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Food Security and the Household

INTRODUCTION

Food security is widely defined as ‘access by all people at all times to enough food for an active healthy life’. Food security is, therefore, ultimately a household and individual-level issue. Recent research has greatly enriched our understanding of household behaviour concerning food and nutrition. The key factors affecting household food security and individual nutritional status are shown in Figure 1. They are influenced by the availability of food, the ability and desire of the household to acquire it, its intra-household distribution and

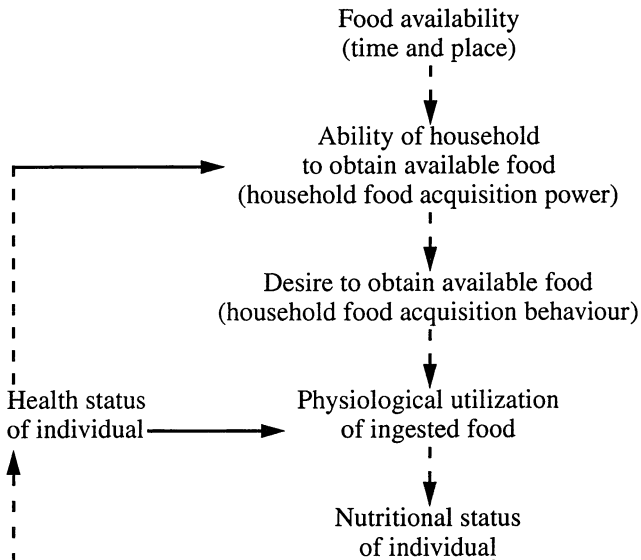


FIGURE 1 *Factors affecting household food security and individual nutritional status*

Source: Pinstrup-Andersen (1981)

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the physiological utilization of the ingested nutrients, which both affects and is affected by the person's state of health. The person's nutritional status also has a feedback effect on their productivity and the ability to acquire food.

INCOME AND PRICES

The general understanding has been that food insecurity and hunger are primarily the result of poverty. With economic growth and improved incomes, poor households will have the ability, and presumably the desire, to obtain an adequate diet, at least in terms of food energy (calories). By the mid-1980s, certain conclusions concerning the income elasticity for food seemed warranted since they were based on many different research studies. The income elasticities for staple foods are typically markedly higher for lower-income than for higher-income households. The income elasticity with respect to food expenditure (in value terms) considerably exceeds the elasticity for energy (calories) among poor households. Even people at low-income levels want to increase the variety and quality of their diets. The poor buy more expensive foods per calorie as their incomes rise.

However, the income elasticity for food energy (calories) was still substantial, varying across several studies from a low of 0.10 for poor urban households in Brazil to 0.60 for poor rural households in Sri Lanka. Most calorie-income elasticities were in the range of 0.30 to 0.40 (Alderman, 1986; Senauer, 1990). A 10 per cent increase in household income would lead to a 3 to 4 per cent increase in calorie consumption.

Several studies in the late 1980s and early 1990s challenged these conclusions and seemed to indicate that the income elasticity for calories might be very low and even close to zero (Behrman and Deolalikar, 1987; Bouis and Haddad, 1992; Bouis, 1994). Behrman and Deolalikar (1987) concluded that 'increases in income will not result in substantial improvements in nutrient intakes'. Hence economic growth and improved income among the poor would not lead to substantial reductions in hunger and malnutrition. The recent study by Subramanian and Deaton (1996) is based on information about rural households in Maharashtra state in India and is methodologically very meticulous, obtaining elasticities which support the previous conclusions. Their elasticity for food expenditures is around 0.75, which is then about equally divided between the elasticity for the quantity of calories and that of their price. The elasticity of calorie consumption with respect to total expenditures is in the range of 0.30 to 0.50.

The many empirical studies of the effect of prices on food demand and nutrient consumption lead to several general conclusions. The price elasticities for most foods are substantial; indeed, the absolute value may be greater than one. Typically, the households which have the lowest income have a stronger response to price changes. In other words, the absolute value of the price elasticities is greater for poorer households. With the poorest households devoting 60–80 per cent of their income to food, they tend to switch among foods in response to price changes (Alderman, 1986; Behrman *et al.*, 1988; Senauer, 1990).

Price increases for preferred staple foods have been found to have positive effects on nutrient intakes in several studies (Behrman *et al.* 1988). This can occur when poor households substitute foods that are a cheaper source of nutrients for a more expensive preferred food in response to its increased price. Senauer and Garcia (1991) found, for example, that the weight in relation to height (a measure of short-run nutritional status or wasting) of pre-school children in poor Philippine households improved in response to increases in the price of rice. However, the pre-schoolers' height for age (a measure of long-run nutritional status or stunting) declined. The households presumably substituted inferior staples, such as maize, for rice in response to its price increase. The inferior staples are a cheaper source of calories, but children's growth (height) suffers because they provide less protein and other nutrients.

Price increases can also positively affect the demand for a food and nutrient consumption when the household produces, as well as consumes, the commodity. This point is important because a significant portion of the poor and food-insecure in developing countries reside in semi-subsistence farm households. Agricultural household models encompass both the household's production and consumption decisions in a single unified theoretical framework. When a farm household produces a food commodity partly for sale and partly for consumption, a price increase affects farm profits and household income. Empirical research with this model for a number of countries shows that the profit effect can completely offset the traditional negative price effect, so that a price increase results in an increased consumption of the product by farm households (Singh *et al.*, 1986).

INTRA-HOUSEHOLD ISSUES

Intra-household allocation has been the subject of substantial research efforts by economists over the last dozen years. For a comprehensive review and appraisal, see Haddad *et al.* (1993). The household has traditionally been treated as a unitary entity with one set of preferences that can be represented by a household utility function. The recent alternative collective models allow for different preferences among individuals in the household. The empirical research has raised questions about the unitary model's ability to explain adequately the observed behaviour. However, it can be said that no one collective model clearly dominates the various alternatives. Economic changes and public policies and programmes can affect intra-household distributions under both unitary and collective models. With the latter, the intra-household allocation rules or decision-making process may also be affected.

Household-level information is frequently used to determine food consumption and nutritional status. However, the ultimate issue is the nutrition of individuals, particularly those who are considered 'at risk' nutritionally. A practical issue is this: if a household-level indicator is used, how many poorly nourished individuals reside in seemingly adequately nourished households and, conversely, how many adequately nourished individuals are there in poorly nourished households? This question can be likened to the statistical concept of type I and type II errors.

Tables 1 and 2 use data collected in conjunction with a pilot food subsidy programme in three provinces in the Philippines in 1983–4 (Senauer and Garcia, 1996). The material is discussed in detail in Garcia and Pinstруп-Andersen (1987). The survey covered 840 households and individual-level food consumption data were collected in 134 of those households. A 24-hour

TABLE 1 *The relation between household indicators and individual calorie adequacy (percentages)*

A. Percentage of household members (ages 2–60) with individual calorie adequacy greater than : ¹					
	70	75	80	85	90
If household calorie adequacy was less than: ²					
70	29.9 (18.2)	22.4 (12.2)	16.3 (8.0)	11.5 (5.1)	8.3 (3.6)
75	...	26.3 (14.5)	19.8 (9.9)	14.7 (6.7)	10.9 (4.7)
80	...	...	22.8 (11.3)	17.2 (7.9)	12.9 (5.5)
85	...	...	...	19.0 (9.2)	14.7 (6.5)
B. Percentage of household members (ages 2–60) with individual calorie adequacy less than:					
	65	70	75	80	85
If household calorie adequacy was greater than:					
70	26.2 (37.5)	32.9 (48.9)	...	...	...
75	19.3 (29.1)	26.2 (40.3)	32.1 (49.9)	...	...
80	14.8 (22.6)	21.6 (32.8)	27.7 (41.6)	35.5 (52.4)	...
85	11.4 (18.0)	18.6 (29.1)	24.8 (38.4)	31.9 (49.5)	38.7 (61.3)

Notes: ¹The first row relates to unadjusted calorie adequacy and the second row (with the figures in parentheses) to calorie adequacy adjusted for activity level, as discussed earlier.

²Household calorie adequacy is not adjusted for activity level.

TABLE 2 *The relation between household indicators and individual calorie adequacy by age and gender*

Age (years)	Female	Male
A. If household calorie adequacy was less than 75 per cent of household members (by age and gender) with individual calorie adequacy greater than 85 per cent: ¹		
2-6	8.3 (12.4)	9.9 (11.1)
7-15	6.9 (6.1)	7.3 (7.7)
16-60	22.5 (3.9)	22.7 (2.2)
B. If household calorie adequacy was greater than 85 per cent of household members (by age and gender) with individual calorie adequacy less than 75 per cent:		
2-6	37.8 (21.6)	35.6 (33.9)
7-15	40.0 (40.0)	21.1 (21.1)
16-60	18.1 (48.2)	11.3 (47.9)

Note: ¹The first row relates to unadjusted calorie adequacy and the second row (with figures in parentheses) to calorie adequacy adjusted for activity level.

food-weighing method was employed in both the household and individual food consumption surveys. For the latter, interviewers were present at meals and weighed the food served to each person and any leftovers. Snacks and food eaten between meals were also accounted for. The adjustments in calorie requirements for physical activity and body weight are based on Haddad *et al.* (1992). Although from a different survey, their data were also drawn from rural Philippine households, in 1984-5. Using information on individual weights and time allocation for several categories of activity, they estimated energy expended per kilogram of body weight per hour for various activities. These were used to adjust the age-gender calorie requirements. The major adjustments were for men and women, ages 16-60. Their calorie requirements each increased by approximately one-third.

In Table 1 and 2, specific household calorie adequacy levels were chosen, and the pattern of calorie adequacy of individual members was analysed. In the first row of Table 1 (Part A), if the household calorie adequacy ratio was less than 70 per cent, 16.3 per cent of family members (ages 2-60) had unadjusted

individual calorie adequacy ratios over 80 per cent; only 8.0 per cent had adequacy ratios over 80 per cent after adjustment for activity level. Conversely, in the last row of Part B, if household calorie adequacy was greater than 85 per cent, 18.6 per cent of those family members had unadjusted individual adequacy ratios below 70 per cent, and 29.1 per cent after adjustment for activity.

These results provide compelling evidence that, because of intra-household allocations, substantial numbers of food-insecure individuals are members of apparently food-secure households, but only limited numbers of food-secure individuals are in food-insecure households. Part A of Table 1 generally suggests that, if households below a certain calorie adequacy level were selected for a food subsidy, or other nutrition assistance, relatively few of the benefits would 'leak' to individuals with substantially higher adequacy levels, particularly after adjusting for activity level. In Part B, if households above a certain adequacy level were excluded, a considerable number of individuals with lower adequacy ratios would be excluded.

Table 2 examines age and gender differences with respect to better-nourished individuals in poorly-nourished households (Part A) and poorly-nourished individuals in relatively better-nourished households (Part B). In Part A, there appear to be no substantial gender differences. The differences between adults and children reverse when adjusted for activity level. Before adjusting for activity, 22.7 per cent of men aged 16–60 have adequacy levels over 85 per cent; after adjusting for activity, only 2.2 per cent do.

In Part B, there are a higher proportion of girls than boys and women than men with unadjusted adequacy ratios under 75 per cent in relatively better-nourished households. The gender difference for adults disappears after adjusting for activity level, though. Before adjusting for activity, there are substantially fewer adults whose calorie adequacy is less than 75 per cent of their requirements. However, after adjusting for activity, a considerably higher proportion of adults (ages 16–60) receive less than 75 per cent of their calorie requirements than do children (ages 2–15). Approximately 48 per cent of the adults in households with calorie adequacy ratios over 85 per cent have adjusted individual adequacy ratios under 75 per cent.

If confirmed by data from other locations, in which intra-household distribution patterns might differ, these findings have important implications for the design and allocation of food and nutrition programmes and policies. Conventional household allocation criteria may lead to substantial undercoverage of malnourished individuals. This might justify more generous or lenient household eligibility standards that would result in only relatively small leakages to relatively well-nourished household members.

NUTRITIONAL STATUS (HEALTH) PRODUCTION

Much has been learned about the determinants of individual nutritional status. Nutritional (health) status is typically measured by anthropometric indicators, for example weight and height in comparison to a reference group. Many prefer to use the more general term 'health status' for such indicators. Behrman and Deolalikar (1988) provide an excellent review of this research area.

Gary Becker's household model serves as the theoretical foundation, with health status viewed as a household-production good. The major inputs in an individual's health production function include food consumption (nutrient intake); health care; other goods and service which contribute to health; the time inputs of the individual and other family members which affect health, such as the childcare time of parents; demographic characteristics of the individual, such as age and education; community and environmental factors which affect health, such as sanitation conditions; and the person's genetic endowment.

Two issues have influenced the empirical estimation of this relationship. First, several of these explanatory factors are endogenous variables that result from individual or household choices. These variables may be simultaneously determined and themselves influenced by health status. Much of the empirical work, therefore, has estimated reduced-form health demand equations which contain only exogenous variables as explanatory factors. The second issue is that several of the explanatory factors may be unobserved, because of limits on data collection or, in fact, unobservable, such as genetic endowment. Longitudinal data with multiple observations for the same individuals over time allow the use of fixed-effects models which factor out the impact of time-invariant unobserved effects (Senauer and Garcia, 1996).

The results of this work have some important policy implications. Nutrient intake is only one determinant of a person's nutritional (health) status. Other factors may be of equal importance and the most crucial limiting factor may be something else. Adequately fed individuals may be malnourished because of parasitic diseases caused by unsanitary environmental conditions. More likely, they will aggravate the effects of an inadequate diet. Alleviating malnutrition and improving health is not just a matter of increasing food consumption.

Much of this research has focused on the health status of pre-school children, a group at high nutritional risk. The importance of the parents', particularly the mother's, education on child health has been confirmed by many of these studies. For example, Kassouf and Senauer (1996) examined the impact of parental education on heights and weights of pre-school children in Brazil. Education levels in Brazil are low; the average mother had only four years of schooling in the 1989 survey. Over 24 per cent of the pre-school children of mothers with less than four years of school suffered from stunting: at least moderate malnutrition in terms of height for age. If these mothers were all educated at least to the eleventh grade, this figure would fall to only 2.8 per cent. The mother's education has a strong positive direct effect on nutrition, a negative indirect effect through her wage and the increased value of time, and a very large, indirect positive effect via household full income. The father's education also has a positive effect, although not as impressive as the mother's.

OTHER FACTORS AND RECENT RESEARCH

Space limitations do not allow for more than a brief mention of three other factors that bear on household food security on which there are recent research

contributions. The factors are the impact of nutritional status on labour productivity, housing coping mechanisms and food subsidy programmes. As shown in Figure 1, nutritional status has a feedback loop through an effect on labour productivity, and hence the ability of the household to obtain food. Empirical studies have shown that nutritional status positively affects wages and own-farm output (Strauss, 1986; Sahn and Alderman, 1988; Haddad and Bouis, 1991). Child malnutrition can affect lifetime earnings because of stunting, consequent poor health and the impact on human capital development.

Poor households have a number of coping mechanisms to cushion the impact from shocks due to agricultural shortfalls and market shortages or other uncertainties (von Braun *et al.*, 1992). The household, extended family and community can provide a safety net. The stages of household coping involve, first, risk management and loss prevention and, then, loss containment and disposal of assets. Under extreme conditions such as famine, the household may collapse (von Braun *et al.*, 1992). Finally, food subsidies are a topic which, although important, cannot be covered here, but Pinstrup-Andersen (1988) provides an excellent review.

THE WORLD'S POOR

Most of the food-insecure are the world's poor. The World Bank has calculated that 1.2 billion people live on \$1.00 a day or less. The calculations are based on country-level average per capita income figures and use the Bank's Atlas method to convert national currencies to US dollars. There are two basic problems. Purchasing power parity (PPP) for currency exchange is preferable to the Atlas method. More crucially, the estimates do not account for the possible skewed distribution of income in countries. Work at Minnesota and the Economic Research Service of the US Department of Agriculture seeks to remedy these problems (Gopinath *et al.* 1997).

In this research an income distribution profile is derived for each country in the world for which data are available by fitting a gamma distribution to the country's material. For countries in which information is not available, the other results, just mentioned, are used to estimate the parameters of the distribution based on each country's characteristics. This is done so that the estimated distribution exactly yields the country's observed average per capita income. The results are shown in Table 3, for major regions and the world.

Given the World Bank's work on poverty and that of others, a reasonable definition of the world's poor might be those living on \$2.00 a day or less. Some one billion people are in this category, representing 19 per cent of the world's population. This figure agrees quite well with the widely used number of approximately 800 million hungry people in the world (Bread for the World, 1994). Of the world's one billion poor, 10 per cent live in Latin America and the Caribbean, 24 per cent in sub-Saharan Africa, 41 per cent in South Asia, 2 per cent in the Middle East and North Africa, 17 per cent in China and Korea, less than 1 per cent in Eastern Europe, 4 per cent in the former Soviet Union and 1 per cent in the OECD countries. When reading down each column in Table 3, the figures are cumulative.

TABLE 3 *Population living on X dollars per day or less (in millions of people)*

\$/day in PPP	Latin Am. & Carib.	Sub-Sah. Africa	South Asia	Mid. East & N. Africa	China, Korea, Hong Kong	East Europe	Former Sov. Un.	OECD	World
0.5	46.482	68.101	44.954	5.999	21.606	0.371	10.856	3.545	201.914
1	69.000	139.363	145.359	11.884	63.931	0.826	20.525	6.677	457.564
2	103.356	244.169	414.431	24.794	176.811	2.027	40.524	12.682	1 018.794
4	154.460	345.457	911.592	52.835	427.853	6.560	84.793	24.676	2 008.225
8	225.052	418.914	1 381.424	105.445	820.125	26.136	166.385	51.035	3 194.516
16	308.993	453.439	1 584.190	171.941	1 137.437	72.287	244.538	117.800	4 090.624
32	386.899	465.397	1 642.307	213.162	1 223.536	102.684	280.298	289.713	4 603.996
64	435.846	470.177	1 657.488	225.659	1 237.061	107.472	291.877	596.391	5 021.971
128	451.526	471.414	1 661.675	229.165	1 242.842	107.600	293.088	829.732	5 287.042
256	453.078	471.500	1 662.174	229.892	1 243.866	107.600	293.100	877.254	5 338.464
512	453.100	471.500	1 662.200	229.997	1 243.900	107.600	293.100	878.699	5 340.095
1 024	453.100	471.500	1 662.200	230.000	1 243.900	107.600	293.100	878.700	5 340.100

Source: Gopinath, Roe and Shane (1997).

Additional calculations were made of the amount of income realized by people living at each level of income per day by region and for the world. The key point is that the one billion poor receive only 1.3 per cent of the world's total income, \$397 million out of \$30.47 trillion total per year. The implication is that a very small transfer in relation to world income could have a very large impact on the incomes and welfare of the world's poor and food-insecure.

SPECIAL FOOD DRAWING RIGHTS

Large food price increases can have a devastating impact on the world's one billion poor, putting them at greater nutritional risk. They typically spend 70 per cent or more of their income on food, hence there is a large real income effect on people already at the subsistence level. Their existing inadequate diets can deteriorate even further, with subsequent increases in morbidity and mortality and declines in human capital.

Real food prices have declined over the last several decades. Evidence seems to be growing, however, that the rate of increase in agricultural production may be slowing. Future increases in demand, assuming a 1.7 per cent per year growth in world population and a 1.2 per cent annual growth in world GNP per capita, are likely to cause real prices to rise slightly, but not to an extent likely to cause a food crisis. The upward pressure on prices will be greater if world population grows more rapidly than assumed or populous countries, such as China and India, experience faster economic growth (Roe and Gopinath, 1996; and Gopinath *et al.* 1997).

However, it is the variance of world supplies and stocks that lead to price spikes which can have a devastating impact on the world's one billion poor. Even during the previous era of declining real food prices, the variability of prices, as measured by the coefficient of variation, increased (Gopinath *et al.* 1997). There are reasons to believe that, with greater variations in yields and smaller stocks due to less government intervention, price variability may be greater in the future. The world needs to devise a way to protect the one billion poor from the kind of transitory shock to world markets and prices that occurred in the early 1970s. As shown in the previous section, the size of the necessary transfer in relation to world income is relatively small.

One possibility is to establish a special food drawing right fund akin to the exchange rate drawing rights managed by the International Monetary Fund, which countries can use to protect their currencies. When there was a spike in world food prices, low-income countries could use the food drawing rights to make purchases on world commodity markets as needed to protect their poor and sustain their food consumption through the transitory shock. The drawing rights fund would be managed by an international agency and the conditions of withdrawal and repayment after the shock would be established.

REFERENCES

- Alderman, H. (1986), *The Effect of Food Price and Income Changes on the Acquisition of Food by Low-Income Households*, Washington, DC.: International Food Policy Research Institute.
- Behrman, J.R. and Deolalikar, A.B. (1987), 'Will Developing Country Nutrition Improve with Income? A Case Study for Rural South India', *Journal of Political Economy*, **95**, 492–507.
- Behrman, J.R. and Deolalikar, A.B. (1988), 'Health and Nutrition', in H. Chenery and T.N. Srinivasan (eds), *Handbook of Development Economics*, New York: North-Holland.
- Behrman, J.R., Deolalikar, A.B. and Wolfe, B.L. (1988), 'Nutrients: Impacts and Determinants', *The World Bank Economic Review*, **2**, 299–320.
- Bouis, H.E. (1994), 'The Effect of Income on Demand for Food in Poor Countries: Are Our Food Consumption Databases Giving Us Reliable Estimates?', *Journal of Development Economics*, **44**, 199–226.
- Bouis, H.E. and Haddad, L.J. (1992), 'Are Estimates of Calorie-Income Elasticities Too High? A Recalibration of the Plausible Range', *Journal of Development Economics*, **39**, 333–64.
- Bread for the World (1994), *Hunger 1995: Causes of Hunger*, Silver Spring, Maryland: Bread for the World.
- Garcia, M. and Pinstrup-Andersen, P. (1987), *The Pilot Food Subsidy Scheme in the Philippines: Its Impact on Income, Food Consumption and Nutritional Status*, Research Report 61, Washington DC: International Food Policy Research Institute.
- Gopinath, M., Roe, T. and Shane, M. (1997), 'World Food Insecurity: Causes, Options, Affordability', mimeo, University of Minnesota, Department of Applied Economics, St. Paul.
- Haddad, L. and Bouis, H. (1991), 'The Impact of Nutritional Status on Agricultural Productivity: Wage Evidence from the Philippines', *Oxford Bulletin of Economics and Statistics*, **53**, 45–68.
- Haddad, L., Hoddinott, J. and Alderman, H. (1993), 'Intrahousehold Research Allocation in Developing Countries: Methods, Models and Policy', mimeo, Washington, DC: International Food Policy Research Institute.
- Haddad, L., Kanbur, R. and Bouis, H. (1992), 'Intrahousehold Inequality and Average Household Well-Being: Evidence on Calorie Intakes and Energy Expenditures from the Philippines', mimeo, Washington, DC: International Food Policy Research Institute.
- Kassouf, A. and Senauer, B. (1996), 'The Direct and Indirect Effects of Parental Education on Malnutrition Among Children in Brazil: A Full Income Approach', *Economic Development and Cultural Change*, **44**, 817–38.
- Pinstrup-Andersen, P. (1981), *Nutritional Consequences of Agricultural Projects*, Staff Working Paper No 456, Washington DC.: World Bank.
- Pinstrup-Andersen, P. (1988), *Food Subsidies in Developing Countries: Costs, Benefits and Policy Options*, Baltimore: John Hopkins University Press.
- Roe, T. and Gopinath, M. (1996), *World Trade and Food Security*, Working Paper WP96-2, St. Paul: University of Minnesota, Center for International Food and Agricultural Policy.
- Sahn, D. and Alderman, H. (1988), 'The Effects of Human Capital on Wages and the Determinants of Labor Supply in a Developing Country', *Journal of Development Economics*, **29**, 157–83.
- Senauer, B. (1990), 'Household Behaviour and Nutrition in Developing Countries', *Food Policy*, **15**, 406–17.
- Senauer, B. and Garcia, M. (1991), 'Determinants of the Nutrition and Health Status of Preschool Children: An Analysis with Longitudinal Data', *Economic Development and Cultural Change*, **39**, 371–89.
- Senauer, B. and Garcia, M. (1996), 'An Intrahousehold Analysis of a Philippine Food Subsidy Program', mimeo, University of Minnesota, Department of Applied Economics, St. Paul.
- Singh, I., Squire, L. and Strauss, J. (eds) (1986), *Agricultural Household Models: Extension, Applications and Policy*, Baltimore: Johns Hopkins University Press.
- Strauss, J. (1986), 'Does Better Nutrition Raise Farm Productivity?', *Journal of Political Economy*, **94**(2), 297–320.
- Subramanian, S. and Deaton, A. (1996), 'The Demand for Food and Calories', *Journal of Political Economy*, **104**, pp. 133–162.
- von Braun, J., Bouis, H., Kumar, S. and Pandya-Lorch, R. (1992), *Improving Food Security of the Poor: Concept, Policy and Programs*, Washington, DC: International Food Policy Research Institute.

DISCUSSION REPORT SECTION I

*Eugenia Muchnik (Chile)*¹ began the discussions with comments on the paper by Pinstруп-Andersen and Pandya-Lorch. She noted that IFPRI is not alone in studying the outlook for global food security, or indeed in coming to the broad conclusion that, for the next decade or so, global demand will be met, but that regional deficits will continue to take place in sub-Saharan Africa and in South Asia, where food imports are likely to increase substantially. For the longer run, there is a wider range of views due to different appreciations of the constraints of resource availability, though, on balance, most views present rather positive prospects. She fully supported these judgments about food availability.

That does not mean, however, that the problem of food insecurity will disappear. There are still problems on the demand side: that is, with access to food. Insecurity is obviously highly correlated with poverty, so that achieving improvement will necessitate policies for direct alleviation. The recommendations from the IFPRI work, in fact, include several features of good policy choice which look beyond the agricultural sector. But it is essential to acknowledge that there is controversy about whether or not the answer lies mostly with agricultural and rural development, and there are still issues to settle relating to the management of farming itself. A checklist has been developed at ECLAC which points to queries about the following:

- interventionism versus a subsidiary role of government;
- self-sufficiency versus agroindustrial export development;
- centrality of peasants or commercial farming in food production;
- pricing to encourage production or to favour consumers;
- acceptance or rejection of food aid; and
- the possible conflict between increasing productivity and sustainability.

As to whether food security in low-income food deficit countries should be achieved through agricultural policies seeking to increase food production or by means of general policies for economic development, which would be neutral with respect to economic sectors, there are differing views. For example, the 1990 *World Development Report* of The World Bank, which dealt with poverty, suggested encouraging both rural development and urban employment, as well as implementing specific policies to improve the participation of the poor in growth. But, in the case of resource-poor regions, the recommendation was to follow a different approach; given their low potential for agricultural development it suggested that policy should facilitate out-migration. That might

¹United Nations, Economic Commission for Latin America and the Caribbean (ECLAC), Santiago.

provide some escape for areas like sub-Saharan Africa and part of South Asia, the regions with the largest number of food-insecure people still, it has to be faced, heavily dependent on the agricultural economy. Although rigid geographical determinism should be avoided, physical geography does matter in many tropical countries; food production is itself the key issue and it is facile to repeat the empty slogan that it is 'poverty' rather than 'food' which is the problem.

Finally, there was strong emphasis on the need for research to explore the lessons from other countries, for example in East Asia and Latin America, that have been successful in escaping from the poverty trap during the last 15 years. What was the sequence of policies followed; what were the key elements of economic policy; what would be a minimum critical effort for success; and what was the role played by the agricultural sector?

*Anthony Ikpi (Nigeria)*² discussed the paper by Rao and Radhakrishna, noting that India, with an estimated 1994 population of 909 million people, is at present nearly self-sufficient in food production. This has been attained as a result of a successful launch of a 'green revolution' in the early 1960s, during which there were large public investments in irrigation and agricultural research, large factor productivity gains especially in land, and a shift from cereal to non-cereal food consumption due to a deliberate change in consumer tastes and preferences. This has drastically reduced food grain imports. Backing this up, the Indian government uses a public procurement and distribution system (PDS) for foodgrains to overcome the country's transient food insecurity. All of that is still not enough for, despite a significant reduction in the incidence of poverty, chronic food insecurity persists in a large proportion of the population. Hence further efforts have included the setting up of several poverty alleviation programmes, employment guarantee schemes and nutrition programmes to try to place adequate purchasing power in the hands of those suffering from chronic food insecurity.

Ikpi expressed some concern about future prospects for India, but he did note that improvement there had been taking place in what could be regarded, given the relationship between population and land, as a classic 'food deficit' region. He then argued that this is not the situation of the 558 million people of sub-Saharan Africa, taken as a whole, where he estimated that there is a food surplus, in grain equivalents, of almost 500 million tonnes. Nevertheless, there is difficulty at a sub-regional level, notably in eastern and southern Africa, with a combined population of 276 million. The sub-regional focus is often forgotten. Much of the problem is caused by a (small) decline in production between 1979 and 1993, allied to growth in numbers, and it is very much concentrated on shortage of foodgrains.

His most important point related to strategy. He was impressed by India's record, but he was not convinced that her policy emphasis on overcoming food insecurity by subsidization of production and public food distribution is suitable for the rather different situation in those parts of sub-Saharan Africa which are in difficulty. The future policy perspective needs to be more on

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building specific human, institutional and infrastructural capacities to remedy past poor performance in food production and distribution. Efforts should be concentrated on promoting sustainable agriculture in sometimes difficult environments; on market development, deregulation and liberalization; and on international trade, regional cooperation and sub-regional integration. It would also be useful to foster diversification to give alternative means of income generation. A comprehensive framework for addressing the various identified capacity-building needs has to be articulated by sub-Saharan Africans themselves, developed and validated by all stakeholders, widely disseminated to all interested parties and meaningfully implemented in a systematic manner with the support of the international community.

Discussing the Senauer and Roe paper, *Luciano Venturini (Italy)*³ considered their four themes of empirical evidence about elasticities, intra-household distribution, determinants of nutritional status and the resources necessary to relieve poverty, notably in the face of transitory shocks. In his opinion, the paper provided an excellent review of the current state of knowledge, though he called attention, in particular, to the fact that the evidence on some of the issues is still accumulating quite rapidly and that it does present somewhat mixed results rather than being in any way conclusive. For example, there is still substantial debate about the response of anthropometric measures of nutritional status to individual or household income. It is a very complex area, especially in relation to children, since age can be a powerful influence which is hard to disentangle from other factors in survey evidence. There are also considerable difficulties in the analysis of elasticities and in tackling the issue of whether higher food prices have a detrimental impact on the nutritional status of the poor, when they are farmers. The 'income effect' is the key issue and the results are equivocal.

Venturini drew particular attention to the problems of the 'billion poor', or some 19 per cent of the world population. The view that only a very small fraction of world income is needed to meet basic human needs is a matter on which there is far less doubt. It is probably only about one-quarter of the combined cost of debt servicing and the military budget of developing countries. Unfortunately, the situation is not being helped by reductions in official development assistance. These are relatively small in themselves, but they *are* reductions which represent a drop in the proportion of donor countries' gross national product being allocated to aid. Management of the *political economy* of aid remains problematic. This has direct relevance to the final suggestion in the paper for the creation of a drawing rights fund to tide countries over food price 'spikes' which are likely to become more pronounced in future. It could be attractive, in that it is meant to be a loan scheme – it is not seen as a transfer scheme. Donor countries, who appear to find it so difficult to devote higher proportions of their income to transfers, might be more easily persuaded to accept a loan system.

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