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Agrekon

VOL. 14 No. 4

OCTOBER 1975

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Articles in the field of agricultural economics, suitable for publication in the journal, will be welcomed.

Articles should have a maximum length of 10 folio pages (including tables, graphs, etc.) typed in double spacing. Contributions, in the language preferred by the writer, should be submitted in triplicate to the Editor, c/o Department of Agricultural Economics and Marketing, Pretoria, and should reach him at least one month prior to date of publication.

The Journal is obtainable for the distributors: "AGREKON", Private Bag X144, Pretoria.

The price is 25 cents per copy or R1 per annum, post free.

The dates of publication are January, April, July and October.

"AGREKON" is also published in Afrikaans.

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2001 THE WORLD FOOD SITUATION*

by

H.I. BEHRMANN
University of Natal, Pietermaritzburg

A distinction may be made between the short-term and the long-term situation. Crop failures, the energy crisis and world-wide inflation, with consequent sharp increases in production costs, have aggravated grave shortages, particularly of grains, which have prevailed since 1972. It is not possible at present to see the extent to which new variables such as the higher cost of fuel, which have been with us for 2 years, are likely to have long-term effects. The underlying food problem, which is presented below, indicates a deeply significant world-wide situation which is independent of short-term effects.

HOW IS FOOD PRODUCTION MEASURED?

The best available statistics on the world food situation are obtained from national food balance sheets which are brought together by the FAO in Rome. The dietary energy supplies of each country are measured in terms of kilocalories per caput, a kilocalorie being defined as the amount of heat required to raise the temperature of a litre of water from 15 to 16 °C. Proteins, starches and fats in foods are converted into this common denominator.

The amount of food available per head of the total population in a country does not show how the food is distributed within that population. A country with an average supply in excess of estimated human needs per head may still have sections of its population that are undernourished.

Dietary surveys within a country enable the distribution of food according to socio-economic group, area, race, and so on, to be measured. Such surveys are, however, costly, but they are necessary if food balance sheet data are to be augmented in a meaningful way.

An average dietary requirement is difficult to measure because the requirements vary according to

age, sex and degree of physical activity. The "reference man" in a population is a mythical individual, but the norm appears to be for a person requiring about 2 600 kilocalories per day, and the norms adopted by the FAO vary from country to country.

THE PRESENT SITUATION

Of 33 developed countries listed by the FAO in a recent report (1974) relating to the year 1970, all but one, Albania, were more than able to meet their dietary energy requirements. Of 95 developing countries, 33 were able to meet their requirements by small margins, and 62 had overall dietary deficits. South Africa is listed as a developed country with 2 730 kilocalories per caput, or 111 per cent of requirements.

At the world level, the dietary energy supply is estimated as 5 per cent above requirements in 1970. The developed regions had more than 20 per cent above requirements, while the developing regions had a total deficit of 3 per cent. Average protein intake in the developing regions was only 60 per cent of that of countries in the developed regions, and much of these smaller intakes is being diverted from their true use in order to meet energy deficits.

Table 1, which lists a few selected countries, shows that highly developed Western countries produce food well in excess of their essential requirements. Cereal consumption per head in these countries, with the exception of Italy, tends to be lower than in countries like Japan, India and South Africa, where meat consumption per head is comparatively low. South Africa is a low consumer of root crops such as potatoes, and its meat consumption per head is only half of that in the United Kingdom and Italy.

A dietary energy supply of 3 200 kilocalories per person per day is 20 to 25 per cent above calculated nutritional requirements. Such levels and patterns of food consumption, as found in developed countries, may be associated with various forms of malnutrition due to overeating and a proneness to degenerative diseases.

* Lecture given at the Winter School, University of Natal, Durban, July 1975.

TABLE 1 — Average dietary energy supply and per caput consumption of some basic foods in selected countries, 1969-71

Country	Per caput consumption (kg per year)			Dietary energy supply		
	Cereals	Starchy roots	Sugar	Meat	Kcal per caput/day	Per cent of requirements
Canada	94	74	55	92	3 180	129
United States	90	53	56	111	3 330	126
Denmark	89	83	55	63	3 240	120
France	104	100	42	95	3 210	127
United Kingdom	107	44	53	76	3 190	126
Italy	187	101	53	76	3 190	126
Japan	180	36	28	20	2 510	107
New Zealand	100	69	52	112	3 200	121
Brazil	115	135	47	32	2 620	110
South Africa (1971-72)	159	25	37	43	2 730	111
India	176	17	18	2	2 070	94

Source: Ojala (1975) and Food Balance Sheet of South Africa (1971-72).

A supply equal to 94 per cent of requirements in India means that if all the food available was distributed to individual inhabitants according to nutritional need, some 6 per cent of the population or 35 million people would have nothing. A minority, in fact, eat better than average, and for many millions, food consumption is much more than 6 per cent below the level of their needs.

Cereals are the most basic food and are abundant in industrialised countries. In Canada and the United States, cereals are used at the rate of 800-900 kg per person per year (Table 2). Only about one tenth of this quantity is consumed directly as food, most of the remainder being fed to livestock to produce more expensive foods such as meat, milk and eggs. In Europe, 400-450 kg per person is used, of which about one fourth is consumed directly, and about one half is used for animal feeding; the balance is used for manufacturing purposes. In South Africa, more than half of the cereals are used for human food and nearly a third for feeding livestock, but in India nearly 90 per cent is used as food.

The developed countries, with about 30 per cent of the world population, were responsible for 54 per cent of the total consumption of cereals for all uses in 1970. The 370 million tons of grain used annually for livestock feed in these countries are more than the total human consumption of cereals in China and India together.

An estimate was made for the World Food Conference of the number of hungry people in the world. This is the number of people whose food intake is below the energy required for maintenance, so that they are forced to reduce activity, which means impaired working or learning ability, or reduced growth if they are children, or a steady loss of body weight. The estimate is 460 million people, excluding China. About half of these are children, and 28 million are estimated to live in developed countries.

TABLE 2 — Use of cereals in selected countries, 1969-71 (average)

	Total use	Food	Non-food	
			Feed	Other
(kg per caput)				
Developed Countries:				
Canada	938	95	727	116
United States	805	90	650	95
France	449	104	299	46
United Kingdom	414	107	244	63
Japan	313	180	102	31
New Zea- land	261	100	128	33
South Africa	304	186	91	27
Developing countries:				
Brazil	246	115	95	36
India	205	176	2	27

Source: Ojala (1975) and Food Balance Sheet of South Africa (1971-72).

Such a situation is unacceptable in this century: 15 per cent of mankind without enough to eat. It may, however, be added that Colin Clark (1967, p. 125) has averred that estimates by the FAO of the numbers of hungry people in the world are too high. There is, however, no doubt that many millions do go short of food.

A consoling fact is that, over the decade of the 1960's in the developing world as a whole, average per caput food supplies increased from 91 per cent of requirements to 95 per cent. But because of the rapid increase in total population the actual number of people who are undernourished may have increased.

The main cause of this situation is poverty. Most of the poor people in the developing countries are in the rural areas, either in families of landless

agricultural labourers or as subsistence farmers whose holdings are so small that they find it difficult to feed their families adequately even in good harvest years. Such people may be caught in a vicious circle of undernutrition and underemployment. When heavy work has to be done, they may not have the energy to do it.

People in the worst nutritional situation are probably the urban poor and particularly the recent migrants from rural areas. They have no access to subsistence food production and they lack regular employment or adequate income to buy sufficient food.

As a result of poor nutrition, infant mortality is high. Paradoxically, an improvement in feeding would reduce child mortality and lead to an acceleration of population growth.

PAST TRENDS IN FOOD PRODUCTION

Table 3 shows a heartening increase in food production in the world during the period 1962 to 1972. On the average, all countries have maintained a rate of increase of 2,7 per cent per year in relation to a population growth rate of 1,9 per cent per year. In many individual countries, however, developments have been less favourable. In almost 40 per cent of developing countries, food production failed to keep pace with population growth.

TABLE 3 — Rates of growth of food production in relation to population, 1962-1972 (exponential trends)

	Population	Food production	
		Total	Per caput
		(Per cent per year)	
Developed countries	1,0	2,7	1,7
Developing countries	2,5	2,7	0,2
World	1,9	2,7	0,8

Source: FAO (1974)

Where food production increases have exceeded the population growth, governments have invariably taken the lead and farmers have responded. Government measures take the form of the provision of infrastructure, i.e. the framework outside the farm such as roads, dams and education, research and advisory services and incentives for farmers, such as price supports and new markets.

The latter part of the sixties saw notable advances in the introduction of new high-yielding crop varieties and the associated "green revolution" technology, particularly in food-deficit countries of the Far East. The seventies started badly, for the fall in world food production in 1972 persisted until 1974, when the situation was aggravated by an atmosphere of uncertainty brought on by the energy crisis and

inflation. These events led to the calling of the World Food Conference in Rome in November 1974.

FUTURE DEMAND FOR AND SUPPLIES OF FOOD

Projections to the year 2000 show that, for the world as a whole, the demand for food will double but for the developing countries it will nearly treble. It is consequently necessary to double world food supplies between 1970 and 2000 in order to keep up with demand, of which the main component is population growth.

In the developing countries, food supplies would need to double in 20 years from 1970. The last doubling of food production took 25 years from 1948 to 1973, both for the world and for developing countries.

Table 4 extrapolates to 1985 the exponential trend in food production from 1961-63 to 1973 and compares the results with expected population growth and expected demand. For the world, production would match demand. In the developed countries, there would be a substantial excess of production over their own domestic demand, and this would only materialise if called for by export demand.

In the developing countries, the rates of production increase will not keep up with the population growth expected in 1970-85, for they would cover little

TABLE 4 — Extrapolations of food production in comparison with population growth and with demand projections, 1970-85

	Production	Population	Domestic demand		
				(% per year)	
Developed countries	2,8	0,9	1,6		
Developing countries	2,6	2,4	3,5		
World	2,7	2,0	2,5		

Source- FAO (1974)

more than two thirds of the projected expansion in demand or 2,6 per cent as against 3,5 per cent per year increase in demand.

To meet their needs in cereals, the net importing countries among the developing economies would by 1985 need to double their annual net imports of 1969-72. Such countries would not be able to export sufficient other goods to the developed countries to meet the import bills, even if there was an immense increase in food aid to cover part of the needs.

What is clear, therefore, is that a substantial acceleration is essential in the expansion of food production in the developing countries themselves. The projected increase in the demand for food could be equalled if the RAO Indicative World Plan for Agricultural Development (1969) was adhered to, for

it proposed an annual rate of increase of production of 3.7 per cent in the developing countries for the period 1961-63 to 1985.

Colin Clark (1967, p. 153) has estimated that the world could produce sufficient food on available land for 47 billion people with good standards of production and at a United States standard of consumption, which is in excess of normal dietary requirements. At subsistence levels, 157 billion people could be fed. The FAO (1974) refers to estimates of from 50 to 130 billion people. But such projections are a far cry from what is actually happening or is likely to happen, and there is no reason for complacency about food supplies and population growth.

AGRICULTURAL EFFICIENCY AND EMPLOYMENT

The world population in 1975 is estimated at 4 000 million (4 billion) people, of whom almost half are dependent upon agriculture for a living and for their welfare. About half of the work force of the world is engaged in agriculture, and in certain African countries more than 90 per cent of workers are in farming. The United States, on the other hand, feeds its own population at high levels, but also exports grains to the rest of the world, with only 4 per cent of its work force in agriculture. The United Kingdom has 3 per cent of its workers in farming, while New Zealand exports 3 or 4 times as much food as is consumed at home, with 12 per cent of the economically active population in agriculture. A food surplus is therefore produced at high levels of farm labour productivity.

The high productivity of farm labour in developed countries has been shown by Ruttan (1974) to be the function of three factors:-

- (1) Resource endowments, i.e. available land and livestock;
- (2) technical inputs, particularly machines and fertilizers; and
- (3) human capital, as represented by the general and technical education of the labour force.

Technical inputs and improvements in human capital have now come to be recognised as factors that outweigh the role of land in increasing food production.

A WORLD FOOD POLICY

The United Nations World Food Conference in 1974 represented a positive move to bring the various nations together to evolve a policy to meet the world's food shortages. One of its principal recommendations to the General Assembly was the formation of a World Food Council to serve as a co-ordinating mechanism for food production, nutrition, food security, food trade and food aid. Essential features of a world food policy would be:

- (1) An acceleration of food production in developing countries, with governments establishing national

goals in conformity with their development plans. More production will have to come from higher yields per hectare.

- (2) An increase in the flow of international development assistance for agriculture.
- (3) The implementation of a policy of minimum food security, by co-ordinating national stocks, and assistance to developing countries to build up and maintain food reserves.
- (4) The establishment of an improved world food information and outlook system incorporating better crop forecasting and weather reporting.
- (5) The elaboration by governments and industry of a generally accepted world fertilizer policy.
- (6) Better facilities for the education of farm workers, and for the fuller employment of underemployed labour. Because capital is scarce and labour plentiful, there is more scope for labour-intensive than capital-intensive agriculture.
- (7) More provision for nutrition education and the better use of available food supplies.
- (8) With greater urbanisation, more food will be marketed off the farm, and improved marketing has an important role to play in providing incentive prices to farmers.
- (9) The relationship between agricultural and economic development policies and population policies needs to be determined. Changes in attitudes toward family size, through factors such as the increased cost of educating children, higher aspirations, lower child mortality and rising incentives to invest on the farm, need to be known. Reduction of the rates of population growth is likely to be easier in a more favourable social environment.

ACKNOWLEDGEMENTS

The writer is indebted to Dr Giovanni Giannini of the FAO, Rome, who sent him the papers pertaining to the World Food Conference. He has also drawn from the valuable articles by the FAO (1974) and Ojala (1975) that are given below.

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