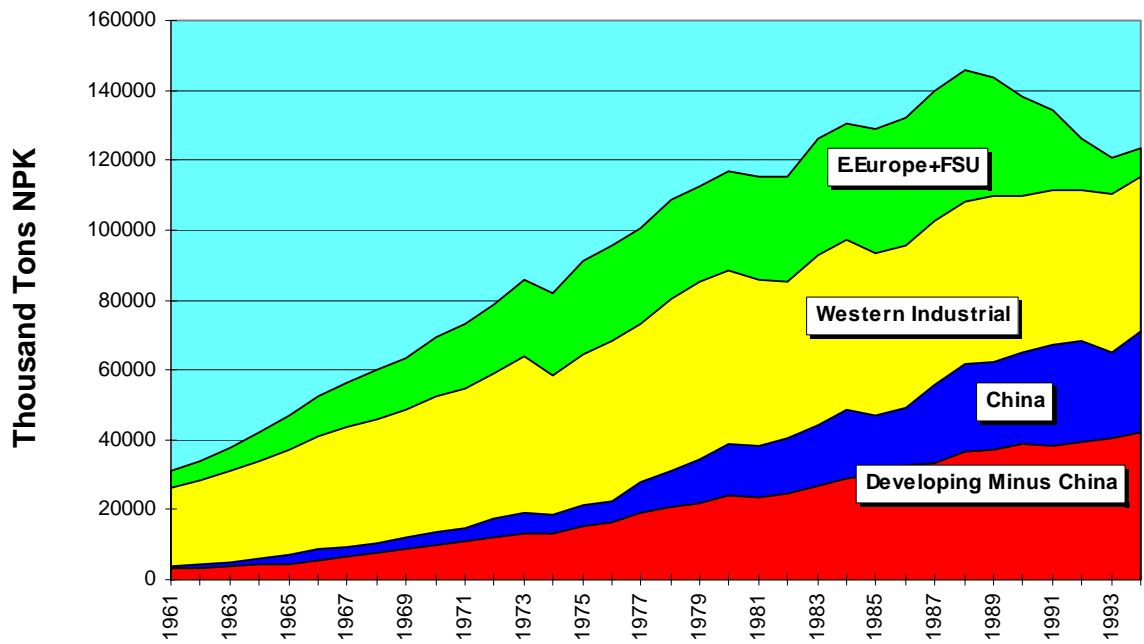
Fig.12. Land with Rainfed Crop Production Potential



(excl.China)

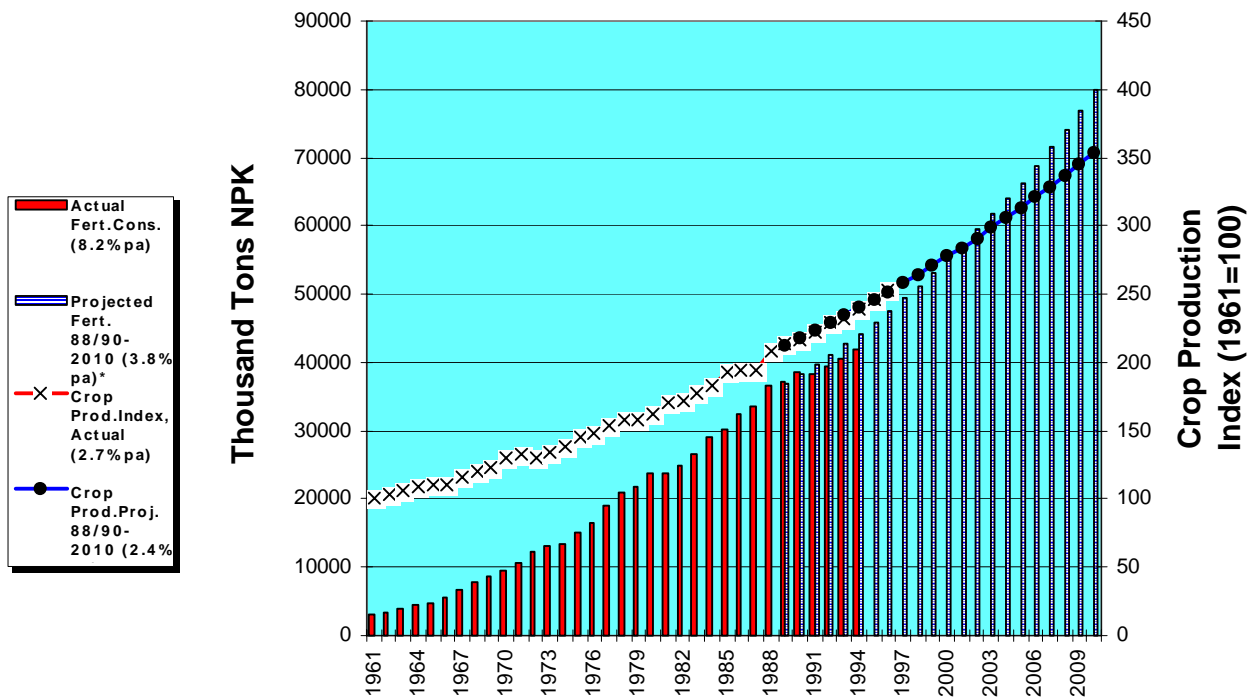
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Fig. 13 Fertilizer Consumption, 1961-94



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Fig.14. Fertilizer Consumption & Crop Production, Developing Excl.China



*Source: Alexandratos(1995):85,193

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