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AGRICULTURE IN A TURBULENT WORLD ECONOMY

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Undernutrition: Extent and Distribution of its Incidence

DEFINITION OF UNDERNUTRITION

A widely accepted definition of *malnutrition* is that it is a pathological state, general or specific, resulting from a relative or absolute deficiency or an excess in the diet of one or more essential nutrients (Scrimshaw, *et al.* 1968). Of the various forms of malnutrition such as specific deficiency, imbalance, undernutrition and overnutrition, the primary concern of this paper is with *undernutrition*. This is not because other forms of malnutrition are not prevalent in developing countries but only because either some other deficiencies (e.g. protein) seem to be closely associated with energy undernutrition or their implications are well understood. Undernutrition has been defined as a pathological state arising from an intake of an inadequate amount of food, and hence of energy, over a considerable period, with reduced body weight as its principal manifestation. Implicit in this definition is the notion that energy intake (that is the energy content of food intake measured in kilocalories or megajoules per day) *required* in order to maintain body weight (and to continue performing whatever energy using tasks that are associated with one's occupation) is well defined. This assumption has increasingly come under attack on several grounds. First, it is inconsistent with the observation of several investigators who found a large variation in intakes of otherwise similar individuals engaged in similar activities. An early study by Widowson (1947) showed a coefficient of variation of 20 per cent in intakes of individuals of the same age, sex and similar activity patterns, even after allowances were made for differences in the body weight. There have been several such findings since then. Second, it is now being recognised that an individual can remain in good health and in energy balance with intakes varying over a wide range (Sukhatme and Margen 1982). Third, it has been found (Durnin 1979) that there are individuals, indeed whole population groups, who maintain energy balance at astonishingly low intakes with no apparent consequences in terms of their health or activity. Fourth, the common assumption that dietary induced genesis is a relatively small part of the energy requirement is question-

*presented by J. W. Mellor.

able. Thus a high resting metabolic rate (RMR) instead of signifying a high energy (food intake) *requirement* may instead be a *consequence* of high intake. Sukhatme and Margen (1982) suggest that the thermic effect lasts for several hours and can account for as much as 20 per cent in RMR depending on the quantity and composition of the meal. Finally, in societies in which there are significant seasonal variations in intensity of work and food availability, there appear to be corresponding variations in energy expenditure of individuals. Indeed Sukhatme has argued that a large part of the total energy intake of an individual is dissipated as heat and it is this part (rather than activity) that adjusts to variations in intake. Thus, there is a homeostatic mechanism that adjusts the metabolic efficiency of energy use so that when total energy intake is reduced (increased) the system wastes less (more) energy as heat. Of course there are limits to homeostatic adjustment so that intakes outside these limits lead to deleterious consequences such as wastage or obesity, reduction in activity, etc.

Besides the conceptual problems with the assumption of a constant energy requirement, there are problems with the data base on which the FAO/WHO requirements rest. It consists largely of studies of Caucasian populations of industrialised countries. The applicability of energy requirements derived from these data to populations of differing ethnic and environmental backgrounds is yet to be demonstrated. Yet most of the estimates of the prevalence of undernutrition in the world are based on these requirement estimates.

EXTENT OF INCIDENCE OF UNDERNUTRITION

There are broadly three approaches to the estimation of the extent of prevalence of undernutrition in a population. The first involves the use of clinical and biomedical evidence to determine whether an individual exhibits symptoms associated with dietary inadequacy and/or imbalance and then estimate the proportion of the population exhibiting such symptoms. The second approach uses anthropometric indicators such as body weight, height, skinfold measurements, etc. and judges the nutritional status of an individual in relation to some standards relating height to age, weight for age, height to weight, etc. The third approach involves judging nutritional status by comparing actual intake of a nutrient by an individual with some standards (as for instance, the FAO/WHO energy and protein requirements).

The first two are outcome-based approaches in that they identify an observed outcome such as departure from some standard relationship between anthropometric measures or a clinical symptom with nutritional status. Obviously, in the absence of other supporting evidence, it is often difficult to judge whether the observed outcome is due to dietary inadequacy and imbalance or due to a whole host of other factors of which dietary inadequacy may be one and not necessarily the dominant factor. Even if we ignore the other factors that may have contributed to the

observed outcome, there is still a question whether the outcome represents the current or past nutritional stresses.

Just as energy standards have been based on Caucasian populations, so have most widely used anthropometric standards. Further, assessment (of nutritional status) based on anthropometric standards need not, and often do not, correspond to clinical assessments. Ferro-Luzzi, et al. (1975) analysed the dietary intakes of 482 New Guinean children aged 1–18 years. Data on body weight and skinfold thickness were also recorded. They found 'that the high proportion of nutritionally inadequate diets, assessed on an age basis using materially favoured Caucasian population as standards, does not match with physiological or clinical signs and symptoms of malnutrition in these New Guinean children'. If the FAO/WHO standards of energy-protein malnutrition and Western standards of growth were applied to their data,

growth retardation and the frequent presence of clinical malnutrition would be anticipated. This was only partly substantiated by an assessment of nutritional status. There was a low prevalence of clinical signs of specific nutritional deficiencies. Only occasional cases of Kwashiorkor and Marasmus were observed in the villages and none were encountered in the survey population. Their incidence and severity did not match the degree and frequency of calculated dietary inadequacy. All cases could be traced back to irregular or prolonged untreated infectious diseases.

Nick Eberstadt (1981) quotes several studies that corroborate the conclusion of Ferro Luzzi et al. A study by the then US Agency for International Development showed that 42 per cent of Sri Lankan children were moderately or severely malnourished and less than 10 per cent were normal when American height-weight charts were used to assess growth. Yet life expectancy at birth in Sri Lanka is over 65 years. The Pan American Health Organization apparently found that nearly half the population of Barbados, Costa Rica, Guyana, Jamaica and Panama suffered from some degree of malnutrition by conventional standards. Yet in each of these countries life expectancy at birth was 70 years or more!

In the first section the controversial nature of the theory underlying the FAO/WHO energy requirements was discussed. Given this controversy, the conceptual basis for the third of the above approaches is doubtful, even if it were possible to collect data on intakes of individuals along with information on their age, sex and physical activity so as to be able to compare their intakes with requirements. The widely publicised estimates (see Table 1) of the global extent of undernutrition such as those of Reutlinger and Selowsky (1976) of the World Bank or those in FAO's Fourth World Food Survey are not based on individual specific comparisons of intakes and requirements. It is true that since the objective is not one of determining whether each individual in a

TABLE 1 *Percentage of population with energy intakes below requirements*

Source	Region	Period	Percentage undernourished	Definition requirements
Reutlinger and Selowsky (1976)	Asia	1985	65	FAO/WHO requirements, calorie-income elasticity of 0.3
	Latin America		46	
	Africa		61	
	Middle East		51	
	Total		60	
FAO, Fourth World Food Survey (1977)	Far East	1972-74		1.2 BMR
	Latin America		29	
	Africa		15	
	Near East		28	
	Total, developing country		16	
			25	
Poleman (1982)	Far East (ex. China)	1975	12	50% of infants up to 5 years of age and pregnant and lactating mothers considered malnourished. Number of pregnant and lactating mothers taken as twice the birth rate.
	China		9	
	Africa		14	
	Latin America		12	
	Near East		13	
	Total		11	
Alan Berg (1981)	India	1972-74	47	FAO/WHO requirements
	Bangladesh		77	
	Brazil		43	
	Morocco		50	

population is adequately nourished or not but only of determining the proportion of inadequately nourished individuals in that population, it is not essential to base the estimation procedure on individual specific comparisons. However, the methodology of FAO and the World Bank does not appear to be capable of yielding unbiased estimates of the extent of undernutrition in a population.

There is an important problem with the data on which many of the estimates of the extent of undernutrition are based. Even though undernutrition was defined as a pathological state of an individual arising from an inadequate intake of food over a considerable period of time, the available estimates of global extent of undernutrition are not based on longitudinal data on intakes of food of a suitable chosen sample of individuals from the relevant population groups. Nor are they obtained from anthropometric or clinical and biomedical evidence from such samples of individuals. In other words, the estimates are based neither on

individual intake data nor on supposed outcomes of inadequate intakes such as anthropometric or clinical evidence. Very few sample surveys of individual intakes exist and even these few provide data on intakes during a day or at the most a week. Even rarer are surveys that provide data on body weight and activity pattern of surveyed individuals. Needless to say, strong and untested assumptions will be needed to interpret these intakes as habitual or long-term intakes of the individuals surveyed. Most consumption surveys provide data on expenditure on food at the household level over some reference period such as a week, month or even a whole year. Even if one were to set aside the myriad problems associated with obtaining complete and reliable estimates of consumption through questionnaires in developing countries where the components of consumption consisting of home-grown food, food obtained in barter and as wages in kind are significant, a whole host of assumptions of varying degrees of plausibility is needed to go from expenditure on food to estimates of energy intake at the household level. The data situation is even worse since such surveys of consumption expenditures are not available for all developing countries and only for a few countries such as India are data from more than one survey available. Given this situation the brave estimators of the FAO and World Bank literally make bricks without straw. With little more to go on than a not-so-very reliable food balance sheet for a country as a whole and even less reliable data on income per caput, they arrive at estimates of the extent of undernutrition by making heroic and often untested and even untestable assumptions about the distribution of income and food among individuals in the population.

Even if we take the estimates of undernutrition at their face value, there is the further problem of assessing the consequences of undernutrition in terms of human function. While severe malnourishment clearly has adverse consequences, there appears to be a lot of uncertainty surrounding the relationship of less than severe malnutrition to human function. Nor is the relationship between an individual's intake and his work output or productivity firmly established. The available evidence (Srinivasan 1983) suggests that the ill effects of severe malnutrition on human function seem to have been established while mild and moderate undernutrition do not appear to have lasting effects. This does not mean that the ill effects can be ruled out, only that the existing studies may not be sufficiently sensitive to detect them. More sensitive studies are therefore needed.

POLICIES FOR COMBATING UNDERNUTRITION

A variety of nutritional intervention policies have been tried in developing as well as some developed countries, either as part of continuing governmental intervention in matters relating to public health and the food and agriculture sector of the economy or as an experimental effort to determine the appropriate form of intervention. Such policies may either be intended to affect *specific* segments of the population (i.e.

target group oriented policies) or *non discriminatory* in their intent. Examples of target group oriented policies include school lunch programmes, supplementary feeding programmes and in general programmes intended to reach nutritionally vulnerable groups such as young children and pregnant and lactating women. Non-discriminatory policies are exemplified by a food fortification policy and a food subsidy programme that subsidises (or provides free, as used to be the case in Sri Lanka) part of the food consumption of the entire population. In addition to nutrition intervention policies there are other policies which have nutritional side effects – these include a whole host of policies that affect the production, distribution and consumption of food. Berg (1981) provides a summary review of the experience with nutrition intervention policies in developing countries. Taylor et al. (1980) review the evidence on food subsidy and food for work schemes in several countries.

These reviews suggest that while substantial improvements in infant mortality, foetal wastage and morbidity were achieved, the design of very few studies permit an attribution beyond reasonable doubt of the success to the interventions. The cost of intervention is not negligible and replicating successes achieved on a far larger scale without escalating costs remains problematic. Policies towards food and agriculture (a sector in which almost all governments of the world have intervened) can have serious nutritional consequences. Even though a number of studies are available of government intervention in agriculture, it is fair to say that a deeper analysis in a number of socio-economic-political environments is needed of the access to food subsidy programmes, the differences in socio-economic characteristics of participants and non-participants and the extent and significance of leakages to non-target groups. In particular, research is needed in designing subsidy programmes in terms of choice of commodities to be subsidised, of forms of subsidisation, (food stamps, provision free of cost of part of consumption, price subsidy, etc.) and even of the location of distribution outlets.

POVERTY AND UNDERNUTRITION

It is increasingly understood that while the true extent of undernutrition in developing countries may not be known with precision and its causes are many and closely interrelated, the principal cause is *poverty*. This is not to say that all the world's poor, however defined, are necessarily undernourished or that all the world's rich are necessarily well nourished but only to say that most of the world's undernourished may be found among the poor countries (South Asia, Africa) and among the poor in these. Thus policies towards elimination of undernutrition have to address the problem of poverty. Since in many of these countries most of the population is rural and agriculture is the dominant sector in terms of its share in employment, though not necessarily in

gross national product, rural poverty accounts for the bulk of the poverty in the world.

It is tempting to conclude particularly from the famine raging in parts of Africa that a major determinant of undernutrition besides poverty is the aggregate availability of food. That this is erroneous should have been obvious: the fact that enough food is available to feed the entire population of a country is no guarantee that no one will starve. Equally, the fact that not enough food is available to prevent starvation of everyone does not mean that everyone will indeed share in the starvation. How the available food is distributed among the population will depend on the institutional arrangements relating to production and exchange (for instance, in a market economy an individual has to have enough purchasing power through his 'income entitlement' to be able to afford a diet above starvation level!), including in particular the nature of transportation, storage and distribution networks. Recent tragic events in Ethiopia show that in the absence of such a network the food shipped by the rest of the world will not reach the starving in time. These elementary and fairly obvious relationships between institutions and access to food and their implications for understanding episodes of famine are elegantly elaborated in Sen (1981).

It will come as no surprise to anyone that the extent of rural poverty is closely related to the ease of access to cultivable land (through ownership or lease arrangements) and to sustained and productive employment. Table 2 provides some interesting data on India from Sundaram and Tendulkar (1982). Nearly 60 per cent of the agricultural labour households are poor and account for over 44 per cent of all poor households in rural India. And these households, not coincidentally, suffer substantial bouts of unemployment. Nearly 40 per cent of other labour households also are poor. It also happens to be the case, though this is not shown in Table 2, that the poor households which are self-employed in agricultural occupations consist largely (though not exclusively) of small and marginal farmers, tenants and share croppers.

The situation in Pakistan and Bangladesh is similar. A World Bank (1982, p. 78) study states that 'the great majority of the absolute poor – over 90 per cent – are rural people who work on farms, or do non-farm work that depends in part on agriculture. More than half are small farmers, who own or lease their land; another 20 per cent are members of farming collectives mainly in China. The remaining one-fifth of one-quarter are landless, and their livelihood is particularly precarious'.

Ensuring access to arable land goes only a part of the way towards reducing poverty. For getting the most out of the land in terms of output, access to high-yielding varieties of seed, irrigation, credit for the purchase of inputs, including fertilizers and pesticides, and remunerative prices for output, etc. have to be assured as well. It has been established time and again that given the right incentives the peasants and workers even in poor countries respond by increasing productivity. The tragedy of some of the African countries today is in a significant measure due to misguided

TABLE 2 *Share of different types of Households in (a) All rural households (b) Households below the poverty line (c) Unemployed persondays and (d) Incidence of poverty within each household type*

All India (Rural): 1977-78

Sr. No.	Household type	Percentage share in all rural households	Incidence of poverty within each household type	Percentage share in all rural households below the poverty line	Percentage share of each household type in total number of unemployed persondays		
					<i>Males</i>	<i>Females</i>	<i>Persons</i>
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	Self-employed in agricultural occupations	46.11	30.37	34.97	20.74	11.44	17.61
2.	Self-employed in non-agricultural occupations	10.60	38.13	10.19	7.82	6.48	7.11
3.	Agricultural labour households	29.88	58.76	44.28	56.24	69.76	60.72
4.	Other labour households	6.88	38.54	6.69	11.10	9.82	0.68
5.	Other rural households	6.65	23.49	3.87	4.10	2.50	3.88
6.	All households	100.00	39.65	100.00	100.00	100.00	100.00

Source: National Sample Survey, Draft Report no. 293.

- Notes:*
1. Household types are defined by reference to the major source of livelihood for the household in the year preceding the date of survey.
 2. All households with the per capita total consumer expenditure of less than Rs. 50 per month constitute the set of poor households. The poverty norm of Rs. 15 per capita month at 1960-61 prices, when adjusted by the consumer price index of rural agricultural labourers, works out to Rs. 48.45. We have approximated it Rs 50 per capita per month.
 3. Incidence of poverty within each household type in column (4) is defined by the percentage of households below the poverty line (of Rs. 50 per capita per month) within each household type.

public policy that distorted incentives to produce. Indeed as Mr Williams, the Executive Director of the World Food Council said recently 'it is quite clear that globally the world can produce enough food to feed all its population. And that assumes a yearly increase in population' (*New York Times*, 2 December 1984). He attributed only a small part of Africa's food problems to drought and a large part to the failure of many African governments to provide incentives to small farmers.

CONCLUSION

The current state of knowledge does not permit an accurate estimation of the extent of undernutrition in the world. While there are reasons to believe that the published estimates may be exaggerated there is no doubt that a significant proportion of the population in the developing world suffer from undernutrition. The principal cause of undernutrition is poverty. Most of world's poor live in rural areas and depend on agriculture for their incomes. Geographically South Asia accounts for a large proportion of the world's poor. Whether or not a country produces enough food in the aggregate to be able to feed its population is largely irrelevant to the extent of poverty and undernutrition in the country. The more important determinants are the distribution to productive resources such as arable land, access to gainful employment, to technical knowhow, etc. Above all a policy framework that provides adequate incentives for the poor peasant and worker to increase their outputs and incomes is essential.

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DISCUSSION OPENING I – JOSEPH KLATZMANN

I am not really the right person to discuss John Mellor's paper, because I am essentially in agreement with him.

First, I want to underline one point concerning both papers. When food supply objectives are discussed, there is always the question of 'physiological needs'. However, one does not eat merely to survive or to be capable of work. Similarly, one can survive perfectly well without meat. I propose therefore that one fixes as the objective something which should be considered a basic human right, what I call 'satisfying food', something well above the minimal requirement, but still remaining well below the exaggerated rates of the rich countries, which are threatening the health of their inhabitants. This is why I have much appreciated that John Mellor raised this problem in the following phrase: 'there is no question that we would consider the FAO standards too low as a matter of fairness'.

Among the other important points of this paper, some do not need to be discussed, as they are indisputable; for example, the fact that a drop in world food supply essentially affects the poor. We could also have got into too long a discussion of such topics as the growing dilemma of equity.

An extremely important topic is that of food aid, in its various aspects (including 'Food for Work' programmes). Voices are being increasingly raised to denounce the negative effects of this aid, and some go so far as to demand that it be stopped. Many of the criticisms of food aid are undoubtedly justified. But ways need to be found to make the various forms of food aid more effective and to reduce their negative effects, rather than proposing purely and simply that all aid be discontinued.

I was very interested in John Mellor's views on the positive effects of food imports into some Third World countries with rapid economic growth. I appreciated the absence of dogmatism in the way there was recognition of both the positive aspects and the limits of the free market; compared with some who condemn it categorically, while others think it is capable of resolving all problems. According to Mellor, food imports allow a higher level of economic development to be maintained when local agricultural production, in spite of making progress, does not measure up to demand. This point seems one which needs discussion.

Now I shall comment on the question of investments. Mellor writes that those investments should be avoided which are not economically justified as a result of high agricultural prices. I recall that the FAO has estimated that some 100 billion dollars investment per year is needed to ensure a satisfactory rate of growth of agricultural production in developing countries (China excluded). While it is sure that such amounts are not available, the problem is to seek out which types of low level

investment can result in increased agricultural production. In other words, if resources are scarce, one must know how to make the best use of those that are available.

Finally, Mellor mentions the variability of harvests. This question poses a problem of statistical interpretation. Thus, I have calculated the variability in the US cereals harvest in the period 1972–82; but I only have to add the figures for one year – 1983 – to give a much greater variability. Care must therefore be taken over choice of years being considered in this kind of calculation.

I have only a few words on Srinivasan's paper. The criticisms he makes of methods of calculating food standards are certainly justified. But the impression which emerges from the paper is that food requirements are actually less than are admitted to. One can also find arguments in favour of the inverse thesis – for example, energy needs being increased by manual labour in a hot climate. I return to my earlier point, that food requirements cannot simply be seen in terms of satisfying minimum physiological needs.

DISCUSSION OPENING II – WOUTER TIMS

Srinivasan's paper on undernutrition makes explicit what many students and observers have, less forcefully no doubt than he, increasingly felt about the numbers of affected persons which have been presented over the past decade, notably by FAO/WHO and by the World Bank. He makes, I think, the point that it is more important to find out why people are poor, and therefore threatened by inadequate nutrition, than to draw lines and estimate numbers below it. And he also attempts to suggest cost-effective means for reducing this threat, both in the short and the long run.

Major issues arising from the paper seem to me to be:

However weak the methods, some estimate of the number of people exposed to inadequate nutrition is nevertheless desirable, because of its mind-setting role and impact; a cautious estimate, no doubt;

Food distribution policies should not be judged by their measured effectiveness alone—even if fully possible—but include an element of risk taking, designing them with errors towards the liberal side;

In the long run there is no way to accommodate poor people, at a more decent level of income, in the agricultural sector even if broadly defined; what is needed is development policies generating employment in all sectors;

Policy failures and institutional weaknesses account for a good part of African food and agricultural problems, but labour scarcity may require quite different incentive policies in Africa than in labour-surplus rural Asia.

The analysis Mellor provides in his paper on dealing with uncertainties in a situation of growing imbalances is a broad one. It is also convincing in its conclusion that, in a general sense, markets have contributed, through

international trade in food, to development: countries on the food-receiving end, when pursuing employment-oriented policies, have been enabled to keep prices of wage-goods lower than these would otherwise have been. It is a two-way argument, as the availability of cheap food in international markets has favoured employment oriented growth.

There are, however, a number of questions which still need an answer:

Food importers in the low-income countries were very sluggish compared to middle and higher-income countries; therefore, where the argument of the paper would count most, it does not seem to apply;

A number of middle-income countries do not import food as a complement of employment-oriented strategies, but because of past neglect of agriculture and in substitution of what they should themselves produce, like most low-income countries of Africa;

The main conclusion of the paper should therefore be that major increases of food aid to low-income countries, dovetailed to domestic employment and income generation of the poor, are called for;

Finally, if so many countries are at present importing more food than would be normal for their stage of development, a major issue concerns the adjustment path to a more tenable and in terms of development a more appropriate use of food imports.

DISCUSSION OPENING III – VIJAJ S. VYAS

It is a privilege to comment on the two excellent papers by Professor John Mellor and Professor T. N. Srinivasan. In my view these papers complement each other to a large extent. Professor Srinivasan has concentrated more on the conceptual and the measurement aspects, though he has some pertinent observations on policy too. Professor Mellor has mainly dealt with the policy issues. I have a few comments which apply to both these papers. I am presenting my comments having in the background the two regions of the world where the problems of poverty as well as malnutrition are largely concentrated. These are South Asia and sub-Saharan Africa.

In the first place, I think Professor Mellor should modify the statement where he suggests that developing countries as a group are importing more food grains in recent years and that fastest growing countries are also the larger importers. This statement is only partially true. It was brought out in the Second Asian Agricultural Survey, during the late 1970s, that the net food imports of developing Asian countries had declined after the introduction of High Yield Varieties Programme in South and South-East Asia. Over the period this trend has further strengthened, especially since some of the large countries of the region, like India and Pakistan, have emerged from being net importers to marginal exporters of food grains. This point has importance because in my view more and more developing countries will try to reach that stage.

This is partly because the technologies for augmenting food grains production are already available for some of the principal crops and their coverage is likely to widen. Partly, it is also because of the foreign exchange constraints imposed by the mounting debt servicing obligations as well as the protectionist policies of the developed countries *vis-à-vis* the exports of the developing countries which will goad the developing countries towards import-substitution policies for food grains.

My second comment pertains to the question of market failure. We should first remind ourselves, and Professor Srinivasan has made this point very convincingly, that it is easy to exaggerate the number of chronically malnourished if we are not clear about the concepts or the measures of malnutrition. Even if we equate the malnourished with the poor, the number of those who can have access to adequate food with the removal of the distortions in the government policies is quite substantial. Yet the fact remains that there is a hard core of rural households who would not be able to respond to the market signals in the best of circumstances. Their number may be considerably less but are not inconsequential. These are the people without assets. People who not only do not have physical assets, but who also do not have marketable skills or physical stamina. They are not in a position to respond to market stimuli.

My third and last point is that the nature of intervention suggested by both Professor Mellor and Professor Srinivasan is directed to strengthen agricultural infrastructure or to have access to agricultural land and other factors of production. This strategy has relevance for countries, such as those in the sub-Saharan Africa, where aggregate production falls short of the potential and where enhancing agricultural production will also contribute to raising income levels of a large number of poor agricultural producers. In a strange way, food security problems in Africa are, relatively speaking, more manageable. We have now a clearer understanding about the mainsprings of growth in the agricultural sector.

The problem is a lot harder for the countries where food production at the aggregate level is adequate and yet a large number of people in the rural and urban areas are poor. India is a typical country in this category. Problems of the rural poor, most of whom are landless labourers or marginal producers, cannot be solved simply by augmenting agricultural production. 'More of the same' is not the solution for India. Its capacity gainfully to absorb the labour in agricultural production is seriously limited. The diversification of the rural economy is the major challenge and that would not come automatically. Even after attaining a reasonable degree of sophistication and after providing a reasonable infrastructure, the pace of diversification in the country's economy is still very slow. What sort of trap is arresting the growth of non-farm sectors in such economies? We do not have a complete answer for that. But it is reasonable to assert that without conscious decisions to encourage non-farm activities, the large bulk of rural people cannot be

provided with opportunities for gainful employment and income and access to food. Neither paper addressed this question in a satisfactory manner.

GENERAL DISCUSSION – RAPPORTEUR: J. A. AKINWUMI

The importance of the two papers can be judged from the rapt attention paid to John Mellor's presentation by a full house in the Sala Malaga, for a full hour.

In the general discussion regret was expressed at the narrow focus of the Conference theme and the contrasting of the fortunate developed food surplus countries with the unfortunate less developed food deficit countries. The real theme is 'Agriculture in a turbulent *world* economy'. It was suggested that there should be a moratorium on the developed versus less-developed dichotomy for the 1988 meeting. 'Food imbalance' which is the title of this session, is harmful, not only to the countries and people who need food but cannot buy it, but also to exporting countries which are experiencing weak markets owing to inability of food deficit countries to buy food.

Empirical evidence in respect of this turbulence exists in the United States, but first attention was called to another source of turbulence referred to by Dr Schuh. It is the sharp increase in the cost of (borrowed) finance capital that resulted from the second recycling of petrodollars in the late 1970s. It affected not only Third World countries but a sizeable part of the commercial agriculture in developed countries. With regard to the empirical report, an upper fringe of élite farmers in the United States who have no debts is doing well but a third of the full-time farmers in the State of Missouri are being forced off the land and in 1984, 71 farmers in that state committed suicide due to the emotional stress.

It was contended that Mellor was too philosophical in his approach. When the entries are repeated, the outcome would make any illusion of unfair world disappear.

It was argued that it was better to have some data/facts for whatever purpose than not to see facts at all. Some countries do not want to face facts. The task should not stop at feeding the hungry but aim at broadening their choice. One may ask whether the Third World countries are really free. It was suggested that they are in the position of economic dependence. The North-South dialogue of the 1970s has fizzled out. On nutrition, United Nations research concluded that a worker does not need too high an amount of certain sophisticated foods.

It was observed that Ecuador's economy grew by 7 per cent (overall) in real terms in the 1970s, while agriculture grew by 5 per cent and population by 2 per cent; yet importation of agricultural commodities accelerated due to rapid urbanisation at 7 per cent per year. Once in the cities people no longer consumed their traditional food; rather they

ate bread and drank Coca Cola, thus creating severe problems of distribution or marketing of their own traditional food products.

It was suggested that markets for the transfer of food from exporting to importing countries are working and benefiting both groups. This, however, failed to emphasise the main issue that there must be self-sufficiency for the developing countries, i.e. they must generate more income and hence purchasing power through production and employment. The first strategy should be to go for rapid increases in food production. Intermediate countries like India and South Asia should attempt to diversify.

It was wondered why Mellor did not disaggregate his data.

The final comment from the floor was a statement that medical evidence showed that limited food plus sufficient essential vitamins made rats live longer. We should therefore think more about good quality of food and how to prevent contamination.

Professor Mellor replied that food imbalances cannot be discussed without noting the plus and the minus. He suspected that the differences are between the implications not the weights. They are structural. The problems in developing countries put pressure on how to deal with the imbalances from the point of view of developed countries that are ignorant of developing ones. He did not treat the capital problems of developed nations because he felt they should be able at this stage to handle their capital problems.

Professor Mellor was disturbed about the self-sufficiency issue. Benefit of trade refers only to a small margin and something ought to be done to adjust the supply to the poor who happen to be causing the fluctuations in both supply and demand. He submitted that dealing with these through trade results in much greater efficiency compared with storage of surpluses. Other difficulties involve high transport costs and lack of infrastructures. Hence developing countries should raise consumption per caput levels to such a point that they consume their own production at so high a point that they are marginal net importers. This will lead to greater movement of food in international markets. In this way we will deal better with the problem of surplus food production. We should avoid saying that a problem does not exist simply because we do not know about it. We should be talking about larger flows of food in developing countries.

Professor Mellor said it should be emphasised that markets worked well in certain respects but there are deficiencies. We should concentrate on those that work. Finally, food aid is unfashionable. We should see what market forces are doing or not doing. But this may lead to a suggestion of massive food aid. We know what is needed through segmentation of the market so that we can concentrate on aiding the poor in rural and urban areas.

If in Bangladesh with a narrow economic situation, the measure works at 70 to 90 per cent efficiency, we should be prepared to live with much

less efficiency in Africa. Intervention should come through market segmentation. Incentive problems may be enormous but they must be handled if food aid is to be managed properly.

Participants in the discussion included Joseph Klatzmann, Wouter Tims, V. S. Vyas, Erhun Kula, K. M. Azam, Bina Cassa and G. S. Bhalla.