FOOD CONSUMPTION AND NUTRITION EFFECTS OF INTERNATIONAL DEVELOPMENT PROJECTS AND PROGRAMS:

An Annotated Bibliography

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Introduction

This bibliography is intended for a multidisciplinary audience. The selections are drawn from the fields of technical agriculture, economics, nutrition, anthropology, project management, and other related areas.

The annotations deal only with the subject matter covered by the articles. No attempt has been made to evaluate the quality of the material. That is left to the discretion of the user. In instances where only a portion of a longer work is relevant to the topics covered by this bibliography, the annotations deal primarily with those portions within the scope of this bibliography.

The selections are arranged into three main categories, followed by a small number of subcategories. The first includes articles which deal with the causes and solutions of malnutrition problems from a technical or policy perspective. The second includes articles on the effects which particular agricultural development programs and policies have on nutrition. The third includes articles which deal with guidelines and methodologies for exploring the nutritional impact of development projects.

Three indexes have been prepared. The author index is by principal (first) author only. The geographic index is divided into global, multicountry, regional, and country-specific articles. The global articles are not country-specific, whereas multicountry articles discuss several countries but are not listed by individual country. The third index classifies the articles cited according to linkages between agricultural development and nutrition, with each article listed under one or more classification.

Description of Categories

Section One contains articles which describe the overall character of the relation between malnutrition and its causes. These articles are of a general nature, expressing either problems that exist or possible policies to correct them. They are divided into two subsections. The first contains articles which are global or multicountry in nature, that is, they do not discuss any one particular country in depth. The second subsection contains articles which pertain to a particular country or region.

Section Two includes articles which move a step beyond those in Section One. These articles make attempts to link specific agricultural projects or policies to impacts on nutrition. For the most part, these articles are country or area oriented. The few articles which are global in focus are included due to their clear exposition of direct linkages between policies and nutrition. This section is divided into four subsections. The first, "national programs or policies," contains articles which discuss policy issues at the national level or programs--such as home gardens--which do not readily conform to the other subcategories. The agricultural production subsection contains articles that discuss projects which have an impact on production, including integrated rural development projects. The third subsection, "marketing and other postharvest activities," contains articles on projects and programs in food marketing and storage. The final subsection contains articles which discuss food price subsidies and food distribution programs, as well as combinations of these.

Section Three contains articles intended to aid the user in discerning the impact of agricultural projects or policies on nutrition. These articles are mostly global in focus. The first subsection has articles which discuss guidelines and/or present clear examples of their use. The second subsection contains articles which are more methodological in content.

I. MALNUTRITION: CAUSES AND SOLUTIONS

A. GLOBAL OR MULTICOUNTRY

1. Berg, A. MALNOURISHED PEOPLE: A POLICY VIEW. Poverty and Basic Needs Series, The World Bank, Washington, D.C., U.S.A., 1981. 108 pp. 41 references.

This report considers broad approaches to the problem of reducing nutrition deficiencies among malnourished persons. It outlines the many facets of the nutrition problem in terms of energy standards and costs, the short-run inadequacy of the growth process, the range of possible actions and their costs, new approaches of nutrition-oriented food policies, and how to put the new approaches to work. The author emphasizes the importance and promise of two types of nutrition-oriented food policies: agricultural production strategies, and food distribution and subsidy programs. He argues that emphasis should be placed on nutritional effects in making choices about allocation of funds and manpower for increasing crop production, reducing seasonal variations, researching yields and diseases of staple crops, and introducing new technology. The government may have to enter the grain market to maintain an even flow of commodities at reasonable prices. The author believes that supplementary feeding programs, such as school lunches and food-for-work programs, are beneficial and should be encouraged. The author views food ration and subsidy programs as major avenues for improving nutritional status within a reasonable length of time. Cost of such programs could be reduced by concentrating the programs on the poorest groups in the neediest regions in the most difficult months of the year. The report includes 5 explanatory appendixes, 12 tables, and 3 figures.

2. Chambers, R., et al. SEASONAL DIMENSIONS TO RURAL POVERTY: ANALYSIS AND PRACTICAL IMPLICATIONS. Discussion Paper No. 142. Institute of Development Studies, University of Sussex, Brighton, England, 1979. 28 pp. 42 references.

This report arises from a conference which examined the severity and causality of seasonal deprivation among poor rural people in developing countries and the relationship of that deprivation to poverty. The authors find that the worst times of the year for poor people living in the tropics are the wet seasons when food shortages, high food prices, high demand for agricultural work, and high exposure to infection all occur. The poor, especially women and children, suffer from poor diet, malnutrition, loss of weight, poor child care, and sickness. Practical implications of this seasonal analysis call for identifying seasonal linkages among food supply, food prices, nutrition, and diseases. For example, calorie requirements and labor demand vary more by the season for the shifting cultivation of rice than for irrigated rice cultivation. The report provides case studies from West Africa, East Africa, and South Asia. It discusses practical implications of seasonal variations for research, health, the family, agriculture and food, and government planning

and administration. Five appendixes present additional data and sources of information.

3. Doughty, J. COMMENTARY: DANGERS OF REDUCING THE RANGE OF FOOD CHOICE IN DEVELOPING COUNTRIES. Ecology of Food and Nutrition, Vol. 8, 1979. pp. 275-283. 49 references.

The author asserts that throughout human history people have eaten a variety of foods, and this dietary variety has safeguarded human health. Every stage of human agricultural and economic development, from hunting and gathering to the Green Revolution, has resulted in a decrease in the selection of foods available, with subsequent loss of nutritive values. While prehistoric hunter-gatherers had about 5,000 edible plants to choose from, fewer than 150 food plants enter the modern market economy. The author examines effects of the cultivation of cash crops and of the Green Revolution on food choices. He asserts that both have caused deterioration in diets, nutritive values, and human health. During the Green Revolution, for example, farmers increased cereal production at the expense of legumes and abandoned indigenous plants for "miracle" varieties. People suffer serious vitamin and mineral deficiencies because they have lost foods for sauces and relishes for their staples. The author also stresses the loss of knowledge about local plants and the loss of genetic sources for food crops.

4. Foster, P. AGRICULTURAL POLICIES AND RURAL MALNUTRITION. Occasional Paper No. 7. U.S. Agency for International Development, Washington, D.C., U.S.A. 1978. 56 pp. 139 references.

This publication summarizes the major conclusions of previous studies on the effects of agricultural development programs and policies on the nutritional status of the rural poor. The literature survey includes material on the relation between malnutrition and poverty, the economic implications of malnutrition, the controversy over the quality versus the quantity of food, and agricultural policies and rural nutrition. More than half the publication is devoted to an annotated bibliography in nine categories: extent of malnutrition; nutritional needs; the quality versus quantity controversy; malnutrition, education, and productivity; nutrition and demographic variables; nutritional planning and policies; elasticity of demand for food; household surveys and household modeling; and general and miscellaneous publications. The volume also contains three figures and six tables of data.

5. Graedon, T. NUTRITIONAL CONSEQUENCES OF RURAL-URBAN MIGRATION. Agency for International Development, Washington, D.C., U.S.A., 1980. 80 pp. 72 references.

This paper examines one aspect of internal rural-urban migration: its consequences upon the nutritional status of migrants and of those who remain in the countryside. The major factors thought to contribute to migration are considered. Both hypothetical and observed relationships between various aspects of migration

and the conditions influencing nutrition are examined. Policy implications are discussed. Each of these elements and the findings of the empirical studies of migration and nutrition shape the policy recommendations made. Because nutrition plays a crucial role in determining resistance to infection, it is essential to minimize the negative nutritional consequences of any social change if health and quality of life are to be improved. Examples of the interactions possible between migration and nutrition are offered in three migration scenarios in the appendix.

6. Johnston, B. F. FOOD, HEALTH, AND POPULATION IN DEVELOPMENT. Journal of Economic Literature, Vol. 15, No. 3, 1977. pp. 879-907. 126 references.

This paper reviews the literature available on development strategies for countries with mixed economies. The author addresses the options and decisions resulting from the dual development goals of reducing poverty and promoting growth. Previously suggested alternative approaches to poverty reduction are reviewed, and the development literature relevant to the choice among competing alternatives is examined. Emphasis is placed on the likely effects of alternative strategies in satisfying basic needs, especially nutrition and health, of all segments of a country's population. Two alternatives advocated for strengthening effects of growth strategies on the level and distribution of income are described: a target-oriented strategy aimed at small farmers' problems and a composite approach to the delivery of health, nutrition, and family planning services.

7. Johnston, B. F., and Meyer, A. J. NUTRITION, HEALTH, AND POPULATION IN STRATEGIES FOR RURAL DEVELOPMENT. Economic Development and Cultural Change, Vol. 26, No. 1, 1977. pp. 1-23. 48 footnotes including references.

Malnutrition and poor health are serious manifestations of poverty and income distribution, particularly in rural areas, in developing nations. Although most nations agree with the need to give high priority to rural development and agricultural production, there is little agreement on the components essential for successful rural development. This paper focuses on the strategy of a "composite-package" approach, including nutrition, health, and family planning services in rural areas. Section I reviews the origins of the current policy focus on poverty. Section II examines interrelationships between socioeconomic development and reduction of fertility. Section III confronts the problem of determining priorities and summarizes reasons for an integrated approach combining nutrition, health, and family planning services. Section IV examines some advantages and problems involved in the design and implementation of the composite approach.

8. Knudsen, O. K., and Scandizzo, P. L. THE DEMAND FOR CALORIES IN DEVELOPING COUNTRIES. AGREP Division Working Paper No. 26. World Bank, Washington, D.C., U.S.A., 1979. 18 pp. 19 references.

Data from household surveys on consumption are used to analyze the determinants of calorie intakes in developing countries. The paper relies on the use

of characteristic demand analysis to specify a demand function for calories and explores the effect of differences in prices, incomes, and other socio-economic factors on the intra-country and inter-country distribution of calorie intakes. By using the estimated functions, broad macro-estimates are also made of the potential impact that income growth and redistribution could have on alleviating malnutrition. Three broad conclusions are reached. First, both income and price elasticities of demand for calories are below unity and tend to cluster around 0.60 for the poorer consumers, while they are much lower and more variable for the higher income group. Second, even a moderate increase in food prices will imply a large nutritional sacrifice for the poor if the present trends in income growth and distribution continue. Only a considerable (and unlikely) acceleration of the trends in economic growth would, under these circumstances, ensure that food needs for the entire population are satisfied within the next 20 years. Third, if moderate redistribution policies are pursued so that a substantial portion of the increase in income generated by growth is allocated to the poor, sizable food price increases would be compatible with the elimination of malnutrition. In this case the price increases would be used to foster increases in production without ill effects on the nutritional status of the poor. Six tables and numerous mathematical calculations are included.

9. Knudsen, O., and Scandizzo, P. L. NUTRITION AND FOOD NEEDS IN DEVELOPING COUNTRIES. World Bank Staff Working Paper No. 328. World Bank, Washington, D.C., U.S.A., 1979. 73 pp. 5 references.

Based on data primarily from household consumption surveys in six nations, this study seeks to present and apply a methodology for forecasting food supplies and needs. Nations chosen for the study (Bangladesh, India, Indonesia, Morocco, Pakistan, and Sri Lanka) represent the world's largest concentrations of poverty and inequality. The methodology relates levels of energy intake to levels of income, and establishes a model of aggregate supply and demand based on projected rates of growth and distribution. This approach concentrates on the question of the causes of malnutrition; income distribution and food prices are isolated as the primary causes, accounting for 90% of the variance in energy intake within each country and across countries. Income growth and income redistribution are related reciprocally: the higher the rate of redistribution, the lower the rate of income growth needed to reduce malnutrition. The study projects the size of the nutritional gap in 1985 and 1995 under the following alternative policies: constant prices, controlled price rises with controlled levels of food imports, and food self-sufficiency. Constant prices could be maintained only at the cost of prohibitively expensive levels of imports. Self-sufficiency would entail extreme increases in food prices and malnutrition. Although many developing nations have adopted a policy of self-sufficiency, this study illustrates clearly the impossibility of attaining that goal while closing the nutritional gap. Increases in food production and in income growth will help fill a nation's food needs, but income redistribution is also necessary so that a nation's poor have access to that food. Supplementary food and market interventions will continue to be essential, although expensive, government services. Additional information is found in 9 tables and 4 appendixes, the latter containing 33 tables.

10. Longhurst, R., and Payne, P. SEASONAL ASPECTS OF NUTRITION: REVIEW OF EVIDENCE AND POLICY IMPLICATIONS. Discussion Paper No. 145. Institute of Development Studies, University of Sussex, Brighton, England, 1979. 33 pp. 47 references.

This report reviews the evidence and policy implications of the following hypothesis: Within many developing countries seasonal variations exist in terms of both energy intake and expenditure, and such patterns have considerable significance for nutrition and health status. Information drawn from a literature review is mainly confined to those studies presenting quantitative data on intake, expenditures and body weight or composition. Qualitative anthropological data are also used. Various indicators of malnutrition among children are discussed. It is noted that protein-energy malnutrition is generally higher during rainy seasons. The few studies which measured adult weight changes also present a picture of marked seasonal fluctuations. Short- and long-term adaptability of populations to varying conditions of dietary stress is emphasized. Climatological conditions are clearly shown to have a major impact on patterns of intake and expenditure of energy. Although problems of measurement suggest cautious interpretation, the authors conclude that seasonal changes are an important, if not the most crucial, determinant of nutrition in developing countries. Further research should examine how seasonal effects are distributed among social classes, households and among family members. Policy suggestions include both specific nutritional aid and more general agricultural and economic policies. Feeding programs are recommended during periods of greatest need. In addition, seasonally based labor programs and policies to reduce labor expenditure through mechanization and plant genetics are viewed as viable approaches. Ten tables and one figure are provided.

11. Mellor, J. W. FOOD PRICE POLICY AND INCOME DISTRIBUTION IN LOW-INCOME COUNTRIES. Economic Development and Cultural Change, Vol. 27, No. 1, 1978. 26 pp. 20 footnotes including references.

The paper delineates the component parts of a general equilibrium analysis relevant to the relation of price policy to income distribution. It also presents data on the relation of price changes to those component parts and suggests the nature of interactions among the parts. In Part I the author examines the effect of a change in relative food prices on the absolute and relative levels of income of various consumer income classes. Part II looks at the distributional effects of price changes on producers of different income classes. Part III analyzes the effect of prices on agricultural production in the context of static technology and in the context of technological change. Part IV presents several considerations relating food prices to employment in the agricultural and nonagricultural sectors. Part V summarizes major policy implications. The author concludes that the data dramatically demonstrate a change in food prices has a large effect on the income of low-income people, and that low-income people make the bulk of the adjustment to reduced food supplies. Other conclusions focus on employment issues, trade, and research.

12. Perisse, J. THE NUTRITIONAL APPROACH IN FOOD POLICY PLANNING. FAO Nutrition Newsletter, Vol. 6, No. 1, 1968. pp. 30-47.

Calories, nutrients, and monetary value are the common units of all foods and therefore form the basis for comparing food consumption levels between regions or countries. In food policy planning, the economist and nutritionist will strive to make their development model consistent using monetary value and calorie and nutrient content. Steps in policy planning include compilation and analysis of data of the base year, a priori determination of targets in demand for food for the horizon year of the plan, projected level of available supplies in the horizon year, estimation of resources essential for attainment of the targets, and adaptation of the targets to available resources by successive approximations. For this method to become a real instrument for planning, decisionmakers must have data on household consumption obtained through nationwide comprehensive food consumption surveys. Annex II describes the trends for certain nutritional indicators according to income levels. Statistical data are presented in five tables and figures.

13. Pines, J. M. THE IMPACT OF NUTRITION GOALS ON AGRICULTURE: AND HOW FARM POLICIES INFLUENCE NUTRITIONAL STATUS. Food and Nutrition, Vol. 2, No. 1, 1976. pp. 2-4.

The effect of farm policies on national nutritional status usually receives little attention, except through concern for food price stability and the "production gap" that must be filled to maintain price stability. Nutritional review is indispensable, however, in calculating costs and benefits of policy alternatives. At the core of agricultural planning for improved nutrition is the difference between food production sufficient to meet individual nutrition needs and that required to maintain stable food prices. In this context, the author looks at food-production requirements, food consumption, nutritional consequences, income, agricultural self-sufficiency, and import substitution. He concludes that the agriculture sector should be part of a multi-sectoral attack on malnutrition. Then farm income, food prices, and nutrient supply become links in a broader system, and nutritional review becomes a tool for program planning.

14. Pinstrup-Andersen, P. FOOD POLICY AND HUMAN NUTRITION. Prepared for a workshop on the Interfaces between Agriculture, Food Science and Human Nutrition in the Middle East, ICARDA, Aleppo, Syria, February 21-25, 1982. International Food Policy Research Institute, Washington, D.C., U.S.A., 1982. 28 pp. 20 references.

The paper consists of three sections: an overview of the causal links between food policy and nutrition, an analysis of the nutrition effects of selected food policies, and a discussion of how nutritional considerations may be more closely integrated with other goals in the design of food policies. The nutritional status of an individual is affected by the interaction of five factors: amount and kinds of food available, ability of the household to obtain available food, desire of the household head to obtain available food, allocation of acquired food among household members, and the physiological utilization of

ingested food by the malnourished individual. The author examines four policy types for their effects on nutrition: food supply policies and programs, consumer-oriented food price policies, food-linked income transfer, and food transfer programs. Successful efforts to improve the nutritional impact of food policy measures must be based on three factors: a political desire to improve the lot of the poor, effective institutional and analytical capacities, and a thorough understanding of the relevant processes and access to necessary information.

15. Place, P. M. O. NUTRITION IN POLICY PLANNING FOR THE RURAL SECTOR. Cornell International Nutrition Monograph Series, No. 8. Cornell University, Ithaca, New York, U.S.A., 1981. 86 pp. 72 references.

The monograph addresses the need to include nutrition in development planning and attempts to describe the complex interaction of agricultural and food policies on family nutrition. The author discusses methods that can be used to discern the nutritional impact of various policies. She uses data from rural areas of the United States, collected in 1965-1966. The monograph presents an overview of nutrition in economics planning and policy, including producer-oriented and consumer-oriented policies, and describes the methodology and data used. Agricultural policies directed toward food crops have a direct effect on nutrition. Policies directed toward cash crops affect nutrition through the indirect effects of income. The author examines the producer-oriented policies of price supports, deficiency payments, credit programs, and extension services; and the consumer-oriented policies of home gardens, nutrition education, food stamps, and commodity distribution programs. The author also discusses some methods of describing the nutritional status of groups of people and what variables affect that status: nutritional deficiency indexes, food consumption theory approaches, and nutrient consumption approaches. The author concludes that what is needed most is the desire and ability on the part of planners to pursue a holistic, interdisciplinary approach to development. Numerous tables and figures illustrate points in the text.

16. Popkin, B. M. ECONOMICS AND NUTRITIONAL CHANGE. Archivos Latino-americanos de Nutricion, Vol. 25, No. 1, 1975. pp. 7-30. 19 references.

The author discusses the positive or negative impact of various economic measures on nutritional changes in low-income groups, and analyzes a number of actual programs and their effects. The approach of introducing low-cost commercial nutritional foods has seldom realized the goal of reducing serious malnutrition. Frequently, families tend to reduce other food purchases when they buy the high-protein special foods, because they assume that the special food alone will produce health and growth for their children. The approach of encouraging home gardens appears to be useful in improving nutrition. The author discusses the problems of verifying nutritional effects in the field and of reaching those most in need, those beyond the reach of market forces and public services. He asserts that governments should state clearly their program objectives. In certain types of programs there may be logic in not

aiming to reach the poorest people in the society. The article includes nine tables of data.

17. Reutlinger, S., and Selowsky, M. MALNUTRITION AND POVERTY: MAGNITUDE AND POLICY OPTIONS. World Bank Staff Occasional Papers, No. 23. The World Bank, Washington, D.C., U.S.A, 1976. 82 pp.

The study assesses the character and magnitude of nutritional deficiency in developing countries and analyzes the cost effectiveness of policy instruments selected to reduce the deficiency. The macro-estimates of malnutrition represent an attempt to take explicit account of the unequal distribution of food among different groups in the population. The study analyzes the potential effects of the projected growth in per capita calorie consumption on projected calorie deficits among the lower income groups. The authors conclude that malnutrition will not disappear in the course of normal per capita income growth. Only policies deliberately designed to reallocate food or income can eliminate undernutrition. Target-group-oriented food programs in urban areas and programs to assist low-income farm families to increase and stabilize production of food for their own consumption can be more cost-effective than outright income distribution. Five appendixes describe data used and mathematical calculations. The volume contains 36 tables and 13 figures.

18. Taylor, L. RESEARCH DIRECTIONS IN INCOME DISTRIBUTION, NUTRITION, AND THE ECONOMICS OF FOOD. Food Research Institute Studies, Vol. 16, No. 2, 1977. Stanford, California, U.S.A. pp. 29-45. 33 references.

This paper attempts to describe the potentially researchable questions about the interaction of income distribution, food production and consumption, and nutritional status. The criteria for selecting topics were that the problems be amenable to policy intervention, that they bear on the welfare of poor people in poor countries, and that they can be effectively studied by small research teams with specialization in economics. The author first presents causal links in the form of two diagrams. He then discusses macro-economic research topics and three sets of micro issues: (1) linkage of food consumption and nutritional status, (2) determinants and consequences of food consumption behavior, and (3) food processing and distribution in agriculture. He concludes that market foodstuffs can be studied through traditional partial equilibrium economics, but household food production is less well understood and a conference is needed to clarify research possibilities. So little is known about rural income distribution that any research approach would be useful.

19. Timmer, C. P. DEVELOPING A FOOD STRATEGY. Paper presented at Food Security in a Hungry World: An International Food Policy Conference, San Francisco, California, U.S.A., March 4-6, 1981. 27 pp.

The paper begins with a discussion of policy perspective to identify the building blocks of a country's food strategy. In a discussion of the analytical

approach to food strategy, the author declares that the hunger problem must be approached explicitly through the food sector, recognizing the linkages from the agricultural sector to the food consumer through the market system. This approach allows the linkage of the hunger problem to macro-economic influences through budgets and price policy, and to international influences. The approach also allows a real-world analysis and a search for possible second-best solutions. The author next focuses on the food system, including consumption, production, and marketing. In a discussion of the macro-economic environment, both domestic and international factors are examined. The author concludes that food prices are the critical link joining the macro-economic environment, the marketing sector, food consumption patterns, and food production potential.

20. Tripp, R. B. ECONOMIC STRATEGIES AND NUTRITIONAL STATUS IN A COMPOUND FARMING SETTLEMENT OF NORTHERN GHANA. Doctoral dissertation. Graduate School of Arts and Sciences, Columbia University, New York, New York, U.S.A. 1978. 294 pp. 119 references.

Tripp carried out anthropological research in a Nankane-speaking settlement in the Upper Region of Ghana. He examined the economic organization of the community, with particular attention to agricultural practices, use of food resources, trading activities, and labor migration. Tripp explains variations in the nutritional status of children by reference to their economic environments. Economic factors showing the strongest influence on nutritional status of children were the trading or wage-earning status of their parents. The strongest correlation existed between female market traders and the superior nutritional status of their children. A second important factor was the long-distance trading and wage-earning capacity of the father. Some significant differences were noted according to the number of males in the residential unit and the sex of the child. The most important question raised by the results of Tripp's study is why, in agricultural communities, there are no strong relationships between variations in agricultural strategy and the nutritional status of children. Tripp concludes with a summary of his methodology and some implications for nutritional status, for example, the importance of increasing women's incomes. Tripp supplements his text with 46 tables and 13 figures.

21. Wilford, W. T. NUTRITION LEVELS AND ECONOMIC GROWTH: SOME EMPIRICAL MEASURES. Journal of Economic Issues, Vol. 7, No. 3, 1973. pp. 437-458. 33 references.

The application of three models (linear, two-line, and per capita Engel function) employed to test income and nutrient data collected in 1958 in 30 countries and in 1968 from 70 countries is summarized. Methodology and calculations are presented. Three sub-hypotheses are proffered: (1) Nutrition and per capita income will be less strongly correlated in nations which have reached an "acceptable" level of nutrition, measured in terms of caloric and protein intake. (2) The relationship between nutrition levels and income per capita may be represented by an Engel function. (3) Per capita income and nutrition are more closely correlated in developing countries than in industrialized nations. Of the three approaches, the Engel function approach was considered the most precise in explaining the correlation of per capita income

and nutrition. The Engel function procedure lends support to the fundamental economic hypothesis that nutrition is a basic motivating force and one that is first to be met with improved income status and that nations having low per capita incomes may increase nutrient intake with a relatively small per capita income; as per capita income levels increase, nutrient intake rises less rapidly. The article includes 7 tables, 4 figures, and 22 notes.

22. Winikoff, B., ed. NUTRITION AND NATIONAL POLICY. MIT Press, Cambridge, Massachusetts, U.S.A., 1978. 580 pp. 255 references.

Past and present attempts of governments to address the problems of malnutrition are illustrated in 11 case studies. Each government's activities aimed at alleviating the malnutrition problem are related by prominent nationals involved in nutrition-related activities within their country. The presentations cover the following countries: Chile, Colombia, Ghana, Indonesia, Jamaica, Nigeria, Panama, Philippines, Tanzania, United States, and Zambia. The case studies dramatize the difficulties of: (1) getting nutrition taken seriously; (2) eliciting participation and cooperation from ministries for whom nutrition is peripheral; and (3) identifying and implementing actions that are likely to help nutrition. Following the country case studies are commentaries by internationally recognized professionals who have been actively participating in the political and medical aspects of nutrition planning. Subject areas covered include nutrition's relationship to: culture, health policy, political process, agricultural policy, and economic policy, as well as professional collaboration in program implementation. The book also presents ways of relating macro-economic and other aggregate variables to community nutritional status and to the conventional nutrition system framework for interventions. The experiences recorded provide tools for dealing with those whose decisions determine these variables. Two summary chapters written by the editor of this volume are also included.

B. REGIONAL OR COUNTRY-SPECIFIC

23. Allen, B. J., et al. CHILD MALNUTRITION AND AGRICULTURE ON THE NEMBI PLATEAU, SOUTHERN HIGHLANDS, PAPUA, NEW GUINEA. Social Science and Medicine, Vol. 14D, 1980. pp. 127-132.

A short but intensive survey of subsistence gardens and child nutrition on the Nembi Plateau in Papua, New Guinea, revealed high population densities, high rates of child malnutrition, food shortages, and low yields of the staple crop, sweet potatoes. There appeared to be no absolute shortage of arable land. The food shortage problem is the result of a long-term decline in yields, caused by cultivation periods extended well beyond the usual. The women are in charge of the gardens and are faced with the task of maintaining food production from old gardens with declining yields. They are working to the point of exhaustion in the production of staples for their families and herds of pigs. Child malnutrition is associated with larger households and

with households having smaller garden areas per head. Three figures and three tables appear in the text.

24. Basson, P. WOMEN AND TRADITIONAL FOOD TECHNOLOGIES: CHANGES IN RURAL JORDAN. Ecology of Food and Nutrition, Vol. 11, 1981. pp. 17-23. 6 references.

The author argues that although economic development which emphasizes commercialized agriculture and food processing increases food supplies, it also excludes married women--a large part of the rural population--from active participation in the development process. Interviews with 350 female heads of households in northwest Jordan reveal an increase in market purchase of foods traditionally prepared at home. The paper documents the loss of traditional food technology and discusses accommodation to that loss through changes in food patterns, religious tithing, credit buying, and transmission of traditional skills. Commercialized production of milk products and eggs in Jordan excluded women who traditionally had produced those products using labor-intensive skills. As women purchase commercial products, eating habits begin to change and belief in the value of home production declines. Simple forms of food production, storage, and distribution through barter, gifts, and tithes are disrupted and skills are lost. Inadequate diets occur because people cannot earn enough consistently to purchase foods they need and to maintain local markets with high-quality products.

25. Beaudry-Darisme, M. N., et al. THE APPLICATION OF SOCIOLOGICAL RESEARCH METHODS TO FOOD AND NUTRITION PROBLEMS ON A CARIBBEAN ISLAND. Ecology of Food and Nutrition, Vol. 1, 1972. pp. 103-119. 14 references.

The authors describe a household frequency survey carried out in 200 households on the Island of St. Vincent in 1968. Their survey was designed to identify ecological areas on a household basis, investigate patterns of food consumption, their socioeconomic correlates, and their relationship to the incidence of malnutrition in preschool children. The highest incidence of malnutrition among infants was in a rural area undergoing modernization. Generally, an increase in complexity of life (rural to urban) led to an increase in complexity of food intake and a lower incidence of malnutrition in children, a lower child mortality rate, and a shorter period of breastfeeding. Among higher income groups, dietary complexity related significantly to educational level and occupational status of household heads. Women in urban areas tended to have more ideas concerning food, good or bad, in different periods of life than did women in rural areas. While complexity of diet does not necessarily mean high quality, diets of poor quality tend to be monotonous and depend on staples of poor nutritional value. The authors present their data in 18 tables throughout the text.

26. Biswas, M. R. NUTRITION AND AGRICULTURAL DEVELOPMENT IN AFRICA. Research Memorandum 78-61. International Institute for Applied Systems Analysis, Laxenburg, Austria, 1978. 26 pp. 29 references.

This article reviews the types and causes of malnutrition in Africa, associations between malnutrition and development, and policy measures to improve nutrition. Among the major causes of nutritional problems are inadequate supply of essential foods due to seasonal food shortages and an uneven distribution of available foods both within the family and within the region as a whole. Urbanization, bottle-feeding, poor weaning practices, restricted food intake resulting from food taboos, and increased consumption of prestigious foods (e.g., breads, sugar, and soft drinks) account for additional malnutrition. Improved nutrition should be the principal goal of development, and food and nutrition policies should lie at the core of development planning. A nationally integrated approach and the establishment of national nutritional targets are essential to nutritional improvement. Suggested measures to improve nutrition and income distribution include increased food production; crop diversification and increased production of animal protein to provide for a balanced diet; improved production, processing, storage, and distribution to all population groups; and nutrition intervention programs, particularly for vulnerable groups. Data are contained in four tables.

27. Chen, L. C., et al. SEASONAL DIMENSIONS OF ENERGY PROTEIN MALNUTRITION IN RURAL BANGLADESH: THE ROLE OF AGRICULTURE, DIETARY PRACTICES, AND INFECTION. Ecology of Food and Nutrition, Vol. 8, 1979. pp. 175-187. 20 references.

The aim of this paper is to explore the seasonal fluctuations of nutritional status among mothers and children in rural Bangladesh. The paper attempts to delineate whether and how the seasonal changes in major determinants operate to influence nutritional well-being. The authors present a simple framework of energy-protein malnutrition. Then, using empirical data from Bangladesh, they examine seasonal impacts on the landless rural poor. The authors find rice prices the highest, foods stocks lowest, agricultural demand weakest, and nutritional status the worst, in the months preceding the major rice harvest. Peak demand on women's time coincides with postharvest rice processing activities, and breastfeeding declines during that period. The landless rural poor are the most adversely affected by seasonal changes. Nutrition intervention programs would be more effective if they took seasonal problems of work demand, food scarcity, and disease into account. Reducing marked seasonal fluctuations is nutritionally important. First, fluctuations may precipitate severe forms of malnutrition among marginally nourished children. Second, seasonal stress periods with loss of family assets may contribute to the perpetuation of rural poverty. Eight figures and four tables supplement the text.

28. Chong, Y. H. ASPECTS OF ECOLOGY OF FOOD AND NUTRITION IN PENINSULAR MALAYSIA. Journal of Tropical Pediatrics and Environmental Child Health, Vol. 22, No. 5, 1976. pp. 237-256. 87 references.

This report assesses food and nutritional problems in Malaysia in relation to a wide range of demographic, economic, and medical issues. A demographic profile of the country is presented. Included are population characteristics (population pyramid, morbidity, and mortality statistics), availability of health facilities, and income data. A section is devoted to a review of the current state of food production and availability as reflected in National Food Balance Sheets. Government agricultural policies designed to achieve self-sufficiency are discussed and major sources of protein and energy are examined. Public health implications of existing malnutrition are stressed, particularly the need to identify and treat both protein-energy malnutrition and specific nutrient deficiencies such as anemia and individual vitamin deficiency disorders. The influence of infections, traditional food habits, and food toxicants on malnutrition is considered. Applied nutrition programs now being undertaken to alleviate these conditions are outlined. Studies pf preschool children indicate less malnutrition than would be predicted using data on demography, national income, and food productivity and availability. The general conclusion, as indicated by such measures as the ratio of doctors to population, is that Malaysia is better off than many other developing countries but still is far behind industrialized nations. Eleven tables, 15 figures, and an extensive list of references are provided.

29. Geissler, C., and Miller, D. NUTRITION AND GNP: A COMPARISON OF PROBLEMS IN THAILAND AND THE PHILIPPINES. Food Policy, Vol. 7, No. 3, 1982. pp. 191-206.

This paper compares two countries with the same Gross National Product (GNP) and similar food supplies to test the correlation between GNP and nutritional status. The authors investigated the countries' use of equal resources and the impact on nutritional status. They found malnutrition more prevalent in the Philippines despite an extensive national nutrition program, better medical and educational services, and safer water supplies. They found the most significant underlying factor was the cost of living, particularly food prices relative to family income. Rises in GNP over the last decade did not translate into equal rises in nutrition levels. The authors conclude that while GNP may be closely related to nutritional status within the international community, there is little correlation between GNP and nutritional indexes within nations. Two figures and 14 tables are presented in the text.

30. Hitchings, J. A. CHILD NUTRITION IN RURAL KENYA. Central Bureau of Statistics, Ministry of Economic Planning and Community Affairs, Kenya, 1979. 142 pp. 62 references.

This monograph reflects the continuation of a previous nutrition survey, and involved revisiting the same sample of households as previous modules of the second Integrated Rural Survey (IRS II). The stratified random sample represents rural smallholders in 29 districts of Kenya. Nearly 1400 children aged

1 to 4 years were measured in February and March 1977; the basic data collected were height, weight, age, sex, mid-arm circumference, duration of breast-feeding, and the approximate frequency of food consumption from broad categories. Ethnic and ecological zone patterns of stunting and wasting, provincial child mortality rates, and correlations between nutrition variables are presented. Discriminant analysis is applied to the frequency of food consumption data. The nutrition survey is conjoined with IRS II variables descriptive of the household and the agricultural production pattern. Information on income, purchases, and yields is not available but the data give the number of household members, the distance to and type of water source, the nature of off-farm employment, cattle holdings, planted areas by crop, and the like. A branching network is generated which selects those variables which are best able to classify children by their percent of Harvard Standard height-for-age and weight-for-height. The findings indicate that rural Kenya has a relatively low prevalence of severe protein-malnutrition. It is noted that if the head of a household was employed in the health, education, or welfare fields, as an agricultural laborer, or in an urban occupation, the children generally had higher growth indicators. This may be due to the increased off-farm income generated by these occupations. Households producing food or cash crops for sale generally had a lower incidence of malnutrition. The General Appendixes give sampling cluster and ecological zone maps, and show that ages are probably reported without systematic bias. The Technical Appendixes are intended for use in other surveys. Equations modeling the Harvard Standard growth curves are derived.

31. Idusogie, E. O. MARRIAGE OF AGRICULTURE AND NUTRITION; AND FOOD AND NUTRITION POLICY FOR AFRICA. Joint FAO/WHO/OAU Regional Food and Nutrition Commission for Africa, Accra, Ghana, 1977. 19 pp. 22 references.

The complex relationships among inadequate food intake, malnutrition, ill health, and impaired work capacity are addressed. The focus is on providing information to assist planners in eliminating nutrition-related problems by stressing remedial measures suggested by numerous studies. The relation between nutrition and agricultural development projects, and food and nutrition policy planning as complementary efforts in Africa has been studied extensively. A consensus of opinion suggests that agricultural development is the most effective base for overall development. Nutrition, however, is a socioeconomic matter and hunger and malnutrition as aspects of it are problems not solved by increased agricultural production alone. Higher priority to the nutrition component must be assigned by national governments than is presently practiced. It is also noted that the poorer segments of the population, frequently quite large in developing African countries, suffer most from malnutrition and its concomitant ills, making the most likely agricultural labor force the least productive segment of the society. Thus, concrete programs to improve nutrition including training of government personnel, general nutrition education for the people, supplementary feeding programs, and nutritional surveillance should be incorporated as required in all national development planning. One figure illustrating a possible organizational structure for food and nutrition planning is included.

32. Jeffries, D. FOOD HABITS IN RURAL AND URBAN ENVIRONMENTS: AN EXAMPLE FROM PAPUA NEW GUINEA. Proceedings of the Nutrition Society of Australia, Vol. 3, No. 46, 1978. pp. 46-56. 22 references.

This paper compares the food habits of culturally similar groups in urban and rural settings in the Eastern Highlands area of New Guinea. Obtaining information on infant feeding attitudes was a major focus of the study. The nutritional status in each population (300 rural villagers, 270 city dwellers) was determined by taking weight-for-age measurements for preschool children aged 0-4 years, with the malnutrition rate based on the number of cases under 80% of the Harvard Standard. Results showed the food preferences and beliefs of village dwellers were a mixture of the traditional and modern, with the young, educated, and well-traveled having more modern beliefs. People were generally willing to use local clinics when ill, but were reluctant to follow dietary advice. City residents had the same mixture of food beliefs and preferences; clinics and hospitals were relied upon more heavily. Traditional taboos were practiced less frequently and more attention was given to proper weaning foods for infants. Dietary recalls showed that food consumption patterns were different in the two areas with more starchy foods eaten in the rural area. City dwellers ate a more varied diet. The weighed intake survey in the rural area indicated that starchy foods were the largest source of protein and energy. Store foods provided about 10% of protein and 8% of energy. The income/expenditure survey conducted in the city showed that families spent 43-95% of their income on food. Of this, 37.5% was for animal protein, 23.7% for snack foods and drinks, and 10.4% for fruits and vegetables. The availability of modern food varieties created a problem in the diets of city children. Based on weight-for-age measurements, 47.1% of the village children and 21.5% of the city children were malnourished. While the diet in the rural areas was adequate for adults, it resulted in slow growth rates for children. Four figures are included.

33. Karim, R., and Levinson, F. J. SOCIO-ECONOMIC CONSTRAINTS IN IMPROVING NUTRITIONAL STATUS IN BANGLADESH. Paper presented at the Third Bangladesh Nutrition Seminar, Dacca, Bangladesh, March 22-24, 1979. 16 pp. 1 reference.

Three explanations for inadequate food intake in Bangladesh are examined using data from the Nutrition Survey of Rural Bangladesh. Estimates derived on the basis of average per capita calorie intake suggest that food is available and becoming increasingly more available throughout Bangladesh, although local or seasonal shortages may occur periodically. Inadequate income is a primary cause of malnutrition. Approximately 66% of the total population are classified as below poverty level, if the poverty line is calculated on the basis of income required for the purchase of 2,250 calories per person per day. If economic status is determined by size of landholdings, 76% of the rural population failed to own sufficient land to produce the same minimum caloric requirements. Commodity price is also analyzed for its effects on malnutrition; a regression model illustrates that 32% of the seasonal variations in malnutrition is the result of changes in rice price. Deleterious belief patterns and practices are an impediment to adequate nutritional status. Weaning practices and delayed introduction of supplementary solid foods are mentioned in

this context as are intra-family food distribution and the ramifications to health of the "hot-cold" classification of food. Patterns of employment and social structure are also discussed briefly with the authors concluding that malnutrition is a structural component of Bangladesh society which can be reduced only via a comprehensive transformation of the national fabric.

34. Kumar, S. K. ROLE OF THE HOUSEHOLD ECONOMY IN CHILD NUTRITION AT LOW INCOMES: A CASE STUDY IN KERALA. Occasional Paper No. 95. Department of Agricultural Economics, Cornell University, Ithaca, New York, U.S.A., 1978. 78 pp. 57 references.

Improvement in health and nutrition is an important measure of economic development. Good nutrition is associated also with the efficient use of resources and higher labor productivity. This paper attempts an analysis of the causality of malnutrition within households, the access of households to different types and levels of resources, and the linkages of household performance to the social, economic, and political environment. The paper also addresses the theoretical basis for the development of nutrition policies. Using a case study of Kerala State in India in 1974, the author discusses nutrition concerns in relation to three development options: land reform, technological change in agriculture, and the participation of women in the labor force. She reports that in Kerala, provision of land for small kitchen gardens resulted in a positive nutritional impact on young children, especially during slack employment seasons. Technological change that expanded wage-earning opportunities could improve nutrition in poorer families, if women could take advantage of wage-earning opportunities. In fact, the positive effect of wage income on child nutrition occurred only when mothers were in the labor force. A limiting factor for their participation was the need for child care for preschool children. Relevant data are presented throughout the text and in an appendix.

35. LeFranc, E. SOCIAL STRUCTURE, LAND USE, AND FOOD AVAILABILITY IN THE CARIBBEAN. Food and Nutrition Bulletin, Vol. 3, No. 4, 1981. pp. 5-11. 12 references.

The paper is concerned with the possible impact of certain social arrangements and cultural orientations on food crop production, food availability, and consumption habits in the Caribbean. Attention is focused on the small-farmer subculture, and the extent to which it has been shaped by the plantation economy. The paper concentrates on two social institutions that have a profound impact on productive activities in the Caribbean: the farm family and the land tenure pattern. The author draws three conclusions with policy implications. First, programs need to shift attention away from the self-sufficient "whole farm" and look at the internal authority structures of kinship groupings which affect individual behavior. Second, policymakers need to recognize the severity of the labor problem faced by the small farmer. Third, efforts ought to be directed toward reducing the level of risk faced by the small farmer in a limited resource situation.

36. Maletnlema, T. N. THE IMPORTANCE OF NUTRITION IN SOCIOECONOMIC DEVELOPMENT. Regional Committee for Africa, World Health Organization, Brazzaville, Congo, 1977. 33 pp. 35 references.

This paper critically evaluates the impact of malnutrition on development in the African region. It discusses approaches taken to eliminate malnutrition, including methods that have failed, and describes the consequences of implementing such approaches. A new approach is offered to the challenge of malnutrition and development based on attempts to correct misguided concepts, improve the economy, and include health activities such as maternal and child health services, comprehensive medical services, school health services, and personnel training; education, use of appropriate technology, improved status of African women, political and ideological motivation, and greater interest in planning are additional objectives. Some planning principles are reviewed and charted. Methods to improve nutritional status are critically evaluated; methods discussed include external aid (food aid, disaster relief, prevention and treatment of malnutrition, projects paid in kind with food, and other aid programs), nutrition surveys, nutrition education (community information, nutrition education for profit, teaching materials), food production and planning. It is concluded that, in general, nutritional intervention programs have failed due to a lack of understanding of Africa's needs. Data are contained in two tables and two figures.

37. McCarthy, F. D. NUTRITION, FOOD AND PRICES IN PAKISTAN. Discussion Paper No. 4. Center for International Studies. MIT International Nutrition Planning Program, Cambridge, Massachusetts, U.S.A., 1974. 43 pp. 45 references.

This report discusses issues involved in nutritional status determination. The empirical work relates to West Pakistan and is based on surveys by the government of that country. Part One deals with the "demand" for nutrition and makes the assumption that, given tastes as a known determinant of demand, nutrient selection may be determined by other quantifiable factors. Income, primary among such factors, then becomes an analytical tool. The high incidence of malnutrition among the nation's poor may be alleviated by income subsidies which would effectively require the establishment of new government institutions. Part Two analyzes demand as it applies to alternative nutrient sources or food groups. As income increases, the trade-offs between quantity and perceived quality of various foodstuffs can be perceived and analyzed. The author concludes that nutrient intake is affected primarily by food price and expenditure, and to a lesser extent by household size, urban-rural location, and job status. As income increases, people consume more though much of the increase goes to buying higher-priced items. Nine tables and four appendixes are included.

38. Olayide, S. O., and Olayemi, J. K. ECONOMIC ASPECTS OF AGRICULTURE AND NUTRITION: A NIGERIAN CASE STUDY. Food and Nutrition Bulletin, Vol. 1, No. 1, 1978. pp. 32-39. 7 references.

The paper discusses the interactions between nutritional intake and the state of Nigeria's food economy, and the economic factors that influence existing food supply and demand. The paper first considers the average nutritional intake in Nigeria, then the major variables in food supply and demand. The four main variables that influence the existing low rate of growth in food supply are: (1) the growing scarcity of traditional farm inputs, (2) marketing and price constraints, (3) profit constraints, and (4) organizational constraints. On the demand side the variables are high income growth rate, poor income distribution, high consumer prices, and socioeconomic factors. The authors discuss these variables in terms of strategies for enhancing quantitative and qualitative food balance. Three tables supplement the text.

39. Omawale. NUTRITION AND NATIONAL DEVELOPMENT IN GUYANA. Master's Thesis. London School of Hygiene and Tropical Medicine, University of London, England, 1976. 121 pp. 22 references.

This report examines food availability and consumption in Guyana and their relationship to the nutritional status of the population, with much of the information drawn from the 1971 National Food and Nutrition Survey. National nutrition goals are proposed and a discussion of selected interventions aimed at alleviating hunger and malnutrition is included. Factors affecting food production are reviewed, and an analysis of the food distribution and marketing system is made. Major constraints on increasing yields such as soil infertility and poor water control will continue to exist. Other problems, including inadequate storage and processing facilities, contribute to high crop losses, particularly among fruits and vegetables. There are considerable regional variations concerning the adequacy of per capita protein and energy intakes. Extensive data are presented on changes in food prices and consumption of various food categories. In certain regions, more than half the population suffers from inadequate energy intake; low levels of riboflavin and vitamin A also are common. This situation is exacerbated by gastroenteritis, respiratory infections, and poor sanitation. Suggested national objectives include the elimination of moderate to severe malnutrition by 1981 and all malnutrition by 1986, accompanied by significant reductions in the prevalence of other nutrition problems such as anemia. The material concludes with a review and evaluation of selected interventions designed to improve nutritional status. These include the marketing of a soft drink made from soya flour, development of weaning mixtures from indigenous foods, and various government programs. It is stressed that government programs should be assessed according to overall costs and benefits, including their effort on income distribution. Forty-two tables, one figure, one map of Guyana, and three appendixes are provided.

40. Perisse, J., and Kamoun, A. THE PRICE OF SATIETY: A STUDY OF HOUSEHOLD CONSUMPTION AND BUDGETS IN TUNISIA. Food and Nutrition, Vol. 7, No. 2, 1981. pp. 3-10.

The authors used statistical data gathered on 2,510 households in Tunisia in 1975 to examine the distribution of income, consumption, food expenditures, and nutritional requirements of each household, and to distinguish deficit from satisfied households. They have tried to establish the income level which coincided with food deficits. The authors also studied the way in which households adapt their consumption to their income level and sought an explanation for the deficits. The article has eight sections: income, demography, income and energy requirements, intake and minimum requirements, patterns of consumption, the cost of energy intake, adjusting income to requirements, and the price of satiety. The authors conclude that there is no close correlation between income level and the adequacy of food intake. The probability of a food deficit merely increases as income decreases. Any food aid to needy households would be better accepted if it contributed to the diversification of diet. A relatively quick method of reducing food deficits might consist of improving food marketing channels to reduce the price premium that seems to be levied on deficit households. Six tables and a scattergram present relevant statistical data.

41. Popkin, B. M. TIME ALLOCATION OF THE MOTHER AND CHILD NUTRITION. Ecology of Food and Nutrition, Vol. 9, 1980. pp. 1-13. 54 references.

The author examines the relationships between the market work status of mothers in 34 rural barrios in Laguna, Philippines, and specific dimensions of the nutritional status of their preschool children. The author looks at the impact of the mother's work status on child care time, child dietary intake, and child nutritional status. First, a background section presents the conceptual framework of the analysis and other issues associated with the time allocation relationship. The report then focuses on the Filipino data and empirical analysis of those data. It is shown that rural mothers who engage in market activities reduce the time they devote to child care, and older siblings replace part of that child care time. Mothers who engage in market activities are able to provide their children with more calories and protein in relation to needs. Yet analysis shows that the initial household time substitutes have net negative effects on the average nutritional status of children 1-71 months of age in each rural household. One figure and seven tables provide relevant data.

42. Rizvi, N. RURAL AND URBAN FOOD BEHAVIOR IN BANGLADESH: AN ANTHROPOLOGICAL PERSPECTIVE TO THE PROBLEM OF MALNUTRITION. Doctoral Dissertation. University of California, Los Angeles, California, U.S.A., 1979. 315 pp. 148 references.

This investigation uses anthropological data to analyze interrelationships among food behavior, environment, and culture in rural and urban settings of Bangladesh. Data were collected through participant-observation, interviewing, and surveys of consumer expenditures and food intake. The interview sample included rural households from the village of Balfadi, and urban households in Dacca composed

of families who had migrated to the city from the same geographic area. Variables measured included several indicators of socioeconomic status, household size and composition, and food beliefs and values. In reporting findings, cultural aspects of food receive considerable attention, including beliefs about rice as a super-food (e.g., increases mental acuity), notions of hot and cold foods, relationships between food, health, and disease, and the use of bitter foods as local medicines. A separate section analyzes inter- and intra-household food use patterns. A large proportion of the sample population in both village and city suffer from inadequate caloric intake. This results primarily from economic deprivation, but is often exacerbated by cultural influences. There were significant differences in food intake among and within households. Greatest variations occurred in the frequency of foods eaten with rice; these patterns are greatly affected by income. Food beliefs concerning two groups at high risk of malnutrition (women and children) are examined. Topics discussed include: (1) food practices during pregnancy and post-partum period; (2) variations in adherence to these rules among socioeconomic groups; and (3) infant feeding practices (e.g., the impact of sympathetic magic beliefs on breastfeeding and weaning practices). Beliefs and behavior concerning diarrhea and worm infestation are also analyzed. It is concluded that cultural factors do not constitute primary causes of malnutrition, even during the high-risk periods described above. Thus, intervention programs which focus on nutrition education will be unsuccessful unless integrated within broader strategies to alleviate poverty. Specific suggestions for improving economic and health status are presented. Extensive supplementary material is provided, including 18 tables, 4 figures, 3 maps and sketches, and 22 photographs.

43. Sai, F. T. THE PROBLEM OF FOOD AND NUTRITION IN WEST AFRICA. World Review of Nutrition and Dietetics, Vol. 10, 1969. pp. 77-99. 12 references.

The author discusses problems of food supply and nutrition in West Africa, defined as the region from Senegal to Congo (Brazzaville). He analyzes the geography, demographic factors, and agricultural activities of the area, the choice of foods, nutrient consumption and deficiencies, the role of infection, and general approaches to solutions for nutritional problems. The author concludes that West Africa should be able to produce enough food for its population, but agricultural practices and food habits produce gross differences in availability of calories among the population. Among the agricultural practices and problems examined are cash cropping, shifting cultivation, staple production, storage facilities and postharvest losses, transportation difficulties, attraction of food to large urban markets, and imported foods. The author concludes that West Africa needs more trained personnel in all fields of nutrition and that each country needs to give high priority to food and nutrition issues.

44. Simmons, E. B. A CASE STUDY OF SEASONAL VARIATION IN FOOD AND AGRICULTURE. Paper presented at the Conference on Seasonal Dimensions to Rural Poverty, Institute of Development Studies, University of Sussex, Ross Institute of Tropical Hygiene, England, July 3-6, 1978. 24 pp. 4 references.

The effects of seasonal factors, such as rainfall and religious customs, on food availability in rural households is explored using an area of northern Nigeria as a case study. Information was collected during three surveys of 18 households in Hanwa, a rural village near Zaria. One survey (1966-1967) examined farm management practices, the second (1970-1971) investigated agricultural marketing and credit, and the third (1970-1971) involved household consumption and expenditures. The sample households were divided into two groups: those owning milk cattle and those that do not. It was concluded that seasonal factors exert a major influence on production, employment, food consumption, and expenditure patterns of Hanwa farmers. However, such factors do not seem to pose major constraints on farmers' capacities to improve their economic situations; more important are land availability, opportunities for productive employment to supplement farm incomes, and perhaps the availability of crop technologies to improve yields per man-hour and per acre. It is suggested that useful information for the programming of development processes can be gained through understanding the seasonal dimensions of the Hanwa farmers' productive capacity and output patterns. Crop technology innovations requiring more intensive labor inputs in the rainy season, for example, are not likely to be adopted by cattle-owners. Conversely, crop changes shown to improve output per acre with no increase in labor demands are more acceptable to the cattle-owning group. Non-cattle-owners, on the other hand, are constrained by land and cash availability and, being able to provide a level of living from their farm resources which is only just adequate, are likely to be somewhat more averse to risk than cattle-owners. For the non-cattle-owning households to adopt new crop technologies, improved credit facilities at the beginning of the rainy season will be critical. Nine tables and three figures are provided.

45. Teller, C., et al. POPULATION AND NUTRITION: IMPLICATIONS OF SOCIODEMOGRAPHIC TRENDS AND DIFFERENTIALS FOR FOOD AND NUTRITION POLICY IN CENTRAL AMERICA AND PANAMA. Paper presented at the XI International Congress of Nutrition, Rio de Janeiro, Brazil, August 27-September 1, 1978. 38 pp. 40 references.

This study summarizes social and economic factors in malnutrition by examining the relationship between population and nutrition. In Central America and Panama demographic changes have markedly affected nutritional status. For example, lower mortality rates have been accompanied by increased malnutrition. The relationship between food supply, population growth, and population-to-land ratio is also elucidated. For example, greatest agricultural population density is found in El Salvador, Guatemala, and Honduras: three countries with the highest rates of malnutrition. Rapid population growth, however, is not necessarily associated with failing nutritional status, as illustrated by the Costa Rican experience. Biomathematical models employing demographic data are used to estimate the effects of constant and declining growth rates on the numbers of malnourished individuals anticipated between the years 1975-1985. Under the most severe assumption there would be, by 1985, 540,000 more children

with second and third degree malnutrition. Under the most favorable assumption, a reduction of 123,000 malnourished children could be expected.

46. Tripp, R. B. FARMERS AND TRADERS: SOME ECONOMIC DETERMINANTS OF NUTRITIONAL STATUS IN NORTHERN GHANA. Journal of Tropical Pediatrics, Vol. 27, No. 1, 1981. pp. 15-22. 12 references.

The study attempts to describe the conditions associated with better-than-average nutrition among children in the farming village of Winkoba, Northern Ghana. The aim is to understand how people cope nutritionally with difficult economic conditions, and incorporate that understanding into development programs. This study examines the relative importance of agriculture and trading in a farming community, and describes the relationship between the nutritional status of children and the economic position of their parents. The results indicate that trading rather than farming leads to more significant differences in nutritional status and economic standing. While the trading activity of either parent makes a contribution to the nutritional well-being of the child, the petty trading of women has the more significant impact. The author concludes that for meaningful impact on nutrition, general development efforts must emphasize women's roles in commercial and agricultural spheres, as well as the domestic one. Programs aimed at increasing productivity and self-reliance of small farmers would be welcomed, but if planners focus on agricultural development as the most important means of improving nutrition, they may overlook a more desirable path for betterment of the human condition. Four tables of data are included in the text.

47. Valverde, V., et al. RELATIONSHIP BETWEEN FAMILY LAND AVAILABILITY AND NUTRITIONAL STATUS. Ecology of Food and Nutrition, Vol. 6, 1977. pp. 1-7. 20 references.

The paper tests two hypotheses: that a relationship exists between a father's occupation and nutritional status of young children, and that the more land available to small-scale farming families the better the nutritional status of young children in the family. The sample population included four rural Guatemalan villages in 1974. Families were divided into three groups: salaried agricultural workers, farmers, and skilled workers and merchants. Children of the latter category tended to have the lowest incidence of malnutrition. Malnutrition in children in farmers' families tended to depend on land available and the risk of malnutrition was greatest where the least land was available. In the study, the group of children at highest nutritional risk lived in farming families with access to less than two manzanas (1.4 hectares) of land. Four tables and three figures in the text present relevant data.

48. Yang, Y. H. NUTRITIONAL AND ENVIRONMENTAL CONSIDERATIONS IN SMALL SCALE INTENSIVE FOOD PRODUCTION. Small Scale Food Production: The Human Element. Proceedings of the Third International Conference on Small Scale and Intensive Food Production. L*I*F*E*, Washington, D.C., U.S.A., 1981. pp. 44-58. 1 reference.

Small farmers, landless farm laborers, and low-income city dwellers share nutritional and economic problems that can be eased by the promotion of kitchen gardens and other individual food-raising techniques. Kitchen gardens are small land parcels, usually in the front or back yards of homes, where vegetables for daily personal consumption are grown. Home gardens, on the other hand, generally are larger and grow permanent crops as well. This paper discusses both approaches to domestic food production, considering crop selection, land preparation, herbicides and fertilizers, water conservation, available labor force, economic incentive, and complementary small animals and poultry. The author uses examples from Hawaii, the Philippines, and Taiwan to illustrate his points, and touches on small farms, fish ponds, and small animal raising as additional means of nutritional self-support. He also covers environmental issues, approaches to maximum nutritional/economic outputs, and government policy regarding intensive food production. Nine tables appear within the text.

II. IMPACTS OF AGRICULTURAL AND RURAL DEVELOPMENT PROJECTS AND PROGRAMS

A. NATIONAL PROGRAMS OR POLICIES

49. Berry, E., and Miller, C. NUTRITION/CONSUMPTION ASPECTS IN AID IMPACT EVALUATIONS OF AGRICULTURAL RESEARCH, RURAL ROADS, AND RURAL ELECTRIFICATION AND WATER PROJECTS. U.S. Department of Agriculture, Office of International Cooperation and Development, Nutrition Economics Group, Washington, D.C., U.S.A., 1983. 68 pp. 15 references.

This study focuses on food consumption and nutrition as elements of impact evaluations conducted in AID-sponsored projects in 10 developing countries. Through actual evaluation reports and interviews with evaluation team members, the authors determined that most of the evaluations failed to consider the extent and nature of project effects on the food consumption and nutritional status of the poor in the project areas. Most of the projects studied, however, were likely to have affected these aspects of local life. Evaluators who recognized these potential impacts but ignored them in their written reports did so for several reasons: (1) improving consumption or nutrition was not a primary project objective; (2) consumption/nutrition improvements held low priority among evaluation team members; and (3) insufficient data, time, and expertise existed to evaluate these effects. Perceiving the need to evaluate food-related impacts in future AID project evaluations, Berry and Miller discuss several case studies in the categories of agricultural research, roads projects, rural electrification, and water projects. In each case, they suggest specific linkages to the consumption/nutrition question, providing both examples and guidelines for planners and evaluators in the years to come. Four appendixes supplement the text.

50. Christensen, L., et al. FOOD PRODUCTION AND MALNUTRITION--REPORT FROM KENYA, TANZANIA AND INDIA. Danish International Development Agency (DANIDA), Copenhagen, Denmark, 1980. 141 pp. 38 references.

This report contains reviews of the present food and nutrition situation and related government policies in Kenya, Tanzania, and India. Kenya produces enough food to feed its entire population adequately; however, because of such factors as regional differences, seasonal variations, and lack of education, one-third of the population has some form of malnutrition. Although the Government's Development Plan (1979-1983) attempts to integrate food and nutrition planning into both overall policy and specific proposals, fundamental problems such as conflicting objectives and lack of grassroots nutrition concerns do exist. Tanzania's high degree of malnutrition (25-30% of all children suffer from some form) stems from, among other factors, poor distribution of food between regions and among socioeconomic groups, overdependence on cash cropping, and the drought in 1972-74 that contributed to dependence on food imports. The Government has always considered food and nutrition as a central policy issue; since the drought, it has been shifting the emphasis from cash crops to food crops. The Third Five Year Plan

(1976-1981) holds as its objective self-sufficiency in all major food products by 1981. During the past 4 to 5 years, India has developed its agricultural production very satisfactorily, to the point of self-sufficiency in food grains in 1977 and 1978. Good weather conditions, high-yielding crops, increased irrigation, and fertilization have contributed to the increased production. However, much of the population suffers from insufficient energy intake. Nutritional considerations are not emphasized by national policies; nutritional problems are left to be solved by traditional feeding programs and price subsidies on food. Certain programs such as the Special Nutrition Programme and the Applied Nutrition Programme are described. All three countries suffer from malnutrition related to unequal distribution of food between regions and among socioeconomic classes. A need for developing operationalized guidelines for planners who are introducing nutritional inputs into programs is emphasized. The report includes 17 tables, 16 appendixes, 3 figures, 3 maps, and 13 photographs.

51. Florentino, R. F. PHILIPPINE COUNTRY PAPER ON THE FOOD AND NUTRITION POLICY: AN EXPLORATORY STUDY. Paper presented at the ASEAN Consultative Meeting on Food and Nutrition Policy, Manila, Philippines, December 10-12, 1979. 26 pp. 13 references.

This paper analyzes food and nutrition policies in the Philippines. Emphasis is given to assessing the potential of nutrition and development programs to reduce malnutrition historically associated with poverty. The author notes development policies designed to alleviate nutritional deficiencies have recently focused on a basic needs strategy designed to serve the poor as opposed to economic growth (e.g., raising the gross national product and per capita income). The most notable effort has been the Philippine Nutrition Program (PNP), begun in 1974, using a variety of strategies including agricultural production and food assistance projects. The Plan had the following objectives: (1) increased food self-sufficiency; (2) reduction of second- and third-degree malnutrition among children ages 0-14 years; (3) increased energy and protein intake in selected households; and (4) reduction of the prevalence of anemia, goiter, and vitamin A deficiency. The Plan concentrated on strengthening and integrating health, nutrition, employment, and family planning programs since many independent previous efforts in these areas have benefited the most deprived segments of the population. Effects of agricultural trade, wage, and price policies on food supplies and nutritional status must also be considered in development planning. Export-oriented approaches during the 1970's, for example, often led to domestic food shortages and high prices. Improvements in environmental conditions (e.g., greater provision of potable water, food sanitation efforts) could result in much higher levels of nutrient utilization from food consumed. Reorganization of the health care system is also necessary to reduce nutrition-related health problems (e.g., infectious diseases) in rural areas. It is recommended that the training of policy makers emphasize the need to incorporate nutritional considerations into development planning. In addition, an organization should be formed to review and influence nutrition-related activities in the economic, agricultural, health, and social service sectors. Four tables are provided.

52. Girdner, J., et al. GHANA'S AGRICULTURAL FOOD POLICY: OPERATION FEED YOURSELF. Food Policy, Vol. 5, No. 1, 1980. pp. 14-25. 9 references.

A single export crop reliance coupled with insufficient support for the small farmer resulted in inadequate food for the growing population of Ghana. In 1972 the Ghanaian military regime initiated "Operation Feed Yourself" (OFY), a national program designed to alleviate food shortages by increasing local food crop production. This article describes the program and evaluates its effectiveness. Food production decreased while locally produced food prices rose. The national consumer price index and inflation rates of local food prices (the latter increasing 190% between 1975 and 1978) underscore the ineffectiveness of the government's price policies. Disparities between actual food production and stated goals are further supported by the government's failure to release salient agricultural statistics (such as annual crop yields). Much of the problem is seen as resulting from misplaced emphasis on large farming enterprises to the neglect of subsistence farmers. The goals of OFY are seen as appropriate, but the program will remain ineffective until such time as: (1) measures are introduced to provide appropriate support to the small farmer who provides food for indigenous consumption, and (2) externally oriented economic policies which support exports are deemphasized. One figure, which provides a diagram of the administrative structure of OFY, and six tables of loans approved and estimated crop production are included.

53. Gray, C. W. FOOD CONSUMPTION PARAMETERS FOR BRAZIL AND THEIR APPLICATION TO FOOD POLICY. Research Report 32. International Food Policy Research Institute, Washington, D.C., U.S.A., 1982. 78 pp. 43 references.

This report combines specific analysis of Brazilian food and nutrition issues with a more general model for studying nutritional effects of various government policies on both agricultural and nonagricultural sectors of the economy. In discussing malnutrition, the author addresses only problems of calorie deficiency--generally believed to be Brazil's most serious nutritional problem at this time. She aims to: (1) estimate the responses of malnourished Brazilians to changes in income and relative prices; (2) expose differences in consumer responses between malnourished and well-nourished groups across income strata; (3) explore the trade-off between quantity and quality in the additional purchases made possible by changes in the real income of different groups; and (4) explain how empirical results can be applied in policy analysis. Two highly visible and important policy programs, food subsidization and the Brazilian alcohol program (to produce alcohol domestically as a substitute for imported oil), are chosen because of their potentially large influence on food supply and consumption and thus on nutritional status. Extensive data analyses on which the report's findings are based are displayed in 49 tables throughout the report and in an appendix.

54. Hakim, P., and Solimano, G. DEVELOPMENT, REFORM, AND MALNUTRITION IN CHILE. International Nutrition Policy Series No. 4. MIT Press, Cambridge, Massachusetts, U.S.A., 1978. 91 pp. 102 references.

The objective of this book is to relate nutritional changes to social, economic, and political conditions resulting from policies during 40 years of successive democratically elected administrations. Data from different sources at different

times since 1927 were used to determine nutritional status up to age 14 in terms of: anthropometric indicators, socioeconomic class, patterns of food availability and consumption in relation to family income, expenditures for food by province, and trends in infant mortality. From these limited statistics the authors developed a profile of nutritional status and malnutrition in Chile. The authors also trace the development of social legislation since 1924 and describe Chile's milk distribution system, started in 1901. The authors attribute reductions in infant mortality in Chile largely to the introduction of new methods for the prevention, diagnosis, and cure of previously endemic diseases, and by the extension and improvement of public health services in the country; improvements in the nutritional status of the children had a limited role, if any. It is suggested that while malnutrition has markedly decreased in Chile, those at the bottom of the income scale have not benefited significantly from the various government measures.

55. Immink, M. D. C., et al. HOME GARDENS AND THE ENERGY AND NUTRIENT INTAKES OF WOMEN AND PRESCHOOLERS IN RURAL PUERTO RICO. Ecology of Food and Nutrition, Vol. 11, 1981. pp. 191-199. 14 references.

The authors investigated the impact of home gardens on the quantity of food available to households and on the nutritional quality of daily diets in the community of Naranjito, Puerto Rico. The sample included 109 women and 50 preschool children, living in one urban and seven rural zones. Results indicated that home gardens had the effect of increasing the total food supply of the household during certain seasons. Preschoolers appeared to benefit nutritionally more than the women. Preschoolers' intake of energy, protein, vitamin A, and riboflavin consistently improved with increasing availability of different self-grown foods. Increased levels of intake of vitamin C and calcium also occurred, but there seemed to be little effect on iron deficiency among the women and children. The authors recommend the consideration of home gardens as a means of nutrition improvement in rural Puerto Rico. Five tables in the text present statistical data.

56. Keeler, A. G., et al. THE CONSUMPTION EFFECTS OF AGRICULTURAL POLICIES IN TANZANIA. Sigma One Corporation, Raleigh, North Carolina, U.S.A. Prepared for Agency for International Development, Bureau for Science and Technology, Office of Nutrition, Washington, D.C., U.S.A., 1982. 109 pp. 40 references.

This report presents the results of one short-term policy impact study conducted as part of the Consumption Effects of Agricultural Policies Project, sponsored by AID's Office of Nutrition. The objectives of this study were to provide an analytical example of the impact of agricultural policies on food consumption, to illustrate the feasibility of performing significant food policy analysis in a short time and at low cost, and to foster an awareness and capability for ongoing analysis in appropriate institutions. The Tanzania study focuses on government policies of self-reliance and industrialization, official and unofficial marketing systems for grains, and consumption effects in urban and rural areas. Seven figures and 35 tables present data relevant to the text. The authors conclude that in Tanzania the dominant influence on food consumption by different groups

has been the country's strategy toward industrialization. Farmers face decreased incentives to produce cash crops or food crops for market and are returning to subsistence food production. Food prices for urban consumers have been kept artificially low through subsidies, state control of grain markets, and reliance on food imports.

57. Levinson, F. J. TOWARD SUCCESS IN COMBATING MALNUTRITION: AN ASSESSMENT OF WHAT WORKS. Food and Nutrition Bulletin, Vol. 4, No. 3, 1982. pp. 23-44.

The article presents seven case studies covering successful or nearly successful nutrition activities, plus a conclusion that seeks to generalize from these experiences. The concept of nutrition is broadly defined to cover activities with a potentially direct effect on food intake and/or nutritional status. The case studies are: the Sri Lanka food subsidy program, the Bangladesh sorghum program, the Palawan integrated area project in the Philippines, the storage system in Nusa Tenggara Timur in Indonesia, the Indonesian family nutrition improvement program, nutrition education in Morocco, and sugar fortification in Guatemala. The Sri Lanka food subsidy system appears to have considerable value in avoiding a high degree of malnutrition. The major problem has been the cost of the program. Costs could be reduced by restricting the number of commodities, the number of recipients, or the months of the year the program operates. The Bangladesh sorghum program was nutritionally successful, but it was terminated in 1980 because of government apathy and U.S. Department of Agriculture opposition. The Palawan project in the Philippines shows the positive role of nutrition advocates in the planning process. Efforts are continuing to use nutrition and food consumption levels as primary evaluation criteria. The project would yield important data for future efforts. The village storage system in Indonesia has provided food security, has increased food intake, and has prevented seasonal deterioration of nutritional status. It also has the potential for increasing the effectiveness of more traditional community services in health and nutrition. The author concludes that successful nutrition activities have depended more on public and political support and commitment than on the technical choice of intervention or its design.

58. Marchione, T. J. FOOD AND NUTRITION IN SELF-RELIANT NATIONAL DEVELOPMENT: THE IMPACT ON CHILD NUTRITION OF JAMAICAN GOVERNMENT POLICY. Medical Anthropology, Vol. 1, Issue 1, 1977, pp. 57-79. 23 references.

The study is an exploration of macro-level and micro-level linkages in national development using the case study of Jamaica. At the macro-level the author addresses the issue of national self-reliance. At the micro-level, he presents data about household economy and nutritional status, particularly as changes in nutritional status appear to reflect some of the economic dynamics of the national and international market system. The study suggests that the benefits of self-reliance policies can lead to positive nutritional benefits for young children of subsistence farmers. The study also suggests that macro-level political and economic events can be directly linked with micro-level research on health and nutrition. The author concludes that in nations where large parts of the population engage in peasant farming, modest changes in national and international

food policies and politics, and in food price, can have significant effects on the health and well-being of the nutritionally vulnerable, especially children. One figure and 11 tables present relevant data.

59. National Academy of Sciences. STUDY TEAM 9, NUTRITION: NATIONAL IMPACT OF GOVERNMENT POLICIES. In: Supporting Papers: World Food and Nutrition Study, Vol. IV, Profile 4. Washington, D.C., U.S.A., 1977. pp. 50-60.

The profile discusses the nutritional impact of food supply policies and practices, of food distribution and marketing policies and practices, and of general government policies. It also examines the failure of the Green Revolution to have a marked nutritional impact except in special circumstances, and the research capabilities needed. The study team lists a range of policies that deserve research priority: production strategies, agricultural research strategies, agricultural extension programs, rural credit programs, food self-sufficiency, food aid, resource uses, price policy, marketing technology, delivery systems, international trade, grain buffer stocks, development strategy, income redistribution policies, budget process, policy process, and food and nutrition policy. The study team concludes that the research called for is multidisciplinary in nature and requires a team that includes an economist, nutrition scientist, agricultural scientist, and political scientist. Research is needed at both the international and national levels.

60. Neff, J. AGRARIAN REFORM AND NUTRITION IN PERU: ASSESSMENT OF THE CORNELL-PERU PROJECT AT VICOS. Cornell Agricultural Economics Staff Paper No. 76-24. Cornell University, Ithaca, New York, U.S.A., 1976. 21 pp. 34 references.

Agrarian reform is widely believed to be central to national economic development throughout the developing world. This paper explores the effect of a particular agrarian reform in the Peruvian sierra on the nutritional status of its Indian inhabitants. It also notes where serious gaps of knowledge exist, how research methods should change, and an alternate method for assessing changes in nutritional status over time. The author concludes that agrarian reform is not a cure-all for malnutrition despite the positive effect on agricultural production, income, and food supply. A simple increase in food consumption may not be sufficient to improve nutritional status. In like manner, careful health planning may not be sufficient to improve nutritional status in a traditional society that preserves low levels of production, income, and food supply for the majority of the rural population. These findings are based on short-term studies of agrarian reform; long-term studies might reveal different nutrition results. A map and eight tables present relevant statistical data.

61. Omawale and Rodrigues, A. M. AGRICULTURAL CREDIT RELATED TO NUTRITION AND NATIONAL DEVELOPMENT IN THE CARIBBEAN: A STUDY OF THE GUYANA AGRICULTURAL COOPERATIVE DEVELOPMENT BANK. Tropical Agriculture (Trinidad), Vol. 56, No. 1, 1979. pp. 1-9. 7 references.

In most less developed countries, maltrutition is strongly associated with poverty, and poverty with a lack of opportunity for agricultural advancement. To determine the effectiveness of Guyana's solution to this problem, the pattern of bank loans granted by the recently established Agricultural Cooperative Development Bank is examined. The results indicate the Bank's criteria for approval of loans were to the disadvantage of the neediest groups. Areas with the highest family income and the highest equity received the largest loans. Areas with the highest incidence of energy-protein malnutrition did not receive a larger portion of the loans granted; instead, regional loan distribution was based more on population diversity. Finally, the bulk of the credit was for export-oriented activities such as cultivation of rice and sugar cane as well as deep sea and inshore fishing. This study underscores the need for programs to ameliorate the problems of current or prospective small farmers, making their loan approval less of a risk for the Bank. Reasons for rejection of the applicants' requests include the applicants' inexperience and the unsuitability of their desire to purchase already developed land or to develop rented land. Such problems could be solved through government planning to provide suitable farm land as well as supervision of farming activity for the inexperienced. Four tables help to summarize the data.

62. Partridge, W. L., and Brown, A. B. THE NUTRITIONAL IMPACT OF RESETTLEMENT, SETTLEMENT AND COLONIZATION. Agency for International Development, Washington, D.C., U.S.A., 1980. 60 pp. 82 references.

Settlement, resettlement, and colonization are frequently disruptive forces in the nutritional well-being of the displaced populations. The nutritionally deprived segments of such populations may or may not survive the adjustment. This paper draws heavily on the body of relevant literature to support research efforts into the nutritional ramifications of displacement, particularly those resulting from development projects. The terms used for various relocation modes vary widely from region to region and are thus defined for purposes of discussion. The authors then outline the types of development projects that lead to displacement, and elaborate on the consequences of adjusting to new environmental, social, or economic conditions. Emphasis, of course, is on disadvantaged and nutritionally "at risk" populations. Empirical findings regarding the incidence, magnitude, duration, and distribution of the negative impacts of displacement are reviewed, and recommendations for planners of benign displacements are offered. The recommendations stress the need for careful planning to minimize the nutritional impacts of displacement and provision of food aid to affected individuals.

63. Pinstrup-Andersen, P. EXPORT CROP PRODUCTION AND MALNUTRITION. Paper presented at North Carolina State University, for the H. Brooks James Memorial Lecture of 1982, October 21, 1982. International Food Policy Research Institute, Washington, D.C., U.S.A. Mimeographed. 32 pp. 27 references.

Much of the current literature on export crops argues that agricultural exports contribute to a worsening of the nutritional situation in low-income countries. The author points out that one cannot assume negative nutrition implications. The usual argument ignores the potential nutrition gains from trade. It also ignores the fact that many low-income and malnourished families depend on export crops for their incomes and would be harmed by policies to substitute domestic-market crops for export crops. This paper reviews and synthesizes what is currently known about export crops and nutrition impacts, and attempts to identify ways in which governments may enhance nutritional effects of trade. Among the factors which may influence the impact of export crop production on nutrition are food availability, ability of the household to obtain available food, consumer preference and spending behavior, and intra-household food distribution. The author concludes that from a nutritional point of view governments should focus on two issues: the ability of low-income households to acquire food and household food acquisition behavior. Other policy considerations are food prices, technological change, food imports and the domestic food market system, nutrition education, and rural infrastructure.

64. Pinstrup-Andersen, P., and Caicedo, E. THE POTENTIAL IMPACT OF CHANGES IN INCOME DISTRIBUTION ON FOOD DEMAND AND HUMAN NUTRITION. American Journal of Agricultural Economics, Vol. 60, No. 3, 1978. pp. 402-415. 16 references.

The objectives of this study were: (1) to suggest an approach for estimating the nutritional impact of changes in income distribution; (2) to provide evidence of this relationship for Cali, Colombia; and (3) to examine the implications for public policy in the areas of income distribution, nutrition, agricultural research, and other supply-related issues. Two supply assumptions are used: a fixed supply and an unlimited supply at current prices. Two income distribution policies are also addressed: those increasing only poor consumer incomes and those transferring incomes from higher to lower income consumers. Findings from an empirical application to the population of Cali, Colombia, suggest that changes in income distribution can effectively improve human nutrition, even in the absence of food supply expansions. These same changes also have a large impact on the demand for individual food commodities. In societies where significant changes occur in income distribution, commodity demand projections preferably should be based on individual stratum rather than on average estimates of price and income elasticities. Nine tables summarizing incomes, nutrition, income elasticities, and the impact of change are provided.

65. Pinstrup-Andersen, P., et al. THE IMPACT OF INCREASING FOOD SUPPLY ON HUMAN NUTRITION: IMPLICATIONS FOR COMMODITY PRIORITIES IN AGRICULTURAL RESEARCH AND POLICY. American Journal of Agricultural Economics, Vol. 58, No. 2, 1976. pp. 131-142. 8 references.

The objective of this paper is to describe an approach to economic analysis that may help establish commodity priorities in agricultural research and public policy where human nutrition is a goal. A model and procedure are developed to estimate the nutritional implications of alternative commodity priorities in agricultural research and policy. The model estimates the distribution of supply increases among consumer groups, the related adjustments in total food consumption, and implications for calorie and protein nutrition. Findings from an empirical application of the model to the population of Cali, Colombia, suggest that a relative increase in total nutrient supply is a poor indicator of relative nutritional impact because both nutritional waste and consumer adjustment in total food consumption are a function of the commodity from which the additional nutrients are obtained. Suggested commodity priorities associated with improved calorie and protein nutrition goals are provided. Tabular data summarize economic characteristics, price elasticities, and modeled supply and consumption changes.

66. Ross, C. S. GRAIN DEMAND AND CONSUMER PREFERENCE IN SENEGAL. Food Policy, Vol. 5, No. 4, 1980. pp. 273-281. 7 references.

This study examined grain purchasing and consumption patterns among consumers in Dakar to evaluate the viability of the government's approach to food self-sufficiency. Urban Dakar households were surveyed between June 1977 and March 1978. Most households regularly purchased millet, usually in whole grain form, indicating economy outweighs the extra preparation time. Rice also is a major staple purchased by all households. Millet and rice generally were consumed at different meals, suggesting the difficulty of replacing imported rice with locally grown millet. Consumers also showed a strong preference for rice produced in Siam as opposed to the local variety. This implies that substituting domestic for imported rice would likely meet with considerable consumer resistance. These trends were confirmed through interviews in which household meal composition was recorded daily for 3 weeks. Analysis of total grain consumption data indicated that government policies and other economic influences (e.g., household income) have little impact on rice consumption patterns. These findings do not support the efficacy of the government's grain self-sufficiency program. Planned decreases in annual per capita rice consumption are unrealistic. Projected increases in maize consumption by 1985 also are overly optimistic. Maize substitution should be explored, but this will not alter immediate trends. Additional study of these issues is needed to bring policy into alignment with consumer preferences. Five tables are provided.

67. Ryan, J. G., and Asokan, M. EFFECT OF GREEN REVOLUTION IN WHEAT ON PRODUCTION OF PULSES AND NUTRIENTS IN INDIA. Indian Journal of Agricultural Economics, Vol. 32, No. 3, 1977. pp. 8-15. 15 references.

This article addresses the issue of nutritional status of Indians following a decline in pulse production as a consequence of the Green Revolution in wheat. The authors look at net nutrient production trends and the economics of the Green Revolution nutrient changes. They conclude that the Green Revolution in wheat and the subsequent decline in pulses did not adversely affect nutrition. In fact, the large increase in wheat production produced a significant improvement in aggregate national well-being. This occurred even though the wheat itself has certain imbalances in protein and amino-acids. The authors call this a testimony to the value of yield-oriented plant breeding strategies as a means of achieving nutritional gains. Yield increases can also enhance the real incomes of low-income consumers as grain prices fall, and thereby provide for the purchase of additional nutrients by the nutritionally vulnerable. The authors call for a yield-oriented breeding strategy for pulses to make sure that their prices remain within the reach of the poor. Two tables and eight figures supplement the text.

68. Ryan, J. G., et al. HUMAN NUTRITIONAL NEEDS AND CROP-BREEDING OBJECTIVES IN THE SEMI-ARID TROPICS. Occasional Paper 4. International Center for Research on Semi-Arid Tropics (ICRISAT), Hyderabad, India, 1974. 34 pp. 39 references.

Recent criticisms of the "protein gap" philosophy have called into question crop improvement and nutritional projects. This paper discusses currently available evidence on nutritional needs in the semi-arid tropics and the implications for crop-improvement strategies at ICRISAT Nutrition data from India, Nigeria, and Brazil are examined. The data suggest that for two-thirds of the population in the semi-arid tropics the overriding nutritional need is calories. Improvement in the quality and quantity of protein in existing diets of the vulnerable groups will not achieve as much as an increase in the size of their diets. The inference is that crop improvement programs should emphasize yield improvement and stability, followed by screening for digestible carbohydrates. Maintaining protein content and amino-acid composition is desirable but should have a lower priority. Illustrations and tables appear throughout the text.

69. Sarma, J. S., et al. TWO ANALYSES OF INDIAN FOODGRAIN PRODUCTION AND CONSUMPTION DATA. Research Report No. 12. International Food Policy Research Institute, Washington, D.C., U.S.A., 1979. 82 pp. 47 references.

This report presents the results of two separate but related studies which attempt to explain the apparent anomaly of reported declines in per capita foodgrain consumption since the early 1960's despite increases in grain production and a rise in per capita incomes. One of the results of the studies indicates the importance of public food distribution programs on food consumption. In years of poor crops, food consumption of the urban poor declined less than that of the rural poor because low prices for subsidized wheat helped the urban poor

maintain their diets. In rural areas affected by the Green Revolution, the rural poor also were helped by greater food availability from high-yielding varieties of wheat and lower prices. The relative price of grain was shown to be one of the most important variables affecting the real income of the poor and the relative distribution of income, with significant effects on nutrition and food consumption.

70. Savané, M. A. IMPLICATIONS FOR WOMEN AND THEIR WORK OF INTRODUCING NUTRITIONAL CONSIDERATIONS INTO AGRICULTURAL AND RURAL DEVELOPMENT PROJECTS. United Nations ACC/SCN Symposium on Introducing Nutritional Considerations into Agricultural and Rural Development, 7th Session of the ACC/SCN, IFAD Headquarters, Rome, Italy, March 2, 1981. Document No. SCN 81/5f. 11 pp. 21 footnotes including references.

Agricultural and rural development projects have often ignored women's roles in the production and processing of food. Nutritional programs have been superimposed on women's already overcharged daily routine. Mechanization of certain agricultural tasks have prolonged the women's work day and made the work heavier. Nutrition and health programs aimed at women have often failed because they have not considered women as full-fledged producers. Because women produce the major part of the household food in many developing countries, the introduction of nutritional considerations into agricultural and rural development projects can have a decisive impact on women and their work and on family nutrition. The author proposes several approaches: (1) rethinking rural development to include division of labor between the sexes, production techniques, method of assigning land, distribution of resources, and specific food requirements of women; (2) setting a higher value on food crops and elements necessary to produce those crops; and (3) providing functional nutritional education, using local food resources, food prohibitions, and women's daily routine. The author concludes that success will be achieved only if the prevailing class system undergoes structural change.

71. Schuftan, C. THE CHALLENGE OF FEEDING THE PEOPLE: CHILE UNDER ALLENDE AND TANZANIA UNDER NYERERE. Social Science and Medicine, Vol. 13C, No. 2, 1979. pp. 97-107. 43 references.

This paper presents an overview of nutritional and agricultural policies under the socialist regimes of Allende in Chile and Nyerere in Tanzania. The article is primarily descriptive and theoretical, and utilizes literature review as its data base. The problem of malnutrition in Third World countries is viewed as subsumed under broader issues of economic ideology and policy. An historical perspective is developed which suggests that overall caloric deficiency in developing countries must be understood within the context of colonialism and its economic legacy. The author is critical of the view which equates economic growth with economic development. Piecemeal nutrition interventions are necessitated by economic structures which favor the upperclasses. A model attempts to provide an integrated picture of the micro- and macro-factors which affect the food cycle. The model is then applied to assess the Allende and Nyerere policies in alleviating malnutrition in their respective countries. In drawing analogies between the experiences in the two societies, there are primary policy areas

through which the overall set of economic interventions were developed. These include: (1) income-related policies; (2) agrarian reform and accelerated rural development; (3) employment generation; and (4) government democratization and decentralization. No definitive conclusions are drawn as to the overall success of the programs and policies in the two countries. Intercountry comparisons are difficult because each country placed different emphasis upon each of the four policy areas. Tanzanian income distribution policy was designed to benefit the rural population, whereas Chile concentrated on the urban masses. Other policy differences are noted in the areas of land reform and employment priorities.

72. Smith, V. E. AGRICULTURAL PLANNING AND NUTRIENT AVAILABILITY. Nutrition Reviews, Vol. 28, No. 5, 1970. pp. 143-150.

Economic development brings improved material welfare but not always improved nutrition. Diets may deteriorate when farmers begin to produce for sale instead of home consumption. Migration from rural to urban areas may also reduce dietary quality. Agricultural development can improve nutrition if it can lower the cost of individual nutrients consumed by poorer people. This paper shows how a computer model of the agricultural economy can identify aspects of the nutritional problem that have their origin in the limitations of production capacity and techniques. The model also can determine patterns of agricultural production that meet nutritional needs efficiently and can suggest extension or research activities that contribute effectively to providing inexpensive nutrients. The author tested the model in Nigeria, defining the cost of a nutrient as the amount by which the cost of a diet rises when that diet is required to provide one more unit of the nutrient. The model indicates that the economically costly nutrients in Nigeria are calories, riboflavin, calcium, and vitamin A. Computations show which crops in each region are the most economical sources of the costly nutrients.

73. Somel, K. THE GREEN EVOLUTION: ACHIEVEMENTS AND IMPLICATIONS. Paper presented at The Interfaces Between Agriculture, Food Science, and Human Nutrition in the Middle East, Aleppo, Syria, by the International Center for Agricultural Research in Dry Areas and United Nations University, February 21-25, 1982. Mimeographed. 26 pp. 44 references.

The basic mandate in the Green Revolution was to achieve rapid increases in food crop production. Without doubt, this was achieved. Controversies have arisen, however, over effects presumed to be caused or exacerbated by the Green Revolution, i.e., employment and mechanization effects, income distribution effects, and nutritional impact. The author describes the controversies over the effect of the Green Revolution on income distribution inequalities and on foodgrain-pulse balance in India. He concludes that nutritionally the Green Revolution increased the food supply but not necessarily the share of those most in need. The author states that future challenges will be increasingly complex and will require multi-disciplinary approaches to evaluate agricultural technologies and research. Scientists must be aware of the socio-politico-economic context, the environmental setting, and the technological sphere.

74. Suttor, R. E. ADJUSTMENTS IN AGRICULTURAL PRODUCTION TO ATTAIN MINIMUM NUTRITIONAL REQUIREMENTS CONSISTENT WITH CONSUMER INCOMES. Analytical Working Document No. 16. Bureau for Latin America, Agency for International Development, Washington, D.C., U.S.A., 1974. 95 pp. 4 references.

A linear programming model, taking into account factors of income distribution and the objective of minimizing agricultural change, is presented and solved to determine the minimum changes in agricultural production needed to attain nutritional requirements. Further, by incorporating restrictions on income, the solution is forced to be consistent with alternative income distribution patterns. In the model, consumers are divided into four groups according to income. Imports and exports of agricultural products are fixed at 1968 levels. Given the distribution of income in 1968, there is no feasible solution because the lowest income group is unable to purchase enough food to attain minimum nutritional requirements. Consequently, alternative levels of income redistribution are assumed, and required changes in agricultural production from the 1968 base are obtained by repeatedly solving the model. Each solution yields the level of production of each crop and consumption of each food by each consumer group for the assumed income distribution. The first two sections of the report provide details of the mathematical formulation of the model and a discussion of the data and procedures for estimating the linear programming matrix. The remaining sections discuss implications of the model's solution. Two appendixes contain raw and tabulated data. The text is supplemented by numerous tables of numerical data.

75. Taylor, D. R. F. LAND REFORM IN KENYA: A REAPPRAISAL. Rural Africana, No. 23, 1974. pp. 79-90. 22 references.

The author uses the historical example of Kenya to examine land reform as an element in rural development strategies and its effect on nutritional status of the participants. The study area is three Kikuyu homeland districts in central Kenya. The author discusses the traditional agricultural systems, the colonial impact from 1910 to 1950, the Mau Mau emergency, the Swynnerton plan of 1954, and the post-colonial period of 1963-1973. The study area experienced rapid economic change and government policy transformed agriculture. Land tenure was reformed, cash crops introduced, soil erosion checked, livestock upgraded, marketing systems developed, and cash income increased. Despite much progress in rural areas, nutritional levels have declined rather than improved. The cause for the decline was land reform policies that failed to consider food production as part of a total national system. The author urges modification of the land reform policy to make it less of a growth model and more of a rural development model. The paper includes a map of the study area.

76. Thimmayamma, B. V. S., et al. A STUDY OF CHANGES IN SOCIOECONOMIC CONDITIONS, DIETARY INTAKE AND NUTRITIONAL STATUS OF INDIAN RURAL FAMILIES OVER A DECADE. Ecology of Food and Nutrition, Vol. 5, 1976. pp. 235-243. 10 references.

This article reports the results of a study carried out among a rural population to measure changes induced by development activities in the socioeconomic conditions,

dietary intake, and nutritional status of Indian families. The families resided in Mallapur village. A comparison of data collected from the same families during 1961 and 1974 showed some favorable changes in the socioeconomic pattern by way of regular employment opportunities and an increase in educational status. Environmental sanitation, however, remained practically the same. An increase in the real income status was not seen because of the increase in prices of food and nonfood items. Diet and nutrient intake did not change significantly over the decade except for an increase in the calcium intake, attributable to an increase in milk intake. Mean values for heights and weights of subjects were similar in 1961 and 1974. Mild forms of protein-calorie malnutrition continued to be prevalent among preschool children, as were signs of B-complex deficiency in all age groups. The mortality rate of children below 5 years of age showed a tendency to decline over the years. Tabular data are used to support the text.

77. Timmer, C. P. THE NUTRITIONAL IMPACT OF THE GREEN REVOLUTION. Paper presented at the First Chemical Congress of the North American Continent, Mexico City, Mexico, December 2, 1975. Mimeographed. 13 pp. 10 references.

The author evaluates the Green Revolution in terms of its impact on nonextreme, or subclinical, malnutrition. Crucial to such an evaluation is the concept of a "protein gap." The author asserts that cereal-based diets can provide satisfactory levels of protein for all age groups if the diet is adequate in energy. Consequently, he argues that the Green Revolution has enormous potential for solving most nutritional problems in poor countries, and in fact it has solved most nutritional problems in some countries. The author next looks at the Green Revolution in terms of directness of effects. He describes the direct impacts on the nutritional status of farming families, the indirect nutritional impacts through lower food prices and higher incomes, the round-about impacts such as mechanization, and the "way out" effects on social and political systems. He concludes that the Green Revolution offers hope to the malnourished. Policymakers should focus on its direct potential to raise cereal consumption and plan to avoid negative indirect or round-about effects.

78. University of Michigan, Center for Research on Economic Development. CONSUMPTION EFFECTS OF AGRICULTURAL POLICIES: CAMEROON AND SENEGAL. Ann Arbor, Michigan, U.S.A., prepared for Agency for International Development, Bureau of Science and Technology, Office of Nutrition, Washington, D.C., 1982.

The purpose of this study was the design and testing of a methodology allowing the integration of expected nutritional impact into the agricultural planning process. Parallel studies in Cameroon and Senegal aimed to assess the anticipated food consumption impact of agricultural policies on farming households on the basis of short-term fieldwork. The Cameroon portion investigates effects on food consumption of farmers in the Northwest Province of Cameroon which would occur following government policies to encourage trade with Northern Nigeria. The study determined, however, that main marketing emphasis comes from Douala to the south rather than from Nigeria. The Cameroon study describes the survey of 72 households in eight villages to relate farm production and food consumption to increased market demand and higher prices. Household food consumption was found

to be adequate in both energy and protein for four out of five families, but the short-run effect of higher food prices was a decline in local diets as more food was sold. Planners therefore need to explore measures to stimulate food crop production to maintain nutrition levels and meet market demand. The Cameroon portion of the study contains six main divisions: agricultural production, marketing, demand prospects, farmers' food consumption, price effects and nutrient balances, and findings and conclusions. A map, 32 tables, 17 illustrations, and 4 appendixes supplement the text. The Senegal portion of the study investigates the consumption effects of government policies on peanut/millet farmers in the Peanut Basin in Senegal. The sample population was made up of 720 persons in 72 households in three villages. Protein intake was found to be adequate but deficiencies in overall calorie intake were discovered. The study concluded that the actual policy options open to the Government of Senegal are limited by consumption preferences of Peanut Basin farmers. Adequate cereal availabilities must be maintained; otherwise, farmers will grow millet in the place of the export crop, peanuts. The Senegal study contains five major divisions: an introduction, a review of Senegalese agriculture and agricultural policies, summary findings, conclusions and policy implications, and a description of food consumption, nutrition, and economic status of the sample population. A map, 49 tables, 8 illustrations, and 4 appendixes supplement the text on Senegal. Part II describes the analytical methods and field survey techniques developed in the course of the project in both Cameroon and Senegal.

79. Ward, J. O., and Sanders, J. H. NUTRITIONAL DETERMINANTS AND MIGRATION IN THE BRAZILIAN NORTHEAST: A CASE STUDY OF RURAL AND URBAN CEARA. Economic Development and Cultural Change, 1980. pp. 141-163. 39 footnotes including references.

Malnutrition has a direct negative impact on the growth of the Gross National Product by reducing the level of productivity of the work force. This article examines the magnitude of the nutritional crisis in Brazil and analyzes factors determining nutritional status using nutritional data from three surveys of nutritionally vulnerable groups. Income, family size, and migration are included. The authors conclude that the major nutritional problem in northeast Brazil is unsufficient consumption of food related to low incomes. Policies to increase the income of the rural poor would increase food purchases and consumption and would slow emigration from rural areas. This would imply a reversal of Brazil's large-farmer orientation in agricultural policy or some type of direct income transfer to the rural poor. The authors also suggest that family-planning measures might be one of the lowest cost public policies to improve nutrition in the long run. Three technical appendixes complete the article.

B. AGRICULTURAL PRODUCTION

80. Calkins, P. J., and Sisler, D. G. THE IMPACT OF HORTICULTURAL DEVELOPMENT ON INCOME, EMPLOYMENT, AND NUTRITION IN NUWAKOT DISTRICT, NEPAL. Agricultural Economics Research Paper No. 79-9. Department of Agricultural Economics, Cornell University, Ithaca, New York, U.S.A., 1978. 53 pp. 6 references.

The government of Nepal hypothesizes that intensive horticultural production and increased intra-regional trade will help improve the standard of living for the residents of the middle hills. This micro-level survey explores the actual and potential contribution of increased horticultural development on income, employment, and nutrition of middle hill residents. Two types of surveys were conducted. In the first, 600 representative farm households in the Nuwakot District were interviewed with respect to farm size, production assets, and cropping patterns. In the second survey, a 40-farm subsample was interviewed daily for 1 year. Information concerning patterns of cash flow, labor allocation, trade, food consumption, and household member nutritional status was gathered. Distance from Kathmandu market and altitude level were the most important variables affecting land utilization and family welfare. If increased horticulture is promoted, then all irrigated fields, regardless of altitude, would need to be devoted to grain production. The results also suggest that increased specialization and trade "between hills and plains" would not be as feasible nor efficient as "within hill" trade and specialization. To make "within hill" trade most beneficial, the identification and development of micro-climatic packets appropriate for specialization in different crops is recommended. This study includes two maps, two figures, and five tables.

81. Collis, W. R. F., et al. ON THE ECOLOGY OF CHILD HEALTH AND NUTRITION IN NIGERIAN VILLAGES. Tropical and Geographical Medicine, Vol. 14, 1962. pp. 140-163, 201-228. 19 and 13 references.

The authors report in two articles their findings about child nutrition in Western Nigerian villages in 1960-1961. The first article describes the prevalence of kwashiorkor as a problem of protein malnutrition in children, and examines the environment in which these children live. The second article reports on dietary patterns, medical examinations, and growth patterns of people in the Ilesha area. The authors indicate that the primary causes of protein malnutrition in that region are poverty and ignorance. Economically their most important finding concerns the cocoa villages. Cocoa villages are dilapidated, adults are apathetic and unhappy, and children sickly. Cocoa production consumes the majority of land, and little food can be grown in remaining areas. The money gained from cocoa lasts only a short time. Thereafter, the farmers can buy only the cheapest foods. Cocoa areas are generally short of food supplies and dangerously short of protein. People in a mixed-cropping village, in contrast, have better diets and happier lives. The study concludes that farmers may not benefit from the introduction of a high-paying cash crop.

82. Colombo, U., et al. REDUCING MALNUTRITION IN DEVELOPING COUNTRIES: INCREASING RICE PRODUCTION IN SOUTH AND SOUTHEAST ASIA. The Triangle Papers 16. The Trilateral Commission, New York, New York, U.S.A., 1978. 55 pp.

Approaches to reducing malnutrition in South and Southeast Asia, through increased rice production, are discussed. The report proposes a 15-year international program for doubling rice production in South and Southeast Asia commencing with technology transfer appropriate to the construction of modern irrigation networks. Maximum cost-effectiveness is to be realized by concentration on land already under cultivation. As beneficiaries of the enhanced agricultural systems, host countries are urged to be major participants in the effort. As noted, however, increasing food production cannot by itself alleviate malnutrition. Strategies to improve distributions of food and income, particularly among the very poorest people, must be employed simultaneously. Social development in the form of family planning should be included in the general scheme.

83. Dewey, K. G. AGRICULTURAL DEVELOPMENT, DIET AND NUTRITION. Ecology of Food and Nutrition, Volume 8, 1979. pp. 265-273. 43 references.

The purpose of this paper is to examine, through a review of the literature, some of the effects of agricultural development on the diets and nutrition of rural people in developing countries. The paper focuses on the nutritional consequences of the shift from subsistence to commercial production. The author has divided the effects of development into five interrelated categories: increased participation in the market economy, replacement of food with cash, direct dietary effects, ecological effects, and social effects. It is noted that, in many cases, agricultural development of Third World countries has led to a worsening quality of life for rural people with economic, social, ecological, and dietary changes often leading to poorer health and nutrition. The author concludes, however, that it is not development per se that causes this, but rather the particular social and economic conditions under which development is carried out. The fact that these factors may cause rural inhabitants to lose control over their lives and livelihood (e.g., loss of control of agricultural production) is considered the most crucial element.

84. Dewey, K. G. NUTRITIONAL CONSEQUENCES OF THE TRANSFORMATION FROM SUBSISTENCE TO COMMERCIAL AGRICULTURE IN TABASCO, MEXICO. Human Ecology, Vol. 9, No. 2, pp. 151-187. 21 references.

This study examines the relationships among subsistence production, commercial agriculture, and nutrition, using a case study from southern Mexico. Recent changes in Tabasco have greatly reduced the production of subsistence crops by rural families. The result has been dietary deterioration, decreased crop diversity, and dependence on outside sources of food. The author challenges the assumption that a rise in income accompanying the adoption of commercial production will automatically lead to improved nutrition. Children of families that converted to cattle production or cash crops did not show improved nutritional status. A high degree of self-sufficiency in food showed a favorable impact on diets. Yet families continued to switch to cash crops because of environmental, economic, and time constraints imposed by the system of commercial

agriculture. The author does not propose a return to traditional subsistence farming but suggests that policymakers need to determine under what conditions a more progressive form of agricultural change can occur.

85. Fleuret, P., and Fleuret, A. NUTRITION, CONSUMPTION, AND AGRICULTURAL CHANGE. Human Organization, Vol. 39, No. 3, 1980. pp. 250-260. 129 references.

Most programs of agricultural and rural development are intended, at least indirectly, to improve the nutritional status of the poor, but that goal is often not accomplished. No general understanding exists as to how specific development programs, apart from direct health and nutrition interventions, may affect consumption patterns and therefore nutritional status. The authors review findings in various studies that show how modernizing communities have become malnourished through the introduction of novel methods of food production, distribution, and consumption. The review of the studies reveals a number of issues to be considered by those who determine and implement development policy: dietary intake among segments of the population, refined definitions of the rural poor, traditional diversity of local diets, local labor responsibilities for crops, marketing patterns that favor urban areas, and monitoring of nutrition and health throughout implementation of agricultural projects.

86. Food and Agriculture Organization. CASE-STUDY FOR FAO ON INTRODUCING NUTRITION CONSIDERATIONS INTO DEVELOPMENT PROJECT PLANNING--PUNO. 1981. Mimeographed. 13 pp.

The FAO Investment Centre and the Peruvian Government cooperated on this inquiry into the nutritional component of the planning for the Puno Rural Development Project. The report has four main sections. The first deals with the investigation itself and data generated. The second describes the ecology, agriculture, and nutrition situation. The third identifies nutrition information relevant to project planning, describes how such facts were taken into account in the design of the project for the Juliaca area of Puno, outlines the plans for monitoring and evaluating the project, and describes the stage in the current implementation of the project. The final section deals with the contribution of these experiences to the methodology for interrelating nutrition and agriculture. Experience indicates the importance of introducing nutrition considerations in the original design of the project, the data needed to implement the project effectively, and the need to train local personnel to carry out activities related to nutrition. Lack of trained personnel is one of the main reasons for the delays in the Puno project.

87. Garcia, M., et al. NUTRITIONAL EFFECTS OF RURAL DEVELOPMENT: AN ASSESSMENT AS PART OF THE PLANNING OF A LARGE-SCALE DEVELOPMENT PROJECT IN PALAWAN, PHILIPPINES. Working Paper No. 12. Cornell Nutritional Surveillance Program, Cornell University, Ithaca, New York, U.S.A., 1982. 46 pp. 15 references.

This paper reports the results of detailed analyses of data on nutritional status, collected in an FAO study in 1979-1980 on the island of Palawan, Philippines. It summarizes the procedures adopted, the findings, and the implications for design of the Palawan Integrated Area Development Project. The procedure for assessment of nutritional effects envisaged an initial assessment to identify issues and data gaps, followed by in-depth studies to include fresh data collection if necessary. Priority issues concerned targeting of project activities toward those most in need, then assessing the likely effects on nutrition of those targeted for project participation, and designing features of the project that would be likely to benefit nutrition. The components of the rural development project that appeared likely to improve nutrition were diversification of cropping, increased production of staples, and development of infrastructure and services to remote areas. One figure and 17 tables supplement the text.

88. Garcia, M., et al. PHILIPPINES: PALAWAN INTEGRATED AREA DEVELOPMENT PROJECT, TRAINING CASE STUDY ON INTEGRATING NUTRITION CONSIDERATIONS INTO A DEVELOPMENT PROJECT. Prepared for U.S. Department of Agriculture, Office of International Cooperation and Development, Nutrition Economics Group, and Agency for International Development, Washington, D.C., U.S.A., 1983. 54 pp.

Palawan is the third largest and most remote island of the Philippines. Its 400,000 inhabitants include lepers, prisoners, reformed anti-government rebels, Indo-Chinese refugees, and other outcasts from its sister islands. Palawan is a poor island whose food production centers on fishing and rice, corn, bean, and sweet potato crops. The Palawan Integrated Area Development Project (PIADP) is one of several Philippine government projects intended to develop rural areas for "growth with equity." Government policy advocates increasing and diversifying food production to improve diets for all Filipinos and to insure a minimum diet for the undernourished. Shortly after the PIADP team began investigating the project area in 1978, FAO decided to use the Palawan project as a test case for a six-country study of methods used to incorporate nutrition in agricultural and rural development projects. This report documents the initial assessment conducted by an FAO/Philippines National Nutrition Council (NNC) food and nutrition planning (FNP) team, as well as the project identification and feasibility studies done over a period of 6 months by a 40-person multidisciplinary team. Ten tables display the studies' guidelines, findings, and recommendations.

89. Goering, T. J. TROPICAL ROOT CROPS AND RURAL DEVELOPMENT. World Bank Staff Working Paper No. 324. World Bank, Washington, D.C., U.S.A., 1979. 85 pp. 58 references.

This paper assesses Tropical Root Crops (TRCs), long stigmatized as poor people's crops, but which are now beginning to attract considerable attention from

researchers and rural developers due to their ability to efficiently convert solar energy into carbohydrates, even in the most adverse of agroclimatic conditions. Major uses for TRCs fall into three categories: human food, livestock feed, and industrial processing. Currently 90% of TRC production is used for human food, but use for livestock feed has been growing rapidly. Recent research shows most malnutrition (except in young children and lactating mothers) is caused by energy deficiency, not protein deficiency; TRCs can provide the extra needed energy. To further ensure sufficient consumption of protein, experiments are now being conducted on intercropped cassava and beans. Research is also underway to develop strains of potatoes--the most nutritionally complete root crop--suitable for growth in the tropics. Of the major groups of TRCs (aroids, yams, sweet potato, potato, and cassava) cassava is the most important, accounting for 60% of TRC production and feeding 300 million people in more than 80 countries. Other uses of cassava offer great potential for development. As livestock feed, cassava pellets are mixed with cereals; the cassava also provides starch (the roots) and protein (the leaves) for both human consumption and industrial uses. Through fermentation, cassava starch can be used to produce sugars, single cell proteins, ethyl alcohol, butanol, and acetone. Markets for cassava both as livestock feed and as starch need to be encouraged in the developing world, though much experimentation remains to develop economical methods of processing. Questions about the scale of processing are crucial, too, for large-scale plants dependent on continuous large supplies of cassava would work against the principles of small-scale rural development espoused by this study. Ten tables, one figure, and five annexes are included.

90. Goldman, R. H., and Overholt, C. A. STUDY VI. AGRICULTURAL PRODUCTION, TECHNICAL CHANGE, AND NUTRITIONAL GOALS. In: Nutrition Intervention in Developing Countries. Oelgeschlager, Gunn and Hain, Publishers, Inc., Cambridge, Massachusetts, 1981. 84 pp. 82 references.

This monograph focuses on linkages between agricultural growth and food consumption in the context of government policies that influence agricultural resource allocation. The distinctive role of agriculture in addressing the malnutrition problem is described, and the impact of technology changes (as opposed to other approaches to nutritional intervention) is discussed. The authors identify the key variables through which agricultural policies generate effects, providing a basis for intervention design. Food price and income effects of agricultural production and technological change are considered; it is concluded that production increases alone are usually insufficient to lower domestic food prices. The factors relevant to evaluating the cost and nutritional effects of agricultural programs are reviewed, and a case study that summarizes an agricultural technology program (the Caqueza Project) in Colombia is presented. Findings of the case study indicate that the sample population did not reveal a strong tendency to consume calories out of incremental income. There was, however, a strong association between milk production and calorie and protein consumption. This occurred in spite of the fact that the study region contains many small maize farms and extension programs to improve maize technology. It is suggested that in terms of agricultural instruments to support nutrition policy, a high priority should be placed on exploring ways to increase on-farm milk production.

91. Gross, D. R., and Underwood, B. A. TECHNOLOGICAL CHANGE AND CALORIC COSTS: SISAL AGRICULTURE IN NORTHEASTERN BRAZIL. American Anthropologist, No. 73, 1971. pp. 725-740. 28 references.

The authors, a nutritionist and an anthropologist, studied the nutritional consequences of introducing sisal agriculture to Northeastern Brazil. They attempted to measure caloric intake, body height and weight, and energy costs of jobs in the context of technological change. Analysis of occupational data revealed a correlation between manual labor in the sisal fields and low economic status. Low economic levels correlated positively with underweight in children born since the introduction of sisal. Certain jobs in the field required high energy expenditures, and a disproportionate amount of family food went to the wage earner in order to sustain his performance. As a result, growing children of manual laborers in the sisal industry suffered caloric deprivation. Two figures and four tables provide supporting data.

92. Hanger, J., and Moris, J. WOMEN AND THE HOUSEHOLD ECONOMY. In: R. Chambers and J. Moris, eds., Mwea: An Integrated Rice Settlement in Kenya. Weltforum Verlag, Munchen, Federal Republic of Germany, 1973. pp. 209-244. 16 footnotes including references.

The chapter documents the impact of the Mwea Irrigation Scheme in Kenya on the life of women and household economies in the settlement area and compares them to women and households in nonsettlement areas of Kenya. The authors describe the gathering of data in 1967. They next describe village life on Mwea, women's use of services, and housing. A separate section of the chapter is devoted to time allocation and women's responsibilities. A final section analyzes adaptation to life on Mwea through reciprocity and kinship, black market trading, and off-scheme investments. The authors found that life in Mwea had altered the traditional division of agricultural labor. About half the women's agricultural work was devoted to men's crops, which remained under the men's control and were destined for cash sale. Women had complete control over their food-crop gardens from which they fed the household; any surplus could be sold or traded. In theory, families in Mwea were supposed to change to rice as their staple food. But adults disliked the taste and consistency of rice, and continued to prefer maize and beans. The shortage of land on which to grow family food crops was a major complaint of women in Mwea. Eight tables and three figures provide relevant data.

93. Hernandez, M., et al. EFFECT OF ECONOMIC GROWTH ON NUTRITION IN A TROPICAL COMMUNITY. Ecology of Food and Nutrition, Vol. 3, 1974. pp. 283-291. 9 references.

The authors evaluated the Chontalpa Plan, an agricultural development project in one of the most tropical regions of Mexico, to assess the impact on nutritional status of participants. Over a period of 13 years, agricultural production (mainly cash crops) increased sixfold while the population only doubled. The average diet improved, but the middle and upper socioeconomic levels accounted for the change. Approximately 30% of the population remained as severely malnourished as before the project. The authors conclude that increasing or changing agricultural production does not necessarily improve diet. In fact, it may

lead to increased consumption of a lower quality food. It seems clear that when farming is not primarily for the production of food to be consumed by the producer's family, no relationship exists between the quantity and quality of agricultural production and the consumption pattern. The economic growth brought about by the agricultural project did not prevent malnutrition. One figure and eight tables illustrate the text.

94. Jakobsen, O. ECONOMIC AND GEOGRAPHICAL FACTORS INFLUENCING CHILD MALNUTRITION: STUDY FROM THE SOUTHERN HIGHLANDS, TANZANIA. Bureau of Resource Assessment and Land Use Planning, Research Paper No. 52, University of Dar es Salaam, Tanzania, 1978. 105 pp. 50 references.

This report is based on 2 months of fieldwork in the Southern highlands of Tanzania in 1977, studying child malnutrition as it relates to regional variances in village and family economic systems. The report presents extensive discussions of the standards applied in measuring malnutrition; of physical, economic, cultural, and health aspects of the study area in Tanzania; and of the social science approach to malnutrition. Through interviews with selected households and analysis of community data, the author discerned a pattern of malnutrition in children that did not match the expected relative affluence of their parents. Cash crop villages and labor-exporting villages have much higher monetary incomes than do food crop villages. Yet food croppers generally are able and willing to allocate relatively more resources to children's food than are cash croppers, who are regarded as more modernized. Monetarization in many villages has diverted economic power away from the mothers and concentrated it in the hands of the husbands (true in 89% of families); men are less likely than women to give priority to children's nutrition. Education, however, is seen as the key to better resource utilization, which can maintain both modernization and adequate nutrition. Jakobsen supports his narrative with 3 appendixes, 29 tables, 12 figures, and 3 maps.

95. Juls, M. UNEXPECTED BENEFIT FROM A DAIRY PROJECT. Food and Nutrition Bulletin, Vol. 1, No. 3, 1979. pp. 15-19.

Favorable experience with the AMUL dairy in Anand in the state of Gujarat, India, encouraged the Indian government to introduce a similar system in milkshed areas for Bombay, Calcutta, Delhi, and Madras. The United Nations also participated through the World Food Programme. A major objective of the milk program was to make milk available to vulnerable urban groups. After 6 years, the project was evaluated. Researchers found little beneficial effect in the cities, but were surprised to find dramatic results in the rural milk-collection areas. Rural participants doubled not only their dairy income but also their nondairy income. Apparently, organizing the milk-collection system brought with it a number of other economic and social improvements. The smallest producer and even the landless farm laborer benefited. Doubling income resulted in a 30% increase in the intake of food-energy and nutrients. The project may have affected the diets of 12 million individuals and thus may have had the greatest nutritional impact of any development project in India. Three figures and ten tables present relevant data.

96. Korte, R. HEALTH AND NUTRITION. In: R. Chambers and J. Moris, eds., Mwea: An Integrated Rice Settlement in Kenya. Weltforum Verlag, Munchen, Federal Republic of Germany, 1973. pp. 245-272. 4 footnotes including references.

The author describes the health facilities and main health hazards on the Mwea Irrigation Scheme in Kenya. He gathers vital and family statistics and investigates medical consciousness. He found the principal health problems to be bilharziasis, ascariasis, malaria, and leeches. A third of the chapter is devoted to nutrition concerns: background information, child-feeding, meals, frequency of foodstuffs eaten, seasonal changes of the diet, a comparison of on-scheme and off-scheme diets, and the adequacy of the diet. In terms of nutrition Mwea families are less vulnerable than off-scheme families to intermittent periods of famine. But the high proportion of cereals in the diet and the low consumption of milk, meat, eggs, and green vegetables have combined to produce protein and riboflavin deficiencies. Improvement in economic status may provide the long-term means for solving health and nutrition problems, but in the short term there has been little improvement in Mwea.

97. Lambert, J. N. DOES CASH CROPPING CAUSE MALNUTRITION? Discussion paper for the Department of Industry Annual Economists Conference, Loloata Island, July 30-August 2, 1980. National Planning Office, Port Moresby, Papua, New Guinea. Mimeographed. 4 pp.

A role for the Department of Primary Industry is the promotion of cash crops as a source of income for the rural population. Cash cropping is defined as the production of agricultural products primarily for sale, either for export or domestic consumption. Unfortunately, the promotion of cash crops has led to undesirable social consequences, unforeseen in most cases. These include a decline in nutritional status in some areas, alcoholism, prostitution, and crime in some settlement schemes. The author concludes that any project evaluation should consider problems of land pressure, availability of labor, and nutritional status, as well as the usual economic criteria.

98. Lev, L. THE EFFECT OF CASH CROPPING ON FOOD CONSUMPTION ADEQUACY AMONG THE MERU OF NORTHERN TANZANIA. MSU Rural Development Series, Working Paper No. 21. Michigan State University, East Lansing, Michigan, U.S.A., 1981. 73 pp. 65 references.

The paper investigates the influence of cash cropping on the adequacy of household food consumption levels. The first step is to formulate an overall view of the role of nutrition in economic development and the entire network of factors that influence nutritional status. The author uses available case studies to illustrate three mechanisms by which cash cropping might influence food consumption: competition between cash and food crops, impact of moving from kind to cash income, and influence of changes in the intra-family distribution of resources. The author examines the particular case of the Meru ethnic group in northern Tanzania, how the Meru economic system functions at the household level. A series of regression models tests the influence of a variety of socio-economic factors on nutrient adequacy ratios. An appendix presents technical data in a series of tables, and an additional 10 tables appear throughout the text.

99. Longhurst, R. RURAL DEVELOPMENT PLANNING AND THE PROVISION OF IMPROVED NUTRITION AND CHILD HEALTH. Report to the Ministry of Overseas Development, London, England, and the Institute of Development Studies, University of Sussex, Brighton, England, January 1979. Mimeographed. 15 pp. 17 footnotes with references.

The paper examines how different types of rural development projects might influence family nutrition and child health. It focuses on different elements of such projects and their characteristics of multiple goals and a large target group. The author outlines a conceptual framework by which their impact on nutrition and health might be evaluated. He makes three main points concerning the design of rural development projects: (1) it is difficult to predict outcomes of projects with certainty; (2) despite such uncertainties, the resource base of women should be increased as the necessary prerequisite for improving family nutrition and child health; and (3) the mixing of components from different sectors can lead to an adoption of the project resources by those in greatest need and where the rate of return is likely to be highest. Three tables of data supplement the text.

100. Lunvén, P. THE NUTRITIONAL CONSEQUENCES OF AGRICULTURAL AND RURAL DEVELOPMENT PROJECTS. Food and Nutrition Bulletin, Vol. 4, No. 3, 1982. pp. 17-22.

Despite the nutritional goals expected of many rural and agricultural development projects, subsequent evaluations reveal that improved nutrition is not intrinsically a benefit of development. Economic and social conditions of a region can change with no real impact on nutrition, or worse yet, with a negative impact. In an attempt to analyze the failure of development projects to provide nutritional benefits, the author offers details from six unnamed rural projects that did not improve nutrition. All were well-intentioned efforts, but they encountered problems with their credit schemes, cooperatives, choice of crops, and targeting. Occasionally they failed to understand the complexities of the social and economic environment, and failed to realize that the project would affect people outside as well as inside the project area. The author supports the application of the FAO methodology as a means of avoiding the mistakes made in the case studies.

101. Martinez, H., et al. PERU: PUNO INTEGRATED RURAL DEVELOPMENT PROJECT: TRAINING CASE STUDY ON INTEGRATING NUTRITION CONSIDERATIONS INTO A DEVELOPMENT PROJECT. Training materials, prepared for the U.S. Department of Agriculture, Office of International Cooperation and Development, Nutrition Economics Group, and U.S. Agency for International Development, Washington, D.C., U.S.A., 1982. Mimeographed. 41 pp.

The materials begin with a detailed description of the historical background of the Puno project in Peru and the pre-project selection and analysis. The report includes the contractor's recommendations for the nutrition component, the project identification and analysis, the project appraisal, and the current project status. The nutrition component outlines the problem, the component objectives, baseline data, the selection of target communities, the description of the component, organization and staff, vehicles, equipment and supplies, training, and monitoring and evaluation.

102. Mason, J. B. CASE-STUDY FOR FAO ON INTRODUCING NUTRITION CONSIDERATIONS INTO DEVELOPMENT PROJECT PLANNING -- HAITI. Cornell Nutritional Surveillance Program, Cornell University, Ithaca, New York, U.S.A., 1980. Mimeographed. 48 pp. 21 references.

In 1979 a health and nutrition component was added to a rural development project that had begun in 1977 in the northwest region of Haiti. The procedure adopted included an initial assessment of the nutrition situation (1979), data collection (1980), preliminary recommendations, and inputs to project planning. The initial assessment described the nutrition problems, characteristics of the malnourished, and causes of malnutrition. The project strategy called for optimizing the nutritional impact of production-oriented activities and identifying a nutrition component. The paper describes at length the methods of data collection and analysis. The implications for project design are discussed more briefly, because implementation of the project fell behind schedule. Recommendations relate first to the type of household that should have highest priority for participation in the rural development project, and second, to ways in which the project is likely to affect the nutrition of those who derive inputs and services from the project. A map and 11 tables supplement the text.

103. Mason, J. B., et al. REDUCING MALNUTRITION THROUGH RURAL DEVELOPMENT: A TEST OF PLANNING METHODS IN HAITI. Working Paper No. 10. Cornell Nutritional Surveillance Program, Cornell University, Ithaca, New York, U.S.A., 1972. 56 pp. 34 references.

The authors studied the methods used by the Food and Agriculture Organization in planning rural development projects that also help alleviate malnutrition. The major questions addressed were the extent to which the malnourished benefit from a project, particularly in terms of income, and the expectation that one benefit would be improved nutrition. The report describes the initial assessment method, the survey methods of sample design, questionnaires, and field research, and the analysis of the data. The initial assessment describes nutrition problems, the characteristics of the affected population, the causes of malnutrition, and project strategy for improving nutrition. The analysis of the data relates selected variables to each other. The report concludes with a discussion of the implications for designing rural development projects, the causes of malnutrition and child mortality, and some conclusions on methods used. The authors have included a map and 16 tables of statistical data.

104. Okigbo, B. N. NUTRITIONAL IMPLICATIONS OF PROJECTS GIVING HIGH PRIORITY TO THE PRODUCTION OF STAPLES OF LOW NUTRITIVE QUALITY: THE CASE FOR CASSAVA (MANIHOT ESCULENTA CRANTZ) IN THE HUMID TROPICS OF WEST AFRICA. Food and Nutrition Bulletin, Vol. 2, No. 4, October 1980. pp. 1-10. 27 references.

Reasons for the development of cassava as a major staple are examined in this article, in addition to possible adverse nutritional consequences for cultures relying heavily on cassava-based diets. Interventions to improve the nutritional value of cassava and other means to ensure nutritional adequacy of cassava-dependent populations also are discussed. Advantages of cassava include its low cost, ability to grow in poor soil, drought resistance, easy propagation, and

high yields. Cassava is very high in carbohydrates and energy, but is deficient in protein, fat, and several vitamins and minerals. It is of poor nutritional quality compared to cereals, legumes, and other root crops such as yams. Also of concern is cassava's toxicity level. Presently, numerous cassava-based dishes are consumed. The nutritional quality of these dishes varies greatly depending on other ingredients and complementary foods eaten. Rural subsistence farmers, to maintain nutritional adequacy, must produce surpluses of cassava to sell in order to purchase other foods. In addition to programs to increase cassava production through high-yield and pest/disease-resistant strains, breeding methods can be used to improve the protein content and overall nutritive value and reduce the cyanide content. Improvements in marketing, storage, transportation, and home preparation also are recommended. Seven tables and two figures are provided.

105. Omawale and Rodrigues, A. M. NUTRITION CONSIDERATIONS IN A CASSAVA PRODUCTION PROGRAM FOR GUYANA. Ecology of Food and Nutrition, Vol. 10, 1980. pp. 87-95. 16 references.

The authors evaluated a Guyanan government agricultural program aimed at partial substitution of imported wheat by locally produced cassava flour. The authors determined the nutrition situation in the area earmarked for cassava production, identified factors which might affect nutrition, and suggested plans for nutrition surveillance as part of the program. The authors concluded that the cassava program, if it leads to greater production and income for small-farm households, can result in increased energy intake. Children of preschool age were found to be well nourished and not nutritionally threatened by the proposed project. Increased household income would allow purchases of milk, legumes, and meat, and help individuals of all ages in the household. In areas where pure subsistence production is prevalent, the project must be careful to bring households into the market system and not lower the availability of food. The program also needs to assure that the real incomes of the urban poor, who are heavily dependent on wheat flour for calories, do not decline, and finally, the prices of inputs and services relative to the income of the rural poor in cassava production areas must not be allowed to increase. Seven tables present relevant data.

106. Otzen, U., et al. INTEGRATED RURAL DEVELOPMENT PLANNING WITH EMPHASIS ON NUTRITIONAL BASIC NEEDS FOR SEROWE DISTRICT/BOTSWANA. German Development Institute, Berlin, West Germany, 1979. 197 pp. 28 references.

A series of investigations in the Serowe District of the African State of Botswana was designed to collect and apply information on nutrition and food habits to an inclusive program of rural development. The research was conducted between November 1978 and February 1979. Following extensive background information, a description and analysis of the three sources of data collected in this project are provided: a food habit survey, agricultural and socioeconomic statistics, and anthropometric measurements. The latter study used a representative sample of 1,147 children under 10 years of age drawn from two typical villages. The anthropometric study revealed that almost 40% of the children in each village were malnourished. This was greater than would be expected using either reports

from clinics or national data such as food balance sheets. After identifying children from this first investigation as members of household units, the food habit survey collected household-based information on availability and consumption patterns, with special attention given to feeding patterns of small children. The agricultural survey collected data on family structure, education, property holdings, cultivation patterns, crop sales, and access to other economic resources related to productivity. When comparing the nutritional status of families with their agricultural performance, the households with a nutritional classification of "normal" have smaller total acreages, but cultivate them more intensively than "at risk" households. Other correlations between social and economic indicators and nutritional status are presented. The complexity of issues addressed in this report leads to multifaceted recommendations for intervention strategies. The areas of program development and improvement discussed include strategies to increase productivity, relationships between employment and income, provision of health services, nutritional surveillance and education, and food supplementation. Five diagrams and 5 annexes including 67 tables are provided.

107. Philippines National Nutrition Council. INTEGRATION OF NUTRITION CONSIDERATIONS IN THE PLANNING OF SAMAR IRD PROJECT. Samar IRD Project Office, Metro Manila, Philippines, 1980. 254 pp. (2 vols).

This report evaluates the potential impact of a multisectorial rural development project on nutritional status. The effort is part of a larger program, Nutrition-Oriented Development Planning (NORDPLAN), being cosponsored by the UN Food and Agricultural Organization. Analysis of the Integrated Rural Development Project (IRDP), to be instituted on the island of Samar and financed by the World Bank, begins with a discussion of the causes of malnutrition, including poverty, inadequate food distribution (regional and intra-familial), and poor health/sanitation conditions. The author presents a model showing the relationship between these variables and nutritional status along with methods for identifying target populations for nutrition intervention programs. The main source of background data was a 1978 survey designed to determine the relative nutrition situation among different localities and socioeconomic groups in Samar. Information was also obtained from several government agencies and other projects. Results indicate approximately one-third of all children under 7 years of age suffer from malnutrition, predominantly in remote and poor areas (e.g., Eastern Samar). Food consumption figures show substantial energy deficits (particularly among children) and mild protein inadequacies. Nearly half of the households have energy intakes less than 80% of recommended values. Levels of vitamin A and iron are also uniformly low. Food production and transportation are also shown to be inadequate to meet the nutritional needs of the Samar population. The major issue addressed is how to ensure that the Samar IRDP nutritionally benefits those most in need. It is recommended that project components be targeted at high-risk populations and focus on the food distribution system and development of immediate, short-term interventions such as feeding programs and nutrition education. The need to consider probable relationships among different aspects of the program (e.g., construction of transportation facilities and food distribution) is also stressed. The report contains 14 tables, 3 figures, and 2 maps. A separate volume contains 7 technical annexes which include 47 tables, survey questionnaires, instructions for carrying out the surveys, and coding procedures.

108. Ruther, N. L. EVALUATING THE NUTRITIONAL IMPACT OF THE SMALL FARM DIVERSIFICATION PROJECT IN THE WESTERN ALTIPLANO REGION OF GUATEMALA. U.S. Department of Agriculture, Office of International Cooperation and Development, Nutrition Economics Group, Washington, D.C., U.S.A., 1981. 46 pp. 25 references.

This report is organized into four sections. The first gives an overview of the Small Farm Diversification Project in Guatemala and the nutrition evaluation component. The second gives a brief review of the nutrition situation in Guatemala, identifying key aspects of the nutrition problem most likely to be affected by the project. The proposed evaluation methodology includes a review of pertinent institutional efforts and capabilities and a general conceptual framework. The fourth describes two possible evaluation packages with their respective implementation plans and cost estimates. Three appendixes list the documents reviewed and data sources identified, names and institutional affiliations of persons with whom the author met, and questions offered for those considering consumption effects of agricultural projects.

109. Smith, V. E., et al. DEVELOPMENT AND FOOD CONSUMPTION PATTERNS IN RURAL SIERRA LEONE. Food and Nutrition, Vol. 7, No. 2, 1981. pp. 24-32. 5 references.

Nutritionists have long argued that development can inadvertently threaten the delicate nutritional balance of the local diet in developing countries. This report describes food consumption patterns among rural households in Sierra Leone and identifies factors that affect these patterns, with special attention to the hypothesis that production for the market has adverse effects upon the diet. The authors describe the survey sample, the findings on food consumption and variables affecting consumption, the importance of rice and other foods. The authors conclude that none of the hypotheses considered is an adequate base for policy, except the hypothesis that food consumption generally rises with income. Even the income hypothesis provides no assurance that the nutritional benefits possible from higher incomes necessarily outweigh the possibility of nutritional losses from changes in production patterns that take place in order to earn those incomes. Data are presented in seven tables.

110. Smith, V. E., et al. FOOD CONSUMPTION BEHAVIOR: RURAL SIERRA LEONE AND KANO STATE, NIGERIA. MSU Rural Development Series Working Paper No. 24. Michigan State University, East Lansing, Michigan, U.S.A., 1982. Prepared for U.S. Agency for International Development. 191 pp. 26 references.

Basing their views on studies in Sierra Leone and Nigeria, the authors assert that food consumption choices of semi-subsistence households respond to economic variables. For most foods, caloric availability and consumption rise as household expenditures rise, though in the Kano sample, caloric availability decreased slightly as expenditures rose except for households already above the mean. As their incomes rose, the households below the mean reduced sorghum consumption in favor of more expensive sources of calories. In Sierra Leone, government policies that raised the producer price for rice by 10% increased the energy content of the diets of low-income households by 2%. Other households tended

to reduce energy intake by about 2%. The caloric content rose for the lower income households because the effect on profits of a rise in the price of rice was greater for them than for others. For the rural population as a whole in Sierra Leone, the price most important to the caloric adequacy of the diet was the free market wage of agricultural labor. A 10% rise in wages increased caloric availability by 5%.

111. Stamp, E., ed. GROWING OUT OF POVERTY. Oxford University Press, 1977. pp. 39-48, 80-85, 94-107.

These chapters, by different authors, discuss three case studies: better use of land in the highlands of Guatemala, introduction of a new food crop in Zaire, and the search for animal protein in Cameroon. An Oxfam program in the 1970's took an integrated approach to development in Guatemala and achieved beneficial health and nutrition results. The program introducing soybeans as a crop in Zaire in the 1960's included an integrated health education program and nutrition training for local leaders. The development plan in Cameroon first sought to inculcate a spirit of self-reliance, then improve health standards, increase food production, and introduce more protein foods. Experimental fish farms, piggeries, and poultry industries were introduced, and individual villages formed cooperatives to manage the projects.

112. Swanberg, K. G., and Shipley, E. THE NUTRITIONAL STATUS OF THE RURAL FAMILY IN EAST CUNDINAMARCA, COLOMBIA. Food Research Institute Studies, Vol. 14, No. 2, 1975. Stanford, California. pp. 111-125. 22 references.

The paper reports on studies designed to test the relationship between income and nutrition of persons of all ages in two rural areas of Colombia. To the extent that nutritional quality is related to income, nutrition can be improved by measures that will foster increased food production, higher incomes for the poor, more efficient distribution systems for foods, and more nutritious, inexpensive foods. The Colombia study showed that food consumption in general is highly related to income, although the consumption of some critical ingredients and the diets of some groups are not income-dependent. The study concludes that nutrition programs that are not income-generating still have a potential for creating significant nutritional impacts. As a result of the study, the Colombian government created a program of nutrition education and a school lunch program, as part of its rural development program.

113. Taha, S. A. ECOLOGICAL FACTORS UNDERLYING PROTEIN-CALORIE MALNUTRITION IN AN IRRIGATED AREA OF THE SUDAN. Ecology of Food and Nutrition, Vol. 7, 1979, pp. 193-201. 38 references.

The study attempted to identify various dietary and nondietary factors contributing to malnutrition in the Gezira Irrigated Area of the Sudan. The sample included 14 villages, 1,292 children, and 150 hospital patients. The average food consumption of the region was found to be fairly adequate, except for a slight deficiency in energy intake. But the averages covered many discrepancies. The

Sudanese do not practice supplementary feeding, so that infants undergo a prolonged period of undernutrition until they are old enough to be weaned abruptly onto the family diet. Intra-family food distribution favors adult males and guests. The dietary problem, therefore, is as much social as economic within the family. The author concludes that althougn income was the major factor determining nutritional status, other significant factors were weaning practices and immunizations against disease. The article includes 10 tables of data and provides a good review of literature on related subjects.

114. Taussig, M. PEASANT ECONOMICS AND THE DEVELOPMENT OF CAPITALIST AGRICULTURE IN THE CAUCA VALLEY, COLOMBIA. Latin American Perspectives, Vol. V, No. 3, 1978. pp. 62-91. 43 references.

A dramatic upsurge in large-scale capitalist crop farming has occurred in Colombia since the early 1960's, but macro-economic studies indicate that peasant incomes have decreased. The author states his view that peasant production is more efficient than large-scale capitalist farming, but that the latter is able to compensate by taking advantage of peasant efficiency through its monopoly over land and its political influence. The author focuses on capitalist development and the appropriation of peasant land, the dual character of the labor force for plantations and large farms, the attributes of peasant agriculture, and energy, exploitation, malnutrition, and capitalist development. The modern peasant farm requires 2.3 times more labor days per unit of land per year than the traditional farm, and the workers net income is lower. A modern worker's annual energy expenditure is 570% higher than that of a peasant working traditional crops. The nutritional balance which must be achieved by working adults occurs at the expense of children and pregnant women. Some 50% of children are underweight and malnourished. The author concludes that plantation development has increased the intensity of labor, the food requirements per worker, and the costs of maintaining nutritional balance, while delivering a surplus of labor time to large landowning employers.

115. Teitelbaum, J. M. NUTRITION IMPACTS OF LIVESTOCK DEVELOPMENT SCHEMES AMONG PASTORAL PEOPLE. Agency for International Development, Washington, D.C., U.S.A., 1980. 156 pp. 88 references.

This report documents some of the effects of livestock policy implementations on the pastoral people in Sub-Saharan Africa and other grazing areas. Secondary data sources, regional nutrition surveys, field studies, and up-to-date literature were utilized in its preparation. The food sources, nutritional conditions, and lifestyles of pastoralists in developing areas are first described, followed by a discussion of the known and potential impacts of livestock projects. Recommended measures for providing nutritional benefits for pastoralists as part of the development process are then made. As noted, the nutritional status of pastoral people may have been adversely affected as a result of a series of events beginning in the early 1960's. The types of projects instituted at that time were aimed at improved livestock health and breeding and had little effect on the lives of the herders. The late 1960's and early 1970's saw efforts aimed at the production of livestock for urban markets; however, little attention was given to the effects this had on seasonal hunger periods, or on the human ecology

of herders. Finally, the cyclical drought of the 1970's signaled development and conservation measures alien to traditional pastoral practices and the expected livestock increases never materialized. Donor agency investment for development was either withdrawn substantially or shifted to programs favoring basic human priorities. The resulting pastoralist avoidance of or resistance to development projects has impacted on them in ways yet to be determined, though it is believed that few benefits, nutritionally or otherwise, have been realized. The recommendations presented are intended to change this situation, and stress the need for addressing the nutritional requirements of pastoral populations in the design phase of all livestock development projects.

116. Yang, Y. H. MAXIMIZING NUTRITIONAL OUTPUT OF SMALL FARMS. Paper presented at the XI International Congress of Nutrition, Rio de Janeiro, Brazil, August 27-September 1, 1978. 27 pp. 15 references.

Various approaches to increasing the nutritional value of crops grown on small farms are discussed. As noted, three-quarters of the people in developing countries live in rural areas, mostly small subsistence farmers with about one hectare of land. Productivity and income from small farms have generally declined, resulting in a deterioration of the nutritional status of people in rural areas. Nutritional output could be maximized through crop selection and rotation, multiple-cropping, and combined operation of crops, and small animal and/or fish raising at farm level. One hectare of land, well managed under suitable conditions, could support the nutritional needs of a six-member family, and provide some income to meet other basic needs of the household. Efficient use of food resources is stressed. Productivity could be increased through government policies and measures, including the access of inputs on favorable terms, price support, technological transfer, improving land tenure and infrastructure, strengthening rural institutions, and involving villagers in planning and evaluation. Three annexes present figures on the size of cultivated holdings in select Asian countries and nutrient outputs of various food crops.

C. MARKETING AND OTHER POSTHARVEST ACTIVITIES

117. Food and Agriculture Organization. FOOD MARKETING PROGRAMS FOR IMPROVING HUMAN NUTRITION. PAG Bulletin, Vol. V, No. 4, 1979. pp. 2-10. 10 references.

The purpose of this paper is to stimulate discussion on the crucial role of food marketing in ending hunger; that is, how to channel available food supplies to needy consumers in a suitable form and at prices they can afford. The paper considers the scope for development of food marketing systems in developing countries and for implementing food price and subsidy policies which may contribute to improved human nutrition. The paper first summarizes the nutrition problem. It then discusses the dimensions of marketing, ways to streamline existing marketing systems, the scope for developing government programs and services, and the future directions of food marketing policies. The paper concludes that in the future a fairer distribution of essential foods will

require increasing government involvement in the marketing process. Governments should also focus on an integrated food system, stressing consumer needs, and should formulate nutrition-oriented, economic development programs.

118. Muller, H. R. CAN EFFICIENT FOOD DISTRIBUTION HELP TO IMPROVE THE NUTRITION SITUATION IN THE DEVELOPING COUNTRIES? In: Somogyi, J. C., ed. Solution of Nutritional Problems: The Contribution of Producers, Distributors and Nutritionists. Bibliotheca Nutritio et Dieta, Vol. 28. S. Karger, Basel, Switzerland, 1979. pp. 114-129. 9 references.

Inequitable patterns of food distribution from producer to consumer contribute to the poor nutritional situation in developing countries. Three patterns are commonly found. In this article, each is described and the advantages and disadvantages in terms of supply and demand are examined with regard to lowering costs of food products. The three patterns are as follows: (1) The traditional "marketplace" in which producers deal directly with consumers provides cheap products and can be suited to a particular geographic region. However, it operates on a day-to-day basis and is generally not adapted for perishable products. (2) The vertically integrated system comprises a long channel operation starting with concentration of raw materials, their storage and processing, packaging, and fractioning of finished products for distribution to the market. It provides for year-round availability of food, standardized quality, and a positive impact on the economics of the country, though products become more expensive, making them unaffordable to segments of the population. (3) Governmental distribution may result in better distribution to vulnerable groups and availability of good products at low prices, but it does not stimulate trade development. To illustrate the value of government subsidies in keeping costs down, cost of importing weaning foods are compared to government-subsidized food in Nigeria and Kenya, respectively. The author concludes that distribution must be carried out with more attention to using existing commercial systems supplemented with a system to dispense food at reduced cost through health service and school meals.

119. Organisation for Economic Co-Operation and Development, Development Centre. CRITICAL ISSUES ON FOOD MARKETING SYSTEMS IN DEVELOPING COUNTRIES. Paris, France, 1977. In cooperation with the Food and Agriculture Organization. 97 pp. 58 references.

This report summarizes papers presented at a seminar held in Paris in 1976 and conducted jointly by the Organisation for Economic Cooperation and Development and the Food and Agricultural Organization of the United Nations. Generally, participants agreed "that the food marketing system, by linking the producer and consumer areas and services as an important communication channel, could become a major catalyst in rural development." Five topics were highlighted by 59 participants from 22 countries: (1) Characteristics of Areas Where Inadequate Marketing Systems are a Major Bottleneck to Improved Food Supply. Population estimates and estimates of food grain requirements for most severely affected (MSA) countries are reported. (2) The Catalytic Role of Various Types of Marketing Enterprises in Stimulating the Expansion of Local Food Production.

The roles of private traders (small traders and rural merchants), cooperatives, or state marketing systems are examined. (3) Appropriate Post-Harvest Technology in Semi-Subsistence Transitional Food Marketing Systems: Transport, storage, processing, and distribution systems. (4) Government Marketing Policies and Services. Governmental intervention is required, at some level. Physical marketing facilities should receive less support from the government. (5) Options for International Aid. Previous commitments to improved marketing systems by the FAO, Inter-American Development Bank, and World Bank are reviewed. Eight annexes accompany the report including a list of participants and working documents; tables of projected population growth, recent cereal production, food supply, grain prices, and cereal producers for selected MSA countries; examples of food marketing projects; and a bibliography of reports on agricultural marketing meetings between 1959 and 1976.

120. Parpia, H. A. B. POST-HARVEST LOSSES AND THE IMPACT OF THEIR PREVENTION. In: Somogyi, J. C., ed. Solution of Nutrition Problems: The Contribution of Producers, Distributors, and Nutritionists. Bibliotheca Nutritio et Dieta, Vol. 28. S. Karger, Basel, Switzerland, 1979. pp. 58-83. 29 references.

Improvements in postharvest technology are examined as an approach toward improving food supplies and fostering socioeconomic development in the Third World. Presently, it is estimated that postharvest losses can be as high as 20-40% of production while an increase of only 4-6% in production would eliminate food shortage worldwide. Both quantitative and qualitative losses occur. Rodents are responsible for 46-78% of crop losses during different stages of production. Insect infestation can destroy between 10-40% of a crop. Birds are also responsible for losses but little is known about their effects. Losses of food grain can be qualitative as well. Infestation, with its metabolic and structural consequences, can affect the protein efficiency rates of food grains and mean growth rate of animals, and can promote certain diseases. Various loss control approaches are suggested. Methods to improve processing technology of rice, grain, legumes, and wheat are also reviewed. With improved milling processes, over one-half of the rice shortage problem could be eliminated. Cassava-peanut flour, wheat-peanut flour, composite pasta products, and wheat-millet bread are described; as are a number of protein foods and concentrates used as weaning foods and milk substitutes. Implementation of all of these recommendations requires more rapid transfer of technology, local infrastructures to absorb these new systems, and training/research programs based on local needs. The article contains 29 references and 12 tables.

121. Parpia, H. A. B., and Majumder, S. K. REDUCTION OF POST-HARVEST LOSSES. Paper presented at The Interfaces between Agriculture, Food Science, and Human Nutrition in the Middle East, sponsored by ICARDA and United Nations University, at Aleppo, Syria, February 21-25, 1982. 66 pp. 51 references.

The subject of postharvest losses and technology relates to both agriculture and nutrition. This paper gives attention to cereals and legumes because they provide the largest portion of calories, proteins, and other nutrients for the human diet. If food losses at various stages could be prevented, the world food supply

would increase at least 10%, without additional demand for land. The paper discusses infestation control of rodents and insects, a conservation process compatible with size and type of processing industry, appropriate technologies for tropical regions, improvements in processing technology of food grains, fish conservation, technology transfer, and research and development. The report concludes with a list of 12 benefits that would result from a sound postharvest foundation. Some of the benefits noted are a rise in the nutritional quality of food, provision of food at reasonable prices, and an increase in food supplies. A set of 20 tables provides data relevant to the text.

122. Seaman, J., and Holt, J. MARKETS AND FAMINES IN THE THIRD WORLD. Disasters, Vol. 4, No. 3, 1980. pp. 283-297.

This paper examines relationships between food distribution and marketing systems and famines in developing countries. Causal theories of famine are presented; major emphasis is on developing an understanding of the most effective methods of famine relief. Most discussions of famine attribute such events to failures in food supplies, lack of purchasing power, or the inability to intervene effectively. One finds, however, that the relationship between food supplies and starvation is extremely variable, and famine is not a typical consequence of poverty. To develop a systematic understanding of famine episodes, the following factors must be considered: (1) the influence of food supply and demand on prices; (2) income patterns; (3) the involvement of affected populations in market exchanges during periods of scarcity; and (4) the existence of institutional structures capable of alleviating shortfalls in production and of redistributing food. The famines in Wollo, Ethiopia, in 1972-1973, Bangladesh in 1974-1975, and the Sahel in 1969-1973 are described with the purpose of illustrating the relative importance of each of the above variables. The conclusion is reached that in both Ethiopia and Bangladesh, market forces were a critical determinant of the patterns and timing of starvation. The author concludes movement from a subsistence to a market economy increases the vulnerability to famine. Environmental adversity still remains the major factor in some famines. Relief efforts in these three cases met with variable success. "Major international food operations appear intrinsically too cumbersome and inefficient to cope with a threatened famine." Food surveillance systems and permanent local stockpiles may alleviate this problem, but accurate timing of relief remains a major obstacle. Given the importance of market forces and the difficulty of developing a method for selecting the most needy, relief efforts prior to the commencement of a famine should utilize food sales at reduced prices rather than entirely free distribution. Eight figures and one table are provided.

D. PRICE SUBSIDIES AND FOOD DISTRIBUTION PROGRAMS

123. Ahmed, R. AGRICULTURAL PRICE POLICIES UNDER COMPLEX SOCIOECONOMIC AND NATURAL CONSTRAINTS: THE CASE OF BANGLADESH. Research Report No. 27. International Food Policy Research Institute, Washington, D.C., U.S.A., 1981. 78 pp. 92 references.

Despite natural restrictions, fragmented plots, and socioeconomic constraints, Bangladesh farmers respond to price incentives by increasing output. Long-term growth in production, however, depends on a balanced combination of price incentives, technology, infrastructure, and supporting institutions. The main impediment to maintaining high foodgrain prices is their acute detrimental effect on the nutritional status of low-income households, particularly landless rural families. The argument that when an increase occurs in the price of rice, low-income families substitute inferior grains and maintain food consumption is found to be incorrect. The supply and demand forces are such that the prices of inferior substitutes rise faster than the prices of finer grades when foodgrain prices in general are rising. In the long run, the effect of higher food prices on consumption is less serious because wage income eventually rises along with prices. The author looks at policies that indirectly support foodgrain prices, such as increasing the income of low-income households by works programs and rural construction. Five appendixes provide technical data, while 28 tables and 7 illustrations provide data throughout the text.

124. Ahmed, R. FOODGRAIN SUPPLY, DISTRIBUTION, AND CONSUMPTION POLICIES WITHIN A DUAL PRICING MECHANISM: A CASE STUDY OF BANGLADESH. Research Report No. 8. International Food Policy Research Institute, Washington, D.C., U.S.A., 1979. 81 pp. 42 references.

The study was designed to describe the role of public foodgrain distribution in Bangladesh. Because foodgrain supply is inadequate and distribution inequitable, the Government of Bangladesh uses cash, credit, and grants to purchase imported and domestically produced grains and then rations these through its public food distribution system. The government appears to profit from sales based on imports purchased on credit and grant terms, but loses money on cash imports and domestically produced grain. A framework based on annual averages is developed to show the relationship among domestic production, imports, procurement, public distribution, income, open market sales, consumption, and market prices. The information suggests that for a given level of domestic production, imports, and income, the government can change prices by changing the proportion of rice allocated to the public distribution or open market systems. Two foodgrain distribution system options are examined: a rural rationing scheme and an open market sales operation. The present rationing system supplied foodgrains mostly to the urban poor even though the rural poor are greater in number. To increase rural food consumption in the short run, it is desirable to lower foodgrain prices and to provide an input subsidy for producers to maintain production incentives. The merits of two policies designed to increase domestic rice production, price supports, and fertilizer subsidies, are also considered. Evaluation of each policy alternative is done in terms of the impact on producer and consumer income, the government budget burden, foreign exchange savings, and

benefit distribution. Although both options have substantial social benefits, the net social benefit of a price support program is negative. The low price elasticity of rice production, distribution ease, and a high degree of self-sufficiency in fertilizer production favor fertilizer subsidy policies. This report contains 24 tables, 6 illustrations, 4 appendixes, and a bibliography.

125. Alderman, A., et al. EGYPTIAN PUBLIC FOOD PROGRAM STUDY: REPORT ON TASK I - EGYPT'S FOOD SUBSIDY AND RATIONING SYSTEM: A DESCRIPTION. International Food Policy Research Intitute, report submitted to U.S. Agency for International Development, 1982. 79 pp. 72 references.

This study was undertaken to assist Egyptian planners and economists dealing with food policy issues. It begins with a discussion of Egyptian policy goals, a brief historical background, and discussions of market outlets, decisionmaking and administration within the food subsidy network, regional variations, effects on nutrition, and linkages to the agricultural sector. The authors present two case studies: marketing within Cairo and Giza, and purchasing subsidized and nonsubsidized foods in nine delta villages. The report concludes with a discussion of modifications of the subsidy system currently under consideration. Five additional task reports will be forthcoming from IFPRI on the Egypt Food Subsidy system. Six illustrations and 33 tables supplement the text.

126. Devres, Inc. ANALYSIS OF THE GOVERNMENT COSTS OF SELECTED STRATEGIES TO ACHIEVE MINIMUM CALORIE STANDARDS FOR A DEFINED TARGET GROUP IN THREE DEVELOPING COUNTRIES. Report submitted to the World Bank, Washington, D.C., U.S.A., 1982. 115 pp. 31 references.

Food subsidy programs are used widely in developing nations. The programs are diverse in format and generally politically expedient, but they are also expensive. This study attempts to determine the budget feasibility of the programs and to determine the effect of complementary agricultural programs on food subsidy costs. Section I explains the procedure of data collection, strategy formulation, the model, and methodology. Section II describes the data base. Section III describes the nutrition strategies examined. These include production, consumption, and combination strategies. Section IV presents results of different nutrition strategies in terms of the calorie gap, government costs, commodity prices, and area and yield effects. Section V reports five findings and six conclusions. The seven annexes describe the scope of the work; present computer printouts for data on India, Senegal, and Colombia; discuss possible future activities; and list references. Relevant data are presented throughout the text.

127. Edirisinghe, N. WELFARE OR GROWTH: SRI LANKA'S PROBLEM IN PEASANT AGRICULTURE. Cornell Agricultural Economics Staff Paper No. 79-18. Cornell University, Ithaca, New York, U.S.A., 1979. 20 pp. 6 references.

The Sri Lanka plan, involving import of food supplies and domestic subsidies, has encountered and created economic problems despite its success at guaranteeing

food availability for the average Sri Lankan. This paper assesses these policies and the problems arising from them. Sri Lanka began public distribution of food as a wartime measure but continued the subsidy because of postwar inflation. To maintain large rations at low prices, the government began to purchase surplus foods from native paddy farmers. The food subsidy has increased continuously due to rising import prices, increased producer subsidy, and a great number of subsidized food items. Cereals, mostly rice and wheat, provide nearly 57% of caloric intake. As the population and demand for food have increased, so have wheat imports. Sri Lanka currently imports nearly one-half of its food requirements. As a consequence of this and other programs in social welfare, Sri Lanka has achieved a dramatically increased life expectancy and literacy rate, reduced crude death rate, and reduced rate of population growth. Real income, particularly among lower income groups, has also increased. However, expenditures for social welfare and subsidy are heavy and could alternately be invested in economic development. The problem is how to reconcile food subsidies with changes that would stimulate the economy in terms of greater growth and more employment. Recently, rice rations have been reduced, in hopes of reducing imports and increasing the demand for nonration rice. As a result, consumption of wheat flour, which remained subsidized and very cheap, has increased by over 100%. This, in turn, led to a surplus of rice, which then had to be exported. It is doubtful that the system which has evolved can bring about net benefits when considering the political and economic complications and expenses of the import-export system.

128. Franklin, D. L., et al. CONSUMPTION EFFECTS OF AGRICULTURAL POLICIES: BREAD PRICES IN THE SUDAN. Vols. I and II prepared for the Democratic Republic of the Sudan and U.S. Agency for International Development, Bureau of Science and Technology, Office of Nutrition, Washington, D.C., 1982. 56 pp. 24 references and 58 pp.

This report presents an econometric analysis of the effects of prices, incomes, and other factors on the expenditures for bread and other goods by households in urban Khartoum. Results indicate that consumers are more responsive to prices than has generally been speculated. The paper reviews bread-pricing policies during the 1970's, discusses other factors which may have contributed to the growth in per capita consumption of wheat products, and describes the data used in the analysis. The policy conclusions that result from the study are: (1) The incidence of the explicit and implicit subsidies on bread favors the upper quartile of the population. (2) There is some scope for managing the excess demand for bread through pricing policies. (3) Bread represents a small share of the poor's budget; there is ample scope for substituting sorghum products for bread and the bread subsidy is a cost-ineffective means of fulfilling nutrient needs of the lowest quartile. (4) It is plausible that allowing the market for wheat to reflect real international costs could improve domestic resource allocation and expand the supply of domestically produced foods. Volume II presents methods for estimating demand parameters for cross-sectional data and a sensitivity analysis of resource allocation in the Gezira Scheme. The second volume also presents an intermediary progress report on the research which has been partially assimilated in Volume I. The appendixes in this progress report provide further information on the analytical approach and its limitations.

129. Gavan, J. D., and Chandrasekera, S. THE IMPACT OF PUBLIC FOODGRAIN DISTRIBUTION ON FOOD CONSUMPTION AND WELFARE IN SRI LANKA. Research Report No. 13. International Food Policy Research Institute, Washington, D.C., U.S.A., 1979. 55 pp. 44 references.

This research report addresses food policy implications of food subsidy programs and is intended to contribute to priority setting at the national level and to understanding the relationships and effects on foreign assistance, long-term growth, and short-term welfare. The operation of the public food distribution system, its effect on the price and availability of foods, and its impact on the food intake levels and nutrition of different income groups in Sri Lanka are explored. The authors comprehensively review the operation of the public rice distribution scheme. Attention is also devoted to a survey of available evidence on food consumption and nutritional status, the development and impact on the rice economy of the rice ration and procurement schemes, rice distribution scheme impact on food consumption, calorie and protein intake among income groups, and the fiscal and social costs and benefit distributions under various foreign exchange rate assumptions. A model of the rice sector is provided. The authors assess the wider implications of the rice distribution scheme. Twenty tables and three illustrations provide economic and nutrition data.

130. George, P. S. PUBLIC DISTRIBUTION OF FOODGRAINS IN KERALA -- INCOME DISTRIBUTION IMPLICATIONS AND EFFECTIVENESS. Research Report No. 7. International Food Policy Research Institute, Washington, D.C., U.S.A., 1979. 68 pp. 44 references.

This study analyzes the operation of the public distribution system for foodgrains in Kerala, a state in southern India. The Kerala system reaches about 97% of the population in both urban and rural areas and is reported to be the best public distribution program in India. The arrangements for public distribution include compulsory procurement of paddy rice from farmers by using a graded levy system, movement restrictions for foodgrains outside the state, importation of grains by the state government from the central pool, and distribution of specified quantities of grains at fixed prices to consumers through fair price shops. Analysis of the benefits of rationing to consumers showed that ration rice accounted for a major share of the rice consumption of low-income consumers. The estimated rice consumption levels without rationing were lower for all consumers in Kerala, and were lowest for the low-income groups. The study concluded that in the short run, the objective of increasing consumption levels of low-income consumers could be achieved more effectively through rationing than through a general income transfer. The author supplements the text with 30 tables and 8 figures.

131. Kaynak, E. GOVERNMENT AND FOOD DISTRIBUTION IN LDCs: THE TURKISH EXPERIENCE. Food Policy, Vol. 5, No. 2, 1980, pp. 132-142. 15 references.

Using Turkey as a case study, this article examines the role of government in the food distribution systems of developing countries. The effects of government policies on the organization and functioning of this sector are analyzed, with

the focus on strategies designed to benefit low-income consumers. It is maintained that most national development plans do not systematically address food marketing issues despite the existence of explicit and consistent government policies in this area. The inefficiency of the traditional retail structure in low-income areas has broad economic and social implications, including negative effects on the entire food system and development in general. Governments in developing countries have recently become more involved in food marketing. Efforts have included both measures to influence private trade and direct participation (e.g., nationalization of retail food outlets). Questions have been raised as to (1) whether governmental bodies can administer such programs more efficiently than private business, and (2) the cost/benefit ratio associated with financial expenditures by governments for such operations. The Turkish government has become extensively involved in food regulation and distribution. Rapid food inflation, along with a growing disparity between retail and wholesale prices, indicates the ineffectiveness of the private distribution systems. Food inflation has become a highly political issue and has resulted in successive government attempts to modernize the traditional food sector. It is recommended that improvements be made in the physical structure, operations, and appearance of existing wholesale areas (e.g., adequacy of storage facilities, grading and weighing of foods). Extension services should also be expanded. Three tables are provided.

132. Kumar, S. K. IMPACT OF SUBSIDIZED RICE ON FOOD CONSUMPTION AND NUTRITION IN KERALA. Research Report 5. International Food Policy Research Institute, Washington, D.C., U.S.A., 1979. 45 pp. 37 references.

This paper reports the findings of a study conducted to determine the impact of a food price subsidy program on food consumption and nutrition. The subjects of the program were a low-income population in Kerala, India. Three related questions were investigated: (1) What factors determine a household's access to subsidized food, specifically rationed rice? (2) What is the impact of the subsidized food on levels of household nutritional intake, child nutritional status, and consumption of major staples? (3) How does the income subsidy implied by the subsidized food compare with increments in other sources of income? Analysis of the study data gathered during 6 months of 1974 yielded the following conclusions: (1) During a period of foodgrain supply limitations, ration cutbacks, and a relatively high price differential between ration and open-market rice, middle income groups had more ration rice available than did the lowest income groups. (2) These lower income households on average suffered a deficiency of both calories and protein in terms of norms established by the U.N. Food and Agriculture Organization. Rice from the ration system contributed one-fifth of both calories and protein in the household diet. (3) A large impact on consumption and hence demand, resulting from ration rice availability, is reflected in the higher marginal propensity to consume foods from subsidy income than from other income sources. (4) Ration rice consumption was also positively related to child nutritional status. Because of the limited geographic area involved in the study and the individual nature of the food consumption patterns and subsidized food system involved, only narrow implications should be drawn in predicting health and consumption impacts of alternative systems. Ten tables are included.

133. McIntosh, C. E. FOOD PRICE SUBSIDIES AND NUTRITION: EXPERIENCES FROM TRINIDAD AND TOBAGO. Paper for Caribbean Food and Nutrition Institute, Pan American Health Organization, Kingston, Jamaica. 24 pp. 19 references.

The paper summarizes a study of the nutritional consequences of the government's price policy and subsidy programs. The study attempted to identify and measure the components of the retail prices of selected basic foodstuffs and the effects of these factors on price levels. In selecting food items for study, consideration was given to the major sources of nutrients in the diet, the per capita consumption, the proportion of income devoted to the food groups, and foods that could be grown locally. The study revealed adverse implications of the present food price policy and recommended a complete change in the orientation and operation of the price control and subsidy program. The suggested policy would combine food price control with a consumer subsidy on a graduated scale according to income. Price increases caused by changes in pricing levels would be alleviated for the poor by distributing coupons for specified products, according to family size, income, and location. Tables of relevant data appear in the text.

134. Perrin, R. K., and Scobie, G. M. MARKET INTERVENTION POLICIES FOR INCREASING THE CONSUMPTION OF NUTRIENTS BY LOW INCOME HOUSEHOLDS. American Journal of Agricultural Economics, Vol. 63, No. 1, 1981. pp. 73-82. 16 references.

This research examines and compares the costs of achieving specified nutritional goals through alternative intervention programs, both in general, and in a specific case study of consumers in Cali, Colombia. The results are expected to be useful in assessing the impact of alternative policies. Three intervention policy categories, directed at supply shifts, demand shifts, or subsidies, are addressed. This study employs a market equilibrium displacement approach to examine the nutrient consumption effects of market intervention programs. When applied to the case study, it was found that a marginal increase in calorie intake among the poor could be achieved at lowest cost with a consumer subsidy of certain cereals, although black market activity might raise this cost to that of an income subsidy. Tables and figures of specific food characteristics (economic, caloric) and intervention costs are provided.

135. Rogers, B. L. CONSUMER FOOD PRICE SUBSIDIES AND SUBSIDIZED FOOD DISTRIBUTION SYSTEMS IN PAKISTAN. INP Discussion Paper No. 13. International Nutrition Planning Program, Massachusetts Institute of Technology, Cambridge, Massachusetts, U.S.A., 1978. 240 pp. 52 references.

Many countries subsidize the prices of some foods to consumers for a variety of reasons; one reason may be to increase the food consumption of nutritionally deficient groups. This thesis contends that food subsidies can be made cost-effective and nutritionally valuable by careful design of the program, and attempts to define some of the relevant design considerations. The major hypothesis is that by selecting for a subsidy a food which is an important contributor of deficit nutrients in the needy population and which is disproportionately consumed by the poor, a subsidy can have a nutritional impact and leakages can be minimized. The wealthy are unlikely to desire an economically low-grade food

and the subsidy will target itself without bureaucratic judgments on eligibility. The author tested the hypothesis by studying Pakistan's ration-shop system for whole-wheat flour and sugar. She found that the benefits of the wheat subsidy were greatest among the neediest groups. Food price subsidies can affect nutritional status only when purchasing power is the limiting factor of food consumption in deficient groups. The paper concludes with a glossary and an appendix of questionnaire forms used to evaluate the Pakistan ration-shop system.

136. Rogers, B. L., et al. STUDY V. CONSUMER FOOD PRICE SUBSIDIES. In: Nutrition Intervention in Developing Countries. Oelgeschlager, Gunn and Hain, Publishers, Inc., Cambridge, Massachusetts, 1981. 114 pp. 60 references.

This study examines food price subsidies and pricing policy, and is intended to provide the key elements which should be considered in the design of such policies. It is not intended to be an implementation manual. The authors define the role of consumer food subsidies and describe common forms and usage, including a tabular summary of price-altering programs throughout the world. Market intervention program design is discussed; the design process should address population targeting, commodity choice, use of rationing, pricing policies, and distribution systems. Cost-effectiveness is emphasized. Intervention program evaluation is also treated. Two case studies, Pakistan's ration shops and Mexico's subsidized milk distribution program, are described and analyzed. The authors conclude that while there are problems with these two programs, they do provide economic, and perhaps nutritional, benefits to low-income families. Thirty-three tables are included.

137. Scandizzo, P. L., and Graves, J. THE ALLEVIATION OF MALNUTRITION: IMPACT AND COST EFFECTIVENESS OF OFFICIAL PROGRAMS. AGREP Division Working Paper No. 19. The World Bank, Washington, D.C., U.S.A., January 1981. 28 pp. 8 references.

This paper takes a preliminary look at the short-run impact and cost-effectiveness of government-operated food distribution schemes in five Asian countries: Sri Lanka, India, Pakistan, Bangladesh, and Indonesia. Section I presents the design and scale of food consumption subsidies in the five countries. Section II outlines the methodology followed and empirical estimates of the effects of the ration systems. Section III presents a series of measures of the impact and cost-effectiveness of the distribution systems during 3 years of operation. It also attempts an econometric analysis of these results and discusses the implications for the design of better programs. An appendix provides an analysis of the economic model used to analyze the subsidy schemes. A series of tables details the basic data used in the empirical analysis. Findings indicate that programs in countries with higher per capita food deficits tend to be more cost-effective. Governments that bear a larger portion of the distribution cost tend to be more efficient distributors of low-price calories. Finally, international food prices appear to be one of the overwhelming factors in determining the cost of the food distribution operations.

138. Scandizzo, P. L., and Swamy, G. BENEFITS AND COSTS OF FOOD DISTRIBUTION POLICIES: THE INDIA CASE. AGREP Division Working Paper No. 35. The World Bank, Washington, D.C., U.S.A., 1981. 40 pp. 14 references.

This paper provides a cost-benefit analysis of food distribution policies in India for 1974. It analyzes some of the characteristics and main consequences of food distribution policies and provides a quantification of their effects on consumers, producers, and the government budget. The analysis shows that even a moderate concern with the nutritional status of the poor makes the schemes a worthy endeavor, despite high costs and high leakages to unintended beneficiaries. The analysis also shows that the bulk of nutritional benefits came from a ban on grain exports and distribution of imported grain, and was a direct consequence of diverting to consumers grain that would have been exported. The authors conclude, however, that procurement and rationing policies can be interpreted as a rational extension of a successful commercial policy. Illustrative tables and figures appear throughout the text.

139. Solimano, G., and Taylor, L., eds. FOOD PRICE POLICIES AND NUTRITION IN LATIN AMERICA. United Nations University, World Hunger Programme, Food and Nutrition Bulletin, Supplement 3, 1980. 170 pp. 39 general references and 74 among various papers.

This volume records the proceedings of the 1978 workshop on the impact of food price policy on nutrition, jointly sponsored in Mexico City by the United Nations University World Hunger Programme and the Center for Economic and Social Studies of the Third World, Mexico City. Governments typically intervene in the marketplace to control the prices, and therefore the distribution, of staple foods. Subsidies on imported foods, and for local producers, taxes on essential food consumption, and other price interventions appear to be facts of life that do not favor poor people, especially in developing countries. Malnutrition is seen as the result of unequal distribution of food rather than as a problem of world food scarcity or agricultural potential. The 22 workshop participants met to formulate both effective policy interventions and research projects in the areas of marketing and monitoring systems, definition of dietary standards, and price and income policies. Case study papers on price policies and consumption in Mexico, Jamaica, Trinidad-Tobago, Chile, and the Dominican Republic formed a basis for the group's deliberations. Six figures and 47 tables appear throughout the papers and in a statistical appendix.

140. Taylor, L. FOOD SUBSIDIES IN EGYPT. Massachusetts Institute of Technology, Cambridge, Massachusetts, U.S.A., 1979. Mimeographed. 14 pp.

The Egyptian government subsidizes a wide range of commodities and services; among them is food. During the 1970's the subsidy system grew to a substantial share of public spending, with important nutritional consequences. This paper summarizes the history and magnitude of the food-subsidy program, discusses the current policy debate over food pricing, and offers proposed changes that might affect the nutritional and economic well-being of poor Egyptians. The policy issues under debate are: the distribution of benefits by regions and income

class, the cost-effectiveness of the system, distinguishing targeted programs from macro-economic impact, and prices of subsidized commodities in an inflationary economy. Four revisions in the subsidy program would retain its nutritional benefits: (1) incorporate a means test and rationing to discriminate against volume sales of commodities for profit, (2) concentrate subsidies on foods to which the poor devote a large share of their budgets, (3) incorporate indexing of subsidized prices to the general rate of inflation, and (4) modify the subsidy system with regard to macro-economic repercussions, especially the purchasing power of the poor. Several tables in the text present relevant data.

141. Taylor, L. PRICE POLICY AND THE FOOD THAT PEOPLE CONSUME. Paper presented at the Workshop on the Impact of Food Price Policies on Nutrition, sponsored by the United Nations University World Hunger Program, Mexico City, Mexico, March 23-25, 1978. 21 pp. 5 references.

The market for staple foods in a poor country accounts for a substantial portion of economic activity, is politically important, and is highly unstable. This paper points out some of the macro-mechanisms through which food price policy acts and their implications for food consumption and nutritional status. The discussion centers around a formal model of a hypothetical economy. Sections I and II present stylized facts and the model, and Section III provides numerical examples illustrating the impact of different policies. The author concludes that governments will always be present in the market to help offset the impact of price fluctuations on the poor. Taxed or subsidized prices may help some segments of the poor. Policies that have positive effects on economic efficiency may have negative distributional consequences. The problem is to choose price manipulations with a minimum of unfavorable side effects and with a maximum of benefits.

142. Taylor, L., et al. FOOD SUBSIDY PROGRAMS: A SURVEY (draft). Report prepared for the Ford Foundation. Massachusetts Institute of Technology, Cambridge, Massachusetts, U.S.A., 1980. 121 pp. 75 references.

Food subsidy programs are reviewed from an economic perspective, and practical results of such programs throughout the world are described. The authors first discuss the economic theories relevant to food subsidy program analysis, in particular the macro- and micro-economics of food subsidies. Other economic factors that affect subsidy program design are identified as well. These include household food distribution, and criteria for commodity targeting. Practical experiences with food subsidy programs in both developed and developing countries are addressed, using for example the British food distribution scheme (of World War II), the American food stamp program, and similar programs in Mexico, Colombia, Egypt, Sri Lanka, Pakistan, and Bangladesh. In discussing their conclusions and the policy implications of the survey, the authors list 13 main findings, among them the following. For poor countries, food subsidy schemes may have macro-economic implications; they can represent a substantial proportion of fiscal outlay, while simultaneously stimulating demand for products that account for a large share of total economic activity. The administrative feasibility of a subsidy program depends largely on local economic and institutional conditions. When possible, subsidizing only a few commodities may be the best approach.

During inflationary periods, maintenance of the real value of subsidized commodities is important. The marginal propensity of households to consume food out of subsidy income may be rather low. The final version of this draft report is expected to contain a more extensive theoretical treatment of the economics of food subsidies (including a macro-economic analysis of the Indian economy) and a survey of empirical literature. The text is supported by tabular data.

143. Timmer, C. P. FOOD PRICES AND FOOD POLICY ANALYSIS IN LDCs. Food Policy, August 1980. pp. 188-199. 38 references.

An attempt is made to reconcile two opposing views on the role of food prices in the economic development of less developed countries. Structural analysis, on one hand, suggests that food prices are irrelevant to long-term development, while neoclassical theorists believe that food prices may actually be a critical factor. More specifically, structural analysts argue that food prices are irrelevant since both producers and consumers are essentially insensitive to price changes, thus allowing political leaders to manipulate food prices for the desired short-term political effect. The neoclassical view holds that food prices are a critical factor in farmers' decisions about which crops to grow and how intensively to grow them. The reconciliation of these two viewpoints is attempted through an examination of the role of prices in the production sector, where evidence for short- and long-term impacts is described as persuasive. The effects of price changes in the consumption sector and on income level and distribution are also addressed. Considerable attention is given to reviewing attempts to understand the differential impact of food prices in Indonesia. One figure and one table of numerical data are included.

144. World Food Council. United Nations. TOWARD THE ERADICATION OF HUNGER: FOOD-SUBSIDY AND DIRECT-DISTRIBUTION PROGRAMMES. Prepared for the Sixth Ministerial Session, Arusha, Tanzania, June 3-6, 1980. 9 pp. 10 footnotes including references.

The document summarizes the selective approaches by governments to provide their low-income people with food entitlements through subsidy, rationing, and direct-distribution programs. It provides a comparative evaluation of these different approaches and concludes that well-designed programs, carefully targeted to the needs of the hungry and malnourished, can contribute substantially to development objectives. Little attention has been given to date to stimulating food production through expansionist food consumption policies. The World Food Council proposes increased international support for the expansion of national food-entitlement programs in developing countries and proposes a new international food-entitlement scheme, with the objective of alleviating hunger of 100 million people in 1981-1983.

III. GUIDELINES AND TECHNIQUES FOR MEASURING AND ANALYZING IMPACTS

A. GUIDELINES

145. Agency for International Development, Bureau for Program and Policy Coordination. POLICY PAPER: NUTRITION. Washington, D.C., U.S.A., 1982. 12 pp. 11 references.

The policy paper reviews the justifications for U.S. investment in improving nutrition in developing countries and sets out policy guidelines for AID programs. The objective is to maximize the nutritional impact of AID's economic assistance. AID plans to implement its policy through identifying nutrition problems, designing programs to address nutrition problems in five sectors, targeting sectoral projects to individuals at nutritional risk, evaluating nutritional impacts, complementing sectoral programs with nutrition projects, utilizing the private sector, encouraging improved host-country policies, and coordinating with others to achieve nutrition goals. Incorporation of nutrition concerns into agricultural programs necessitates a balanced allocation of resources among short-term, production-oriented investment, long-term human resource development, and medium-term investment to ensure access to markets and factors of production for those households nutritionally at risk. Agricultural projects should anticipate changes in food consumption patterns and monitor nutritional status. Nutritional impacts of new labor requirements require focusing employment opportunities to high-risk groups and assuring that wages are commensurate with energy costs of the labor. Planners need to be aware of how various members of the household use their income; generally, a higher proportion of women's income will be spent on food.

146. Food and Agriculture Organization. MONITORING SYSTEMS FOR AGRICULTURAL AND RURAL DEVELOPMENT PROJECTS. FAO Economic and Social Development Paper 12En, Rome, Italy, 1981. 261 pp. 12 general references and several supplementary throughout.

National governments and international funding agencies feel strongly the need for continuous evaluation and close monitoring of agricultural and rural developmental projects. This volume attempts to fill the current gap in training materials on these functions by presenting the actual experiences of a number of FAO member countries. Monitoring the nutritional impact of rural projects receives particular attention. Nutrition reflects several aspects of basic needs; its value as a measure of success for rural projects designed to improve the standard of living is thus legitimate. Nutritional conditions are monitored by assessing the nutritional status of individuals, mainly children aged 1 to 5 years, and by measuring factors closely associated with socioeconomic and health conditions of population groups--namely, nutritional status, morbidity, mortality, sanitary environment, and wealth. A project's financial and manpower resources and its lifespan determine how often these data are collected. In a rural development project of long duration, a 1- to 2-year cycle may be adequate. In short-term projects and those expecting rapid results, more frequent assessments are indicated. Baseline data for the monitoring system generally evolve from an initial

assessment, followed by a small-scale nutrition/socioeconomic survey. The text is replete with tables, charts, forms, and figures.

147. Food and Agriculture Organization. INTEGRATING NUTRITION INTO AGRICULTURAL AND RURAL DEVELOPMENT PROJECTS: A MANUAL. Nutrition in Agriculture, No. I, Rome, Italy, 1982. 58 pp. 24 references.

This manual provides nutritionists and planners with a specific methodology for linking nutrition with the planning of agricultural and rural development projects. The nutrition investigation that is key to this process gathers substantive information on (1) the food and nutrition situations of population groups in the project area, particularly the most disadvantaged; (2) the relationships of such conditions to underlying demographic, socioeconomic, and environmental factors; and (3) the relationships of proposed (and later implemented) project inputs and activities to changes in food consumption and nutrition. Applying such knowledge during project planning and implementation allows nutrition equal coverage with other social, economic, ecological, and political objectives and considerations. Sample nutrition objectives presented include providing employment opportunities for the landless and seasonal employment for small farmers, developing local storage facilities to even out seasonal distribution, and increasing the purchasing power of small farmers, small fishermen, women, and other disadvantaged groups. The reader is referred to supplemental FAO publications on data collection and analysis. This text includes two annexes, two figures, and three checklists for use during the nutrition investigation.

148. Food and Agriculture Organization. INTRODUCING NUTRITION IN AGRICULTURAL AND RURAL DEVELOPMENT. COAG 81/6. Report for the Sixth Session of the Committee on Agriculture, Rome, Italy, 1980. 24 pp.

As recommended by the Committee on Agriculture at its Fifth Session, the Food and Agriculture Organization (FAO) has now finalized its guidelines and basic methodology for the introduction of nutritional considerations into the planning and implementation of rural and agricultural development projects. The guidelines and basic methodology have been applied in case studies carried out in six countries (Haiti, Kenya, Peru, the Philippines, Sri Lanka, and Zambia). This paper reports on these successful activities and puts forward suggestions for further actions in training, and in the application of the finalized guidelines to agricultural and rural development projects on a priority basis. It also describes plans for assisting Member Governments in the application of the guidelines and basic methodology to maximize the nutritional benefits of major agricultural and rural development projects and initiatives. The basic perspective of this paper is that the causes of malnutrition are closely linked to those of economic inequality, poverty, and socioeconomic dependency and, therefore, can be dealt with effectively in the framework of socioeconomic development programs and projects. Accordingly, FAO priorities reported here and proposed for the short and medium term, focus primarily on projects which are likely to yield the greatest lasting benefit to the most disadvantaged. In the past few decades a whole range of direct interventions to overcome malnutrition have been used. They have been shown to contribute to lasting improvements in nutrition only when undertaken

along with measures to attack some of the causes of malnutrition at their roots. Otherwise, when these interventions are implemented in isolation of socioeconomic development measures, they prove to be, at best, short-term palliatives.

149. Food and Agriculture Organization, Committee on Agriculture. NUTRITION IN AGRICULTURE. COAG 79/6, Rome, Italy, 1979. 18 pp. 8 references.

Since its first meeting in 1972, FAO's Committee on Agriculture has stressed the importance of governments' including nutrition considerations in plans for economic and social development. This report summarizes progress to date, especially through FAO programs, and offers guidelines for increasing the impact of agricultural projects on nutrition. The guidelines suggest a "first-stage analysis" must precede project planning to determine if nutrition considerations are relevant to a project and if positive effects on target groups' nutrition are likely to result (within 5 years of project start-up). The risk of negative effects on nontarget groups in the project area must be addressed as well. Accurate definition of the target group(s) subject to nutritional improvement is central to establishing the relevance of a project to nutrition. "Second-stage analysis" and substantial efforts to integrate nutrition into an agricultural development project are warranted only if this relevance has been determined. The report requests that FAO and member governments consider the guidelines presented and prepare definitive guidelines for introducing nutrition considerations into development programs. An annex to the report elaborates on the first-stage analysis process.

150. Foster, P. A FRAMEWORK FOR THE SIMPLIFIED ANALYSIS OF THE IMPACTS OF AGRICULTURAL POLICIES ON NUTRITIONAL STATUS. Agency for International Development, Washington, D.C., U.S.A., Revised 1978. 49 pp.

This paper is described as an outline to a "first approximation" approach for assessing the impacts of agricultural policies on the nutrition of the disadvantaged. A tabular listing of 43 food priority countries by region and the severity of their food problem is first presented. The remainder of the outline is an appendix of nine tables, each dealing with a generalized set of agricultural policies. A breakdown of population segments (rural landless, semi-subsistence farmer, urban poor, etc.), uniform for all tables, appears on the horizontal axis. The vertical axis lists variables hypothetically impacted. Variables include real income, food prices, infant mortality, and nutritional well-being. Following each table, certain reference coordinates are listed and matched by assertions concerning the significance of the policy impact on the variable for the appropriate population segment. The assertions are supported by a short declaration of the logic underlying the conclusions drawn.

151. Holmberg, J. GUIDELINES FOR THE INTRODUCTION OF NUTRITIONAL CONSIDERATIONS INTO DEVELOPMENT PROJECTS--A FIELD TEST APPLIED ON MONAP IN MOZAMBIQUE. Food and Agriculture Organization, Rome, Italy, Paper No. 3.6, 1980. 32 pp.

The purpose of the paper was to field test FAO guidelines for the introduction of nutritional considerations into development projects. The guidelines in the form of a questionnaire were applied to projects constituting the Mozambique-Nordic Agricultural Programme (MONAP). The long-range goal of the test was to develop a practical, easy-to-apply methodology for integrating nutrition into agricultural and rural development programs. The author describes the method of testing, the MONAP projects, and his analysis and findings. The author proposes a different questionnaire, applicable to the more modest projects which FAO usually supports. The author also suggests separate questionnaires for general development projects and for those projects directly influencing nutrition. Three annexes describe MONAP projects and the proposed questionnaire.

152. Hulse, J. H., and Pearson, O. E. HOW NUTRITION PRIORITIES CAN BE INTEGRATED INTO CROP IMPROVEMENT PROGRAMMES. Food and Nutrition Bulletin, Vol. 2, No. 1, 1980. pp. 7-10. 8 references.

A discussion of problems inherent in estimating both food availability and nutrient requirements is presented against the background of world hunger. Some of the factors considered are nutrient losses during processing and maldistribution of food among regions, and among and within families. Development and subsequent modifications of recommended dietary allowances as determined by such organizations as the Food and Agriculture Organization and the World Health Organization are reviewed. Controversies and current standards for protein and energy receive considerable attention, especially as affected by age, pregnancy, and other variables. To improve nutritional status in developing countries, the greatest attention has been focused on increasing total production of grains and legumes. Various means of accomplishing this goal are described. It is argued that efficient use of available land also implies attention to nutritive value of crops grown and "technological value" which includes attributes related to consumer acceptance such as milling and cooking characteristics. It is recommended that interdisciplinary research be conducted to assess the "social, economic, and nutritional impact of better cropping systems." Mixed cropping is suggested as a means to overcome nutritional deficiencies associated with regions which rely heavily on a single major staple such as cassava.

153. Intech, Inc. INTEGRATING NUTRITION PLANNING CONCERNS INTO AGRICULTURE AND HEALTH SECTOR ANALYSIS. Intech, Inc., Silver Spring, Maryland, U.S.A. 135 pp. 145 references.

Research into malnutrition and its causes in the developing world has shown that nutritional status is determined by a complex interaction involving food supply, income, health status, environmental conditions, education, and other factors. The main purpose of this study is to determine ways in which the analysis of agriculture and health sectors can be used to further nutrition planning objectives. After describing models and methods of analysis, the paper focuses on health issues, then agriculture. Nutritional status is described as a function

of the amount and quality of food ingested and the efficiency with which the body utilizes the food consumed. The quality and quantity of food consumed are determined by family income, family food habits, level of education, and availability of foods and their relative prices. The efficient utilization of foods depends mainly on the occurrence of infectious disease, a factor involving environmental sanitation, potable water, and preventive health services. A lengthy appendix describes the design of various models referenced in the text.

154. Kennedy, E. T., and Pinstrup-Andersen, P. NUTRITION-RELATED POLICIES AND PROGRAMS: PAST PERFORMANCE AND RESEARCH NEEDS. IFPRI Miscellaneous Report. International Food Policy Research Institute, Washington, D.C., U.S.A., 1983. 156 pp. 122 references.

The monograph identifies the knowledge gaps and research needs believed to be most critical in applying nutrition-related programs and policies. The authors propose research on four types of programs and policies: agriculture and rural development, food price policies, income and transfer programs, and integrated health and nutrition programs. The primary goal of the research effort is to improve the understanding of how key factors and relationships influence the performance of program components within various environments. The authors point out that research evaluating the nutritional effects of agricultural and rural development projects is limited to a few small-scale studies. Evidence is too scarce and fragmented to be useful in project or policy design. Food-for-work projects have assumed nutritional improvement, but data relate almost entirely to income effects. More information is needed on nutritional effects of different types of rations, household behavior toward the food rations, and their effect on child nutrition. Consumer-oriented price policies tend to benefit farmers with large marketable surpluses. The authors suggest a broad range of research topics, covering health, nutrition education, formulated foods, fortification, and food-linked income transfer programs.

155. Lunven, P., and Sabry, Z. I. NUTRITION AND RURAL DEVELOPMENT. Food and Nutrition, Vol. 7, 1981. pp. 13-21. 3 references.

The article summarizes the conceptual and methodological work carried out by an FAO team in a continuing effort to introduce nutritional considerations into the planning and executing of agricultural programs and projects. Responsibility for nutrition improvement falls on agricultural planning because both the rural and urban malnourished are affected by developments in agriculture. The authors describe the assessment of project potential for nutrition improvement, the constraints upon the introduction of nutrition considerations, experience in project assessment, and guidelines methodology. The methodology includes screening of projects to identify those with potential nutrition impact, desk review to assess relevance of projects to nutrition problems, site visits, and an initial or in-depth assessment of nutritional impact. The authors present case studies from Peru, Haiti, Kenya, Zambia, the Philippines, and Sri Lanka. They conclude that there is considerable scope for improving the nutritional impact of agricultural projects and that the guidelines strategy seems to be correct. A manual for field operations is in preparation and will be circulated for application and testing to FAO and other agencies concerned with food and nutrition problems.

156. Mason, J., et al. PRINCIPLES FOR EVALUATION OF ON-GOING PROGRAMS. Cornell Nutritional Surveillance Program, Working Paper No. 5, May 1982. 77 pp. 37 references.

The authors were asked to determine how to evaluate the effects of a program, at one point in time during implementation, under conditions where results are needed quickly and there are few baseline data and no control groups. The authors propose a hierarchy of fundamental questions to establish whether a nutritional intervention could affect the performance, health, and survival of individuals. They assert that evaluations of on-going programs should deemphasize the researcher's concern with causality and prediction and seek to provide information of interest to managers, administrators, and funders. They also point out that evaluation should proceed in a sequence of stages so that easier and cheaper answers are found first before embarking on more elaborate types of investigation which may prove to be either unnecessary or impossible.

157. Myint, K., and Foster, P. AID STRATEGY PAPER FOR ASIA: NUTRITION AND AGRICULTURE. Prepared for U.S. Department of Agriculture, Office of International Cooperation and Development, Nutrition Economics Group, and Agency for International Development, Washington, D.C., U.S.A., 1982. 85 pp. 20 references in footnotes.

This report addresses the issue of undernourishment in Asia: three of every four undernourished persons in the Third World are Asians and almost half of all Asians are undernourished. The authors see the first line of attack on this nutritional inadequacy as including: (1) improved employment opportunities for the poor to generate additional purchasing power; (2) increased production of appropriate food crops, particularly grains which are produced and consumed by the poor; and (3) decreased household food consumption requirements through better health and smaller families. Myint and Foster aim, in their paper, to (1) improve the nutrition impact of AID-supported programs; (2) minimize inconsistencies among the goals of AID policy regarding agriculture and nutrition; and (3) provide AID field staff with guidelines for translating nutrition-oriented strategies into programs and projects. Six specific strategies are discussed: (1) identify household types most likely to be at risk nutritionally; (2) increase their purchasing power through employment policies; (3) increase grain production and thereby decrease food prices; (4) promote better health and smaller families; (5) increase food production through backyard gardening and small-scale animal husbandry; (6) encourage growth monitoring to catch nutrition problems in preschoolers before they become acute. Women have a pivotal role in these strategies. Two appendixes and eight tables are included.

158. Okigbo, B. N. INTRODUCING NUTRITIONAL CONSIDERATIONS INTO RESEARCH AND TRAINING IN FARMING SYSTEMS. Paper presented at the Symposium on Introducing Nutritional Considerations into Agricultural and Rural Development, 7th Session of the ACC Sub-Committee on Nutrition, IFAD Headquarters, Rome, Italy, March 2, 1981. Document No. SCN 81/5h. 50 pp. 27 references.

Trends in food production and the overall food situation now and in the foreseeable future in most countries of tropical Africa are major causes of concern.

Large amounts of scarce foreign exchange are spent on food imports. The author reviews the prevailing farming systems and advances reasons for the continuing poor performance of the food production subsectors in sub-Saharan Africa. He notes that traditional farming systems are complex and usually exhibit some balance between subsistence and commercial elements of the system. But changes in farming systems based on cash crops have had some undesirable effects on nutritional well-being. The author reviews the interdisciplinary nature of food production and nutrition problems and highlights various avenues of introducing nutritional considerations into farming systems design and research. He suggests areas of training to enhance the inculcation of nutritional consciousness in relevant agricultural production and development activities. Five figures and five tables supplement the text.

159. Omawale. NUTRITION PROBLEM IDENTIFICATION AND DEVELOPMENT POLICY IMPLICATIONS. Ecology of Food and Nutrition, Vol. 9, 1980. pp. 113-121. 15 references.

The only effective means of achieving a self-sustained, lasting reduction in undernutrition is socioeconomic development. Nutrition planning efforts are therefore turning toward a search for the means of appropriately guiding development, and group-targeted programs are replacing general growth strategies. This article analyzes data from a multi-purpose household survey of Laguna province in the Philippines in 1974 to identify groups at nutritional risk. The analysis reveals that the prevalence of malnutrition among preschool children is generally related to the ratio of household income to the cost of calories, dictated by food prices and family consumption patterns. Nutrition in the households of small fishermen was most severely affected. Food-crop farmers tended to have a diet of cheaper calories than non-food-crop farmers, probably because they retained farm-produced cereal for household use. Households of livestock raisers and larger farmers showed the least nutritional risk. The author concludes that productivity-increasing interventions, such as credit and technology, would benefit households of food-crop farmers. Non-food-crop-producing families would need significantly higher incomes to avoid undernutrition. Two figures and five tables present relevant data.

160. Pinstrup-Andersen, P. INCORPORATING NUTRITIONAL GOALS INTO AGRICULTURAL SECTOR PLANNING. Proceedings of the XI International Congress of Nutrition, Rio de Janeiro, Brazil, August 27 - September 1, 1978. pp. 39-50. 4 footnotes including references.

This paper focuses on several important issues associated with the incorporation of nutritional goals into agricultural sector planning, as well as some problems and fallacies associated with such incorporation. The paper begins with a discussion of agricultural sector planning and the need to consider the effects of alternative strategies on both prices and incomes. An explicit statement of nutritional problems is essential but often absent, primarily due to lack of information. Planning must be based on effective market demand or purchasing power. Lack of purchasing power may be translated into effective market demand through transfer payments, food subsidies, or similar arrangements. Research and

technology may contribute to the achievement of nutritional goals through the production of larger quantities of food or through a change in the nutritional characteristics of commodities. In the short term, direct nutrition intervention programs are essential to improve the nutrition of the poor. In the long term, economic growth, increased food production, increased employment, and more equitable income distribution may eliminate serious malnutrition.

161. Pinstrup-Andersen, P. INCORPORATING NUTRITIONAL GOALS INTO THE DESIGN OF INTERNATIONAL AGRICULTURAL RESEARCH. Paper prepared for the meeting of the directors of the International Agricultural Research Centers, Washington, D.C., U.S.A., November 5, 1982. International Food Policy Research Institute, Washington, D.C., U.S.A., 1982. 34 pp. 60 references.

The paper focuses on identifying ways in which the nutritional impact of international agricultural research may be improved and summarizes current efforts by the international agricultural research centers to consider the nutritional effects of their work. The paper has four sections. The first presents an overview of linkages between agricultural research and human nutrition. The second discusses how the research community may incorporate nutritional concerns in its decisionmaking. The third summarizes current activities by the international agricultural research centers. The fourth proposes additional activities which the centers might wish to consider. The author concludes that the centers are already doing more than is generally believed to assure nutritional considerations are reflected in research planning, and he suggests nine additional activities to further improve the nutritional effects of agricultural research.

162. Rabeneck, S., and Stone, T. STRATEGIES FOR NUTRITION IN CIDA. Canadian International Development Agency, Ottawa, Canada, 1982. Mimeographed. 94 pp. 21 references.

This paper provides a detailed review of nutrition issues and linkages in developing countries; of nutrition interventions undertaken by governmental and nongovernmental agencies, multilateral organizations, and various research groups; and of practical considerations for nutrition in CIDA. Specific information is presented on supplementary feeding programs, nutrition education, fortification, formulated foods, food price subsidies, and the activities of UNICEF, AID, FAO, the World Bank, and Swedish SIDA. The authors acknowledge that although malnutrition in the Third World is closely linked with poverty and social injustice, aid agencies like CIDA can be effective not only with technical and material assistance, but also with help in designing development projects that explicitly address problems of malnutrition. Toward this end, Rabeneck and Stone consider CIDA sectoral guidelines and projects as they now exist, and propose nutrition-specific recommendations to intensify the group's focus on the problems of malnutrition. Five appendixes complete the package.

163. Sai, F. T. SYSTEMATIC CONSIDERATIONS OF HEALTH AND NUTRITION IN AGRICULTURAL AND RURAL DEVELOPMENT PROGRAMMES AND PROJECTS. United Nations ACC/SCN Symposium on Introducing Nutritional Considerations into Agricultural and Rural Development, 7th Session of the ACC/SCN, IFAD Headquarters, Rome, Italy, March 2, 1981. Document No. SCN 81/5b. 13 pp.

The paper attempts to present an approach to a systematic consideration of health and nutrition in development programs and projects aimed at the poor. The first step is to examine what effect a program will have on major demographic variables, such as population growth rate. Social and cultural structures, particularly those related to health, food, and nutrition, need to be considered. The division of work, for example, may affect the economic role of women and therefore affect the family's nutritional status. Income levels are of considerable importance to food intake. Any development program should be assessed from the point of view of its impact on cropping patterns, gathered foods, food production and consumption, and nutrition. Programs that change the type, quality, or quantity of foods available may adversely affect nutritional status unless care is taken to assure proper diets. Water, sanitation, and health services are intimately related to nutritional status. Nutritional impact assessments should include these areas, as well as the more specific measures of nutritional status.

164. Schwefel, D., et al. PRODUCCIÓN, EMPLEO Y CONSUMO RACIONAL: HACIA UNA CUANTIFICACION DE IMPLICACIONES NUTRICIONALES DE PROYECTOS DE INVERSION. Instituto Aléman de Desarrollo, Berlin, 1976. 134 pp.

This methodological essay analyzes the nutritional implications of investment projects. The study is based on two investment projects in Peru, for which nutritional effects were evaluated. The author points out the need for changing production planning to a consumption planning process. He considers the question: "Who gets the benefits from investment projects or programmes?" to be the key point for analyzing nutritional implications. An investment project can, in theory, contribute in two ways to improving nutritional conditions: by increasing production and its real consumption, and by generating incomes and purchasing power. In order to evaluate these effects, a description of current nutritional status has to be made and compared with a constructed "rational budget of foods." The study ends with some proposals for a system of information on nutrition.

165. Swaminathan, M. S. INTRODUCING NUTRITIONAL CONSIDERATIONS INTO AGRICULTURAL AND RURAL DEVELOPMENT. United Nations ACC/SCN Symposium on Introducing Nutritional Considerations into Agricultural and Rural Development, 7th Session of the ACC/SCN, IFAD Headquarters, Rome, Italy, March 2, 1981. Document No. SCN 81/5e. 23 pp.

The paper examines the current nutritional status of rural and urban poor around the globe, and the farming systems used in the tropics and subtropics. The author then discusses land-use boards, which he recommends for each specific agro-ecological area; postharvest technology; and components of rural development projects. He concludes that the need for an integrated approach to nutrition problems can hardly be overestimated. He recommends the design of action programs

at the field level which gain a momentum of their own through a process of self-replication. The starting point for such a "people's nutrition movement" would be the organization of multidisciplinary land and and water use planning groups in appropriate clusters of villages. He also recommends a national food security system for each country, with five components: ecological security, technological security, safe storage of grain reserves, social security, and nutrition education.

166. Valverde, V., et al. SOME NUTRITIONAL CRITERIA FOR AGRICULTURAL DIVERSIFICATION PROGRAMS IN THE HIGHLANDS OF GUATEMALA. Institute of Nutrition of Central America and Panama, Guatemala City, Guatemala. 17 references.

The authors first present background information on child nutrition, definitions and interpretations, studies on income and food consumption, and corn consumption and agricultural diversification activities in the highlands of Guatemala. The data included in the report consist of 60 dietary records from two subsistence communities; this information was gathered as part of a national evaluation program of fortified sugar, conducted in 1975. The authors present results of their study in eight tables and a discussion in the text. They found that in "poor" communities a sizable proportion of the families may have adequate diets, although half the families will have inadequate diets. In order to have an important impact on nutritional status, an agricultural diversification program in the highlands should have as primary objectives the increase of income for those families in the worst state of malnutrition, and the production of food with good nutritive value.

167. Venkitaramanan, S. INCORPORATING NUTRITION GOALS INTO NATIONAL INTERSECTORAL PLANNING--THE ISSUES. Paper presented at the XI International Congress of Nutrition, Rio de Janeiro, Brazil, August 27-September 1, 1978. 14 pp.

Economic planners have limited resources which must be allocated among a multitude of sectors, each with different objectives and priorities. The author discusses the communication gap between the economic planner and the nutrition advocate and offers guidelines for the presentation of convincing justification by nutritionists for the implementation of nutrition programs. The author points out that nutrition projects offer long-term benefits such as better schooling, increased work productivity, reduced hospitalization costs, and decreased child mortality that will likely lead to a lower birthrate. The planning process has to include specific nutrition efforts along with increase in incomes and greater equality of distribution as no evidence presently exists that economic growth means better nutrition. Nutritionists need to be sensitive to the concern that food subsidy programs may increase worker productivity and ultimately unemployment. The importance of understanding the many sectors of government which have a potential nutrition component is stressed, and nutritionists also need to increase the exactness of their methodologies and evaluation procedures.

B. MEASUREMENT AND ANALYTICAL TECHNIQUES

168. Acheson, K. J., et al. THE MEASUREMENT OF FOOD AND ENERGY INTAKE IN MAN--AN EVALUATION OF SOME TECHNIQUES. American Journal of Clinical Nutrition, Vol. 33, No. 5, 1980. pp. 1147-1154. 29 references.

How accurate are the techniques used to measure food and energy intake? How long should food intake be measured to determine "habitual intake"? Answers to these questions were sought during a study which utilized various techniques for measuring food and energy intake. Carried out as part of an energy balance survey, a dietary survey was conducted on 12 individuals on an Antarctic base for 6 to 12 months. Mean age of the 12 subjects was 24 years, mean weight over the year was 71.56 kg, and mean height was 179 cm. During the study period, the food intake of each subject was determined for an average of 1 week of each month. Three techniques (weighing and recording of all foods eaten, 24-hour dietary recall, and bomb calorimetry) were evaluated. Since the bomb calorimetry was found to have a reported accuracy within 1% it was regarded as the standard. Use of weighed food intakes and food composition tables was found to underestimate energy intake by 7% when compared to analysis of duplicate meals by bomb calorimetry. One week was found to be the most practical period over which intake should be measured to determine "habitual" food intake. The underestimation associated with a dietary recall was even greater, at times being as high as 33.6%. The mean 24-hour intake of 3,210 calories reported in this study is similar to the average male population and lower than those reported in other Arctic diets from studies in Russian, British, and American bases. Six tables are included.

169. Burk, M. C., and Pao, E. M. ANALYSIS OF FOOD CONSUMPTION SURVEY DATA FOR DEVELOPING COUNTRIES. Food and Agriculture Organization, Rome, Italy. FAO Food and Nutrition Paper No. 16, 1980. 139 pp. 62 references.

This manual, one in a series produced by FAO, focuses on the analysis of food consumption surveys. The aim of the manual is to contribute to planning, programming, implementation, and evaluation of programs for nutritional improvement among particular population groups at the national, regional, and project levels. Examples of ways to interrelate various kinds of data are included in order to show the uses and limitations of food survey data and analyses. The manual deals with eight major topics: analysis of important food and nutrition problems, data reduction and other preparation for analysis, variations in characteristics of survey participants and evaluation of samples, variations in measures of food consumption, comparison of household food data with other types of data, planning multivariate analyses of food consumption, measures of relationships and their interpretations and use, and analyses of food intake of individuals. The manual includes an extensive note on technical problems, three explanatory appendixes, six tables, and five figures.

170. Burk, M. C., and Pao, E. M. METHODOLOGY FOR LARGE-SCALE SURVEYS OF HOUSEHOLD AND INDIVIDUAL DIETS. Home Economics Research Report No. 40. U.S. Department of Agriculture, Washington, D.C., U.S.A., 1976. 88 pp. 129 references.

The U.S. Department of Agriculture is responsible for measuring and appraising trends and variations in U.S. food consumption. This report summarizes technical information relevant to planning large-scale surveys of food consumption by households and individuals. It includes six sections: (1) specifications of concepts of food consumption measured by several types of data, (2) brief descriptions of alternative procedures, (3) identification of several problems in evaluating alternative survey methods, (4) criteria to be used in evaluating alternative methods, (5) summary of research findings relevant to measuring household food consumption, and (6) summary of research findings relevant to measuring individual food intake. Tables and illustrations throughout the text present relevant data.

171. Casley, D. NOTES ON GUIDELINES FOR SMALL-SCALE NUTRITION INDICATOR SURVEYS. Prepared as a record of discussions held within ESN, Food and Agriculture Organization, Rome, Italy, January 8-9, 1980. 8 pp. Mimeographed. 6 references.

The notes give a few guidelines to assist in the detailed preparation of small-scale nutrition indicator surveys. The topics covered are indicators of population quality of life, food consumption surveys, sample design and sample size, questionnaire design, and data anlysis. The author states that most accurate data on food consumption come from very small case-study surveys. Many large, food consumption surveys produce sizable overestimates for substantial numbers of the households. Measurement of food consumption requires the use of short recall periods repeated several times within a cycle and across seasonal cycles. Quantities of food are estimated through in-depth questioning or by physical measurements. The author recommends that consumption surveys be conducted as part of a budget survey, and points out the danger of using estimations of calorie-income distribution to project change.

172. den Hartog, A. P., and van Staveren, W. A. FIELD GUIDE ON FOOD HABITS AND FOOD CONSUMPTION: A PRACTICAL INTRODUCTION TO SOCIAL SURVEYS ON FOOD AND NUTRITION IN THIRD WORLD COMMUNITIES. ICFSN Nutrition Paper No. 1, rev. ed. International Course in Food Science and Nutrition, Wageningen, Netherlands, 1979. 105 pp. 144 references.

This manual is intended to serve as a practical guide for field personnel involved in food and nutrition programs. The original guide has been expanded with two new chapters addressing ways to collect and analyze food consumption data and the use of food balance sheets, family budget surveys, household food consumption surveys, and techniques for individual dietary determination. This version also presents a systematic approach to the collection of data on food habits. Environmental considerations, the role of urbanization, and various beliefs and practices are outlined and reviewed. Sampling techniques, interviewing strategies, questions,

model questionnaires, and notes on tabulation and presentation of data are included. Sample forms and worksheets are provided throughout the text.

173. Eckroad, J. C. A METHODOLOGY FOR DIAGNOSING CAUSES OF MALNUTRITION AT THE COMMUNITY LEVEL: THE CALI APPROACH. Community Systems Foundation, Ann Arbor, Michigan, U.S.A., 1981. Funded by U.S. Agency for International Development. 117 pp.

This manual describes the diagnostic approach used to select and implement nutrition intervention strategies. The method utilizes a nutrient flow model. Community survey design is the most critical step in the diagnostic procedure. Communities should be defined and classified according to characteristics, then sampled for study. Initially, a survey of family composition should be made, particularly for the presence of preschoolers, in whom nutritional status of the community can then be most reliably assessed. Family food availability and consumption can be analyzed by the 24-hour dietary recall method. If food availability and intake are found insufficient, methods of production, transportation, storage, imports, exports, income, and marketing must all be considered. For data analysis, a small inexpensive computer is recommended. Analysis should proceed sequentially, determining first if there is a problem of malnutrition, then its extent, characteristics, and possible contributing factors. Detailed explanations of these steps, as implemented in Cali, are found in 13 appendixes. Four tables and 17 figures also accompany the text.

174. Habicht, J. P., and Butz, W. P. MEASUREMENT OF HEALTH AND NUTRITION EFFECTS OF LARGE-SCALE NUTRITION INTERVENTION PROJECTS. In: Klein, R. E., et al., eds. Evaluating the Impact of Nutrition and Health Programs. Plenum Press, New York, New York, U.S.A., 1979, pp. 133-170. 42 references.

Health and nutrition professionals increasingly prefer large-scale integrated intervention programs to simple interventions which often fail to produce measurable and important changes in health and nutrition indicators. Complex interactions characterize biological, social, economic, and agricultural systems of poor populations; these interactions result in nutrition and health impacts. This article discusses the issues involved in evaluating interventions with multiple treatments. The greater the number of factors purposefully changed, the more difficult it is generally to estimate the separate effect of changes in each factor on chosen indicator variables. The authors conclude that indicators must be sensitive to the particular intervention and be specific for that intervention. Knowledge about sensitivity must come from single-purpose intervention studies, which can help researchers validate indicators used in integrated intervention studies and develop other more useful indicators. The article includes three figures and six tables.

175. Hageboeck, M. MANAGER'S GUIDE TO DATA COLLECTION. Bureau for Program and Policy Coordination, Agency for International Development, Washington, D.C., U.S.A., 1979. 91 pp. 96 references.

The guide is designed for the project manager and is concerned almost exclusively with project information. The objectives are to improve the manager's ability to undertake data-gathering efforts in developing nations, and to provide governments with a basis for planning and monitoring studies that yield informatin in a timely manner at reasonable cost. The guide is written for nonspecialists and its treatment of data collection is basic. Part I focuses on the manager's role in data collection efforts: how to determine what information is needed to make decisions and how to manage field studies. Part II is concerned with strategic choices that must be made in designing a field data collection effort. Part III addresses specific techniques and procedures for selecting study units and determining the best way to secure data. The bibliography is divided into four topics for easy reference.

176. Hay, R. W. THE STATISTICS OF HUNGER. Food Policy, November 1978, pp. 243-255. 34 references.

Commonly used statistics for estimating or projecting food production, market supply and demand, nutritional requirements, and food consumption are critically reviewed, leading to the assertion that a more demanding form of analysis is necessary. Such statistics are commonly used because of availability and ease of use; they are generally per capita indices which assume equal access to food resources. The first part of the article demonstrates the general inadequacy of these conventional statistics for the assessment of household food supply and for forecasting future trends in the prevalence of malnutrition. The second part discusses an alternative method of determining food availability, utilizing an analytical approach that relies on conventional data categories and collection techniques, but is focused on the household. The technique described has three components: household classification according to food acquisition mode, data aggregation within these classes to produce a food supply distribution estimate, and an analysis of food flows within and among household classes taking exports and imports into account. A food accounting matrix for summarizing food commodity flows within and between food supply systems is also described. Five figures are included.

177. Jonsson, U., et al. VILLAGE FOOD AND NUTRITION PLANNING IN TANZANIA. Food and Nutrition Bulletin, Vol. 3, No. 4, 1981. pp. 12-20. 26 references.

Hunger and malnutrition in Tanzania are most often caused by insufficient intake of food and infectious diseases. In recent years the government has developed a national food and nutrition policy consonant with socialist ideology. Nutrition planning activities at the village level are the subject of this paper. The authors first describe the policy of Ujamaa and self-reliance, outlined in the Arusha Declaratin of 1957. Then they discuss the five levels of the planning and decisionmaking process and the area of food and nutrition policy. The Tanzanian government developed a community-oriented, village-level planning strategy and worked out a village food production model. The model contains a four-step

process: (1) estimate of village food needs, (2) crop pattern, (3) energy and protein returns expected per hectare, and (4) food production plan. The authors conclude that Tanzania has developed a unique institutional structure for a more efficient mobilization of local resources--human, material, and technical. Although the system is far from perfect, it has created a forum for direct dialogue between villages and the government.

178. Martorell, R. NUTRITION AND HEALTH STATUS INDICATORS: SUGGESTIONS FOR SURVEYS OF THE STANDARD OF LIVING IN DEVELOPING COUNTRIES. Living Standards Measurement Study Working Paper No. 13. The World Bank, Washington, D.C., U.S.A., 1982. 97 pp. 84 references.

This report reviews the type of indicators of nutrition and health status that would be appropriate for household surveys of the standard of living in developing countries. It focuses on data collection at the family and individual level with only brief attention to community variables of health and nutrition. The report begins with a description of the objectives of data collection and constraints on indicators of nutrition and health status. The author then presents health and nutrition as measures of the standard of living. He discusses diet, effects of infection on nutritional status, and outcomes of a poor nutritional status. The areas of study include anthropometry, birthweight, clinical examinations, measures of food and nutrient intake, breastfeeding, biochemistry, illness, and community information. The report concludes with specific recommendations, comments on gaps in research and methodology, and possible uses of health and nutrition data. Thirteen tables and 12 figures appear throughout the text.

179. Mason, J. B. MINIMUM DATA NEEDS FOR ASSESSING THE NUTRITIONAL EFFECTS OF AGRICULTURAL AND RURAL DEVELOPMENT PROJECTS. Paper prepared for FAO and ACC-SCN Working Group on Nutrition in Agriculture and Rural Development. Cornell Nutritional Surveillance Program, Cornell University, Ithaca, New York, U.S.A., October 1982. 68 pp. 50 references.

The paper makes recommendations on "minimum" methods that would have wide application in assessing the nutritional effects of agricultural and rural development projects, mainly in the planning stage. The author outlines the important decisions, relative to nutrition, on project design. He then specifies the questions that need to be answered to provide information for these decisions. Minimum data required, possible sources of data, and appropriate analysis methods for field work are evaluated. The underlying theory is that the major effect of rural development projects on nutrition comes through the income generated for malnourished households. The planning decisions include targeting toward the malnourished, design of activities, and decisions on indirect effects and tradeoffs. Policy decisions are based on the evaluation of nutritional effects. An appendix assesses the nutritional effects of changes in food supply. Two figures graphically illustrate points in the text, and 13 tables present relevant data.

180. Myint, K., et al. AN APPROACH TO THE BASELINE SURVEY INDONESIA SECONDARY FOOD CROPS DEVELOPMENT PROJECT. Prepared for U.S. Department of Agriculture, Office of International Cooperation and Development, Nutrition Economics Group, and Agency for International Development, Washington, D.C., U.S.A., 1982. 49 pp.

This report proposes an approach to the baseline survey to be conducted for a secondary food crops development project in Indonesia. The survey is intended to provide basic information for benchmark purposes, both quantitative and qualitative bases for project analysis, and the basis for evaluating changes in the indicators of the project's impact. The survey instruments record the current state of these indicators: (1) demographic data (age, sex, general health, family planning practices); (2) economic data (land ownership, crop yields and income, nonfarm income, spending patterns); (3) resource base and institutional support (tools, draft animals, farm machinery, storage facilities, institutions like cooperatives and extension services); (4) social data (literacy, educational level attained, perceived need for changing cropping system or crop production technology); and (5) nutrition data (child weight/height watch, measures of arm circumference and triceps skinfold, supplemental feeding). The monitoring and ongoing evaluation exercise typically proceeds from the baseline survey and ultimately results in conclusions for future policies, programs, and projects. The article includes four annexes, three tables, and one figure.

181. Norton, R., and Salcedo, D. NUTRITIONAL RELATIONSHIPS IN FARM MODELS. Estudio de los efectos de politicas de desarrollo agricola para el consumo de alimentos de la poblacion Centroamericana, Document No. 28/82, Secretaria Permanente del Tratado General de Integracion Economica Centroamericana, Tegucigalpa, Honduras, 1982. 27 pp. 12 references.

The purpose of the paper is to present a class of optimizing farm models which may be used to evaluate the nutritional consequences of production policies, and to illustrate the application of such models with data from southern Honduras. The paper develops the basic theory of the models, presents a simple linear programming version of the farm model, explains and analyzes aspects of the model, and presents an expanded version of the model to illustrate its applicability to policy questions. The authors draw two tentative conclusions from the Honduras sample. First, increase in the wage price or land and credit availability had a stronger effect on rural welfare than increases in rural wages. Second, land increases give rise to the greatest increments in nutrition for families at low-income levels. An appendix provides supplementary mathematical calculations.

182. Pekkarinen, M. METHODOLOGY IN THE COLLECTION OF FOOD CONSUMPTION DATA. World Review of Nutrition and Dietetics, Vol. 12, 1970. pp. 145-171. 43 references.

The collection of food consumption data is an essential part of nutritional, medical, and economic surveys. The information obtained forms a base for evaluating national nutritional status, planning proper educational programs, and formulating agricultural and nutritional policies. Both public institutions and private

enterprises can benefit from the availability of food consumption data. The author examines six methods of collecting food consumption data. He explains the factors affecting the choice of method, the survey unit, and the accuracy of each method. He concludes that no one method is superior to the others, but that each method has specific strong points. For example, the weighing method produces accurate data on food intake for a small sample. The interview method allows coverage of a large population group selected at random, but is less suitable for determining food intake of individuals. The six methods analyzed are food balance sheets, food accounts, weighing method, interview method, questionnaires, and food samples for chemical analysis.

183. Pinstrup-Andersen, P. AN ANALYTICAL FRAMEWORK FOR ASSESSING THE NUTRITION EFFECTS OF POLICIES AND PROGRAMS. Paper prepared for the Rockefeller Foundation Workshop on Strengthening National Food Policy Capabilities, Bellagio, Italy, November 1-4, 1982. International Food Policy Research Institute, Washington, D.C., U.S.A., 1982. 27 pp. 10 references.

The paper proposes an analytical framework for acquiring information on the potential or actual impact of various efforts to alleviate malnutrition. The information is particularly important as a means of selecting and designing the most appropriate nutrition intervention programs and influencing the selection and design of other programs not specifically aimed at nutritional improvements but having significant nutritional impact. The scope of this paper is limited to a discussion of how analyses may best be approached in order to provide useful information. It presents no empirical analysis and makes no suggestions regarding the appropriateness of particular programs and policies. The first section of the paper deals with the current state of affairs. The remainder is devoted to aspects of the proposed framework: entry points for influencing nutrition, selected nutrition and health programs, various actors within the process, household behavior, local political power structures, and nutrition indicators.

184. Pinstrup-Andersen, P. DECISION-MAKING ON FOOD AND AGRICULTURAL RESEARCH POLICY: THE DISTRIBUTION OF BENEFITS FROM NEW AGRICULTURAL TECHNOLOGY AMONG CONSUMER INCOME STRATA. Agricultural Administration, 4, 1977. pp. 13-28. 15 references.

Past research on the distribution of benefits of new agricultural technology has paid little attention to distribution among consumer income groups. The author uses sample data from Cali, Colombia, to illustrate his method for estimating the distribution of benefits from expanding the supply of food commodities among urban income groups. The author's primary objective is to suggest how economic analysis can provide the decisionmaker with useful information for relating agricultural research and policy to equity goals. In the text the author discusses data requirements, pesents empirical data in seven tables and figures, and discusses how such results can assist in establishing commodity priorities. In a six-page appendix the author explains his methodology, using mathematical formulas and figures.

185. Pinstrup-Andersen, P. METHODS FOR ESTIMATING THE NUTRITIONAL IMPLICATIONS OF AGRARIAN POLICIES IN COSTA RICA. (Text in Spanish) Report for the Program of Nutrition of the Office of Information, San Jose, Costa Rica, March 1979. Mimeographed. 52 pp. 33 references.

The purpose of the study is to explain and suggest a strategy and some practical methods for using current information to estimate the nutritional consequences of agrarian policies and other economic factors in Costa Rica. First, the most common types of agrarian policies and a framework for their relationships to nutrition are presented. Then the relationships and variables of major interest, available and needed data, and possible future activities are identified. The study concludes that nutritional consequences of almost all agrarian policies come from changes in one or more significant variables: demand, food prices, revenues. The study recommends that the System of Nutrition Information (SNI) give priority to gathering data and analysis with respect to the impact of each variable on family nutrition. It also recommends that SIN promote collaborative studies with other groups and that SIN promote the incorporation of nutritional criteria in future studies of agrarian policies, plans, and programs. The report presents 11 specific recommendations within this general framework.

186. Pinstrup-Andersen, P. NUTRITIONAL CONSEQUENCES OF AGRICULTURAL PROJECTS: CONCEPTUAL RELATIONSHIPS AND ASSESSMENT APPROACHES. Staff Working Paper No. 456. The World Bank, Washington, D.C., U.S.A., 1981. 93 pp. 150 references.

This paper provides a survey of past and ongoing activities aimed at including nutritional considerations in development projects and policies. Explicit consideration of nutritional goals as part of the identification, design, and assessment of rural development projects offers great potential for reducing energy-protein deficiencies. However, no effective and acceptable approach is currently available for incorporation into project assessment on a routine basis. The author suggests one approach, the caloric consumption indicators. It assesses the nutritional effects of development projects in terms of the total change in calorie consumption by malnourished households; intrafamily distribution is not treated. The author discusses several other project assessment approaches: project-specific information, non-project-specific data, analysis of cost-effectiveness of nutrition related elements, and analysis of the social-demand function to determine the degree to which basic needs are met. The author identifies the major gaps in methodology and empirical knowledge and puts forward a set of recommendations.

187. Poleman, T. T. QUANTIFYING THE NUTRITION SITUATION IN DEVELOPING COUNTRIES. Cornell Agricultural Economics Staff Paper No. 79-33. Cornell University, Ithaca, New York, U.S.A., 1979. 122 pp. 60 references.

Previous attempts to quantify nutrition problems in developing countries are critiqued, and alternative approaches to this objective are outlined. The limitations of earlier methodologies employed to quantify food availability and requirements are first identified, followed by a review of several major nutrition studies (such as those by the U.N. Food and Agriculture Organization and the

World Bank). The author suggests that these reports have placed undue emphasis on the effects of income on nutritional status, given the inherent complexity of this association. Alternatively, it is suggested that attempts to quantify nutritional status incorporate a behavioral component in which the perceptions of the local population, as to whether they are adequately fed, are taken into account. This would allow analysis of nutritional situations, while avoiding past problems such as inaccurate measurement of actual food intakes, inexact assessment of national food availability, and problematic use of arbitrary minimum nutritional requirements. A preliminary analysis of field survey data (collected from Sri Lanka, Bangladesh, Indonesia, and Brazil) using this alternative approach is presented. The impacts of malnourishment and possible approaches to alleviating the problem are also discussed. Twenty-seven charts, 11 tables, and 2 figures are included.

188. Rao, K. V. EFFICIENCY OF ANTHROPOMETRIC INDICES FOR THE DIAGNOSIS OF MALNUTRITION. Courrier, Vol. 30, No. 2, 1980. pp. 113-121. 31 references. Summary in French.

The studies described were carried out by the National Institute of Nutrition, Hyderabad, India, to determine the best set of anthropometric measurements required to accurately diagnose malnutrition, particularly protein-energy malnutrition (PEM). Data on anthropometric indices and clinical deficiency signs associated with mild to severe degrees of malnutrition were collected from large-scale cross-sectional and longitudinal studies on rural and urban Hyderabad preschool children. The accuracy of various approaches to diagnosing PEM was determined by employing several multivariate statistical techniques. Height and weight were found to be adequate to assess growth and development, and the following criteria were, in decreasing order, the best combination of anthropometric measurements to discern nutritional status of children: height and weight/height^2; height and weight/ height; height and calf circumference; and height and arm circumference. Five tables and four figures are included.

189. Rose, C. METHODOLOGY TO QUANTIFY THE IMPACT OF DEVELOPMENT PLANNING ON NUTRITION. Working Document for ESN Programme 1978/79, Paper 3.2. Food and Agriculture Organization, Rome, Italy, 1979. 46 pp.

The purpose of the document is to develop a methodology to quantify the impact of development planning on nutrition. The nutritionist must deal with specific groups most likely to be at nutritional risk under specific development plans. The first section of the paper examines the conceptual framework of this study. The main idea is that to bring about desirable change, it is equally important to be able to assess the impact of development planning on nutrition and the impact of nutrition on development planning. The next section explores the methodology which is likely to be appropriate where little real data exist. Under such circumstances, it is essential to take full advantage of the structure of the situation. The final section discusses four specific procedures: additionally constraining the development plan, impact vector method, explicit investigation of interrelationships, and micro-resource allocation. The author concludes that these procedures need to be tested and modified in the field. Illustrations and mathematical computations appear throughout the text.

190. Schofield, S. DEVELOPMENT AND THE PROBLEMS OF VILLAGE NUTRITION. Institute of Development Studies, Sussex; Croom Helm Ltd., London, England, 1979. 174 pp. 234 references.

This book describes a micro-level approach to nutrition problems, aimed at the village, which is defined as the smallest administrative unit in which a "whole range of factors affecting nutrition are displayed, and individual, community and regional problems can be diagnosed." This micro-level approach is based on the Village Studies Programme (VSP) at the Institute of Development Studies (IDS) which involves "the identification of villages by type of diet." This is followed by a discussion of the nature and type of micro-level data available around the world, garnered from VSP's efforts in collecting 360 nutrition-oriented survey reports which cover 900 villages; in addition, another 82 general village surveys which provide useful information on nutritional status are examined. Of the village surveys, 30% were from India, 25% from Africa, 22% from Latin America, 11% from Asia (excluding India), and 6% from Oceania and the Middle East. Using the data bank of surveys, the author classifies and discusses the frequency of the various methodologies used. The surveys are then used to produce a typology of village diets through a determination of inter-village differences based on the type of food staple consumed, the village economy, food consumption data, village location, and accessibility. Intra-family and inter-family disparities, as well as those factors which determine at-risk groups, are examined. Women's time constraints, percentage of income spent on food, and seasonality are among the specific causative variables discussed. Among the numerous findings of this section are that households with different incomes may require different types of interventions. Finally, the information gleaned from this analysis of more than 900 villages is used to make recommendations on the implementation of nutrition programs at the micro-level. The social, political, cultural, and economic structures, which prohibit a successful intervention, are outlined. The village typologies generated by the micro-level approach will be an asset to planners and evaluators trying to tailor programs to local needs and conditions. Numerous tables, and two appendixes which present information on studies of seasonality in selected villages and the calculation of calorie requirements for hypothetical villages, are included. Also included is a subject index.

191. Scrimshaw, N. S., and Lockwood, R. INTERPRETATION OF DATA ON HUMAN FOOD AVAILABILITY AND NUTRIENT CONSUMPTION. Food and Nutrition Bulletin, Vol. 2, No. 1, 1980. pp. 29-34.

The first task of agriculture should be to supply a sufficient quantity and quality of food to meet energy and protein needs of the local population. A major problem lies in determining national needs for food energy and protein from available data. The usual means of estimating needs is a comparison of per capita requirements, but it tells nothing about food actually received by the lowest socioeconomic group. The authors examine the significance of calorie intake data, significance of protein intake data, the protein-calorie ratio, and nutritional requirements. The nutritional requirements for various populations in developing countries under different tropical environments are unknown. Meeting a requirement applicable to healthy individuals in a temperate climate does not assure adequate nutrition for populations of the developing world, because of such factors as parasitic infection, malabsorption, and fevers associated with infectious diseases.

192. Singh, I., and Squire, L. A MODEL OF THE AGRICULTURAL HOUSEHOLD: SOME IMPLICATONS FOR NUTRITIONAL POLICIES IN RURAL AREAS. Prepared for discussion at the Conference on The Economics of Nutrition-Oriented Food Policies and Programs, Bellagio, Italy, August 24-28, 1977. World Bank, Washington, D.C., U.S.A. 46 pp. 22 references.

The purpose of this paper is to evaluate the implications of new developments in the theory of the "farm household" for nutrition and nutrition-oriented policies in the rural sector. Some of the main issues that such a model could focus on are discussed, and a theoretical model developed for farm households practicing monoculture is described. The model's implications for household consumption and hence nutrition decisions are also addressed. Results from the estimation of this model for Malaysian data and their implications for nutrition policies are drawn; and finally, an extension of this model to a multi-crop environment is presented. The authors suggest that the theory of the farm-household is of considerable importance when examining the likely impact of exogenous changes in input and output prices, prices of nonfarm goods and technology, and hence of nutritional policies in rural areas designed to impact through these instruments. Seven tables are included.

193. Timmer, C. P., and Alderman, H. ESTIMATING CONSUMPTION PARAMETERS FOR FOOD POLICY ANALYSIS. Paper presented at the American Agricultural Economics Association Summer Meeting, Pullman, Washington, U.S.A. July 1979. 12 pp.

The swing in the price for a commodity (such as a specific food) from the point where lowering the price will not generate greater demand, to the point where increasing the price will shift demand to another commodity, is at the heart of the econometric food policy analysis reported in this paper. Actually intended for use by theoretical economists, the study introduces the variable of aggregated income elasticity to the price elasticity described above in constructing a complex matrix for use in a consumption model. If certain restrictive assumptions are made, cross-section analysis can be employed to determine income-class-specific income elasticities; but projections are meaningless beyond the time and space parameters of cross-section consumption surveys. Gathering increased amounts of survey data (sampling more households) over longer time periods (several seasons) in a more extensive space frame would of course permit more significant statistical inference from computer outputs but at substantially increased cost. It is footnoted that in Indonesia, fresh cassava is consumed in about equal quantities per capita by all income groups. Rice, on the other hand, is consumed in greater quantities by higher income groups, with maize falling somewhere between cassava and rice. When applied to food policy formulation, such analysis shows that subsidizing cassava would be more equitable than subsidizing rice. For the poor, distribution of subsidized gaplek (dried cassava) would have its most beneficial effect on the lowest income group. Two tables are included.

194. United Nations University. World Hunger Programme. THE USES OF ENERGY AND PROTEIN REQUIREMENT ESTIMATES: REPORT OF A WORKSHOP. Food and Nutrition Bulletin, Vol. 3, No. 1, 1981. pp. 45-53.

The objective of the workshop was to identify and comment on issues arising from the application of requirements estimates for human energy and protein. This report presents a series of interrelated themes that developed during the meeting. There were irreconcilable divisions of opinion about the appropriate uses of nutrient requirement estimates, and about the methods by which such estimates should be related to population data. The report summarizes the planning framework, alternative policy indicators of nutritional impact, requirement estimates for energy and protein, definitions of subsistence energy need and recommended energy allowance, distributional considerations and problems of analysis, and research needs. The workshop emphasized one overriding message: to improve the planning process, nutritional knowledge must be moved from the laboratory and office to the actual community where the problems are located. The workshop also stressed the need for multi-disciplinary involvement in research and the need to study the effects of social change on food intake patterns.

195. Uzzell, J. D. TRAINING MODULE: RAPID NUTRITION RECONNAISSANCE. Training materials prepared for the U.S. Department of Agriculture, Office of International Cooperation and Development, Nutrition Economics Group, and the U.S. Agency for International Development, Washington, D.C., U.S.A., 1982. Mimeographed. 28 pp. 11 references.

The unit uses a series of seven activities to train managers in the use of rapid micro-surveys for assessing nutritional status and nutrition-related behavior among populations felt to be at nutritional risk. It suggests ways of sampling to permit maximum generalizability from the data obtained and gives a number of suggestions for carrying out the surveys themselves, including selection and training of field workers. Although the focus is on rural areas, most of the methods could be translated to urban areas as well. This kind of research has been shown to be effective when time and/or funding for large-scale surveys are lacking and when macro-economic studies are unable to pinpoint the exact distribution of malnutrition and the cultural-economic conditions which affect it.

196. Yetley, M. J., and Tun, S. HOUSEHOLD DEMAND ANALYSIS FOR ASSESSING NUTRITIONAL IMPACT OF DEVELOPMENT PROGRAMS. Staff Report AGES810806. International Economics Division, Economic Research Service, U.S. Department of Agriculture, Washington, D.C., U.S.A., 1981. 72 pp. 22 references.

The objectives of this study were to review consumer demand theory and demand elasticity methodology, develop analytical procedures, and present empirical results and implications. The procedure developed estimates a full matrix of demand elasticities for a developing economy using household survey data. The results, as applied to Sri Lanka, show that the estimates appear to be reasonable in magnitude and internally consistent. The demand elasticities can serve as a useful tool in policy decisions. They are used to investigate expected changes in per capita quantities of nutrients consumed as a result of alternative development programs. The report includes mathematical aspects of the methodology

used, references, and an appendix of selected numerical results and statistical coefficients.

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C. Linkages Index

Description of Linkages Between Agricultural Development and Nutrition

Agricultural development has impacts on or linkages with nutrition through several routes. This index employs one method of classifying these interactions in order to facilitate usage of this bibliography. These linkages are grouped into three major categories: agricultural production and income, the general food situation, and household conditions. In the area of production and income, these linkages are through (1) the level and/or type of employment; (2) amount of land available (e.g., land reform); (3) changes in yields; (4) production programs or policies in general; (5) the level and type of income and its variability; (6) the distribution of income or amount of poverty; (7) the level or growth rate of the population.

The general food situation has linkages to nutrition through (1) the availability of food; (2) prices of food; (3) the diversity of foods available; (4) the state of marketing and distribution of food (including government programs); (5) the amount of food from home production; (6) the season of the year.

The household conditions through which development programs affect nutrition are (1) women's role in the project, i.e., how does it affect their time allocation and monetary situation; (2) consumption preferences of the household and/or level of nutrition education; (3) the distribution of food within the household; (4) the household's reaction to prices of nonfood goods; (5) the size of the household; (6) the worker's energy requirements; (7) health conditions of the household.

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