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the state of the art

edited by Leonard Joy



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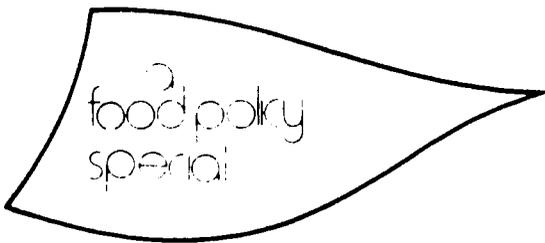
nutrition planning

the state of the art

Proceedings of meetings held at
the University of California,
Berkeley 1976-1977



edited by Leonard Joy
with the assistance of Christina Wood



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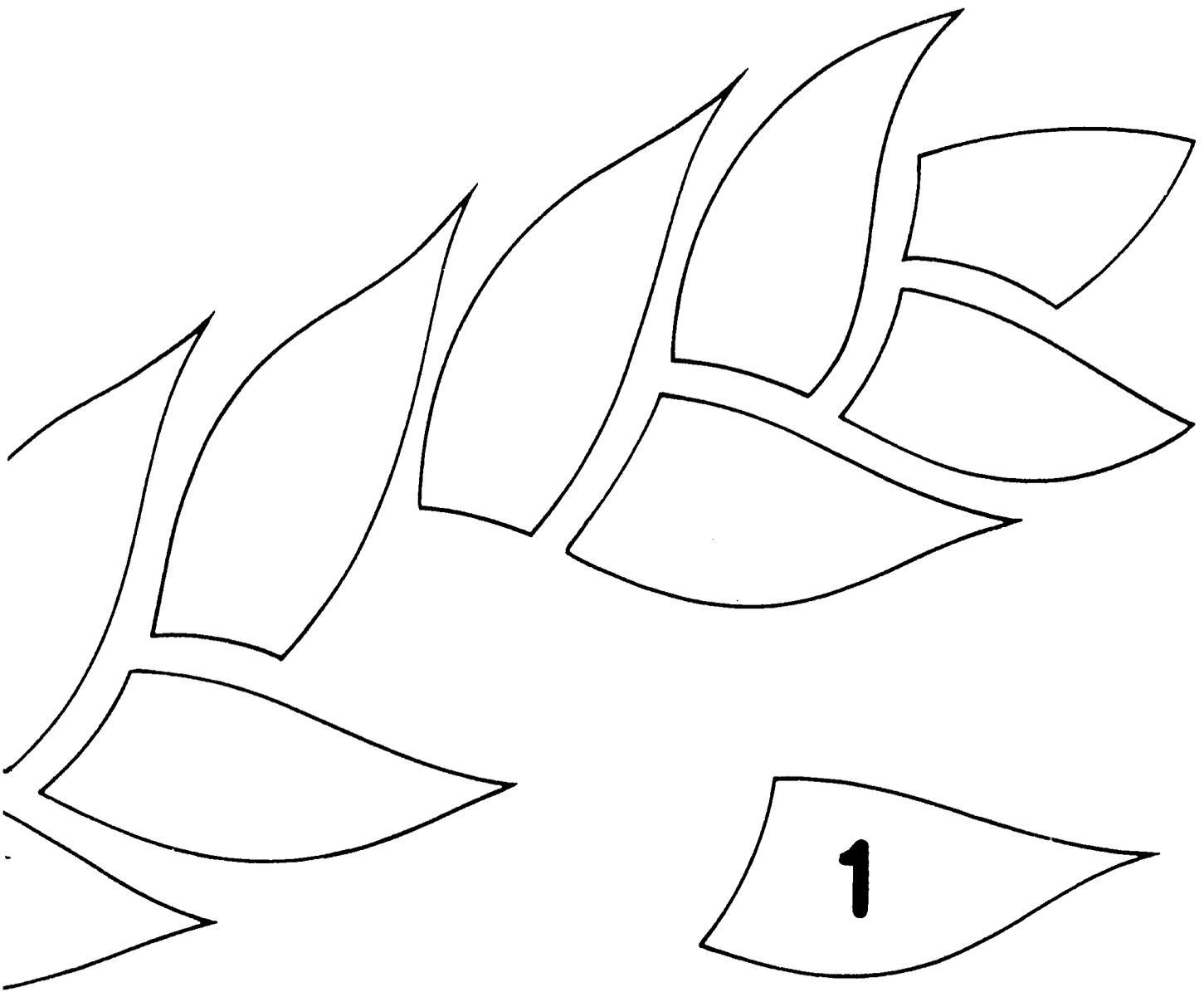
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Introduction and acknowledgment

These Proceedings are of two conferences. The first was a gathering of about forty people, selected for their expertise in their own field as it related to nutrition policy analysis. This was planned as a preparatory meeting for the second, much larger, conference held some six months later in March 1977. Initially, in discussions with the US Agency for International Development who sponsored these meetings, only one large conference was envisaged, but it was then agreed that a preliminary workshop would be helpful to survey 'the state of the art' with respect to food and nutrition planning and, possibly, to provide a point of departure for the larger conference.

But things did not quite work out that way. The Workshop produced an array of papers which seemed fairly to reflect 'the state of the art', but it became clear that there was as yet no consensus on the existence of any satisfactory approach to food and nutrition planning. Indeed, there was some likelihood that aspiring nutrition planners reviewing the workshop proceedings would find them confusing, unhelpful, and even, perhaps, conducive of skepticism that anything could be done, or that anyone knew what it was that should be done. Certainly, the workshop participants were chastened by their collective inability to give answers to these questions. Most felt that they had more to offer than they had been able to communicate and also more to learn from others who had partly failed to communicate to them. Everyone felt that the various contributions had not yet combined to form an integrated view.

If 'the state of the art' was still confused, would anything be gained by discussing it at a large conference? Should the idea of a large conference be dismissed? In the event, what was decided was that the large conference should go ahead, but with an unusual format: there would be only two plenary papers and the major activity would take place in small groups in which participants would discuss how to go about 'nutrition planning' in specific situations described and presented to them as well documented case studies. It was hoped that this would allow the participants to learn from each other and give them an opportunity to appraise both the nature of the problem and alternative approaches to it. How far this succeeded and what people felt they learned from this experience may be judged by the report of the retrospective thoughts of the participants given in these Proceedings ('The Symposium in Retrospect'). This volume does not, however, include the five case-study documents, or the presentations by the people from the areas concerned, which provided the basis for the group discussions. It includes

the papers and summary discussions of the September Workshop and the Plenary Papers and discussions of the April Symposium, together with the review of participants' post-Symposium reflections.

In presenting these Proceedings, the contribution of those who have provided this forum should be recognized. The major financial support for the Symposium and for the earlier Workshop was provided by the United States Agency for International Development, but they gave more than funds. Dr Martin Forman conceived the idea of a meeting and encouraged the Berkeley hosts to seek the widest international and bilateral support for it. He devoted a significant portion of a leave period at Berkeley to fostering this activity and the AID offices in Washington and missions around the world were instrumental in securing attendance of national representatives. UNICEF sponsored the attendance of many delegates from several countries. A number of other overseas delegates were supported by the British Overseas Development Ministry, the Swedish International Development Agency, the Community Systems Foundation, and the Asia Foundation. All the international agencies represented sponsored their own delegates, as did a number of universities, voluntary service agencies, major foundations and private firms. Much effort was given by country representatives to the preparation and presentation of exemplary case studies and special note should be made of these contributions by delegates from Honduras, Jamaica, Kenya, the Philippines and Sri Lanka. The Symposium would not have been possible without their gracious help.

Special recognition should be given to the chairmen of the study groups who performed a most critical and difficult role: Barton Burkhalter, Robert Chambers, Martin Forman, Leonard Joy, Michael Latham, James Levinson, Paul Lunven, Philip Payne, James Pines, George Poyner, Charles Slater, Robert Stickney, S. Venkitaramanan.

The Organizing Committee wishes especially to acknowledge the efforts of those who assisted in the management of the two meetings and the preparation of the report: Linda Ellinwood and Dale Ogar carried a particularly heavy burden, but important contributions were made by Cheryl Afflerbach, Jan Aleck, Marion Baer, Robin Beall, Eric Behrens, Nancy Butte, Linda Neuhauser, Josefina Pabalan, Suzanne Pettigrew, Frances Powers, Suzan Rainey, James Stewart, Gary Tannehill, Robert White, Christina Wood, Mary Yurko and Allison Zzulka.

These many contributions and the goodwill and concern that they reflect are recognized with gratitude.

The determinants of nutrition status

What economic planners need to know

Lance Taylor

Department of Economics, Massachusetts Institute of Technology, Cambridge, MA, USA

This paper* outlines research topics regarding income distribution, food consumption and nutrition which should be pursued to improve the basis of planning designed to raise nutrition status. It focuses on the problems amenable to policy intervention, which have some bearing on the welfare of poor people in poor countries, and which can be studied effectively by fairly small research teams with some specialization in economics.

Interrelating variables

Figure 1 shows in diagrammatic form 34 'causal' links among agricultural, food processing and nutritional variables. Many more arrows could be added to the diagram, but it is already clear that interactions among these variables are elaborate and complex. Of course, many arrows have been followed up extensively over the years (eg the quantification of Engel's Law gives a good understanding of arrow number 21 linking income flows and household consumption patterns), but others are virtually untouched.

In an amplification of Figure 1, Figure 2 outlines relationships among nutritional status and other socio-economic variables. While the central part of the first diagram contains linkages traditionally studied by economists, those in Figure 2 are usually investigated by other disciplines -- public health, nutrition, anthropology and psychology, especially. There is room for interdisciplinary research along the lines of Figure 2.

*Originally prepared for another purpose under the title 'Research topics in income distribution and the economics of food', the paper was offered at the Workshop to illustrate the presentation which follows it. It is included as a paper in its own right and to make the reported Workshop paper fully comprehensible.

The general structure of the two diagrams is discussed in the remainder of this section with prominent clusters of arrows pointed out. In succeeding sections, possible research topics focusing on each cluster are analyzed in more detail.

Beginning at the left of Figure 1, arrows 1-11 deal with the rural/agricultural sector of the economy. First, a number of factors influence production patterns of crops which may be taken to include both animal and vegetable products. Among these factors are government crop price and acquisition policies (including officially imposed restrictions on the cropping pattern, forced sales, etc); rural investment programs, rural credit, input pricing policies (eg fertilizer and water subsidies); the general technical level of agriculture, and rural socio-political environment (eg power relationships in the countryside); and rural wealth and income distributions.

The distinction drawn by arrows 10 and 11 between crops entering the market and those processed at home is important with regard to both nutrition and income distribution. On the nutrition side, marketed and non-marketed crops are processed into foods in different ways, and the foods in turn are consumed by different groups in the population. Policies aimed at increasing marketed surplus, either through technical change or price manipulation, typically affect the income distribution in ways which benefit the larger and richer farmers more than small landholders or landless laborers. Finally, crop production, wealth distribution and, more generally, power relationships within the countryside and with the city determine rural income flows.¹ On the right side of the diagram, income is a major determinant of food consumption and nutritional status.

Before continuing, it should be noted that causal arrows numbers 1-11 traditionally fall into the domain

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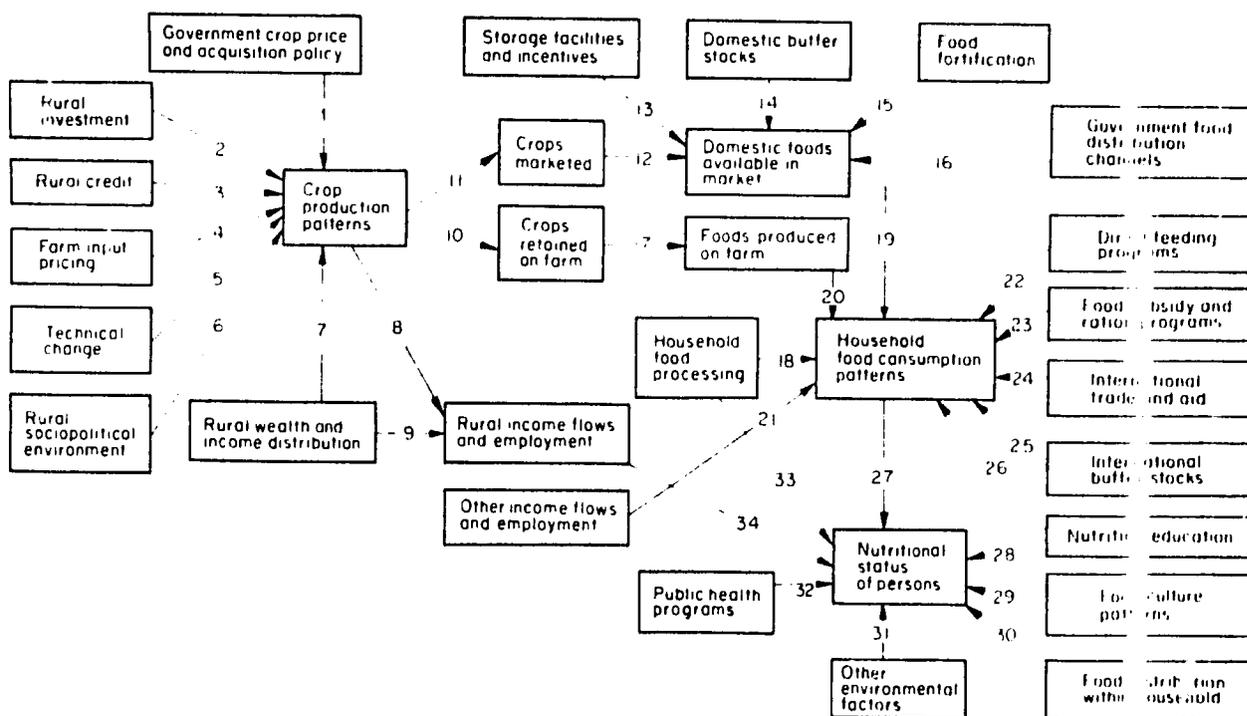


Figure 1. Linkages among agricultural, food processing and nutritional variables.

of agricultural economics or rural sociology, and have been investigated extensively in many countries. However, other variables not in the agricultural scientist's bailiwick intervene between 'crops', 'foods' and 'nutritional status', and the whole package has not been adequately studied. For example, there is very little in the literature about linkages between the mode of production in agriculture and the distribution of food consumption within the family (arrows 21 and 34). Peasant, and especially plantation, agricultural techniques in poor countries are often built around large inputs of human labor; in other words, they require high calorie expenditure on the part of the workers. When total calories are limited by poverty, such technology automatically creates great risk of destructive competition for food within the family between workers and non-workers. Infant, female and child malnutrition is a natural consequence of this particular micro mode of production.²

Distribution channels

After crops leave the field, they go through processing, transportation and market or non-market distribution channels before they are consumed. Non-market channels include storage and subsequent use of crops as foods in the household, barter and culturally dictated food redistributions between households (the potlatch in its pre-White discovery form is an example of the last mentioned activity).

Traditional processing techniques and a host of cultural patterns influence final nutritional status, as shown by arrows 10, 17, 18, 20, and 27-30. In a poor country, a very large share of total food use takes place outside the market: for example, in Pakistan, the marketed surplus of grain may amount to a third or less of total production. The utilization of non-commercialized food is clearly influenced by economic variables (the acquisition price and/or policy package for the staple crop is a

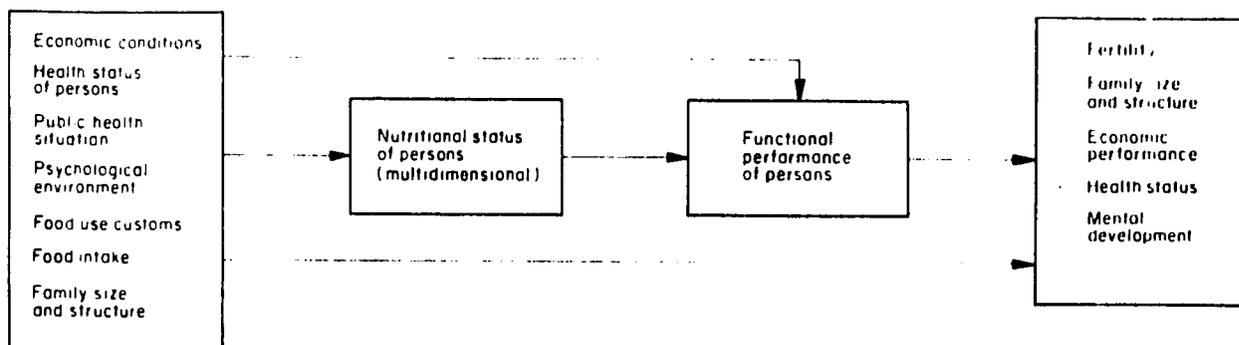


Figure 2. Relationships among nutritional status and other variables.

clear example), but cultural practices and known processing techniques are at least equally important influences. Economic anthropological research into non-market food channels could have policy payoff in such areas as design of 'nutrition education' (read 'food culture modification') programs and introduction of new storage and food processing technologies at the household level.

Market food channels, at least for crops produced within the country, are charted by arrows 11-16. As a country becomes richer, food shifts from non-market to market channels, and the value added along the latter increases until farmgate prices make up a very low share of food costs, as in Europe and the USA.³

The government can modify this apparently inevitable process in several ways: for example, by maintenance of food stock (storage of grains and the provision of refrigeration and slaughterhouses for animal products are two common instances); food fortification programs, which in effect put new products on the market; and provision of its own distribution channels such as government-subsidized supermarkets or ration shops in urban areas. Also, in a mixed economy, private initiatives in processing and packaging can be expected (eg sale of canned baby foods, expansion of frozen food products, more elaborate packaging). For good or ill, such entrepreneurial innovations can be influenced by tax and subsidy policy.

Food consumption patterns

After food reaches the household, its use there is influenced by another set of variables, as shown by arrows 19-26. Once again, the government can modify food intake by programs attempting to distribute food directly to members of some target group within the population ('direct feeding programs'), and food subsidy or ration schemes; outside agencies enter through international trade, and international buffer stocks. More generally, the trade strategy of a country may largely determine its food consumption patterns. For example, Egypt exports cotton and may increasingly export vegetable and fruit products to pay for cereal imports. Should it continue with this strategy, or shift towards autarchy and use its limited land for cereal self-sufficiency? Nutrition is not the least important factor which should influence such a decision.

Finally, food consumption and 'nutritional status' of individuals are linked by another set of factors, including the food cultural patterns mentioned previously, public health activities, the overall health status of the population, other environmental factors and accepted rules about food distribution within the family. Some of these interactions appear in more detail in Figure 2, showing the ecology of nutritional status.

Malnutrition and environment

To interpret Figure 2, it is useful to view malnutrition as a type of disease, and ask how it fits into the overall environment of a society. To the left of the diagram, there are factors influencing the incidence of malnutrition,

ranging from the economic condition of the population down through customs governing breast-feeding and cooking practices. If someone is actually malnourished, then there are additional problems in detecting and measuring the characteristics and gravity of the 'disease' (for example, is the malnutrition moderate or severe, is it protein-calorie malnutrition or lack of specific nutrients, what clinical and biochemical signs exist, etc)

Continuing to the right in the diagram, next one must question whether or not being malnourished affects a person's functional role in his society. The answer will again depend on specific conditions. Iron deficiency anemia may be economically dysfunctional for workers in some environments,⁴ but not in others where different factors are limiting productivity. For example, the widespread tropical disease schistosomiasis may cause negligible productivity losses in the environments where it is endemic.⁵ Similarly, the common assertion that infant protein-calorie malnutrition leads to mental retardation has to be analyzed in terms of some model of mental development in a given environment, à la Piaget or otherwise.⁶ Finally, improved nutrition may widen or narrow birth intervals, depending on the circumstances.⁷

To summarize, the presence of conditions conducive to malnutrition of some sort does not assure that a given person suffers from the 'disease'; the degree and nature of the disease can differ greatly in different individuals suffering from it; having the disease may not be dysfunctional in a given environment; and the extent of dysfunctionality depends on a host of other factors. There are ample research bones to chew on in this set of interactions.

If any general conclusion is to be drawn from the two figures, it is that the generation of malnutrition within a society is an extremely complex socioeconomic process, which is far from completely understood. At the same time, demagogues and food faddists, statesmen and allegedly disinterested scientists often seize on one or another of the many links in Figure 1, and trumpet it as 'The Cause' of malnutrition and its associated ills.

Single-minded concentration on just one relationship in the whole ecology of malnutrition is an error, and a pernicious one. A millenium might ease the lot of all the poor in poor countries, but any single remedy within human hands -- whether a new Green Revolution or a radical income distribution -- will not. In so far as researchers can make any contribution towards solution of the hunger problem, they must take into account at least part of its whole web of causation.

Macroeconomic research topics

There have been very few attempts to investigate food production, distribution and consumption as a system. The macro food system is summarized by arrows 1-21 of Figure 1, and comprises the agricultural sector treated as an aggregate producer of crops and associated income flows, food processing and distribution channels, and food consumption behavior of easily manageable group-

The determinants of nutrition status

ings of households. So defined, the food system does not encompass the interrelationships among food intake, other variables and nutritional status shown in Figure 2: for normative purposes, a convenient status indicator is food consumption at the household level.

Aggregate flows of crops and foods are usually analyzed with food balance sheets. These can be interpreted as demand-supply balances for a number of food products, and are usually used rather unimaginatively to point out possible inconsistencies between crop production and food consumption levels in the future. That is, independent projections of both sides of the demand-supply equation are made: if the projections are not close, appropriate warnings are sounded. Evidently this crude methodology can be extended, perhaps by a fairly small group. Some possible research topics are listed below.

Improvement and coordination of data

For example food balance sheets are usually estimated from agricultural production statistics together with foreign trade data and a set of more or less arbitrary guesses about use of grains for seed and feed, storage losses, and so on. Consumption (or 'disappearance') is the residual item. Yet in many countries, especially in Asia, independent estimates are available for food consumption and possibly other uses of crops.

Production and consumption data sets are often inconsistent conceptually and contradictory in their implications, but if both exist they do provide two views of flows along the food system: by most people's standards two views are better than one. If the two types of data can be integrated into an overall set of demand-supply balances, so much the better. Although it sounds like pedestrian research, the development of good statistical descriptions of the food system in several countries would be an extremely useful exercise. It would open the way to nutrition planning activities of the type to be discussed shortly, and would also help in an overall assessment of the magnitude of the world food problem. Existing calculations of international nutrition deficits (a recent, representative one is by Reutlinger and Selowsky⁸) suffer from both inadequate country data on food availability and use, and from inadequate definition of what nutritional standards really are (or should be). The latter problem, as argued below, may be insoluble. But better data gathering and analysis is always possible and useful.

Baseline demand-supply balances

With these balances, a number of other essentially macro problems can be tackled. For example, what would be the impact of shifts in any of the variables at the ends of arrows 1-7, 13-16, or 20-26 on 'nutritional status', at least as measured by household consumption levels disaggregated by income level, region, etc, in some policy-relevant way? To answer this sort of question, one would first have to know probable responses of the crop mix and production levels to changes in the variables of interest. Changes in cropping practices would in turn shift rural income levels and distribution, and the mar-

keted surplus. There would presumably be policy-affected responses in food processing and distribution, and households would change their consumption baskets in response to price and income movements.

Since several markets and groups of economic factors are involved in the food system, it is hard to develop a good intuitive feel for its characteristics on the basis of qualitative information. Some quantification of system-wide response to price and policy changes is required. The natural way to put together a model of the food system is through looking at markets—first setting up partial equilibrium models of rich rice farmer or poor urban consumer reactions to prices, incomes and other variables, and then putting the partial models into a multimarket system based on demand-supply balances like those suggested above. This approach has proven useful in economics since before Marshall: all that is proposed here is extension of the traditional demand-supply cross to several related markets, using the computer instead of hand manipulation in the algebra of elasticities to isolate the important responses and potential areas for policy intervention.

If the oft-touted but seldom accomplished systems studies in nutrition planning ever materialize, they will have to take the form outlined here—an analysis of input-output balances for crops and foods, with due regard to how economic factors are likely to respond to available policy sticks and carrots. Some academics are already doing such research.⁹

Response characteristics

With regard to demand-supply balances, more is known about some response characteristics than others. For example, programming models, econometric studies and good intuition go at least some way towards indicating how wheat production might respond to changes in the farmgate price, fertilizer prices or water availability. Less is known about determinants of the marketed surplus of cereal crops, and knowledge about production and use of nutritionally important legumes is virtually nil. Similarly, processing of food in market channels has been little studied by agricultural economists, and industrial economists in developing countries often ignore food manufacturing as a 'traditional' or 'non-dynamic' sector. Since much food distribution takes place in the 'unorganized' sector, even the rare economist specialized in tertiary activities does not know much about it. Finally, in so far as food processing within the home falls into economic analysis, it is left to the distaff side in home economics departments, and largely ignored. Food consumption, on the other hand, has been studied extensively since the time of Engel, and a good deal is known about response patterns there.¹⁰ Some obvious gaps in empirical knowledge have to be filled before the whole food balance sheet can be studied in Marshallian terms, but beginnings can easily be made.

Government policies

Extensions of the above approach to take account of such government policies as direct feeding programs,

domestic buffer stocks and international trade policy are in principle straightforward. Some of these policies affect demand-supply balances directly. For example, a single crop, such as wheat, would enter on the supply side of balances for non-marketed and marketed foods like home-produced chapatti and bakery bread. These foods would in turn flow to various consumer groups in quantities determined by their income levels and socioeconomic characteristics. Wheat imports or releases from a government wheat stocking agency would affect this set of interrelated demand-supply balances by increasing supply at the root end of a tree of diverging flows of wheat and its products. A direct feeding program might operate at the end of one of the branches. Price policies and nutrition education would affect levels of flows along some of the distribution channels.

One can set up many conceptual models of this type, and even ascertain cost-effectiveness of different possible interventions aimed at the same general target, but careful specification of how markets operate is necessary before sensible conclusions can be drawn. For example, if food donations from international agencies go into normal market channels in poor countries they may, as T.W. Schultz pointed out,¹¹ reduce domestic prices, producer incentives, and the overall level of food availability. On the other hand, if the donated food goes through special channels to poor people, all these unfavorable effects may be evaded while nutrition levels (or at least food consumption levels) improve. As summarized by Isenman and Singer,¹² this specific food aid issue has been debated extensively over the years, and not resolved. The debate illustrates both potentialities and limitations of Marshallian methods.

Keynesian approach

So far in this section, macro interactions have been interpreted as occurring along demand-supply balance equations involving producers and consumers in large groups, responding to prices, incomes and government policy variables of one kind or another. Macroeconomics can also be interpreted in Keynesian terms with data organized into consumption functions, statements of government revenue sources, fiscal expenditure patterns, and so on. Not surprisingly, food looms large in the macroeconomics of many countries. The staple cereal may be a major import, or else it may compete with an export crop for available agricultural resources. Food subsidies may be a major component of government expenditure, and agriculture may generate a good share of tax revenues. Under these circumstances, modifications in food policy variables may have substantial effects on the level of macroeconomic activity, even in advanced countries (eg cereal exports in the USA). The posing of this type of question indicates how it should be answered.

Marxist approach

Finally, there are macro issues which are neither Marshallian nor Keynesian, but which can perhaps be discussed in terms of Marx. The role of the means of production,

power and class structure in determining the behavior of the agricultural sector, industry, and even consumption patterns is clear enough, and is not captured by orthodox economic analysis. The possibility of radical shifts in the socioeconomic structure of the food system is real in many countries, and conscious thought beforehand about the probable impacts of major changes in the institutional set-up of agriculture and industry may minimize grief and ease the transition to socialism (or another new system) thereafter.

Micro issues

From food consumption to nutritional status

So far we have measured 'nutritional status' on the input side - how much food are people actually consuming? As we have already seen in connection with Figure 2, this approach is misleading. There are many complex linkages between what a person eats and his/her functional socioeconomic role. A few are discussed here.

Setting nutritional standards. This is a vexing exercise. In the past, levels of recommended food intakes have been dictated by the doctors' main notion about social functionality - a person should eat well enough to avoid becoming recognizably sick. In practice, this criterion reduces to setting calorie requirements high enough to support 'normal' growth and development in average children and energy use in average adults; protein requirements high enough to keep 99% of the population from having net nitrogen losses over the long term (at least theoretically); vitamin requirements several multiples of the levels which seem to preclude overt deficiency disease in most of the population, and so on. These rather purist standards sidestep all issues of scaling the severity of malnutrition in a given environment - how great is the social, economic or even personal loss if individual *A* is somewhat malnourished during season *X* in region *Y* of country *Z*? Answering a question like this requires value judgments and technical competence in a wide (and expensive) range of fields.

Even if one ignores the political issues, a thorough analysis of a sociocultural system is something an economist cannot do; nor are biomedical assessments of nutritional debility within a social scientist's skills or research funding. Any serious rescaling of nutritional standards in socioeconomic terms relevant to poor countries will be a long and combative process,¹³ and it is not clear that a small research group should put many eggs in such a basket.

Monitoring nutritional status. For immediate policy purposes, another set of questions becomes relevant: how is the nutritional status of important groups within the population monitored on a continuous basis to check whether there is improvement in the medium term, or incipient deterioration from currently achieved levels due to short-term problems? Two difficulties arise here. First, policy makers have to know how to measure the nutritional status of the population at a point in time:

The determinants of nutrition status

we have just noted some of the conceptual pitfalls to which this apparently simple activity can lead.

Second, even if a set of standards is agreed upon, there must be some base level to which they can be compared, in order to measure change. On the measurement issue itself, some sort of rough and ready agreement regarding techniques and standards is perhaps possible. Furthermore, there are methods for detecting protein-calorie malnutrition and some nutrient deficiencies which can be used in the field in poor countries (anthropometric measurements are usually feasible, and biomedical techniques based on very small blood samples may soon prove so). Establishing accurate reference data about the extent and severity of malnutrition in policy-relevant groups of the population is an information gathering activity similar to those already discussed. Not much is known beyond anecdotal evidence about either the macro food system or the micro details of nutritional status in most of the less developed countries.

Impact assessment. Related to the issue of setting standards is the assessment of the impacts of malnutrition on economic productivity, fertility, resistance to infection, and mental development – and *vice versa*. For better or worse, all these fields have long been staked out by investigators from several disciplines. Some brief observations may illustrate the controversies.

Some nutritionists and economists claim that better infant nutrition is likely to reduce mortality and lead to reductions in birth rates as more children survive. On the other hand, if infants survive longer they are likely to be at least partially breast-fed, which may reduce fertility. How are these two effects distinguished? Add to them other nutritionists' claims that better nutrition for mothers will increase fertility and perhaps the birth-weight and the ability of their children to thrive, and the interactions between food flows into the nuclear family and its reproductive capability become still more complex. Keeping up to date with all these claims and counterclaims is time-consuming in itself; falsifying them on the basis of existing data is virtually impossible. It is an intriguing mare's nest, but one should recognize its nature before jumping in.

Similar complexity characterizes the debate about malnutrition and mental performance, with its obvious similarities to the recent race-IQ-equality of opportunity controversy in the USA. Again, getting up to date with research is a sizable task, and Washington, DC is not an ideal location for an established investigator who wants to do work in the field. It may be a good location for someone who has the appropriate qualifications to sit down and draw policy conclusions from the work already done. The main problem is that a single individual with well honed psychological, nutritional, statistical and policy making expertise may be impossible to find.

Effective studies of relationships between nutrition and infection or economic productivity can only be done in the field, preferably by mixed teams of economists and medical people. However, there is a clear risk

that even field studies may be so artificial as to be useless for policy purposes.

Mother-child relationships. Over the years, medically trained nutritionists have built up a large body of knowledge (and prejudice) in this area. Much emphasis has been placed on the importance of breast-feeding, as a means both to maintain nutrition levels among infants and possibly to delay additional conceptions. There have also been large-scale longitudinal studies of interactions among nutrition, infection, public health, fertility and other variables at selected village locations in various corners of the world (eg the Khanna and Narangwal studies in India, the INCAP three-village study in Guatemala, etc). Finally, there has been practical experience in attempting to influence nutrition and health status among mothers and infants in mothercraft centers, maternal and child health centers, and similar agencies throughout the world.

One can fairly say that the microeconomics of none of these activities has been seriously investigated. There are hints about the economic importance of breast-feeding,¹⁴ but they are mostly impressionistic. Some PhD theses have been done at the fringes of the large medical projects,¹⁵ but they suffer from the usual drawbacks of that genre. And the existing studies of mothercraft centers have been done by medical people,¹⁶ and could be improved.

Synergy of intervention activities. Along similar lines, an issue which bears investigation is whether or not intervention packages are synergistic in the sense that if one does do sanitation, public health, mothercraft, etc, all together, then the sum of nutritional and other benefits is greater than it would be in response to separate interventions applied to separate parts of the population. Some minds revel at the prospect of such externalities or big pushes; others (especially those of neoclassically trained economists) doubt that they ever exist. Before many more large package program demonstration projects are commissioned by the foundations, a critical assessment of the synergism of defunct ones might be in order.

Food and culture. Finally, one can study relationships among food customs and the structure of cultures anthropologically à la Julian Steward and followers.¹⁷ This approach attempts to encompass all of Figure 2 in one model of a society, and makes a good deal of methodological sense. Unfortunately, it is more easily applied in the context of a static, primitive culture than in changing circumstances in an underdeveloped country attempting to modernize.

Nonetheless, such ecological investigations probably hold keys to the understanding of how nutrition fits into socioeconomic systems, and can avoid the errors of omission which arise when analytical investigators focus on one link in a complex pattern (as is amply illustrated by the juvenile quality of debates about malnutrition v

fertility, morbidity or mental development). As long as a good researcher is available, he can do such synthetic studies almost single-handedly.

Food consumption behavior

Beating a graceful retreat from the complex linkages between food intake and nutritional status, however measured, I turn to issues more amenable to economists and marketing experts. Below, some data gaps which might usefully be filled are summarized, and then conceptual problems are discussed.

Vulnerable groups. As hinted above, the most important conclusion from past debates about nutritional status is that certain groups are likely to be especially vulnerable to food deprivation – infants, small children and pregnant and lactating mothers are the target populations usually cited. If a planner wanted to avoid the worst long-term effects of malnutrition, he would direct food distribution programs preferentially towards children and expectant or recent mothers.

The major problem for planning is that extremely little is known about distribution of food and nutrition within the family. Consumer budget surveys typically collect data at the household level; partial information from nutritionists about breast-feeding and weaning practices does not take into account the full complexity of food allocation practices among all family members. Comprehensive studies of food use within the family (based either on recall procedures or from putting an observer in the household) would be extremely useful, both scientifically and in the design of programs for intervention. Gathering and analyzing such data are difficult tasks, but probably feasible in underdeveloped countries with good statistical services.

Income distribution and employment. Economists emphasize the importance of income and prices in determining consumer behavior; other social scientists stress sociocultural conditioning variables, and in addition there are always advertising and education. One can always counsel more research, but yet another standard household expenditure survey in a country where two or three have already been done will not add much to our knowledge of consumer responses to possible policy interventions.

More helpful would be delineation of the linkages at the top part of Figure 1 for well defined groups within the economy. Retrospective studies might be of interest (eg the effects on employment and income distribution of the Green Revolution have been well documented in some areas – what were the probable linkage effects to nutrition with in the affected populations?).

Looking towards the future, it is now becoming customary to try to say something about the income distribution impacts of investment projects, rural development schemes or small farmer strategies in general. The usual research focuses on relationships between farm size and productivity, new technological options,

employment and income distribution, and so on. A natural extension would be to trace probable shifts in income distribution and employment through to possible shifts in consumption patterns, food intake and nutritional status.

Measuring impact of policies aiming to shift food consumption patterns. The problem of trying to measure the benefits of such policies (eg the interventions at the ends of arrows 15, 16 and 22-26 in Figure 1) has been tackled in some studies with traditional benefit-cost techniques,¹⁸ but their results are not completely convincing for two reasons. First, the accepted benefit-cost methodology becomes bogged down in endless discussion of welfare weights and other intangibles when it is applied to public expenditure programs focused on income distribution. A simpler set of tools to cut through the theoretical rococo is needed. Second, when dealing with nutritional issues, one really has to ask how far the distribution of food intake across the population goes towards satisfying the distribution of nutrient requirements needed to support some standard of well-being.

Both of these distributions can presumably be shifted by policy (eg food distribution programs for the requirements distribution). The question is, how does one find a simple benefit measure, sensitive to income distribution, which can measure the impacts of policies aimed at shifting one or both distributions? One approach might be to choose policies which lead to a high level of consumers' surplus under the food demand curve while insuring that, say, every person but one in a hundred receives enough food to be at or above his 'safe' nutrient requirement level. The theory of such benefit-cost assessment has not been worked out fully, although there are some tantalizing suggestions.¹⁹

Lessons from the past. Finally, with or without newly sharpened benefit-cost tools, one can learn something from failed attempts to alter food consumption patterns in the past. There are already useful reviews of the history of protein-supplemented foods for children,²⁰ fish-protein concentrates,²¹ and the Chilean milk distribution program.²² Food fortification schemes of one kind and another beg for similar treatment, as do the few nutrition education programs that have been more than a gleam in some physician's eye. Such studies require a lot of legwork and in economists' terms are not particularly glamorous (although a political scientist might think differently).

Food processing, distribution and agriculture

In the above section on macroeconomic research topics there is some discussion about gaps in our knowledge of food processing and distribution practices in underdeveloped countries. As pointed out there, most development economists understand very little about the food industry, and one suspects that advanced country marketing experts who occasionally show up in poor country capitals as advisers on advertising and nutrition

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education know even less about the subject. For this reason, a good deal of methodical gathering of facts and a feel for local institutions is necessary before generalization is possible. Some areas of interest are discussed below.

Food subsidy or ration systems in LDCs. The announced goals of these programs vary — helping the poor, stabilizing food prices, improving nutrition levels, and so on — but their general orientation is always towards altering the existing market to improve the food supply situation. Non-market schemes have also been attempted, frequently by international agencies such as CARE or the World Food Program, which aim their donations at vulnerable groups through school lunch and similar programs. Field studies of where these food subsidy programs have succeeded and where they have failed, and the reasons why, would be useful at this time. As already mentioned, this sort of research could be extended to high-protein foods, food fortification schemes and other panaceas of the past.

Efficiency issues in processing and distribution. Such issues also appeal to economists. For example, just how extensive are food storage losses in poor countries? Is their reduction only a matter of new technology, or are economic incentives rigged against effective storage procedures? Would domestic buffer stock schemes in fact complement existing private storage, or would they lead to its extinction? All along the food chain one can ask similar questions — what are incentives towards production of high extraction flour? Highly polished rice?

Agricultural linkages. Moving towards the agricultural sector at the left of Figure 1, it is clear that it affects nutrition levels through three main linkages:

- Production of crops which are in turn marketed and pass through commercial food processing chains to consumers.
- Production of crops for use at home, with their own processing and storage technologies.
- Generation of income and employment flows, which directly affect the pattern and level of household consumption.

As indicated before, the first of these can be studied using traditional partial equilibrium economics, and one can expect knowledge to accumulate gradually about this particular set of markets, as it has about others. The household food production to consumption linkage is less well understood.

Finally, I have already discussed the need for looking at distributional impacts of agricultural production patterns, and tracing them through to nutritional status. At our present stage of knowledge about income distribution in rural areas, a many-pronged attack on the problem is probably desirable, with the prongs ranging at least from

the neoclassicism of Cline²³ through eclecticism²⁴ to neo-Ricardian and neo-Marxian formulations.²⁵

One natural line of research would be the development of multisectoral income distribution models parallel to the multimarket analyses of the food system suggested above. Some prototype models of this type exist (most of them supported by the Development Research Center of the World Bank), and their elaboration to deal with the details of the macro food system would be feasible. However, it should be recognized that little enough is known about rural income distribution to make almost all roads to understanding it equally good.

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Presentation by Lance Taylor

Nutrition planning has been widely discussed in the past five, or even ten years, but so far there have been very few pilot operations. The work by Joy and Payne at the Food and Agriculture Organization (FAO) represents an interesting stab at methodology, but it would be an exaggeration to say that there is nutrition planning at a national level in any country. Nutrition planning units exist in several places, such as Pakistan, Sri Lanka, Brazil and Colombia, but just how active and successful they are remains to be seen.

The basic question is why has the development of nutrition planning been so slow? The answer may be partially found in Figure 1 of the above paper. The arrows depict potentially causal links among variables that influence nutritional status and many of these links are simply not well understood. This is not true of the linkages involved in other fields where there actually is some sort of planning. In this context, planning refers to rational thought applied to some reasonably well defined problem to generate proposals for policy interventions which have some chance of being implemented, tested and evaluated in an underdeveloped country. Nutrition planning differs in a number of dimensions from the sort of planning that has actually been applied overseas.

Defining variables

There are several criteria which define plannable variables. One criterion is the scope or dimension of the system. It must be small enough for policy tools to be manageable, for outputs to be quantifiable, and for responses of the system to be normal. It is also essential that responses be quantifiable and data easily obtainable.

If these criteria are applied to various examples, it becomes clear why nutrition planning is still in its infancy. Consider balance of payments, for example, a topic that occupies a fair proportion of the competent manpower of many planning offices. Balance of payments is a fairly small dimensional system: there are a few exports, a few imports and a few policy tools, such as devaluations and tariffs. The outputs are rapidly quantifiable, available in simple terms, and the infrastructure already exists within the government mechanism to gather quickly the kind of data needed for analysis of balance of payments. There is a certain amount of theory concerning balance of payments which permits one to guess at the elasticities, if nothing else.

Another example is agricultural product planning, which is more complicated in that it is multidimensional. Differing responses from all the farmers in a country must be tackled. The simplicity of the balance of payments is lost. Policy tools are manageable in the sense that procurement prices and sale prices of fertilizer, etc, can be set. The output and crop yields are quantifiable, again because the infrastructure exists. As for response

characteristics, some theories predict farmer responses in the aggregate and can be used to attempt quantification of response characteristics, but there is considerable disagreement about the extent of this practice.

A third example is river basin planning in the hydrological sense. The system is relatively small-dimensional (dam-building, irrigation). Policy tools are expensive, certainly, but the technology is well known and there are no great breakthroughs to be expected. The output can be easily quantified, and the responses of the river basins and the different sorts of initiatives are at least partially known in theory.

Now consider nutrition planning. Is it small-dimensional? Evidently not. As Joy and Payne rightly pointed out, it deals with fairly complicated disaggregated structures of people who are receiving food. It is a major undertaking just to ask about their nutritional status - to consider how to do the aggregation and to determine how to set up the problem. Are policy tools easily manageable? This depends on the kinds of tools, but at least some are easily manageable. For example, the existence of fair price shops on the subcontinent is a policy tool which can be manipulated. Are outputs easy to quantify? This is a serious problem which is discussed in the above paper and it depends on what the output of a nutritional system ought to be, from the planners' point of view. If they agreed that the output should be, for example, the prevalence of protein-calorie malnutrition or infant mortality, then the output would be fairly easy to obtain on a one-shot basis. But on a continuing, long-term basis, data comparable to those available for the analysis of balance of payments or river flow would require a new data gathering infrastructure.

What theory is there? Economists (again see Figure 1) can say something about the food system, but the interface between food consumption on the input side and nutritional status on the output side is not well understood. It involves many other variables in addition to nutrition. Until more is known, attempting to quantify the outputs in terms of the inputs - that is, attempting to develop a theory of the response characteristics of the whole nutrition system - would be very difficult.

The same is true, *ipso facto*, of attempts to quantify the response characteristics. This is an important point, from the planner's point of view. For a balance of payments problem, Al Fishlow can go into Country X for half a day, and he will be able to guess the relevant elasticities with a fair degree of precision. Carl Gotsch can go into Country Y and he will be able to say something about how agriculture is likely to respond to various policy tools. But it is doubtful whether anyone could perceive how the whole nutrition system is likely to respond: the theoretical basis for numerical intuition is too slight. Finally, data tend to be relatively difficult to obtain largely because the data gathering infrastructure does not exist and planners are essentially dependent on data gathered by other people for other purposes. So far, governments have not set up the appropriate data gathering machinery for nutrition-related variables.

Medium-term program

In the light of the above, what would be a reasonable program for the medium-term future, both in terms of planning operations which will have some policy impact and also in terms of research operations that feed into the planning?

The devising of macroeconomic models of the food system would probably be a feasible action in the short to medium term. In practice, this means disaggregating a food balance sheet, for example, on the demand side into food consumption by policy-relevant groups. The policy-relevant groups could be organized according to size and distribution of income or by region, depending on the interesting questions within the country and the data availability. A fairly disaggregated picture of demand and supply emerges for the most important agricultural products within the country. A model could then be developed with policy tools such as procurement price, fertilizer, input price, water availability, and the operation of the food processing, transport and distribution system (a vast lacuna in our knowledge of many countries). Other policy tools include the fair price shops, fortification schemes and different kinds of food distribution schemes. Given the various policy tools, what is likely to be their impact on food consumption levels of different classes of people within the economy? The answer to such a question takes us a long way from a description of the prevalence of grade three malnutrition in Region Q.

A second interesting topic for institutional analysis would be an assessment of past interventions in different contexts and in different countries. Again, the major area in which knowledge is lacking is food processing, transport and distribution, both through market channels and within the household. Integration of that knowledge would be extremely useful for planning purposes.

A third area of interest which is obviously relevant to policy is the prediction of a particular food system's response to stress (bad harvests, changes in urban income levels, oil price increases leading to fertilizer price increases, etc). What are likely to be the weak points? Where should interventions be made at least to maintain current levels of welfare? This area is not given much attention until the emergencies arise.

A fourth area, which relates to some of the issues brought up by Joy and Payne, concerns relevant extensions of benefit-cost analysis to deal with problems such as the fact that there is a requirements distribution across the population as well as an input distribution. Different policy tools can shift those distributions - what are they and what methodology should be used to determine which tools should and should not be used?

There is a further, and more basic issue, which was also raised by the Joy-Payne paper and others, which concerns the economic theory used in planning. Economics (as presented at MIT and Berkeley, at least) tends to stress supply limitations, and there is an implicit assumption that the growth and development of a

country is determined by that country's productivity and thrift. That is one way to look at economic growth. Another way, which I think is equally valid, although most of my colleagues do not agree, is to focus on demand determinants of growth. If one influences aspects of the demand side, such as income distribution, what would be the growth response to shifts in patterns of demand?

There is a line of thought that goes back to Malthus (an interesting case since he had a schizophrenic mind about population pressures on the one hand and the importance of demand determinants of growth on the other) which has been developed by economists in Cambridge, UK. It asks how the growth process is governed by savings propensities and demand patterns.

This approach has potential because, evidently, in the context of planning, demand variables are much more important than supply variables. It seems to be difficult for us to think in terms of demand determination of economic development.

The final point is that the focus both in planning and in research has to be on isolating relatively closed and quantifiable subsystems within the system of arrows in Figure 1. Economists are at their best when they can apply analytical reasoning to relatively simple problems, and planning is best when planners apply this kind of reasoning. There has been very little effort towards trying to distinguish analytically tractable subsystems within that whole confusion of arrows. Some effort should go into that.

Discussion

Albert Fishlow (University of California)

One of the first applications of linear programming in the field of economics was made by George Stigler, and it addressed the least-cost diet problem. He made that application because economic prices were not based on nutritional units. He also showed that it was possible to achieve a particular objective in nutritional units by combining inputs of foods in different ways. It is important to realize that individuals do not, on the whole, maximize in nutritional units, but any discussion of the nutrition planning problem usually takes place in the context of nutritional units. Also, people, even very poor people, rarely spend all their income on food, so that there is a margin of additional expenditure which is devoted to other kinds of consumption. So planning is complicated by the fact that planners do not deal in the same units that individuals customarily employ in allocating their budgets. Why do people not purchase food for its nutritional value? How can they be encouraged to do so?

Another theme which emerges in the literature of economic development and planning is the question of the difficulties encountered in agricultural sector planning. Economists excel more in establishing steel plants or in processing automobiles than they do in the agricultural sector. This is true regardless of the system, whether it be a Cuban failure to achieve ten million tons of sugar, a Soviet wheat deficit, similar difficul-

ties in China, or food surplus problems in the USA.

The agricultural sector has always been very difficult to handle. This is especially true in developing countries where many characteristics of traditional agriculture are quite rational. This is analogous to what might be called 'traditional consumption' in the nutrition field. Certain behavior and habits which seem less than desirable from a nutritionist's point of view may be entirely rational within the context of the particular system. As in the agricultural sector where planning is done badly, there is a danger in treating symptoms rather than basic problems, in observing a circumstance of malnutrition and not recognizing its symptomatic quality. The symptom may be a condition of the fundamental system which gives rise to a very rational behavior within this system.

A third observation is that nutrition planning is explicitly distributional planning, whereas economic planning has been much more successful as production planning. There is a communication problem here in that distributional planning implies the concept of distribution in an extraordinarily specific fashion, rather than in terms of the general command over resources that typically concerns economists.

It has been noted that it is very difficult to accomplish distributional objectives without extraordinarily radical changes in the production structure. The most vivid examples of success in the redistribution of income have occurred when the production structure itself has been entirely revolutionized. The various attempts to deal with the distribution

problem through taxation, subsidies, or minimum wage changes, for example, have given rise to second-order effects which cancel out the intended objectives.

Now it seems logical to try to improve the position of low-income workers by raising their minimum wages, but by the time this is translated throughout an entire economic system, the wages are frequently lower rather than higher. As was suggested in Dr Taylor's paper, intervention may very well have a second-order effect which defeats the attainment of the objective.

Finally, it appears that there may be a choice in the pursuit of planning at this point to pursue theory by developing subsystems which describe the complicated set of behavioral relationships involved, or to engage in planning without theory. Most academics would say that these alternatives are not mutually exclusive and that the right way to proceed is to do both. However, I think that in practice there is a certain degree of exclusivity which is imposed by the priorities of resources and personnel, and by the lack of a focus on these kinds of problems within developing countries. I would submit, therefore, that it is a real choice that is worth some consideration.

James Levinson (USAID)

Most of us here would probably agree with Dr Taylor's overall premise that nutrition planning is in its infancy. Certainly if one subscribes to Dr Taylor's definition of nutrition planning as the application of quantita-

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tive macroeconomic models to nutrition policy, then it has barely developed beyond an embryo. However, I see nutrition planning as a broader set of activities in which we have indeed been making progress. Traditionally, planning has not been a tool in the black bag of the biomedical community, the group which has been the primary advocate for international nutrition over the years. Planning is the domain of the economist, and economists have not been interested in nutrition until very recently. I think the reason why economics departments in the industrialized countries have done such a very small amount of work related to nutrition is that such work has not been seen as prestigious among economists.

Concerning Professor Fishlow's discussion on the treatment of symptoms, Leonard Joy and a number of us have been concerned about treating symptoms when there are underlying determinants that need attention. It has reached the point where treating the so-called 'symptoms' has become almost tabu. If we can affect the underlying determinants of malnutrition and remove the need for, say, child feeding programs, then the child feeding programs could be terminated. But we should hesitate before we dismiss those interventions which seem to be dealing with symptoms. I am reluctant to give up anything that provides even a little bit of resource redistribution to the poor until the need for that kind of program is eliminated.

The identification of a series of somewhat overlapping phases through which we have passed since the second world war places concern with nutrition in a historical context. The first phase is characterized by humanitarian concerns, largely expressed by the biomedical community and largely curative in nature — malnutrition was perceived as a disease to be dealt with as a disease. Little progress was made, given the realities of scarce resources and the political impotence of the poor, among whom the problem of malnutrition is concentrated. In addition, the decision makers in planning commissions in low-income countries (many of whom studied at prestigious Western universities) were taught that development means growth of the capital stock with nutrition being, if anything, a very minor issue.

By the early and mid 1960s, the nutrition community began to respond to that message from the economists by striving to justify nutrition investment on the basis that improved nutrition would somehow stimulate those indices that were of primary concern to the economic planner. The basic idea was that improvement in the condition of the human capital of the nation could be achieved by alleviation of the malnutrition problem. An increase in nutritional status would lead to better performance and ultimately improve productivity and national income increments.

This seemed attractive at first, but then it appeared that malnutrition-related physical and mental debilitation might not be the limiting factor in the production process. Productivity probably depended more on the size of land holdings, irrigation, industrial spare parts, raw materials, and power supply than on the physical or mental capacity of the labor force. It was also possible that increasing productivity in a labor surplus economy might exacerbate existing problems of unemployment.

However, the argument that improved nutrition would promote development was reinforced, in part, by fixation on technological solutions to malnutrition that were proposed in the late 1950s and the 1960s. There was a lot of discussion about the protein gap and the production of protein from unconventional sources. The alleviation of protein malnutrition was a popular idea for quite a while before the realization was made that it was not the solution to the primary problem. The main problem was more a matter of inadequate food and resources in the hands of the poor and inadequate effective demands inextricably entangled with the complex structure of poverty and the whole syndrome of deprivation. Instead of using nutrition as an inexpensive lever on the development process, nutrition advocates began to find themselves in the middle of the development thicket. Nutrition seemed to be a fledgling area of technical speciality — a fatal indictment if judged by traditional development premiums.

In fact, at the same time, a serious reassessment was taking place in the development community. Premiums placed on growth of the capital stock and investment-oriented planning and capital goods production were

being questioned by concerns for the quality of life, distribution of resources, development of the agricultural sector, rural development and labor-intensive activities. With this new development philosophy, many in the development community began to look more specifically at nutrition.

It is easy to expound on the need to reach the poor, but how is this actually accomplished? This was the challenge facing the nutrition community. Was it ready for a new set of guiding principles, a new philosophical base? This philosophy began with the notion of dealing more specifically and explicitly with the problems of the poor majority — those excluded from the development process. It included making a much greater effort to share the benefits of development and to meet the most basic needs of the poor themselves — better concepts of nutrition and better health and survival.

So where does the nutrition planner fit in? It is a real pitfall for nutrition planners to think that they can solve hunger and malnutrition problems in a low-income country with perhaps one quarter of one percent of the national budget — and that they can do it with direct nutrition interventions alone. Those low-income countries that have made significant progress in dealing with the problems of malnutrition have done so without nutrition interventions. They have done it through radical social change or through rapid economic growth with a concern for equity.

I would suggest a threefold role of the planner. First, he must realize that problems of hunger and malnutrition are concentrated among the poor and any attempts at their solution require some redistribution of resources. Not many governments have political mandates to redistribute resources, but unless something is done about commitment, we can expect very little progress. So the primary role of the nutrition community is the use of its potent, valuable ammunition, which is its information on the nature and magnitude of the problem, to indicate to decision makers in low-income countries that there is a problem deserving explicit attention. The nutrition community can strengthen its cause immeasurably by finding out a great deal more about the functional implications of

malnutrition and putting these scientific findings into terms that are meaningful to decision makers.

The second role deals with the area of direct nutrition intervention, an area where the nutrition community has made accomplishments. However, the nutrition community has been no more successful in gearing these interventions to the poor than has the development community in gearing the benefits of development to them. This is a major challenge facing the nutrition community.

The third role relates to Lance Taylor's comments. Malnutrition problems are probably affected more significantly by development activities that go on outside of the nutrition sector *per se* than by nutrition interventions. Relatively little has been done to affect those decisions.

A nutrition planner should be able to look at an agricultural price policy, a works program, an agricultural production program, or a land use program and say that a certain income effect or price effect will have certain specific consumption effects on specific groups, income and age specific. These are tools that can be used by non-economists in these countries on a day-to-day basis. In the past when nutritionists have been asked about such policies, particularly in the agricultural sector, they have looked at the amino acid profiles and the protein contents of specific crops and then have argued endlessly as to whether the profiles were good or bad.

I think nutrition planners can affect some of the relevant decisions. Lance Taylor and I had the occasion

to intervene moderately in a decision that would have had significant effects upon the poor. The ration system in Pakistan that Dr Taylor discussed was almost terminated because Pakistan had a good crop. We indicated that were it terminated, the caloric intake of the poor would be significantly decreased and the real income of the poor would be reduced by about 10%. Senior decision makers were reluctant to drop programs and policies where those consumption effects were made explicit. This was a rare instance in which policy decisions moved in a direction to affect the poor positively. So the whole range of non-nutrition activities must be considered in an attempt to affect these decisions because they do have important effects on nutritional well being and consumption.

Recent developments: poverty-focused planning

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Poverty-focused planning is a broader subject than food and nutrition planning, but both face the same major problems of formulation and implementation of plans. This paper concerns redistributive planning in general, with emphasis on the lowest level of poverty – absolute destitution. Since the majority of the world's poorest people are concentrated on the Indian subcontinent, this area provides a suitable context for a discussion of redistributive planning: the approaches and controversies related to investment allocation to reduce poverty.

Western planning literature indicates that the intellectual community has just recently discovered poverty, but planning literature in the developing countries has been concerned with poverty for the past twenty years. Obviously, any problem of development has to do with poverty. One of the first articles detailing calculations of poverty-focused planning was based on work done in India in the 1950s. It is entitled 'Implications of planning for a minimum level of living' and was published in 1962 by the Prospective Planning Division of the Human Planning Commission. The paper describes a model which is still in use. This document introduced the concept that the primary concern of planning must be the removal of poverty as quickly as possible.

The time has come when planning efforts should focus on the provision of an assured minimum income for every citizen within a reasonable period of time. What does this goal imply in terms of the model and in terms of detailed sectoral allocations? There is a basic socioeconomic postulate implicit in most of the planning literature that, in a non-revolutionary context, no basic changes are contemplated in the scale and structure of wages, salaries and property rights. But in the India of the 1950s there were two exceptions to this postulate, both relating to property rights. One was land reform and the other was the growing importance of public ownership of property.

The land reform program obviously involved a substantial alteration in property rights. Although land reform did not succeed in redistribution, it did change the feudalistic, non-cultivating, absentee landlords to

the cultivating landlords, or the big farmers, who took a more direct interest in the land. This type of land reform changed nothing as far as poverty was concerned.

The second exception, public management of capital, is much more important today in many poor countries than it was in 1950. But once again, its impact on poverty has been minimal. Public capital has essentially provided the basic infrastructure, capital goods and intermediate goods, often underpriced, to the private sector. Barring these two exceptions, there have been no drastic changes in the structure of property rights. How, then, has planning approached the property question? Given the private ownership of the means of production, the economy generates its own income in the private sectors – so it is through intervention in income disposal that the planning process has attempted to achieve some redistributive impact. Planners have focused their efforts on the redistribution of consumer expenditures rather than on the redistribution of incomes generated.

The planning model

The static reactive model is a simplified model which has been used in redistribution of consumer expenditure. It starts with some base-year output level in the various sectors and from this the maximum feasible growth of the system can be worked out. There is a target rate of growth which is decided independently of the redistributive objective. Given the target rate of growth and the base-year level of income, there is a target level of income at the end of the planning horizon. Usually, this is a single-period, five-year model. Once the target level of income (or aggregate expenditure) is established, it must be decided how to redistribute that total expenditure in terms of the different subgroups of the population. It is usually assumed that the distribution of total expenditure satisfies the log normal distribution. This is convenient, because once the mean and the variance are established, the whole distribution can be described and the mean is taken as the target aggregate expenditure.

In the log normal distribution, the variance is a function of inequality as expressed by the gini coefficient.* Thus the gini coefficient and a target gini coefficient are fixed. Planning models have approached income distribution in this way. In the 1962 Human Planning Commission document the existing Family Budget Surveys indicated a gini coefficient of roughly 0.33 and the target gini coefficient was set at 0.25. The report was a plan for the improvement of the gini coefficient over fifteen years and it actually did come down from 0.33 to 0.25. The document calculated what this would mean in terms of numbers of people below the poverty line. A more recent five-year plan proposed a much greater reduction in the gini coefficient, from 0.32 in 1969 to 0.22 in 1974. This meant a two-thirds reduction in the percentage of people below the poverty line in five years.

After using the target gini coefficient to obtain the whole distribution, the mean aggregate consumer expenditure is determined for each subgroup of the population. Then the demand factor is worked out and the Family Budget Table is used to find the income elasticities of demand for each of the subgroups. The target output pattern is derived from the target income distribution. The investment pattern, however, is determined outside the model, as is the target rate of growth.

There are at least four limitations to this approach. First, target redistribution is postulated independently of the target rate of growth and the pattern of final demand. Second, the only redistribution envisaged is of consumer expenditure, not of income generation. The third limitation is vitally important: technology and the organization of production, which are assumed to be constant, remain invariant to redistribution. This assumption not only ignores the neoclassical economists' emphasis on choosing the proper technology, but it also ignores questions about the organization of production and the issue of decentralization inherent in a redistribution program. The fourth limitation of this type of model is the implicit assumption that mobilization of the required amount of domestic savings for a given level of foreign assistance is quite low. Mobilization and channeling of savings cannot be assumed to be invariant with redistribution. These limitations of the basic redistribution planning model are shared with other such models.

There are two practices which might prove harmful to the process of planning and the implementation of plans. First, the political and social constraints and the sacrifices required of the dominant economic and political interests are grossly underestimated. The model does not expose the unpleasant choices and policy

implications that accompany the redistribution process. Second, the model assumes that a government has complete control over all policy instruments, which is obviously not true for most developing countries. In summary, these models do not face the major problems involved in the implementation of a redistribution program. It is no wonder they have had so little impact.

Approaches: core sector v minimum needs

In developing countries, the planning model is not regarded as an instrument of redistribution but rather as a determinant of the pattern for allocation of investment funds. Those who believe in this standard planning orthodoxy believe in the 'steel-cement-fertilizer-power-transport-oriented' plan - or a core sector plan. The other school emphasizes a minimum needs program which often includes food and nutrition planning. While advocates of the first school appreciate the problems of poverty and malnutrition and the need for redistribution, they feel that core sector development must come first. The minimum needs school argues that the transfer issue must not be separated from the core sector plan.

The minimum needs basket naturally includes food and nutrition needs as well as others peculiar to each region (such as a supply of protected drinking water). It also prescribes a basic infrastructure for health and sanitation, the provision of elementary education, housing sites for the landless, etc. The case of Kerala in India is pertinent here. It is one of the most densely populated areas in the world and also one of the poorest, by standard nutritional or family budget guides. However, it has the highest life expectancy and the lowest infant mortality rate in India. Kerala leads the nation in health, sanitation, and elementary education. This indicates that the indivisibility of the whole basket is preferable to emphasis on just one part of the basket.

One other part of the basket, 'the rural works program', is worth mentioning. Such programs are designed to generate income which can then be used to satisfy basic needs. They have not been generally very successful, probably because of the nature of the unemployment problem in developing countries. Chronic open unemployment is almost non-existent, but there is underemployment in certain parts of the year and at certain times of the day (this is particularly true of the female labor force). The rural works programs cater to the chronically unemployed, completely landless people, not the underemployed workers. This is important because the minimum needs basket should contain some provision (credit, inputs, knowledge) for the small farmer who cannot benefit from rural works programs.

To return to the controversy surrounding the two planning approaches, the minimum needs group argues that the core sector plan aims to solve poverty by increasing demand at a time when the poverty problem is so acute that funds should be immediately transferred to the poor. These programs may not always be

*A measure that shows how close a given distribution of income is to absolute equality or inequality. As the coefficient approaches zero, the distribution of income approaches absolute equality. Conversely as the coefficient approaches one, the distribution of income approaches absolute inequality.

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viable in terms of the rate of return, which measures the surplus ultimately to be generated. It is assumed that the projects which have the highest rate of return will, at some point, transfer this surplus back to the poor, but this rarely happens. Therefore, projects which do not satisfy the standard rate of return criteria should not necessarily be rejected if they do achieve such a transfer.

However, the minimum needs planning approach has failed to include any exercise to check the consistency of supply and demand. It is insufficient simply to determine that minimum needs and rural works programs do not make intensive use of scarce intermediate materials such as steel, cement, fertilizers and capital equipment. Any substantial transfer program will not only add substantially to the demand for food, but also to the demand for fertilizers, fuels, power and transport. Such a program also presumes governments to have much greater control over procurement and public distribution of food than most governments have ever achieved or are likely to achieve in the near future.

It is heartening that the Pakistani government has accepted the suggestion of Taylor and Levinson to retain the ration program, which means retaining the procurement system. In times of crisis, such as drought years, there are tremendous pressures on the government to abolish the procurement system, but more often than not, the government raises the procurement prices and essentially pays the market prices, which almost negates the whole scheme. Alternatively, in India for example, the big farmers are subsidized. The government gives them a high price and sells to the rationing system at a subsidized price. The government budget takes care of the deficit, often by inflation financing which hits the poor.

Potentials for leakage

The question of government control over procurement of public distribution of food is vitally important, particularly to poverty-focused planning. Both sides in the controversy over distributive planning strategies are banging their heads against the same political wall – the prohibition of substantial mobilization of additional resources to support massive programs of direct transfer. Even if this constraint did not exist, the redistributive planner would still have to contend with the frequent appropriation by the relatively rich of a disproportionate share of the benefits of any direct transfer scheme. It is therefore imperative that the potential for leakage into non-target groups of alternative planning strategies be assessed.

However, it is possible that all alternative redistributive programs will be equally 'leaky', given the politics of scarcity and the corrupt nature of the oligarchies controlling the programs at the local level. But, at a microlevel, alternative programs do vary in their redistributive impact, even when carried out within a constraining political and administrative framework.

One leakage area in the rural works program is the money sanctioned for rural works, which goes into the pockets of rural contractors and petty bureaucrats. Leakage occurs in the minimum needs program when low cost housing or slum improvement schemes are usurped by the upper-middle class. Some rich farmers will even divert the village drinking water to irrigate their fields.

In general, there are two kinds of leakages in transfer programs: the leakage from the pipeline itself, in the form of absorption by the delivery infrastructure (middleman, contractors, petty bureaucrats, etc); and the recipient leakage in the form of benefits appropriated to the wrong groups. Sometimes these leakages are interlinked – the rich recipient bribes the middleman to divert the flow of benefits in his favor.

The various leakage possibilities in core sector planning and the spoils of the accompanying system of licensing and regulation are well documented and need not be repeated here. It seems that a substantial transfer cannot be carried out without a sizeable increase in the availability of essential consumer goods, which needs a sound core sector. But experience has shown that planners have little control over the generation and disposal of income by the rich. In that context, an expansion of the core sector in terms of steel, cement, power, transport, etc, in the name of ultimately supporting redistributive programs, hardly guarantees that these basic intermediate and capital goods will not be diverted to non-priority uses.

Planners are often impatient with this nagging emphasis on the question of leakage. They feel they are essentially technical advisers and the political and administrative machinery should handle the mundane problems of implementation, ensuring the proper deliveries and stopping the leakages. However, it seems clear that many of the problems of implementation are inherent in the nature of these programs themselves. Some are inevitable in the context of the social and political framework and could be anticipated at the planning stage. The planner cannot honestly refuse this responsibility.

The planner and redistribution

The final point concerns the role of the planner in the redistributive context. Planners, individually or in a group, certainly cannot change existing political and administrative constraints, but they can refrain from restricting themselves in two important ways. First, they should strive to integrate food and nutrition planning into the general planning process rather than append food and nutrition programs when the acute need arises. Second, planners should recognize their political role and the fact that effective redistributive programs depend on organization of the intended beneficiaries. Effective redistribution cannot come from voluntary abdication of the top.

Kerala, for example, presents a non-revolutionary situation where there is a distinct change in performance. It is no coincidence that rural labor has been unionized, land reform has succeeded, and minimum wage regulations have been implemented in Kerala. The concern there is not merely with food and nutrition or public health and sanitation issues - the

intended beneficiaries are highly organized in the receipt of a wide spectrum of changes. The redistributive planner is ultimately responsible to these groups and he should aid and encourage their organization. The planner can translate the radical slogan of the politicians into clear and concrete statements, intelligible to the public which will pin down the politicians.

Discussion

Irma Adelman (University of Maryland)

Three studies formed the basis for my present remarks on poverty and income distribution oriented planning. The first was an empirical cross-sectional countrywide comparison. The second was a historical cross-country analysis of the effects of the industrial revolution and commercialization on the size and composition of extremely poor groups in the middle of the nineteenth century. The third was a carefully integrated modeling effort applied to South Korea and intended to provide a laboratory for policy-focused experiments. The results of these studies were mutually reinforcing and consistent with Dr Bardhan's account of the Indian experience. I shall here refer chiefly to the Korea model.

The core of the Korea model was a general equilibrium system in which production and consumption interacted and were mutually determined in a consistent way, allowing prices and wages to be determined inside the system. The economy was disaggregated into about thirty production sectors with four firm sizes in each sector. Each firm size had its own type of technology. The consumer groups were disaggregated into twelve socioeconomic categories, each with a characteristic distribution of incomes and expenditures. The accounting relationships were observed not only in terms of the flow of monies and goods, but also in terms of the flow of people and the composition of households. The model was dynamic and had been carefully validated against Korean historical data. It had about 3500 endogenous variables.

After running the model over ten years, we found that the distribution of income was exceedingly stable, even in the face of substantial policy intervention. Whether or not the

intervention was sustained over time, it was quite rare to find more than 5% change in the gini coefficient, or a percentile share altered by more than 15%. In that light, the figures cited as planning targets for India were outlandish. Even the movement of the gini coefficient from 0.33 to 0.25 over fifteen years was much more than we have been able to produce in a model without the sorts of leakages that Dr Bardhan mentioned.

It seems to us that interventions aimed at changing consumption patterns which do not significantly alter the structure of production are ineffective in that their impact is quickly eroded, even when the intervention is sustained. More lasting effects are possible only when many different interventions are applied simultaneously to change the basic development strategy from one of growth to one of redistribution. If redistribution is the goal, the development strategy should not be based on growth with redistributive policies added on at the end. In summary, there needs to be a change in the structure of production but this does not imply revolution or changes in the mode of production: it implies socioeconomic and political change.

Returning to our model, while the size distribution of income was exceedingly stable, the socioeconomic composition of the income group was extremely sensitive to the manner of policy intervention. Radical change could have been achieved in the composition of the poor, especially in the balance between urban and rural poverty. But the overall extent of relative poverty would remain unaffected: one group of poor would merely be traded for another group of poor. The agricultural terms of trade (ratio of prices paid to farmers to prices paid by farmers) is the single most important factor governing income distribution and the incidence of poverty.

We also discovered that the most important demographic variable in the intermediate term was not population growth, but rural-urban migration. Provided that the rural poor were poorer than the urban poor, rural-urban migration improved the distribution of income and reduced the incidence of poverty up to a point. Carried too far, rural-urban migration impoverishes the urban group much more than it enriches the rural group. Historically, nations have felt the need to control migration and to let population growth take its own course. Recently, there has been a desire to do the opposite, namely to control population growth and let migration take care of itself.

The results of our modeling suggested that the historical experience was the right one. Limitation of population growth has had little effect on poverty reduction even over a 35-year span. Indeed, reduction in the rate of population growth involved deteriorations in the distribution of income and increases in the level of poverty. Only after many years was a reduction of population growth followed by a reduction of poverty. This was consistent with historical experience where periods of low population growth have seen stagnation and poverty and periods of high population growth have seen prosperity and less poverty.

Our results showed that appropriate international trade strategy could lead to significant improvements in both the shares and the absolute incomes of the poor. In particular, import substitution adversely affects growth, equity and the extent of poverty. Export expansion, which is labor-intensive and/or skill-intensive, benefits both growth and distribution.

The assessment of various policy programs was based on three indicators: the percentage of households whose real incomes fell below an absolute poverty line; the per-

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centage change in the relative income of the poorest decile; and the extent of change in the gini coefficient. The first criterion would be the most useful in a nutrition focus, and it is the one most amenable to change. As noted earlier, we also found that multiple policy interventions were needed for effective anti-poverty policy. This implies that a big push balance strategy impinging on many sectors and target groups is best.

Finally, we found that partial analyses were liable to lead to incorrect conclusions on the ultimate effects of policy intervention. The failures of many policies and programs, as Bardhan has stated, may be blamed on designs based on inadequate partial equilibrium and static analysis. The failures are reinforced by leakage and diversion effects. The Korean model focused on the economy; demography was treated as exogenous. By contrast, another model formulated for The Philippines by the International Labor Organization in its World Employment Program emphasized detailed demographic modeling and underplayed economic specification. It also focused on the year 2000 rather than the next decade. We performed experiments analogous to both models with comparable quantitative and qualitative results throughout.

Carlos Schlesinger (Ministry of Health, Chile)

Poverty-focused planning is often carried out by a team of a country's elite, with programs based on a limited understanding of poverty. The programs are often designed to provide what the elite imagines the impoverished lack - houses, employment, schools and tools. When the programs are evaluated a year later, the sad conclusion is reached that a billion dollars have been spent to change the appearance of poverty, but not to reduce it. The new apartments are dilapidated, the school windows are broken, the same workers are unemployed and there are still malnourished children. The elite concludes that the poor do not appreciate the things they are given, do not take advantage of them, and do not try to escape from their poverty. With conscience clear, the elite can write off the impover-

ished as naturally lazy, filthy and ignorant - in Chile they are called *flojos venerlos*.

Government programs which promote increased agricultural production, improved health services, fortified foods and food supplements may achieve their goal of reducing malnutrition, but they are not eradicating misery and underdevelopment. Because of the planners' limited perception of the meaning of poverty, the programs tend to be superficial, paternalistic, short-lived and self-serving. In most underdeveloped countries, the elite is a self-perpetuating, comfortable club with restricted membership based on wealth, not merit. In fact, merit beyond certain limits of good taste is frowned upon and even censured. Now let us turn our attention to the impoverished - the destitute.

Vulnerability and physical limitations are two characteristics of destitute people. 'Vulnerability' means complete defenselessness, physical and mental frustration, which leads inevitably to fatalistic acceptance of the conditions. The physical limits within which the destitute live take many forms. Expression of genetic potential is constantly stifled, even before birth. Slums provide a very limited view of the world and the slum-raised mind grows only as far as the limited vocabulary permits. Social mobility is prohibited for succeeding generations, and the child of poverty is taught to be satisfied with the bottom rung of the social ladder. The child of the undeveloped elite is taught to struggle for the middle rung, but not higher. If he is placed at the bottom, he will work his way up to the comfortable middle. This difference accounts for the bias of the elite in assuming that the removal of constraints to education, nutrition, etc. is all that is required for the poor to climb to the middle, or at least as far as the second rung.

I believe that vulnerability and such physical limitations must be eliminated before poverty can be abolished. This implies an effective change of power to enable the impoverished to decide their destiny and defend themselves from insecurity. The elite must come to understand the essence of vulnerability and to accept some insecurity for themselves - yet, this is a virtual impossibility since no one is willing to relinquish security in the

absence of political stability and economic growth.

In Chile, the immediate goal is to reduce the childhood malnutrition rates by half in ten years and most of the resources are concentrated on reform of the two large government-sponsored feeding programs, the National Complementary Feeding Program of the National Health Service and the School Feeding Program. Together they cost the Country some one hundred million dollars per year, yet they have never been evaluated for nutritional impact except by reference to the number of school meals served. This is an example of the deductive style of nutrition planning, which proceeds somewhat as follows: the problem is identified, a solution is proposed, a pilot project is carried out and, if it is successful, it is amplified to a national program. Everyone ignores the fact that the problem may be changing and the solution may need modifying as the intervention takes effect.

In Chile developing communities currently have considerable autonomy in the institution of programs. The formation of local nutrition monitoring groups raises the possibility of an induction phase of nutrition planning - it gives the local elite a sense of participation and commitment. The nutritional recuperation homes program and the national program to increase breast-feeding are aimed at the upper and middle classes, not at the poor. With regard to the first program, we found that 80% of the hospitalized malnourished children died before the end of their first year of life. Given the investment of \$2700 per case in hospital care, this is hardly cost-effective attention. In an effort to provide cost-effectiveness, we promoted the formation of a voluntary group to set up centers for recuperation of the severely malnourished. In a warm, homelike atmosphere of love and attention, long-term recovery from malnutrition has been virtually one hundred percent. Even more remarkable has been the level of commitment of the volunteers who have devoted themselves not only to paying for the infants but also to household supervision of the children after their release. Their profound understanding of the essence of misery provides the basis for widespread support of

poverty-focused programs. The second stage of the program included its extension to marginal areas where volunteer women are to be trained to monitor the effectiveness of the programs and communicate the results to us.

The national program to increase breast-feeding is aimed at the sensitization and commitment of the elite to breast-feeding promotion. It was developed in response to the alarming increase in severe infant malnutrition and a national decline in breast-feeding. In 1940 some 85% of infants were breast-fed to six months of age, and only 25% of the children hospitalized for severe malnutrition were under one year old. In 1974, with breast-feeding to six months at an all time low of 11%, almost 90% of hospitalized, severely malnourished children were under one year of age, and 76% were less than six months old.

Our studies show that breast-fed infants are often malnourished. It was also discovered that in marginal neighborhoods of Santiago, fully 80% of the baby bottles were contaminated with diarrhea-producing organisms at the moment the baby was fed. Response to these studies has shown that over 75% of properly motivated mothers from marginal neighborhoods will nurse their babies for six months.

Accordingly a nationwide program was undertaken with a three-pronged attack. The first two prongs were aimed at encouraging the elite to persuade health personnel to promote breast-feeding and to persuade upper and middle class women to breast-feed their infants. The third prong was aimed at the population in general and constituted an approach

to increasing solidarity between the elite and the poor by a national television study course on breast-feeding. I have described the programs in Chile and I hope it is clear what I believe should be done.

Aaron Wildavsky (University of California)

Dr Bardhan has raised the essential problems for this conference in two respects. First, he has raised the pervasive boundary problem: is it useful to single out a poverty or even a nutrition problem apart from all the others with which it is associated? Some would argue that it might even be counter-productive. Second, he raised the leakage question, although he did not discuss what planners might do about leakage.

Let me begin with the morning news and Jimmy Carter's taxation problem. Carter is a victim of the gini coefficient, which measures income disparity or relative poverty. He is also a victim of liberal rhetoric which encourages him to continue raising the tax rates for half the population. In 1960, 20% of the federal budget was spent on transfers. In fiscal year 1976, about 42% was spent on transfers. But these large transfers have not achieved a change in behavior. They have not reduced smoking, drinking, crime, or sickness. I suspect that this experience would also be relevant to Kerala.

Considering the boundaries, if it is true that poverty is interrelated with so many other phenomena, then an approach dealing only with hunger, or only with poverty, may

not be appropriate. Therefore, it behoves planners to pay special attention to the difficulties created by their own modes of analysis.

Lance Taylor's paper suggested that planners may inadvertently contribute to more evil than they destroy. Effective redistribution cannot come from the top, and it certainly is not going to come from planners. If bureaucratized redistribution is the main agenda, then who will benefit? The answer is fairly clear: the bureaucrats and the people with whom they find it easiest to deal. These people are the large landholders or labor union heads, anyone who can play by the rules of the game and organize himself to gain access to the bureaucracy. Consider, for example, the vast numbers of public-interest lawyers making their fortunes from the environmental movement.

Planners cannot deal with mass politics. If they really tried to organize at the grass roots they would be dismissed. The dilemma of planners is that if they act like politicians they are removed, and if they do not act like politicians they have no power. Planners necessarily prefer large projects to small ones. Strategies using many small projects to reduce local employment, for example, are unlikely to be favored, because the planner can only deal with large projects. But the massive models the planner uses are beyond public comprehension. The approaches that planners take and the actions they usually recommend – government intervention, large bureaucracies, multidisciplinary planning teams – seem inappropriate. We must seek other mechanisms, having less to do with people like us.

Sectoral approaches to food and nutrition policy analysis

Nutrition and health sector planning

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The technical competence required in the concern for human nutrition falls between the areas of agriculture and health. It has become evident, however, that socio-economic development and community development require a special focus on nutrition as a neglected area.

It is a common attitude among agriculture experts that if food is provided for everyone, nutrition problems will disappear. This notion is negated by the general prevalence of malnutrition in food surplus areas. Providing food is only part of the answer. Learning to cope with economic constraints limiting the equitable distribution of food is an important challenge. Conveying information on locally available foods which are cheap and nutritious can help people to solve their own nutrition problems.

On the other hand, the extensive prevalence of malnutrition has been systematically ignored in the health sector as well. Most nutrition research has been devoted to sophisticated laboratory biochemistry: there has been minimal nutritional epidemiology and even less research on nutrition services and their impact. Little is known of the consequences of multimillion dollar expenditures on feeding programs.

The reason for this shared ignorance is that researchers have not gathered the facts about what happens to people as a result of what they eat or do not eat. Much energy and expense is devoted to producing and disposing of food for the poor, but often the reason is not to meet nutritional need. For instance, the impact of feeding programs in the USA has received little study because a primary motivation for mass distribution of food has been to maintain economic benefits for US farmers. This method of disposing of food surpluses has been used with only an occasional reference to the rationalization that it was also a good way to redistribute resources.

The central theme of this paper is that health and nutrition concerns should be integrated with family planning and population control which would in turn improve program effectiveness. Some recent developments in health planning are examined for background and discussion of the evidence for integration is presented. A final section reports briefly on three nutrition planning case studies.

Present trends in health planning

National systems of health planning

The development of health planning in less developed countries (LDCs) in the past two decades has been notable.¹ Whereas planning used to be characteristic only of centralized socialized countries, it has now gained general respectability. The greatest impetus for this emphasis on planning has been that the international donor agencies require systematic planning as a prerequisite for loans and grants. It is hoped that this will increase accountability. Presumably, where resources are minimal, planning will help to make the best use of those available for focusing on high-priority problems.

Many LDCs have established planning units to provide a structure for the planning process in the health ministry, but only a few function effectively. They tend to have the anatomy of the planning process without the physiology. Two new emphases are needed to improve planning. More attention needs to be given to policy making and mechanisms for general political will. An early stage in any planning sequence is to define policy and to set broad goals. The early involvement of decision makers promotes later implementation. But little is

understood about the intangibles associated with decision making in varied cultural settings or the mobilization of political and administrative commitment. The best that can be done at this stage is to produce case studies.

Second, more attention should be given to ensuring implementation through better management. Too many elaborate planning exercises end up in multiple volumes which are never implemented or even approved by responsible political or administrative bodies. There is a particular need for developing management methods appropriate to local cultures and administrative patterns.

When planning first became a serious official activity, widely varying patterns and approaches developed depending mainly on the political orientation of the country. Around the world a fascinating convergence now seems to be occurring, with a progressive blending of planning methods as countries learn from the experience of each other.

Planning from below

Perhaps the greatest change in health and nutrition planning has been the increasing emphasis on the need for planning from below. The rationale is mostly negative and is based on awareness of the deficiencies of centralized planning.² Many local projects have demonstrated that decentralized planning increases local involvement in implementation, but it is not clear how these lessons can be best applied to general health services. Planning from below will never have the symmetry and conceptual integrity of a centrally generated plan. Inconsistencies and gaps will have to be accommodated. In setting priorities, professionally determined need will be subordinated to public demand. Allocation of resources will tend to be politicized. Efforts to acquire consumer representation in the US regional and local health planning agencies have been complicated, but consumer representatives have learned quickly and have eventually tended to identify with the health services.

The process of creating local involvement has been even slower to evolve in LDCs. Outstanding success in involving the community has been achieved in China, but powerful central control through the Party is also strong. The writings of Paulo Freire, Dennis Goulet, and Ivan Illich provide challenges for future experimentation.

The question remains, how can political will be generated in mass programs to stimulate peripheral involvement and keep it channeled? It is necessary to learn how to balance responsibilities between central and decentralized parts of the system. Central planners should be responsible for defining broad goals and policies, making major allocations and setting up data collection and quality control. Local planners should have considerable freedom to set their own priorities within the broad goals and to work out processes of implementation. During implementation, central planners should be involved mainly in setting standards and targets. Evaluation can be shared, with local units doing continuing evaluation for administrative control of services. Central plan-

ners also should do periodic overall evaluations to see if goals have been met and if objectives should be changed.

The next challenge is to involve communities in their own health care. This is a major new thrust in the World Health Organization and other international agencies. Particularly in rural health services, the experience of the past twenty years has taken the emphasis away from Western-oriented hospital specialty care.

In some countries, growing political commitment is emerging for comprehensive care based on decentralized health centers and the use of auxiliaries for primary care. Village studies in several countries have shown that a wide gap remains between the health center and the home. Typically, coverage reaches only 10-15% of rural populations. This has led to new efforts to identify and strengthen community capabilities to meet their own health needs. At first, the use of village volunteers resulted in a tendency for organized services to coopt community resources and weaken the capacity of families to solve their own problems. Dependency was created. Now synergistic patterns of work are being developed at the interface between the health service and the community, designed to make the best use of both service and community resources.

Nutritional component in health sector planning

In the USA nutrition has been a recognized but minor component of health services for many years. The problem has been that nutrition-oriented activities have become stereotypic and repetitive with little attention to evaluation. As is true of most health indicators, nutritional status has steadily improved. The health sector has taken credit for the improvement on the assumption that whatever it was doing was obviously right. Major activities such as feeding programs and nutrition education have been blessed by lack of evaluation. Only recently has the reality become clear that most of the improvement has been due to broad socioeconomic development and that specific measures have often been irrelevant. In affluent societies people tended to meet their own needs. Now there is growing concern about the poor food habits of many Americans and the relationship to disease of affluence.

In developing countries, much less has been done to promote better nutrition. When program stereotypes from affluent country experiences have been translated to conditions of real need, they have not worked. Maternal and child health clinics have channeled large amounts of food to vulnerable groups but the malnutrition persists. School feeding programs seem to have been more useful for income distribution than for changing nutrition status. Furthermore, it is usually the preschool children who are most seriously at risk, and the preschool children from poor families where malnutrition is most prevalent are not reached by school feeding programs. Nutrition education may have had some favorable impact, but it has been more than negated by commercial advertising of inappropriate food and of formulas that discourage breast-feeding.

It is apparent that present approaches have been unsuccessful especially where general socioeconomic development has been minimal or slow.³ Six specific program areas that need research attention are examined briefly below.

Interactions with infections. Since Scrimshaw, Gordon and myself published the review⁴ and WHO monograph⁵ that defined these interactions, additional research has confirmed their importance. Work is in progress to elucidate nutritional effects on host resistance, primarily through cellular immunity. Mechanisms by which infections increase metabolic demand have become somewhat clearer. However, there is need for further research on specific relationships, such as that between malabsorption and intestinal infections.

Cultural and biological correlates of lactation. The importance of lactation seems to increase as more and more research is done on this subject. Infant nutrition in poor countries depends so much on lactation that other measures are appropriately called 'supplemental'. From a simple economic viewpoint, breast milk is one of the greatest food resources available to human beings. Because of the significant effect of lactational amenorrhea on fertility, breast-feeding plays an important role in maintaining child spacing and should be closely related to family planning.

Food preparation. The preparation of weaning foods needs more study. In poor families the problems of preparing separate foods for young children are considerable. Much of the family economy goes into fuel and time for cooking. Small children often cannot cope with bulky adult foods that are generally indigestible and contain inadequate nutrients per fluid volume. The low caloric density of weaning diets appears to be responsible for considerable malnutrition among infants and small children, even within families where the total food supply is adequate.⁶

Food combinations. Poverty is only one reason for the inadequate combinations of food consumed. Most areas grow green leafy plants that would meet any nutrient requirements, notably for minerals and vitamins. Research is needed on easily available items that can be introduced into nutritious combinations with traditional cereals. Instead of trying to make cereals behave like legumes, it would be better to concentrate research on maximum production of calories, through tubers for example, and then to add the other nutrients through available combinations of food.

Relationship between dietary levels and health. Standards of nutritional intake have become suspect. This is especially true because most standards were developed in tests on healthy young men in affluent countries. Is bigger really better in human growth? Countries with chronic food deficiencies might be better

off with children who grow up to be small and lean. But this may seem to be discriminatory, and too little is known about the effects of nutritional level on function.

Cultural constraints in food and nutrition. Simplistic approaches to nutrition education provide some of the worst examples of developmental colonialism. Very few programs have accommodated local concepts of 'hot and cold foods', even though in most countries these beliefs really determine what people eat and when. Common cultural practices, such as abstinence from food during infections, require anthropological investigation. Many of the most important cultural values in a society are related to food, and yet they are treated casually as mere superstitions.

Measurement problems

Serious advance in nutrition knowledge requires better measurement methods. My inclination is to urge the use of direct measurements of nutritional status rather than to continue the past emphasis on attempts to measure food supply and demand balances. Increasingly, simple techniques are being developed which measure changes in adults and children in relation to their nutritional environment. Six examples are worth mentioning:

1. Mortality of children aged one to three or one to five is probably the first index to register improvement in nutrition.
2. The second most sensitive index is infant mortality, which may be easier to record because many data systems incorporate this information. Sample surveys can give some information where vital statistics are poor.
3. Weight for age in both cross-sectional surveys and longitudinal growth charts provides some of the most convincing data in child nutrition. Growth charts can also be used as powerful program and educational tools.⁷
4. Arm circumference measurements are crude but may help in distinguishing the most malnourished children.⁸
5. Eye changes with Vitamin A deficiency are identifiable from surveys and are of primary importance in some areas.
6. Simple laboratory tests for anemia and other specific deficiencies are available and becoming more so.

Integrated services for health, family planning and nutrition

Most analyses of the world food and nutrition situation present a gloomy perspective on the interaction between nutrition and population growth. They correctly stress the negative impact of population growth on world food balances and on achievement of economic and social objectives of development. Hence, birth rate reduction must follow mortality decline as closely as possible.

Since one effect of better nutrition is to increase population growth by reducing mortality, it is essential that family planning should accompany effective nutrition programs. Well nourished mothers seem better able to bear children. One reason why breast-feeding is important is because lactational amenorrhea helps to maintain birth spacing, but there is now evidence which suggests that its contraceptive effect is considerably less pronounced when mothers and children are well nourished. However, greater child survival increases child spacing (child death removes the contraceptive effect of lactation thereby shortening birth intervals).

Improved nutrition contributes to the reduction of fertility through other positive interactions. Potentially fruitful topics for study are suggested by a set of behavioral factors that have become evident in studies of programs integrating health, family planning and nutrition services. Unfortunately, a polarization has emerged between those who favor integration of nutrition with health services and those who oppose it.⁹

The issue has become symbolic of a major policy issue, with millions of dollars of international and national funds for family planning and health care riding on the roll of the scientific dice determining which combination of numbers is going to emerge from the analyses. Some extreme positions have been taken. On the one hand, there has been a pervasive but generally unspoken feeling that if health and nutrition activities lower death rates and exacerbate the population problem, then international assistance programs should not support expenditures on health and nutrition. There has also been a tendency for health advocates to try to obtain some of the family planning money which has been available in recent years. Such attempts were most common in situations where laboriously developed but scantily funded maternal and child health services were drastically reduced because personnel and facilities were coopted by large family planning programs.

The arguments against integration are usually couched in terms of the urgency of the population problem, the relative ineffectiveness and low status of health services in many developing countries, and the need to bring the birth rate down faster than the death rate because overpopulation is already evident in some countries.

Advantages of the integrated approach

In my judgement, the potential advantages of an integrated approach to nutrition, health and family planning seem much more compelling. To design an organizational structure and procedures for implementing integrated programs is admittedly a difficult undertaking, but there are five corent reasons which support the argument for administratively integrating this set of activities.

One argument is political, in the sense that aggressive family planning programs have created resentment and cultural backlash which in its most extreme form results in suspicion of genocidal intent. This is most evident in black Africa, but resentment of compulsory or quasi-

compulsory sterilization was a major factor in the recent national elections in India.

Another argument for integration is administrative, in that it is more efficient to combine personal services which require continuing contacts in the home. Multi-purpose community health workers can readily cover many areas – nutrition and health education, environmental sanitation and family planning – rather than duplicating key supporting costs such as training, travel time and facilities for unipurpose workers. It also should be noted that where health services are inefficient, separate family planning services tend to be inefficient also.

Further, there is a cultural argument for integration in that village people tend to link family planning with a whole complex of activities associated with mother and child care that seem naturally associated.

The motivational argument for integration of services capitalizes on improved communication at the interface between the service system and the home and community. The rapport created by health care activities which are constantly in demand can enhance acceptance of family planning activities normally received with ambivalence. This is especially true among the demographically important low-parity couples.

Finally, there is the issue of whether or not a linkage can be scientifically demonstrated between falling death rates and falling birth rates as direct and indirect effects of increased child survival. Uncertainty about the child survival hypothesis has emerged in the discussion of the pros and cons of integration. At first, it was accepted as common sense, but it has recently been strongly challenged, and is now moot.

Child survival hypothesis

According to this hypothesis, experiences with or fear of child mortality will tend to induce parents to have additional children either to replace those lost or as insurance against expected loss. At a recent conference of the Committee for International Coordination of National Research in Demography (CICRED) in Bangkok, demographers and family planning experts reviewed the available data and concluded that there was essentially no evidence to support the hypothesis.¹⁰ They showed that much of the shortening of birth intervals following child loss which had previously been cited as evidence for the hypothesis could be more reasonably explained by the cessation of the antifecundity effects of lactational amenorrhea. As is often the case, scientists have taken great delight in debunking what had seemed to be a common-sense idea.

As part of the original statement of the theory of demographic transition, it had been postulated that a decline in birth rate would almost automatically follow a fall in death rate. Many have become dissatisfied with such simplistic and mechanistic interpretations of the child survival hypotheses. My colleagues, Jeanne Newman and Narindar Kelly, and I have attempted to redefine the hypothesis in terms of the following propositions.¹¹

First, it is not true that a fall in death rates is a necess-

ary but insufficient cause for a fall in birth rates, because the opposite has been shown in a few historical demographic studies in Europe.

Second, it is naive to think that parents would automatically replace child loss on a one-to-one basis and then go beyond this to overcompensate. It has been said that such a demonstration would be necessary to justify health expenditures, because unless more births were prevented than were saved, money invested in health would produce net population growth. This was the main conclusion of the CICRED conference. The fact is, of course, that motivation for family planning is complex and no one variable can be expected to override other determinants of desired family size. Every partial influence must be examined. This is especially true because of the inexorable demand for improved child care.

Third, the practical impact of this hypothesis is not uniform over time but seems to depend on the developmental level of the country. The insurance effect appears to be greatest when death rates are beginning to fall and birth rates are still high — precisely the situation in which population growth is most rapid. The replacement effect seems to become evident after general practice of family planning and lowered family size norms have already placed considerable constraints on fertility.

Fourth, demographers have tended to classify child survival effects with volitional as distinct from natural causes of family limitation. But there is evidence that suggests they should be placed in a third classification of subconscious expectations which would also include many of the motivational influences related to the economic value of children.

Fifth, and of most practical importance, is the probability that child survival effects may be manipulable in contrast to many of the other demographic variables that have been studied. Retrospective data give little indication of the full potential of the interactions. But a direct effort to raise awareness of child survival from subconscious to conscious and personal decision making levels may be feasible in integrated programs. This opens up the possibility of identifying and systematically using family planning entry points as part of routine maternal and child health services provided by auxiliaries. Although it is frequently alleged that health services are too expensive for low-income countries, several studies have shown that under village conditions auxiliary-based integrated services can be provided for less than two dollars per capita per year.¹²

Evidence supporting this redefinition, with its important implications for integrated programs, has been mobilized from many sources. Time-series analyses of country birth and death rates showed a clear association: the rate of fall in infant mortality is highly correlated with the interval between infant mortality decline and the onset of fertility decline. This time lag has averaged about eleven years since the second world war.

Since data showing associations provided little evidence on causation, more weight should be given to nine in-depth studies of infant mortality/fertility re-

lationships done in six geocultural areas with particular attention to the sequential family building process. Similar data from four other studies associated with action programs were also analyzed.

Both types of studies were consistent in showing that the following wide variety of indicators of higher fertility were associated with a similar variety of measures of experience or fear of child loss.¹³ Fertility variables included birth intervals, number of births, ideal number of children, parity progression ratios, expected total births, approval of contraception, timing of contraception and effectiveness of methods of contraception used. Mortality variables included number of child deaths, fear of child loss, loss of child born preceding the measured intervals between births, community levels of child loss, perception of child survival and approval of insurance births. The various data sets included controls for parity, sex, lactation, surviving sons, maternal age and births in previous year. Lactation would have its main influence on birth intervals.

Of even greater importance were studies by Adlakha,¹⁴ Alam,¹⁵ Heer and Wu,¹⁶ and Rutstein,¹⁷ which separated the motivational from the lactational effect of greater child survival. They demonstrated a shortening of the second birth interval after a child death or a shortening of intervals among non-lactating women after a child death.

Even more significant in program terms are findings that relate child survival to the use of family planning. Studies of the relationship between child mortality and family planning show that among couples experiencing child loss, attitudes towards contraception were less favorable, current usage was depressed, and the timing of first use was delayed in comparison with couples without such loss. Perception of increased child survival was associated with greater use of the more effective methods of contraception.¹⁸

Challenge to planners

From the program point of view, the practical challenge is to determine how these motivational variables can be applied in mass programs. The spontaneous relationships that have been measured in retrospective surveys probably provide only a partial indication of what may be achieved through deliberate use of child survival motivations in integrated programs. If the motivational mechanism is subconscious, then direct efforts to increase awareness of child survival can become part of the use of family planning entry points in child care.

Some ten years ago, the Rural Health Research Center (RHRC) in India set up long-term prospective research in the Punjab at Narangwal primarily to test the child survival hypothesis.¹⁹ Various groups of villages received experimental inputs of different combinations of maternal and child care or family planning provided by auxiliaries in a research design which measured differential impact. Definitive data on fertility were not obtained because of political pressures that caused premature termination of the Narangwal research project. Family

planning practice and fertility decline more than doubled in the service villages as compared with controls. When the study ended, however, family planning practice curves in all study groups were still increasing and had not plateaued to show the ultimate impact of each combination of health and family planning. Nevertheless, the study did indicate some important changes in motivational patterns.

Despite the close agreement of the findings from all of the field studies on child survival, it remains difficult to evaluate the long-term demographic effect of reductions in infant and child mortality. Replacement and insurance desires should not be expected to override all other considerations as motivational forces. There is probably a spectrum of responses ranging from lower-parity children who are lost even though wanted, and are therefore replaced, on to children at higher parities whose births go beyond family expectations, so that there presumably would be no tendency to replace further losses.

These family-level relationships operate within broader community norms and expectations. At a development level, where eight to nine children are born and only three to four survive, as in many African villages, insurance and replacement desires may add three or more births. In more developed situations, where an average of four children are born and three survive, the potential replacement desire would undoubtedly be considerably less than one. As child mortality declines, the subconscious expectation of death would also normally decline but only after a lag period. The important issue is where on this spectrum does practical decision making lead to the practice of family planning? An important program component may simply be the education of parents who must understand that survival has improved and insurance births are no longer necessary. When conditions have improved so that expectations of survival are high, then replacement desires may become more explicit.

The indirect attitudinal effects of improved health on family decisions may eventually be shown to be more potent than the direct effects.²⁰ Expectations of child survival seem to be part of a general subconscious orientation towards the future which influences general attitudes towards development planning and hard work. Field studies to quantify these effects for populations at different levels of mortality and fertility, and in different geocultural regions, could make significant contributions to our understanding of the rationale for integrating health, nutrition and family planning services.

Nutritional impact of field programs

The lack of success in implementing most mass nutrition programs requires reevaluation of basic approaches. In recent years I have been involved in two field studies of nutrition and evaluated a third. A need for adjusting planning to the specific local ecology can be illustrated by comparing these case studies. They demonstrate the need to understand how local causal variables act at vari-

ous levels of development. They also demonstrate that nutrition interventions can produce major changes in some situations. Obviously, it will not be easy to achieve general implementation.

Narangwal

As mentioned above, a reduction in mortality was achieved at Narangwal with intensive, home-based, comprehensive child care by auxiliaries.²¹ Child mortality from ages one to three was reduced by 40% and infant mortality by about a third through a program combining infection control and focused nutritional supplementation based on close surveillance of all children.

In controlled trials where groups of villages received different interventions, infection control was more effective than nutrition alone for children under two years of age. Nutrition alone and infection control had equal impact on children from two to three years old. A significant prevalence of malnutrition continued even after maximum program impact. In longitudinal studies the amount of grade two and grade three malnutrition was reduced by about half; but then the reduction stopped and a hardcore group, mainly female children, continued to have recurrent marasmus in spite of intensive efforts by family health workers. The high-parity mothers did not have time to provide adequate care. It was evident that family planning was needed to reduce community malnutrition levels further. Significant improvements in health and nutrition could not have been achieved simply by increasing food production.

Companiganj

I was associated with a government health intervention study which applied the lessons of Narangwal to 120 000 population in Noakhali District, one of the most conservative and crowded parts of Bangladesh.²² Services were streamlined compared to those in Narangwal.

The Companiganj Project confirmed the observations from Matlab Thana that infant and child mortalities fall after the rice harvest and then rise before the next harvest. Clearly, here is one situation where just supplying food makes a difference. Percentages of children with third-degree malnutrition also fluctuated between a preharvest level of 22% and a postharvest level of 14%. Conditions were especially bad during the famine in 1975.²³

Beyond that, however, the project showed an improvement resulting from a care program which subsidized sale in health posts of *pushtikor*, a cereal-pulse mix prepared from local supplies in local mills. A successful family planning program, using mainly pills, takes much of the time of the project workers.

Cornwell County, Jamaica

Under the auspices of the US AID's Latin American Bureau, I helped to evaluate a nutrition project in St James Parish, Jamaica.²⁴ The key activities were carried out by community health aides (CHAs), who were rural

women trained in short courses and assigned to visit regularly a group of homes in rural neighborhoods. In one parish, intensive supervision was provided by two-month rotations of Cornell University medical students.²⁵

The finding was confirmed here that infant mortality had declined by half within a year after the program was started. In reviewing the inputs, it seemed probable that the activity which made the most difference was the weighing of children every month by the CHAs. This revealed to mothers the fact that a child who was not gaining weight was a sick child. As Jamaican mothers are very capable and food was available, they were able to take care of the problem once it had been recognized.

Summary

These three case studies obviously represent a spectrum of nutritional problems. In Bangladesh infant mortality ranges from 150 to 200 per 1000 live births or more during famines. The obvious nutritional planning need is to provide food. By targeting the use of food in association with family planning, it may be possible to produce change in both fertility and mortality. In the food surplus Punjab, where infant mortality ranged around one hundred, a more comprehensive care program of nutrition and infection control produced a significant decline in mortality. In Jamaica, with infant mortality below fifty, all that was needed was simple surveillance to identify lack of weight gain. Mothers were then able to take care of the problem and again reduce child mortality by half.

Program development

All programs which successfully provide comprehensive coverage for rural populations depend on auxiliaries. At Narangwal, the auxiliary nurse midwives employed had high school education plus two years of training. They learned the Narangwal routines in six weeks. Detailed functional analysis studies included careful work sampling which described time allocation in minutes per week and detailed cost data. Detailed household socio-economic data were also gathered over the four years of the study. The average per capita cost for the comprehensive care was less than two dollars per year.

At Companiganj, there was no trained pool of personnel to draw on and village women were recruited and given six weeks of training. The range of responsibilities was reduced in comparison with the Narangwal pattern. In all such programs, the key to effective implementation is supportive supervision that is primarily educational. An interesting analysis is emerging because about half of the village workers are illiterate and to date they are doing as well as the literate women. The cost here is about one dollar per capita per year.

A major question is how much can be done to persuade villagers to assume responsibility for their own health and nutritional care. In a project in Kenya, an effort will be made to test alternative ways of promoting community involvement. A first step will be for the

people to gather data to make their own community diagnosis. Then, village women will be trained to weigh children and to provide nutrition education as well as family planning and health care. A major unmet challenge is to work at the interface between services and communities to strengthen the capacity of the people to solve their own health problems.

Conclusion

The integrated approach to providing health, family planning and nutrition makes sense because it is complementary to other approaches. Clearly, it has to fit in with broad-based intersectoral development. It has particular appeal because it is made up of a package of flexibly adjustable components which include specific measures that people already want. It promises efficiency in the use of limited resources. It provides coverage for complete populations with considerable potential for bringing services to the rural poor. Another important consideration is that an integrated program resolves many of the ethical dilemmas associated with programs focused on single activities, especially family planning. Finally, it provides an opportunity for meaningful interactions between service personnel and communities.

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Discussion

Ivan Beghin (INCAP, Guatemala)

Concerning Dr Taylor's discussion of planning from below, a central issue is the question of how to arrange collaboration between community and central planners. Communities need the resources that central planners control. Central planners must understand community needs.

I cannot agree with those who believe that too much time and resources are spent on research in nutrition. Of course we need action, but we also need more research on behavioral and cultural aspects of, for example, the design of programs which integrate family planning, nutrition and health concerns in a consistent way comprehensible to the people in the villages.

The health sector has a primary responsibility to take care of the malnourished. Its second responsibility is prevention, especially prevention of the diarrhea that complicates malnutrition. In this case, there is sufficient evidence that the key factor is the availability of water. Malnutrition is related to other diseases

which call for preventive medicine, especially for immunization. Nutritional status will improve as preventive medicine and immunization services improve. The health sector has the responsibility of assessing the disease-related causes of malnutrition and of undertaking measures to reduce them.

Another responsibility of the health sector is the surveillance of nutrition status. Information is needed to plan preventive and curative services and the health sector should be providing much of this information. However, these problems are urgent and we cannot wait for full information before tackling them.

Of course, the allocation of these responsibilities will differ depending on the particular country. It is not only ministries of health that are involved, but also public works departments, the ministry of social security, and so on.

Considering the broader picture of nutrition planning, it must be recognized that it will take time to develop nutritional planning systems, but this is no cause for pessimism. As planners, we need to understand our role in relation to political decision making. We cannot content ourselves

with setting targets and priorities; politicians need support and reward for their actions, and planning proposals should take this into account. There should be continuous dialogue between planners and politicians, for it is the politician that we have to influence.

We must also be realistic in setting targets and defining goals which are feasible and meaningful in that they reflect some fairly reliable view of reality. Some of the targets we have set have been based on nothing more than educated guesses about the real situation. However, I think it is important to distinguish between planning and program design; program design is only part of overall planning. One of the dangers involved in promoting programs is that the promotion stems from a less than adequate overall integrated view of the problem and its possible solutions. After seventeen years of field work in developing countries, I would plead very strongly in favor of an integrated approach at all levels.

At the Institute of Nutrition for Central America and Panama (INCAP) there is presently a team of eight people which will expand to fourteen or fifteen next year, covering six

small countries in Central America. The team includes doctors, nutritionists, dieticians, systems analysts, as well as a demographer and two agricultural economists. In our three years of experience, we have come to feel that we should move from viewing nutrition as part of health planning to considering it as an aspect of overall development planning. It may be harmful to allocate resources for nutrition plans which are not fully associated with overall development planning.

We are trying one specific approach proposed by Joy and Payne. It is a method of presenting disaggregated information to define specific groups in terms of certain actions which need to be taken in relation to the particular groups.

In conclusion, I would add that I do not think there is any such thing as a nutrition planner. I do believe in nutrition planning teams, but I do not expect any one person to master nutrition, economics and every other subject on his own. Not many references have been made here to the preceding paper, but I fully agree with the basic statements put forth. Certainly the health sector has a role to play in relation to nutrition planning and this role is bigger than we realize.

**Henrik Blum
(University of California)**

Dr Taylor's paper presents the complex interrelationships between food, nutrition, health, family size, and birth control. Policy analysis and formulation are derived from an understanding of how these elements interact. As usual, it became clear that everything was related to everything else.

It seems that Dr Taylor is searching for fairly specific tools to be applied in an overall methodology that can be expected to work under many

conditions with suitable modifications. My own belief is that he will not come up with a methodology. He may devise a laundry list of available tools and another of possible factors to look for in each situation, and this may affect the selection of interventions in each specific situation.

There are many millions of malnourished in the USA due to poverty. The criterion of poverty is irrelevant. The poor in the USA are not buying potatoes in the street markets of La Paz or rice in the street markets of Asia, they are buying food in US stores, at US prices. They may pay more here for the package, its decorations and the trade name than for the food itself.

It is also interesting to observe the higher cost, more limited choice and lower quality offered to poor communities v wealthy ones by outlets of the same chain stores. And it is educational to observe the 25-30% markup on foodstuffs at the small neighborhood stores which serve the poor and the elderly who are trapped by their inability to shop around. In addition, the poor have more than their share of medical bills and a higher percentage of out-of-pocket costs than others. They also have a disproportionately high cost for housing. So they have less for food.

In other words, this is a plea for careful systems analysis of each situation to determine not only who is in fact suffering from malnutrition, but also what forces are operating in each situation that result in a high risk of malnutrition. The interventions that suggest themselves subsequent to such an analysis have a chance of being the right ones. Laundry lists of factors and of interventions useful elsewhere may aid that systems analysis. But systems analysis alone is not enough, even though it accurately identifies the forces that create malnutrition in a given group or place and suggests acceptable and feasible interventions.

The most important ingredient

in overcoming malnutrition or any other major problem is the degree of commitment to overcoming it. Without the commitment, even the systems analysis will probably be performed in such a shallow way that it will be misleading or meaningless. Food stamps as distributed in the USA in the 1960s represent one hypocritical, misleading, and close to irrelevant, intervention against malnutrition, in my opinion. Commitment is necessary for meaningful evaluation of the outcomes and impacts of interventions. This facet of planning is notoriously absent when it comes to low priority problems.

A third concern that follows commitment is the need for decision makers in a country to think in terms of the kinds of resources (and thus the sorts of interventions) obtainable through that country's own efforts, rather than in terms of dependence on gifts from abroad. A country must mount interventions in keeping with the sophistication of its labor force, the machinery it can maintain, substances it can produce, and so on. For example, high-flying Western medical technology is not only irrelevant to the bulk of health interventions needed in a poor developing country, but is also bankrupting. It attracts attention to the irrelevant.

A realistic perception of one's own resources is part of a realistic systems analysis. A dependence on gifts which ignore those resources or lead to a depletion of them by poorly thought-through interventions is tied strongly to a fourth concern; the risks of utilizing outside expertise. Outside experts, such as ourselves, commonly come with a built-in dependence on our own culturally defined goals, methodologies declared useful elsewhere, resources typical of our home base, and gifts associated with our presence that are expected to establish appropriate national commitments by seduction. These characteristics violate each of our precepts for effective planning.

Sectoral approaches to food and nutrition

Agricultural policy and planning

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An attempt is made in this paper to focus on those aspects of agricultural policy and planning which relate most closely to food and nutrition. Within this broad topic the center of interest is twofold: a quick and undoubtedly partial survey of some of the situations in which food and nutrition planning and policy making is practised and the problems involved; and a review and appraisal of the state of the art relating agricultural sector analysis, planning and policy.

The core of the ideas and case material presented comes from experience gained in the work of the Food and Agriculture Organization (FAO), but it is neither an official presentation of FAO's program in this field, nor is it offered as an official statement of FAO's view. The presentation moves from a discussion of problems of agricultural sector planning to a discussion of agricultural sector analysis as a possible preplanning input for food and nutrition planning and policy making.

Agricultural policy making: formulation and implementation

Agricultural development has not generally resulted in nutritional improvement. Frequently, it has resulted in no improvement or even in a worsening of nutrition status. There is a further problem, too, in the translation of plans into reality. Even where plans are implemented as conceived, implementation is often slow. Four major agricultural policy areas can be singled out for attention: production policies, marketing and storage policies, price policies and consumption policies.

With nutrition concerns in mind, production policies and programs need to be considered with regard to their effects on total and regional production as well as the production of identified target groups. The main prob-

lems in plan implementation with respect to production programs are:

- Overoptimistic planning and target setting (resulting more often from misplaced political pressure than from technical incompetence).
- Unforeseen administrative constraints.
- Plan revision following political changes.
- External factors beyond the control of government which prevent the realization of targets.

Across the board in most developing mixed economies, food production performance remains roughly 30-50% below planned target growth rates. This should not detract from the fact that food production is growing in developing countries at about 2.5-3.0% per annum, an unprecedented performance level over long periods, even for developed countries.

Concerning marketing policies, the central issue in nearly all developing countries is the sharing of market functions between private entrepreneurs and public or quasi-public institutions. The record here is a mixed one, but public intervention in the marketing functions seems generally to have been premature. Marketing margins are usually high as a result of the general inefficiency of most systems, but it seems that the profit incentive motivating private entrepreneurs still results in lower costs than public administration. Underlying the problem is a tendency to underestimate marketing and storage costs.

The fundamental issue relating to price policies is the conflict of interest between producers and consumers, which frequently results in a clash between political and economic development interests. Price policies often include implicit or explicit subsidies to producers or consumers and the 'stickiness' of down-

Sectoral approaches to food and nutrition: agricultural policy and planning

ward adjustment in subsidy levels is now proverbial and results in resource misallocations in the economy.

Selective price regulation to lower prices for staples to the urban consumer may depress supplies for those items. (Egypt in the 1960s was a good example of this situation). In price policy decisions, the concern is both with relative levels of prices and with their stability. Inflationary pressures existing in many developing countries require frequent adjustments in administered prices and this creates almost permanent political conflict, uncertainties and major distortions of relative prices.

Consumption policies here include those policies which aim to influence consumption levels through measures other than those discussed above. Consumer education and institutional or other direct feeding programs provide the best examples. Commonly, such programs can cover only a small portion of the target population and resources are usually too scarce to achieve the targets set. For many nutrition education programs, too, the programs are less effective than predicted.

Disaster-relief feeding programs with their highly specific geographically defined target groups should be mentioned. Results here are again mixed; there have been a number of instances where political and market forces have deflected the supplies of food from the target population.

Improved planning could distinguish between feasible and non-feasible proposals and set out a consistent path to the achievement of targets within the limits of operative constraints. The next section discusses some representative patterns of agricultural planning in relation to their nutrition orientation.

Agricultural sector planning

Agricultural planning is concerned with the detailed path of development and the achievement of targets set, possibly including food and nutrition targets. Many of the problems which face agricultural sector analysis (ASA) are those of multiobjective policy analysis more generally. Difficulties associated with the weighing of objectives are closer to the political decision making process and appear less severe because they become 'given' parameters for the planners themselves. Ideally, though, the relationship between planners and politicians should be reciprocal.

Four approaches to the inclusion of food and nutrition planning in practical agricultural sector planning are analyzed here: centrally planned socialist countries, developed market economies, developing *laissez-faire* market economies, and developing economies which engage in formal planning within the framework of a mixed economy.

Centrally planned socialist countries

It is useful to distinguish again between phases of development as related to reliance on the market for

distribution. In the early stages of building socialism, there has been a tendency, often influenced by recovery needs from wars or revolutions, to organize the food economy, at least for the main staples, through state production purchases and distribution. Often rationing systems are used to ensure minimum diets and just distribution under scarcity conditions. It could be said that, in practically all cases, as soon as scarcity conditions eased, recourse was made to market operations and rationing was abolished. This may be taken as an indication of the perceived high costs of the rationing system, both in terms of administrative costs and disutility from the consumer's point of view.

In most situations of this kind, food planning aimed to cover nutritionally defined minimum diets, with little attention to taste preferences. Since there were direct controls over most of the production capacity, little use was made of the market or price mechanism either on the production or on the consumption side.

In the post-recovery phases, most socialist countries have turned to more flexible management of their food systems. Still, at present there are major differences in terms of direct control, retail convenience and consideration of consumer choice preferences among various socialist centrally planned countries. At one end of the spectrum, Yugoslavia and Hungary make substantial use of market forces in the guidance of food production and consumption as compared to the USSR or Romania where direct controls and informal rationing are still in effect.

Even in periods when food is not scarce, nutritional considerations enter clearly into the planning and management of the agricultural production potential. Good examples of this are the relative price policies pursued with respect to staples v luxury food items. There is also a considerable institutional feeding component in the total diet and considerable influence is exerted on the food intake of a large share of the population through that subsidized channel. Increasingly, all Eastern European countries have entered into a development and income phase where their basic nutritional needs are well covered and central issues of food management are much more concerned with the taste and income based demands of the population than with their nutritional needs.

Developed market economies

During times of peace in these countries there is little planning and relatively little concern with attempts to influence food intake and nutrition, with the exception of the growing interest in the problems of underprivileged groups. There are some minor attempts at nutrition education of the consumer countered by negative effects of commercial advertising. At the same time there are two developments which have aroused attention in the recent past. One is a direct result of overeating and this has little relevance to considerations for agricultural planning with the exception of certain

dietary changes such as shifting from butter to vegetal fats for health reasons. A more important agricultural policy and planning question may be described as the 'food security' syndrome, which includes both the attempts to regulate exports and influence storage and supply decisions at government level.

Developing laissez faire market economies

This is a small group, including those countries which either have not yet reached the level of administrative ability to manage the country within the framework of major state participation in the economy, or have such a comfortable financial position (eg. oil exporters) that they do not need to turn to state control of the economy for rapid development. Decisions about food production and distribution in these situations are left mainly to the operators on the open market and government planning in this field is practically non-existent.

Developing market economies with a mixed economy

These include the bulk of the developing countries. State intervention is an important component of their development process and in most cases it includes formal medium-term planning of the economy. Where the food situation is relaxed, little attention is paid to food policy, although there may be growing concern for the plight of special groups. In others, food and nutrition objectives are among the principle concerns of planning and influence overall strategy and policy choices. Food scarcity in these countries is a serious constraint on general economic development.

In these countries food and nutrition objectives appear to enter into the planning process in two main forms. One of these is the concern with the physical availability and low price of basic staples, usually cereals for the population at large, but especially for the lower-income groups. Reflections of this concern may express themselves in the planning of production, storage distribution and pricing, frequently by efforts to provide safeguards for the lower-income groups. The other aspect is related to the market demand of the urban middle class, which usually has quite powerful influence on government decisions. Here the policy usually is to provide these items to the consumer at prices below those which would rule under fully open market operations. Subsidized urban milk schemes and control or subsidization of meat prices are examples of this type of planned intervention.

The main problems with food and nutrition oriented agricultural planning in these situations is the frequent lack of real assessment of the impact of policy measures and development programs in relation to food and nutrition targets, whether they are formulated at national levels, which is the most common case, or for specified target groups. It is here that the methodological developments and improvements in the ASA tool-kit suggested below could also provide high returns.

Agricultural sector analysis

ASA as a more or less formalized approach and tool has been developed and more widely used in developing countries only in the course of the past decade - thus, it is a relatively new field of activity with a resulting fluidity in approach and an ongoing experimentation and development of new methodologies. Before entering into the details of how ASA treats food and nutrition, it is useful to clarify the difference between it and agricultural sector planning. The agricultural sector analysis is a preplanning exercise. It aims at analyzing the relationships within the agricultural sector, between demand and supply, between output and input, between various multiple objectives and the programs which help to achieve them. It also analyzes the relationship between the agricultural sector and the rest of the economy, both in terms of resources and income flows. Once ASA has identified and quantified these relationships, the planner is able to develop in detail the programs and projects which, after their acceptance by political decision makers, would implement the policies aimed at reaching the development objectives, by now converted into specific plan targets.

It was the magnitude and the growing complexity of the problems involved in agricultural development which created the need for ASA. It analyzes the results of population and income growth rates, coupled with rapid urbanization and their implications for required rates of growth in food production, and for the allocation of resources to agriculture.

The growing complexity of agricultural development policies is the result of two major trends. The first of these is the growing technical and institutional complexity of agricultural production as it moves from predominantly subsistence to predominantly commercial farming systems. The second trend may best be described as the growing recognition that sound development demands the use of multiple objectives for its guidance in resource allocation and policy and program development. Multiple goals or objectives increase the complexity of development planning not only because they require more complex methodology to deal with the analytical problem *per se*, but also because they call for multidisciplinary analysis. It is recognition of multiple-objectives which links ASA to food and nutrition planning and requires us to look at it more closely.

A wide range of methodologies and models of agriculture have been developed in the past few years. The typology and review of various agricultural sector analyses and models of agriculture presented below follows closely the classification developed by Thorbecke.¹ At the same time, this presentation includes some more recent developments and it is also biased towards presenting in more detail the activities of FAO in this field.

In Thorbecke's typology, two main criteria are used. The first of these is the level of formality of the model and the second relates to the 'sets' or domains which are covered by the model and the links between the sets

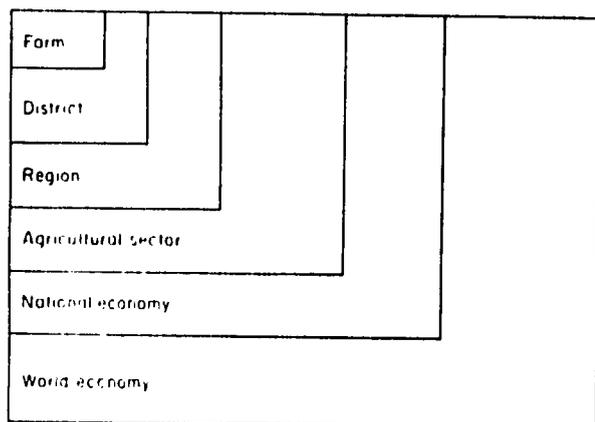


Figure 1. Sets or domains of analysis.

which are included. Figure 1 gives a simple view of sets or domains. In the following section a short description is provided of the major types of models and their relation to food and nutrition planning is appraised.

Non-formal general equilibrium-consistency approach

This is the least formalized approach, using only a minimum of quantitatively defined explicit relationships: it is 'open-ended' and thus flexible in adjustment to specific situations. Three prototypes are discussed below.

*FAO's Country Perspective Studies.*² This program grew out of FAO's previous activities connected with the preparation of the Indicative World Plan³ and was started in 1972. The original objectives of the program were to initiate an agricultural development policy dialogue with the governments concerned on the basis of the analysis of alternative development paths for the agricultural sector, and to improve FAO's understanding of the agricultural development problem at country level.

As the program has developed, two further objectives have become important: to provide a perspective analysis of the agricultural sector which could offer a sound basis for the development of the agricultural sector within medium-term plans of economic development; and to help identify projects and programs within agriculture within the scope of the policy framework developed in the analysis to be carried out either by the governments themselves or with FAO and other outside aid.

Country Perspective Studies have been completed for Egypt (1973), Sudan (1973), Nepal (1974), Bangladesh (1974), Iraq (1974), Iran (1974), Pakistan (1974), Malaysia (1975), Ghana, Zambia, and Tanzania (under completion). A very similar regional study following basically the same methodology was completed for seven countries of the Sahel Region (Senegal, Gambia, Mali, Mauritania, Upper Volta, Niger and Tchad) in 1976.⁴

The methodology used in the Country Perspective Studies is relatively simple, and may best be compared

to a budgetary analysis in farm management, where stated objectives are to be reached through a trial-and-error process with informed judgments within the constraints of resource availabilities, technologies and social circumstances.⁵ It considers a large number of variables, but their treatment is often more implicit than explicit. The process can be broken down into the following main steps. First is the completion of a so-called 'Policy Issue Note' which explores the present and recent past agricultural situation of the country, flags some of the major development issues for agriculture, and examines main government policy lines. After this note is discussed with the government and agreement is reached on major policy issues to be explored, a set of alternative *macroeconomic projections* are carried out, using alternative assumptions with such variables as population growth, Gross Domestic Product (GDP) growth, foreign trade, or investment. These macroeconomic projections, which include a substantial amount of normative alterations, are organized into a macroeconomic framework, which is basically a simplified set of UN National Account Tables.

Given the macroeconomic framework, and from it personal consumption expenditure estimates, fairly disaggregated *demand projections* are carried out. These are done usually for two or more alternatives, based on different production, consumption and expenditure growth rates per capita, and show individual commodity quantities demanded, assuming constant relative prices of the commodities. The demand projections cover about 20-30 items, including a few non-food ones (cotton, tobacco). Domestic demand is either treated at a national non-disaggregated level or in certain specific cases separate estimates are made for parts of the population (urban rural, regional). The derived draft demand estimates are checked for nutritional consistency, as the long-term nature (up to twenty years) of the estimates can result in highly inflated/deflated caloric intakes, which need correction.

In the next step, crude *production projections* are carried out to see whether past trends would satisfy requirements as defined by domestic food demand, domestic raw material demand and potential export market demand. This is a relatively simple exercise of projecting area yield and production of individual crops and choosing the most rational pair of the projected values and calculating the third. In most cases past trends of production are well below those required by estimated demands.

Next, a set of *normative production proposals* are developed. These take into consideration resource constraints, possible changes in technology, and thus productivity - in institutions serving agriculture. They are carried out by an interdisciplinary production team which develops production proposals crop by crop into an output mix, which represents a good, not necessarily optimal, use of resources towards meeting defined objectives. The output mix is then in turn valued at farmgate prices and after the value of identified inputs is

deducted from the Gross Value of Production, national level GDP from agriculture is derived and the earlier projected estimates made in the macroeconomic framework are revised as necessary.

The implications of the resulting demand projections and supply proposals are also evaluated (wherever possible quantitatively) with respect to other objectives of development: for example, nutrition, employment, income distribution between regions, balance of payments, rural non-agricultural development. Finally, a set of policy recommendations conducive to the attainment of the production and consumption goals are formulated covering such areas as structural and institutional changes, investment policies, price policies and technical assistance.

The Country Perspective Studies deal with food and nutrition planning and policies in a number of ways. The first is in the dialogue with the government concerning development objectives and issues. Food self-sufficiency, nutritional improvements, improved income distribution among groups of the population or among regions may be taken into account. The relative importance of food and nutrition related objectives in the studies has depended mainly on the interest of the government, and it was also the specific nature of this interest which defined the orientation of the food and nutrition analysis included. In general, it could be said that the Country Perspective Studies, as they developed over time, have tried to take into consideration food and nutrition policies through the analysis of five areas:

- Food demand based on effective economic demand, i.e. standard demand projections.
- Demand for food defined via some form of modified economic demand projections reflecting nutritional requirements.
- Effects of urban-rural and other income differentials on nutrition.
- Production potential in relation to nutrition.
- Applied nutrition programs for identified groups.

The main thrust of the food and nutrition analysis was anchored, however, around standard economic demand projections and rather informal nutritional considerations in the formulation of production and import proposals. Approaches to a number of specific food and nutrition issues as they were analyzed in individual studies are presented below by way of illustration.

The Zambia Study demonstrates well the opportunities for the improvement of standard demand projections in situations where relatively detailed household consumption data are available. In this study separate demand projections were developed for four socioeconomic strata, according to their relative integration into the money economy: urban population, township population, rural monetized and rural subsistence. The data came from a reworking of the report on *The Food Economy of Zambia*.⁶ In addition, food consumption was differentiated by provinces, thus further reflecting income differentials and patterns of

diet, especially for those strata relying more heavily on their own production. A distinction was also made between the consumption of marketed and home-produced, home-consumed foods.

The expected shifts in the population between the strata, which were estimated as trends and then adjusted in the light of policy objectives, and the differential income growth between strata and between provinces gave a much richer account both of the present situation and of the future possibilities. The demand projections themselves were run according to the standard FAO method. This treatment offered some interesting opportunities to bring together regional ecological production opportunity differences with differences in diets and demands. Furthermore, it gave a good indication of the magnitude of the future demand for the marketed share of foods, a parameter of great interest to the Zambian government.

An even stronger regionalization of production and consumption planning is being attempted in Tanzania and of necessity the Country Perspective Study for the country had to reflect this goal of the government. However, in this case, the whole regionalization of both production and consumption rested on extremely weak data, which has made it difficult to reconcile production and consumption estimates for the present period. Interesting aspects were the special efforts of the government to foster the production of more drought-resistant crops, mainly cassava, millets and sorghum, to replace maize in an effort to reduce year-to-year fluctuations in food supply. Some of these policy directions appeared to have been too hastily constructed and to have given too little consideration to the desires and eating habits of the people or farm production patterns and opportunities. However, even the crude attempts to build rough regional food balance sheets for the major food commodities have resulted in some important findings with respect to the problems which could emerge if present government policies are continued.

The analysis of income distribution among groups of farmers specified according to the main line of agricultural activities which they pursue (rice farmers, rubber smallholder, rubber plantation workers, etc) was an important feature of the Country Perspective Study carried out for Malaysia. A simple income payments and receipts matrix yielded some very useful insights into some of the major policies which need to be pursued in Malaysia if the poverty reduction goals of the government are to be achieved. While income levels were not linked to food consumption/nutrition, more recent cooperative efforts by FAO with the Government of Malaysia are aimed at exploring these relationships and making them a part of the policy framework. This is discussed further in the examination below of suggested new approaches.

Given the extreme pressure on food production resources, the rapid growth of population and a very small non-agricultural income base and opportunity, the planning objective in the Country Perspective

Sectoral approaches to food and nutrition: agricultural policy and planning

Study for Bangladesh was to produce a minimum satisfactory diet. It was recognized that achieving production targets to satisfy effective demand might not achieve this. Actual dietary levels had fallen well below those achieved earlier. One interesting possibility which was explored in that study was that of Bangladesh exporting rice and buying back wheat on the world market, as a means of increasing the availability of both calories and proteins.

A different set of problems was faced in Iran. There, a very rapid increase in income levels had created exceptional increases in demand for certain items of high income elasticity. Accelerated by government food subsidy policies, growth of total food demand seemed well beyond the production potential of the country. The study was carried out during the height of the 'world food crisis' of the early 1970s, at a time when the Iranian government feared that it might not be able to rely on the world market for its needed food supplies. Thus it was felt that any long-term food policy planning exercise should explore the opportunities for maximizing food value output from domestic sources.

Two large-scale studies were commissioned to explore, first, the possibilities for maximum domestic animal protein production and, second, an optimal cropping plan to meet target dietary patterns.* The Country Perspective Study relied more on a conventional demand projection to arrive at a domestic production and import policy for food so as to achieve reasonable levels of self-sufficiency in major staples in a way which used the comparative advantages of Iran's production potential.

The limited available information on income distribution and the extreme sensitivity of the Iranian government on this issue did not permit the exploration of many of the income-related nutrition problems which were, however, estimated to be serious in the lower-income rural groups, especially in the more isolated areas. Discussions with the government explored its reactions to the problems of pursuing a food availability policy which was in conflict with its food price policy and also, to some degree, with its agricultural development policy goals.

The above examples show that food and nutrition objectives receive attention in Country Perspective Studies, but that success in tackling the specific food and nutrition problems depends on the policies governments wish to explore and, to an even larger degree, on the availability of data which would permit more detailed and reliable analysis.⁷

Critical evaluations of Country Perspective Studies have shown that, while their simple approach has many advantages, they also suffer a number of shortcomings. The simplicity of the approach permits their use in most

developing countries. They take a relatively short time to complete. (Three studies undertaken concurrently occupied our team for 13-14 months.) The process of analysis is easily incorporated in the institutional planning set-ups of most developing countries; the methods of analysis are understood by most senior decision makers in agriculture, and the results are thus easy to communicate to the users.

However, the approach would not always produce the same results as it involves a large amount of judgment. Also, the simple but slow analytical processes do not permit the development of more than perhaps two alternative policy scenarios. Nor is the approach suitable for the derivation of shadow prices and its reliance on a constant relative price system is also a severe handicap. Disaggregation of the agricultural sector into subsectors of relevance to nutrition concerns has been feasible only to the extent reported above. The quantification of multiple objectives, and orientation of the proposed action towards them, is only implicit and the force of the conclusion is diminished thereby.⁸

*The Guatemala Study of Fletcher et al.*⁹ This study is another representative example of a consistency approach to sector analysis. A general equilibrium framework was used in preparing the sector study of Guatemala. It is a broad-based study and analysis of Guatemalan agriculture within the context of the national economy which emphasizes the role of agriculture in the overall process of economic development of the country. In general, this study suffers from the same limitations as those previously mentioned with respect to the Country Perspective Studies.

The World Bank Agricultural Sector Survey of Zambia. This represents a third type of approach, ie an analysis of a country's agriculture from the point of view of a major donor with the aim of identifying major sectoral issues and related project opportunities and policies, thus guiding the lending agency in its loan program.

The World Bank Zambian sector survey has some special features which set it apart from the usual reports of its kind. In the first instance, it explicitly set an 'analytical horizon' of twenty years on such components as demand projections and quantified interrelationships between the agricultural and non-agricultural sectors of the economy with respect to income, consumption, savings, investment and other macroeconomic variables. It also analyzed in substantial detail some of the subsidy, price and marketing policies and government institutions in relation to both short-term and long-term agricultural development policies.

The demand analysis used the same household consumption data as the Country Perspective Study for Zambia, but its analysis was more aggregated, and only limited use was made of the derived demand projections in appraising supply projections. The policy rec-

* The Animal Protein Production study carried out by the US Federal Meat Commission (FMC) and the Master Cropping Plan were developed by Booker Brothers and Hunting Technical Services. Both were presented as confidential consultants' reports.

ommendations and the identified action possibilities focused on projects in which the Bank could participate or which would facilitate the successful operation of Bank-supported projects (eg price, subsidy and marketing policies). The main food and nutrition oriented recommendation was that subsidies on food (mainly on maize) be reduced and it reflected a careful appraisal of the benefits and costs of such an action.

Linear programming models

The Iowa State University Thailand Model. The linear programming (LP) model underlying this study is based on information drawn from a farm sample survey covering six thousand farms in sixty regions of the country. The national model is to be an aggregation of the regional submodels with a transportation submodel linking them.* It aims at developing interaction models between agriculture and the rest of the economy and further improvements by the incorporation of endogenous price determination.¹¹

This model is designed to maximize income and to raise the income of the poorest in agriculture. The only nutrition related objective is the satisfaction of a very general food production requirement. The food demand estimates are used in the study only to explore price implications.

Perspective Study of Agricultural Development of the Sahelian Countries. This study of FAO was completed in spring 1976.¹² Its basic methodology was quite similar to the one followed in most Country Perspective Studies and in the FAO Perspective Study of World Agricultural Development for Latin America.¹³ The agro-climatic zones of the Region and of the countries were differentiated, and a simple LP model was used to analyze production potentials with specified input and other constraints. The demand projections were necessarily rather crude given the poor data, but the usual nutritional consistency tests were applied and special nutritional program proposals were taken into account. Food availability was assumed to be primarily from domestic sources, and production for subsistence was assumed to have a prior claim in the allocation of resources over production for the market. Alternative runs were made with the model to test sensitivity of the results to different levels of assumed constraints concerning input availabilities, internal migration among regions and institutional support for development.

Microeconomic-dynamic recursive programming models

These models are built entirely from the bottom up from individual farm units within a region. The farm is viewed both as a production and a consumption unit. The most representative examples are those of Singh,¹⁴ Day and Singh,¹⁵ and Mudahar¹⁶ for the Punjab, and

Ahn and Singh for Southern Brazil.¹⁷ The importance of this approach is a realistic depiction of the farmer as a decision maker both in production and consumption. Also the models are dynamic, thus showing cumulative changes over time. In general, these models permit realistic assessments of responses to proposed policies. They also allow the analysis of the distribution of benefits between socioeconomic groups by decomposing regions by farm types and size. Their main shortcoming has been the lack of treatment of linkages to the rest of the economy and to other regions of the country.

Multilevel planning models

The central characteristic of these models is the explicit structuring of the relationships between different levels in the agricultural sector, ie farms, districts, regions, and also between the sector and the rest of the economy. Two examples are discussed below: a study carried out by the Development Research Center of the World Bank for Mexico,¹⁸ and the Agricultural Sector Analysis for Tunisia supported by FAO.¹⁹

CHAC: an agricultural sector model for Mexico. This is a linear programming model designed by Duloy and Norton. It deals with agriculture at four levels, (farm, district, region and nation), specifying constraints at each level. It generates prices endogenously and models the highly dualistic nature of Mexican agriculture. A transportation submodel links the components together into a national market. Its main objective is to provide a basis for project decisions by permitting much improved project evaluation, including feedback effects and competition for resources across a wide range of types of projects and locations. It has relatively little direct concern for nutrition, but might well be adapted to examine such issues.

The Agricultural Sector Analysis for Tunisia. This is a model similar to CHAC in that it maximizes consumer-producer surplus and thus generates commodity prices endogenously. It specifies four agricultural regions and, according to their characteristics (particularly population depending on subsistence production), constrains production of each commodity to be at least equal to the observed subsistence consumption. The surplus is marketed at prices generated by market demand functions. Some of these are defined for the economy as a whole while the rest are specified at the regional level. Demand projections are made on the basis of regional population estimates (and regional aggregate income growth assumptions) since interregional migrations are not endogenously treated.

Extensive use has been made of FAO country food balance sheets and the resulting food basket for consumers has been checked to determine its reasonableness in terms of implied protein and calorie intakes. This has probably been done because of lack of statistical data of a nature that would have allowed the model

*A somewhat similar effort is made in the USAID-supported LP model analysis for Colombia. Daines et al¹⁰ describe the main features of its methodology.

builders to use econometric methods for the estimation of demand relations. The calibrating process made use of parameters assumed on the basis of *a priori* general knowledge of the situation and on the basis of analogies with similar situations. Experimental runs of the model have also been made with specific nutrition targets in addition to runs with other main objectives for agricultural development.

One of the direct future uses of the model will be in connection with the food and nutrition planning exercises intended as part of the formulation of the next medium-term plan. FAO will help Tunisia to formulate alternative food and nutrition policies with respect to selected target groups, recognizing the socioeconomic factors which influence nutrition behavior, and the alternative policy and program proposals will be tested through the model for their quantitative implications with respect to other development objectives.

Systems-science simulation models

These large-scale, interdisciplinary models may be best represented by the Nigerian²⁰ and Korean²¹ models built by researchers from Michigan State University under the leadership of Glenn Johnson. These models are composed of submodels, each simulating certain functional relationships within the economy. In the Nigerian model, two major regional submodels were generated and these contained production, marketing and consumption activities for a number of crops which provide income to the regional populations. The models can be applied to the analysis of policy proposals to explore their effects on per capita nutrition and other concerns.

The Korean model is similar, but builds on the experience gained in the Nigerian study. The complexity of these models, however, makes their use in practical policy work rather limited.

Models emphasizing relations between agriculture and the rest of the economy

A special type of agricultural sector model may be added to the typology developed by Thorbecke. This class is characterized by its focus on the interrelationships between the agricultural sector and the rest of the economy. In most cases it also specifies a minimum number of technological subsectors within the main sectors identified.

It is important to recognize that these models in most cases have been explicitly designed to deal with a specific aspect of agricultural sector analysis in its intersectoral respects. They should not be viewed as potential substitutes for agricultural sector analysis but rather as supplementary to it. Representative examples are the Byerlee-Halter submodel²² of the Nigerian model discussed above, the Blitzer Dynamic Simulation Model for Zambia,²³ the Martos-Lin Demographic, Employment Intersectoral Models,²⁴ and the Mellor-Mudahar Simulation Model of Modernizing Agriculture, Employment and Economic Growth.²⁵

Byerlee-Halter macromodel. The model is a simple simulation model built on an input-output framework. Its main objective is to provide an opportunity to embed an agricultural sector analysis into an economy-wide framework and to demonstrate intersectoral linkages. The linkages are both backward and forward from agriculture to the rest of the economy. The model takes into consideration structural and income distribution issues by breaking up both the agriculture and non-agriculture sectors into size-defined subsectors expected to reflect a dualism between labor-intensive traditional and capital-intensive modern industries and agriculture. The model has been developed explicitly to interface with the above-mentioned Nigeria model of Michigan State University, but it also aims to provide a generalized model for developing country situations with weak data bases through its restricted data requirements.

The interaction between the sector model and the macroeconomic model is reciprocal. The macro model provides estimates of population, urban food demands and migration for use in the sector analysis. For variables to be passed up from the sector analysis into the macroeconomic model, a major disaggregation is possible within the sector analysis and thus a direct link to policies and programs. Interesting results have been shown by runs of the model to depict export-oriented and domestic food promotion-oriented policies or mixes of the two.

The authors feel that the model is not only capable of interacting with formal sector models, but can also be used in situations where only an informal analysis of the agricultural sector is available. From the food and nutrition point of view, the model could be used successfully to estimate food prices and generalized food consumption. A differentiation of subsectors could be used to provide income distribution estimates, but more commodities would need to be explicitly modeled for it or be used for food planning. It seems to be a highly useful tool in the explicit field for which it has been developed, i.e. to be the background for more detailed agricultural sector analyses.

Blitzer Dynamic Simulation Model for Zambia. The objective of this model is to generate quantitative estimates of major policy parameters which could describe the longer-term results of specific policies pursued with respect to income distribution, subsidies, taxes, prices and savings-investment in the economy. The model reflects the strong dualistic nature of the Zambian economy with a high-income, export-oriented mining sector supporting a high-income, modernized urban economy and a predominantly subsistence-oriented agriculture. Important food and nutrition implications of the model relate to taxes and subsidies and the whole gamut of price policies as they influence both incomes to farmers and food prices to urban consumers. One of the central issues explored in the simulation runs of the model has been a major reduction in the subsidies spent on

food (mainly maize meal) and the use of these savings for investment, thus reallocating income to future periods.

Already the Zambian Government has made use of the food subsidy suggestion of both the World Bank/Blitzer and the FAO/CPS Zambian studies, to effect major reductions in subsidies on food consumption. The model itself is a dynamic simulation model which accumulates non-normative estimates over a long time period.

Martos-Lin Demographic Employment Intersectoral Simulation Model. This presents a conceptual and quantitative framework which would serve as a means of integrating population components into its long-term perspective development planning with special focus on demographic change, food v non-food household consumption in the rural and urban areas, agricultural growth and the overall economic development. The methodology adopted is systems simulation. The interdependence of the selected demographic, economic and government sectors is explicitly recognized within a total systems framework. The objective is to improve our understanding of the interrelations and feedback effects between population growth and economic development in the development process, thus enabling the local and national planners to integrate more fully the population components into the overall development program.

The simulation model consists of five submodels, namely: national accounts, agriculture, industry and service, labor market, and population and its related socioeconomic components. Each submodel is further divided into two to four sections. The model, within the framework of dynamic multisector analysis, consists of two parts. One describes the demographic features of a country and the other the economic features. On the demographic sequence, population growth and its age and sex distribution affects consumption and demand for education and health service and therefore capital formation. On the other hand, increase in population will increase the supply of labor force, thus also implying the need for the related policy on enlarging labor absorption capacity and creating employment opportunities.

On the economic sequence, initial value of sectoral investment and its capital stock together with labor inputs and technical progress determines Gross National Product by sector with the sum being equal to the economy's GDP for the first year projection. The year's GDP consists of consumption, capital formation and external trade. The available investment and its capital stock together with labor inputs and technical progress determines the economy's GDP in the following year, and this process is repeated each year for the duration of the projection. The sectoral investment also determines sectoral employment of labor in the formal sector by an incremental capital employment ratio, where employment potential as generated by capital

formation is further conditioned by the degree of the tightness of labor market.

The industrial breakdown, with distinction between informal v formal sector and endogenous specification of rural-urban migration and labor switch from the informal to formal sector, can also potentially be facilitated to evaluate policy with respect to labor absorption, employment potential, rural-urban migration and income differential by sector (using productivity differential as a proxy in this model) which are important issues for food and nutrition planning. Other major features of this model include:

- The incremental food v non-food consumption in the rural and urban areas is broken down into the effects respectively accounted for by the changes of household units, household size, rural-urban migration and household expenditure.
- The agricultural sector is further disaggregated according to small v large farm size and rainfed v irrigated farming. This sector disaggregation is essential for analyzing the structural transformation of GDP and labor among the sectors in response to the government program and the policy target variables, which would shed some light on reflecting the policy issues of regional development and income distribution.
- The government sector and selected economic-demographic policy target variables are explicitly introduced into the model. Food self-sufficiency strategy is also built into the model to take account of the objective of reducing the dependence on external sources of food supplies.

Mellor-Mudahar Simulation Model of Modernizing Agriculture, Employment and Economic Growth. The need for modernizing agriculture, especially the food grain production subsector, and the repercussions of such changes on the supply of wage goods and raw materials to the non-agricultural sector, income distribution patterns, employment and migration patterns, intersectoral resources transfers, and changes in non-farm consumer demand constitute the center of interest in the study. The model has been developed for countries where there is a combination of a large population base with relatively elastic labor supply; acute food problems and a relatively inelastic food supply; high marginal propensity to consume food grains by the low-income laboring class population; and scarcity of capital with less than perfect capital-labor substitution. The authors describe the model as follows:

The model developed is a simultaneous equation system simulation model. The purpose of it is not to estimate the coefficients of the simultaneous equation system, but to generate a growth path for each of the endogenous variables included in the model. . . . It is highly aggregative and is for the Indian economy as a whole. However, the economy is divided into agricultural and nonagricultural sectors. The agricultural sector is further divided into foodgrains and nonfood grains sectors.

The foodgrains are produced by using both traditional and modern technologies. The nonagricultural sector is further divided into agro-industrial and nonagro-industrial sectors. All the sectors are linked with each other through several simple 'feedback and coupling functions'.²⁶

Through the focus on wage goods for the low-income class, the model emphasizes the role of food grains in the interrelationships between agriculture and the rest of the economy. It provides only a highly aggregated picture which would need to be substantially disaggregated for practical policy purposes. Its food and nutrition implications are direct: although it is not concerned with specific nutrition objectives, the income-consumption link and the importance of employment for the income generation of the lower-income classes provide useful results for overall food and nutrition planning.

As the mandate of the author has been to report to the workshop studies of FAO which are relevant to the topic of food and nutrition planning, the global-oriented agricultural development analyses of FAO are also reviewed here in summary form. The first major undertaking of this kind was the Indicative World Plan.²⁷ The study itself started with a clear focus as a food plan but, as it developed, it concentrated more on general agricultural development issues among which nutrition became only one of many concerns, and income generation, employment and export earning or saving have been the guiding objectives. The study covered 64 developing countries representing about 85% of the population of the developing world excluding China. It was similar to the Country Perspective Studies in its methodology, but by necessity had to use much more standardized approaches and assumptions to enable aggregation of the analytical results from the individual countries and regions. Four regional studies covering 8-25 countries per region constituted the building blocks for the global analysis.

In its food and nutrition aspects, it relied on conventional national-level (average) demand projections for estimating future demand which, in most cases, was also taken to be synonymous with the proposed food intakes. The demand projections were checked from the nutrition point of view for consistency, but no explicit nutrition goals were postulated. The study also contained a substantial cross-country nutrition analysis and recommendations for programs aimed at improving nutrition levels.

The second output in this series has been the analysis carried out for the World Food Conference of the UN held in Rome in 1974.²⁸ The main part of the analysis was an updating of the Indicative World Plan, but with a focus on food and hunger. This included an effort to identify the 'food gap' which is likely to face developing countries if past trends continue, and to evolve a plan of action to overcome this problem. A specific effort was made to quantify the number of 'undernourished' people in the world and to advocate special means for ameliorating their conditions.

At present, FAO is engaged in a Perspective Study of World Agricultural Development which has a strong food focus and looks ahead to the year 2000, with 1985 and 1990 as intermediate horizon dates. In its methodology the new study is going to use more formal analytical methods than were used in either the Indicative World Plan or the World Food Conference analyses and it is hoped that some form of income distribution and nutrition alternatives can also be included in the effort. The study is to be completed by 1979.

Conclusions of review of ASA

It seems that two major conclusions can be drawn from this short review of recent Agricultural Sector Analyses from the point of view of food and nutrition planning. The first may be expressed as a criticism of some studies for not dealing at all with food and nutrition problems. In selected studies, this is fully justified as in the country under study food and nutrition do not represent the most urgent development problems. In other cases, such as the Country Perspective Studies, food and nutrition policies have been taken into account and the results provide reasonable guidance, but there is certainly room for improvement.

The second conclusion is that, for a number of those models which do not deal with food and nutrition issues, it would not be very difficult to expand them to include at least some analysis which would ensure that, to a minimum degree, food and nutrition issues are taken into consideration.

In a sense, the overall conclusion emerging is that substantial improvements are needed in agricultural sector analyses before they will be able to handle the core food and nutrition issues effectively and feed the results into the practice of planning. Five areas appear to deserve special attention:

- Definition of nutrition objectives in manageable forms to enter into the analysis of multiple objectives.
- Formulation of criteria for defining target groups with respect to nutrition objectives and the establishment of a data base for their analysis.
- Analytical methods for the treatment of multiple objectives.
- Methodological approaches for the disaggregation of food demand by specified income or other groups.
- Linking agricultural policy measures to food and nutrition objectives.

Defining objectives in manageable forms

As was pointed out at the beginning of this paper, one of the changes on the development scene which created a need for agricultural sector analysis has been the recognition that sound development of agriculture has to consider multiple objectives in its goal structure, and this makes policy formulation, planning and program implementation a much more complex issue than it would

be in a situation with a single development objective. To be able to add food and nutrition objectives to the bundle of other development objectives, they need to be quantified and linked to other parameters of the decision making system.

Most planning economists dealing with agriculture in the past had only very vague notions of proper nutrition objectives and usually, if nutrition targets were accepted for the analysis at all, they were simply related to national average caloric and protein intakes with a possible distinction between animal and vegetal sources of protein. By now much more sophisticated, and also more meaningful, measures have been developed by nutritionists which can be used to judge the sufficiency of diets. There is a need to popularize these measures among planners and to assure that their measurements are feasible under practical conditions.

Both the studies reviewed and other analyses point to the need for considering food and nutrition objectives less in isolation from other objectives for development. This relates to another, even more important, aspect of nutrition objectives which concerns the links between income, socioeconomic status and nutrition, and which requires the focus of food and nutrition analysis to bear on those groups which can be identified as needing support. Nutritional objectives will need to be defined in terms of specified groups, which makes the integration of food and nutrition objectives into the overall objective structure even more problematic. This brings us to the second area of required improvements in approach.

Formulation of criteria for defining target groups

As most of these groups are rarely homogeneous and seldom form single identifiable large groups, identification starts in a complex manner, in which these groups are approached by both clinical and anthropological measurement. The knowledge gained from this is used to relate nutritional problems to socioeconomic factors which cause the specific groups to be undernourished or malnourished. This is no simple procedure and requires substantial ingenuity and flexibility to design the classification system which will help to identify the groups at nutritional risk. As a large share of the lowest-income people in most developing countries are in agriculture, this calls for new approaches in income differentiation, and also for new approaches with respect to other factors which influence food consumption and nutrition.

Once the groups have been conceptually identified, there is a need to gather empirical information on those socioeconomic parameters which would help the analysis to guide policy formulators and decision makers to solutions for existing food and nutrition problems. There is a growing recognition that this requires a multidimensional approach to the complex mix of biological, social-psychological, economic and political problems which are involved, and in turn calls for a broad-based multidisciplinary participation in the effort.

Methods for treatment of multiple objectives

While major methodological developments have taken place, substantial problems still exist in their application to nutrition objectives. One approach has been to attempt to develop a single multiple objective function including all objectives through aggregation of common units of measurement. While this is a conceptually attractive proposal, in practice it has not proven to be very useful.

One of the recurrent problems is the weighting of objectives which enters into the aggregated multiple objective function. Another relevant problem is the aggregation of objectives measured along cardinal, ordinal, or sometimes even only along nominal scales. The difficulties involved in evolving a meaningful weighting system have led to the wider use of simulation models which generate alternative non-optimizing outputs that show different combinations of outputs, and imply different levels of achievement towards individual objectives. Then the political decision makers are asked to choose among these alternative outcomes. Practical experience has shown that this can lead to rather unsatisfactory results, unless it is very carefully set up in terms of a choice situation to which the actual decision makers respond with interest and understanding. Thus the issue is one of how to develop communications between analysts and political decision makers.

Methodological solutions for aggregation problems

This is a more specific technical problem. FAO's experience from a number of perspective studies, such as the Latin American Regional Perspective Study (1974), and that of Zambia (1976) has shown that the simplistic approach of using a national average demand function and specifying on it target groups (income groups) and using this for projections of future demand for them, can be highly misleading. This was the case in the South American analysis. At the same time, the Zambian study has demonstrated that, once separate base period consumption estimates and income elasticity estimates are available for FNPP target groups, then aggregation is no problem at all. However, this disaggregation produces results clearly different from analyses carried out with national averages.

This is possibly the most crucial of the improvements needed in the combined area of agricultural and food and nutrition planning. What is meant here is analysis which would estimate the relationship of a number of factors and their parameters, which seem to define food intake and nutritional behavior and then in turn a search for linkages between these factors and agricultural development policy measures, so that not only a conceptual but also operational causal chain can be identified and used later on in planning, policy formulation and implementation. As can be seen, this relates closely to the definition of FNPP target groups, because much of the criteria which is used there is frequently identical with the factors which can be identified as influencing food and nutrition behavior. As discussed above, it is

this area where even the currently attempted food and nutrition planning and implementation action fails to achieve success.

Once the need for this type of focus is accepted, then the practical application of it moves through the process of project formulation, evaluation and selection. It requires that in all the above three steps in project analysis, the socioeconomic factors influencing food and nutrition should be among those for which quantified parameters are estimated and which influence choice among projects. It seems important also to emphasize more strongly the fact that many nutrition problems require solutions which spread across economic sector boundaries and thus require sound intersectoral analysis for their solution. Furthermore, much of this intersectoral analysis could be best done if placed within an 'area planning' context, revealing more clearly, and in a more concrete manner, both the problems and their solutions within a defined relatively homogeneous and differentiated area.

Summary and conclusions

The review attempted in this paper indicates that increasing links are being established between agricultural sector analysis, planning and implementation of agricultural development on one side, and food and nutrition planning on the other. The importance of the links is attributable partly to the fact that agriculture is one of the main influences governing food and nutrition status and partly to the fact that food and nutrition objectives are becoming clearly accepted for inclusion within the bundle of multiple objectives which guide agricultural development analysis planning and action. It can also be concluded that the concern for food and nutrition objectives by those engaged in the analysis, planning and implementation of agricultural development shows a wide range, from nil to a serious concern to integrate food and nutrition objectives in their activities.

It could also be said that substantial improvements have been achieved in developing a workable methodology to bring FNPP into the gambit of agricultural sector analysis, planning and development action. At the same time, there are a number of methodological aspects which require the attention of those with an interest in developing improved methods for tackling these inadequacies in methodology, who are able to bring their product to the practitioners for real world application.

While the proposals presented to develop new methodological approaches to FNPP in relation to agricultural planning and development have covered a number of specific fields, the thread of thought going through all of them relates to two major issues which in themselves may be worth the attention of this workshop and of the symposium to follow. The first is the complex interrelationship between food and nutrition objectives and other development objectives which calls for multi-

dimensional analysis of whatever specific development problems stand at the center of interest, thus requiring close and meaningful interdisciplinary cooperation. The other issue is the question of the level of appropriate application of planning and analysis. This relates to the need for, and increasing use of, 'intervening variables', i.e. socioeconomic factors to be manipulated for the achievement of food and nutrition objectives. These intervening variables are those which then in turn can provide the direct links between agricultural planning and FNPP. It could also be useful for the spring conference to look at the relative importance of developing FNPP in different countries whose food and nutrition problems are of very different severity.

Finally, the intricacy of the food and nutrition problem complex, coupled with the richness of the agricultural sector in its social, biological, physical and economic aspects, demands that the analysis oriented towards solutions be multidimensional -- 'analysis in the round'. This, in turn, implies the necessity for making the analysis truly interdisciplinary.

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Summary and conclusions

The review attempted in this paper indicates that increasing links are being established between agricultural sector analysis, planning and implementation of agricultural development on one side, and food and nutrition planning on the other. The importance of the links is attributable partly to the fact that agriculture is one of the main influences governing food and nutrition status and partly to the fact that food and nutrition objectives are becoming clearly accepted for inclusion within the bundle of multiple objectives which guide agricultural development analysis planning and action. It can also be concluded that the concern for food and nutrition objectives by those engaged in the analysis, planning and implementation of agricultural development shows a wide range, from nil to a serious concern to integrate food and nutrition objectives in their activities.

It could also be said that substantial improvements have been achieved in developing a workable methodology to bring FNPP into the gambit of agricultural sector analysis, planning and development action. At the same time, there are a number of methodological aspects which require the attention of those with an interest in developing improved methods for tackling these inadequacies in methodology, who are able to bring their product to the practitioners for real world application.

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dimensional analysis of whatever specific development problems stand at the center of interest, thus requiring close and meaningful interdisciplinary cooperation. The other issue is the question of the level of appropriate application of planning and analysis. This relates to the need for, and increasing use of, 'intervening variables', ie socioeconomic factors to be manipulated for the achievement of food and nutrition objectives. These intervening variables are those which then in turn can provide the direct links between agricultural planning and FNPP. It could also be useful for the spring conference to look at the relative importance of developing FNPP in different countries whose food and nutrition problems are of very different severity.

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Discussion

Carl Gotsch
(Stanford University)

During the discussion yesterday, I groped for a clear statement of the link between income distribution (particularly the levels of absolute income) and nutritional status. It is obvious that a number of participants at this conference regard the correlation as being quite high. Others, for example Dr Taylor, are less sure and his presentation introduced a range of social and cultural factors that cannot be captured in any simplistic incomes analysis.

The relevance of this issue becomes apparent when discussing the use of various agricultural planning models that have been presented. Given the aggregation required and the limited number of variables that can be included, there seems little hope of capturing many of the issues with which nutritionists concern themselves. About the best

they can do is to assist in making some guesses about the distributive effects of price policies, changing technology, and the like.

Those interested in planning for nutritional programs ought not to be too alarmed at this apparent inability to deal with their interests, because little of what goes into those formal optimizing exercises actually finds its way into the planning process. The comments that have been made about how planning actually takes place in most developing countries are persuasive, and reflect the realities as I know them from working inside planning commissions. I think most people (economists) who engage in modeling activities are well aware of these limitations and use models primarily for pedagogic purposes. It gives them a way of organizing information, a way of putting together data, and a way of making explicit interactions which they think may be important. This should be understood by those interested

in nutritional planning, for I think it would create a much more relaxed attitude towards what economists do. (This is not to excuse economists who argue for model-based policy judgments when these judgments go well beyond the limitations of the modeling exercise).

More could be said about ways to improve sector modeling to reflect nutritional concerns, but I think perhaps my comparative advantage lies in offering some observations about the reality that such models must try to encompass. That is, I would like to talk about the agricultural environment -- or agricultural environments -- in which the problems of malnourishment and malnutrition are most likely to arise.

Disaggregating to the level of individual farming systems is extremely important, for it underscores the difficulty of advocating technology and increased productivity as the panacea for all nutritional problems. Consider, for example, those non-irrigated areas that have

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less than 250 or 300 mm of rainfall. These include portions of East Africa, Iraq, Sudan, portions of Nigeria, a fair part of the fertile sections of the Sahel, Turkey and Iran. These are largely pastoral nomadic areas with little sedentary agriculture. Over the past two decades, the food production by these peoples has been severely limited by the imposition of increasingly restrictive administrative boundaries between countries. Their traditional ways of dealing with a highly uncertain agroclimatic environment has been undermined. As a result, these areas are undergoing ecological deterioration due to overgrazing. Unfortunately, no one has come up with a way of improving range resources that does not involve getting rid of a substantial number of people and animals and imposing a rather authoritarian regime at the local level. Consequently, without large-scale outmigration, it is hard to see how anything much can be done about improving the nutritional level of the local inhabitants.

As another, less extreme example, consider the areas between 300 mm and 700 mm of rainfall. Many of these areas lie in countries already mentioned, but much of North Africa and India ought to be included. In these areas, some improvements in technology can be made that involve better management of the moisture available. However, the change in farming systems frequently means that the traditional practices of grazing livestock on the communal 'weedy' fallow will have to be abandoned. Given the highly unstable character of agriculture in such areas (two bad years out of five), one wonders how the smaller farmers, accustomed to having livestock as a buffer in lean years, will fare. The nutritional problem is somewhat different from that of nomadic areas, but the general problem is the same: that is, it is unlikely that improved agriculture technology can yield a surplus sufficient to alter the basic consumption patterns of the poor majority.

Shifting agriculture in subtropical Africa is still another example in which the appeal to additional incomes as a way of improving nutrition is unrealistic. As far as I know, no alternative to shifting cultivation in subtropical Africa has yet been

devised that offers a period of rotation less than the traditional eight to ten years. What can one say about proposals to improve the welfare of farm people in the absence of means to increase food production significantly?

We could probably all think of more examples of inhospitable environments where it is unlikely that agricultural technology is going to solve the problem. What should be done in such cases? I submit that this is a rather significant point as far as nutrition planning is concerned. Agricultural planners have learned the hard way that if there is no appropriate technological package which has a good chance of increasing productivity, then one might as well concentrate development resources elsewhere. Those of us who have been in the agricultural development game for some time know that this is a hard-won position. For years we were engaged in extension programs and community development programs without a technology that would significantly improve the productivity and the incomes of the people in the area. Failure was inevitable.

These comments are not intended to downgrade the role of agriculture in helping to improve the welfare of rural people. They are merely intended to point out that, in many situations, the introduction of improved agricultural technology is not going to have much of an effect. Consequently, the groups that occupy the 'depressed' areas are likely to contain the largest numbers of malnourished people. It may be important that those interested in nutrition will be forced to think in terms of encouraging migration, initiating food-for-work programs aimed at creating rural infrastructure, etc.

Glenn Johnson (Michigan State University)

This paper has done an excellent job of discussing FAO's Country Perspective Studies (CPS) and the relationship between agricultural sector analysis and food and nutrition planning. What I now want to discuss is the question of how we achieve credibility for an agricultural sector analysis. My concern is for the credibility of analysts among decision makers concerned with problems of

food production and with the generation of incomes sufficient to satisfy people's nutritional and other needs. I disagree with Carl Gotseh about the use of models. I think the CPS types of models Dr Hrabovszky mentioned are used rather extensively, but I do not know whether their use does more harm than good.

In focusing on what is required to obtain credibility, I shall expand the discussion of the CPS to include the early USDA and FAO projection modeling, farm planning research and extension work, and my own experiences in Nigeria and Korea with respect to agricultural sector analysis and planning. It is profitable to examine how credibility was obtained in the CPS and in the early USDA studies. All of these studies involved interaction between the investigative staff and the decision makers in the countries involved. This has been characteristic of CPS and also of the early USDA work.

Another characteristic is that they have been simple: their calculations are easily understood, they tend to be built around national accounts, and the decision makers generally know something about the national accounts either for agriculture or for the entire economy.

These studies have also been exploratory, using several values for a number of criteria and variables; they have not involved a single objective function; and they have been adaptable in their use of specialized techniques. The studies made use of a wide range of information and they used the decision makers themselves as sources of information.

Generally speaking, this kind of iterative research has involved the use of submodels as building blocks in setting up the quantitative analysis. This was true of the projections which were made regarding the agricultural production capacity of this country in the second world war. It was also true with respect to post-war international allocations, particularly those involving European relief. It seems likely that part of this approach was carried over from USDA to FAO at the time FAO was formed. In the work that we did at the Economic Development Institute and, especially, for the study of Nigerian rural development, we took account of the characteristics that I have just listed. Agricultural sector analysis - and food and nut-

rition planning and policy analysis – should not be done in isolation from the decision makers. It should also avoid complex, sophisticated models, unless they are clearly worth the cost, and models should incorporate normative information which is essential when modeling for prescriptive purposes.

One of our problems has been to learn to work objectively with values, with prescriptions we reach, and with the maximizing theories we use. It seems to me that specialized analysis using one technique – linear programming, input output tables, or simultaneous equations fitted to time-series data, cost-benefit ratios, or net internal rates of return – are almost always going to result in loss of credibility, and the same is true of analyses based on only one kind of information, such as time-series information. Decision makers know that there is more than one type of information which is relevant, and if they spot something missing they will be quite unconvinced by the results.

Technical information is important, but it is inadequate. Analyses dealing with only one dimension, such as time, but which neglect spatial or regional dimensions, will also lack credibility. Information or analysis from the point of view of any one discipline, such as economics or nutrition, is inadequate. But holistic overall analysis will also lack credibility. Thus, a building block approach that puts together nutritional components, economic components, technical components, and so on, in configurations that are appropriate, is more likely to be convincing to decision makers.

All this explains why specialized technology-oriented analyses, of the sort that some of our best economists have developed in recent years, have

not yet attained credibility with decision makers or with the non-economists in this meeting.

I would like to discuss computerized CPS-type analyses. Our first Nigerian study was not computerized. It cost one and a half million dollars. We put nine years into it, and a lot of that time was spent with worksheets and desk calculators. We made projections for three alternative policy packages. It was prohibitively expensive. The question was whether or not we could computerize it and reduce the cost. It turned out that the model was cheaper to develop and run than the previous one, and it was used rather extensively. I wonder why FAO has not moved forward to computerize its very creditable common-sense approach?

To answer, I will talk about two kinds of research and about the decision making capacity of different cultures. There is problem-solving research and there is subject-matter research. By 'problem-solving' models or research, I mean research explicitly directed to producing a solution to a specific problem. By 'subject-matter' research, I mean 'research which brings together information in a form which is expected to be useful in solving a set of problems faced by a group of decision makers. The analysis of nutritional or food information might be an example of subject-matter research.

There is also 'disciplinary' research: research exploring or testing the properties of a theory in economics, for example. Disciplinary research engages only analysts in the discipline concerned. Subject-oriented research requires analysts in, perhaps, more than one field. But problem-oriented research requires not only analysts in many fields, but inter-

action with administrators also. This is essential and poses severe demands on research organization.

Moreover, in problem-solving work one cannot avoid having to deal with values, because its purpose is prescription. Disciplinary research need not involve questions of problem definition. There will be no interaction with the decision maker required. If we do disciplinary or subject-matter research and try to pass it off to decision makers as adequate for problem solving, we shall lose credibility. For ourselves, we need to be concerned with the validity of our models – their logical coherence and whether or not they are capable of reflecting reality.

We have already discussed the distribution of power and rationality. Perfect knowledge for problem-solving is infinitely expensive and unattainable. In reality, power substitutes for knowledge in decision making. A decision making rule will be employed which will relate to the distribution of power. This power may be market power. In a decentralized system, power is distributed according to the ownership of resources and the income generated with those resources. It may be political power. Some of us were complaining about the distribution of political power, and the distribution of the ownership of resources and market power. There are other distributions of power: military, police, and the power of knowledge itself. Basically, if we are dissatisfied with the decision which results from the power distribution, we are asking for the redistribution of the ownership of power. One of the nasty things about real power is that one cannot redistribute it. And yet the distribution of power governs the decision making process.

Community approaches to food and nutrition policy analysis

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Today there are some forty to fifty field staff in the countries of Colombia, Chile and Zaire implementing the community approaches to nutrition planning described here. In each country the community level approach is integrated with regional level development planning as well as with national planning.

The community level methodology grew out of a program in Candelaria, Colombia, which began in 1968. The Candelaria program was not 'planned' in the sense that we use the word today. The objective was to put some of the staff of the local university in touch with the reality of the lives of 75% of the less privileged Colombians. 'Experts' from the university proposed their specialities as those which were needed by the population of Candelaria. By a selection process, which was never documented, many interventions were implemented (environmental sanitation, health services, hospital improvements – even a special ward in the hospital for grade three malnourished children).

Fortunately, in addition to the implementation of these interventions in Candelaria, data were collected on the effects of the implementations.¹ As the interventions were implemented in many cases sequentially, some data were collected which allowed the analysis of the interactions among the selected interventions.

The following effects were observed. The children's ward in the hospital for grade three malnutrition was closed a few years later and the malnutrition rate (all grades) was reduced from about 50% (children up to six years old) to about 30%. But not all the interventions had an effect: almost all of the change in nutritional status could be explained by the potable water and health services for diarrhea control interventions.

The people involved in the Candelaria project began to raise some interesting questions:

- Would the same interventions produce the same effect in another community?

- Is it possible that some intervention which was not tried in Candelaria (food production or marketing, etc) would have had an even greater effect at less cost and in less time?
- Is there a best (cost-effective) implementation time sequence for multiple interventions, etc?

During 1971 a small group began an attempt to answer the above questions and others, to rationalize the nutrition planning process. Gradually, a simple model was developed which is thought to be useful in deciding priorities for community nutrition interventions. This model and the procedures for its use are described in the next section.

Nutrition planning model

The first part of the model related nutrient gap to nutritional status and health status. The nutrient gap (or deficit) is the difference between the requirement for nutrients and the consumption of nutrients. Nutrient requirements are the sum of the 'normal' requirements (based on age, climate, activity, etc) and additional requirements based upon the body's demand for nutrients to overcome inefficiencies in the digestive system (primarily caused by diarrhea) and the demand for additional nutrients to combat infectious diseases (antibody production and cell replacement). The model states that a reduction in the nutrient gap leads to an improvement in the nutritional status. This relation holds at the individual level but is modified at the family and community levels by the unequal distribution of nutrients among members of a family and among families of the community. An improvement in nutritional status lead to an improvement in health status which, in turn, can further reduce the nutrient gap by a reduction in requirements down to the normal level.

Thus, this part of the model states that all nutrition

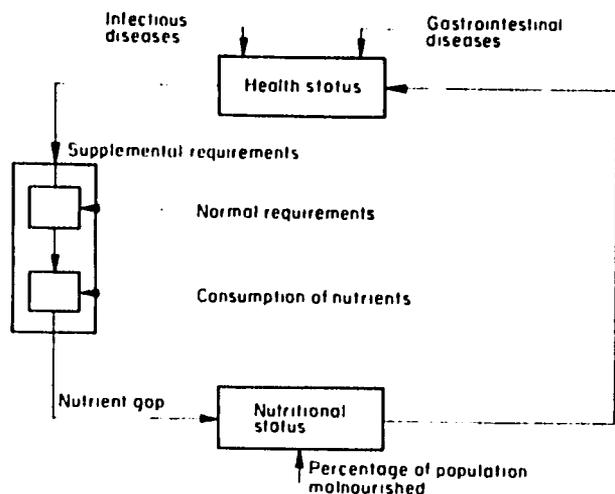


Figure 1. Model used in deciding priorities for nutrition interventions.

interventions must reduce the nutrient gap if they are to improve the nutritional status. The model is presented schematically in Figure 1.

In the Candelaria project the nutrition interventions were aimed only at improving health status through changes in environmental sanitation and preventative health services. Consumption of nutrients by the population was observed during the course of the project and no changes in the quantity of nutrients consumed were observed. It is now believed that further reduction in the malnutrition rate of the children in Candelaria is only possible by increasing consumption.

The second part of the model deals with consumption. The model states that the quantity of nutrients consumed by an individual in the community depends upon the following:

- Production of nutrients which depends upon quantity and quality of land, climate, technology and choice of crops selected for production.
- The losses of nutrients in transport and storage.
- The importation and exportation of nutrients to and from the community.
- The distribution of nutrients among the families of the community.
- The distribution of nutrients within the family.

The model can be used to calculate the increase in nutrient consumption (and the resulting change in community malnutrition rate) for development interventions designed to modify any of the above.

Using the model as a diagnostic tool

The above model is being used or has been used in diagnosing six communities in Colombia and Chile. The diagnostic procedure is to sample sequentially the values of the model parameters for the specific community. The sequential nature of the diagnosis is illustrated as follows. Measure the malnutrition rate within the

community. If less than, say, 40% for children up to six years old, then there is another community of a higher priority. If it is greater than 40%, calculate the nutrient gap (the difference between consumption and requirements) and if consumption of nutrients is greater than normal requirements, (minimum daily requirements for a healthy person) then measure the health status of the population (diarrhea and specific disease surveys). In the above case no measurements need be taken for nutrient production, nutrient losses, distribution among families, within families, etc. But if the nutrient consumption is less than normal requirements (MDR) then measure nutrient production in the community, etc. It is beyond the scope of this paper to detail all the alternatives in the sequential diagnostic procedure but, in application, it has significantly reduced the time and the cost for determining priority nutrition interventions.

A case in point is Villa Rica, Colombia. Fifty-five percent of the children in Villa Rica were determined to be malnourished. Analysis of the nutrient gap indicated that the average family was consuming 30-40% fewer protein and calories than the minimum daily requirement for the families. Clearly, increased consumption was a greater priority than environmental sanitation and/or health services. But, the production of nutrients in the community was 600% above the community's requirements (MDR)! The loss of nutrients in Villa Rica was traced to the market. The population of Villa Rica was exporting most of its nutrient production and importing other nutrients to eat. In the exchange there was a fifteen to one loss, i.e. the producers in Villa Rica were exchanging fifteen grams of protein for one gram. The priority interventions were directed towards improving this exchange ratio.

Self diagnosis

Community participation in the development process is preached by many and practised by few. Various degrees of participation exist, from the inhabitants of a community submitting to be surveyed, to being employed in simple tasks in the process, and to controlling the professionals in the process.

The county of Buenos Aires, Cauca, Colombia, was selected as the site for an experiment which would attempt the greatest possible degree of community participation. Buenos Aires is a county of some 50 000 inhabitants, a remote little infrastructure (one health post, a few roads which are passable only in the dry season, government services available only in the county seat - a village of about 1200 inhabitants) and an average education of less than three years. During the past year some one hundred inhabitants of the area have been engaged in conducting experiments to test the relationships in the nutrition planning model. These relationships are the following:

- The relation between growth and selected foods.
- The relation between growth and quantity of protein in the diet.

- The relation between selected crops and nutrient production per acre.
- The relation among selected crops, technology of production and cost of nutrients produced per acre, and so on.

The inhabitants have also been using the model as a diagnostic tool for the community of Buenos Aires by collecting the following data: malnutrition rate measurements; household census; consumption measurements; determination of requirements; nutrient production measurements; import-export measurements; environmental sanitation measurements; and health survey.

The output of this learning process is expected to be a nutrition plan for a county, containing the priority interventions, the costs, the requirements for assistance from outside the county and the logical arguments for arriving at these conclusions.

Community, regional or national level planning?

Clearly, nutrition planning should not be limited to the local or community level. The nutritional well being of one county or state or nation is not independent of other counties or states or nations. But the general strategy should be oriented towards more independence for the same reasons as is the current US strategy with respect to energy.

Reference

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Discussion

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The concept of 'nutrient requirements' underlying the procedure suggested by Dr Wilson differs from the definition of this term proposed by the Joint Food and Agriculture Organization/World Health Organization Ad Hoc Expert Committee in the Energy and Protein Requirements Report¹ and with the opinions expressed by Harper, Payne, and Waterlow² in connection with the concept of the Protein Advisory Group on the 'safe level of protein intake' as defined by the Expert Committee. The FAO/WHO Report states:

The energy requirement of persons is the energy intake that is considered adequate to meet the energy needs of the average health person in a specified category.

and further that:

The safe level of protein intake is the amount of protein considered necessary to meet the physiological needs and maintain the health of nearly all persons in a specified group.

It is true, as the Report states, that . . . The suggested intakes . . . do not apply to persons under severe stress of environmental origin, nor do they cover any additional requirements that may result from pathological conditions, such as severe infections and other diseased states.³

How can a calculation of additional nutrient needs be objective unless it takes into account specific conditions of the community such as age distribution, environment, level of resources, knowledge of sanitation, availability of services, risk of contracting infection or parasitic infestation, its type, number of cases, frequency of occurrence, and duration? How can a safe level therefore be established on the basis of any calculation of additional requirements? By way of authority, I turn again to the above-mentioned Report:

We do not question that children (and adults) recovering from illness require extra food, but we do question that there is sufficient evidence to justify the implication of the Protein Advisory Group (PAG) Report that most children in developing countries would be less at risk from malnutrition if provided with a different kind of diet with a protein content higher by some unspecified amount than the safe level of protein recommended.⁴

Would not increasing the normal requirements by an additional amount of nutrients to overcome losses due to pathological conditions be equivalent to the behavior of the farmer who plants many additional seeds because plagues might be expected to attack each crop?

The second part of the model lists the various factors on which 'the quantity of nutrients consumed by an individual in a community, the production of nutrients, the losses in transport and storage, the import-

ation and exportation of nutrients from or to other communities, and the distribution of nutrients among and within the families of the community' depends. Factors which determine food consumption, such as population (size, structure, density), income (property, employment, unemployment, wages and salaries, prices, purchasing power, etc) and educational conditions of the community are not mentioned specifically, thus minimizing their importance. Breast-feeding is not mentioned either. The general economic and political conditions which affect effective food demand, the level of activity and trade, the levels of investment, productivity, etc, were also overlooked.

Although the model attempts 'to rationalize the process of nutrition planning and . . . is thought to be useful in deciding priorities for community nutrition interventions', its role still seems limited to that of a diagnostic tool. Surely Dr Wilson should discuss the different steps leading from the diagnosis to the determination of the objectives and specific targets, and some of the details of cost-benefit analysis of the various alternative interventions which are missing owing to the brevity of the notes.

Concerning the sequence of the diagnosis, an arbitrary level of malnutrition greater than 40% in a community was neither explained nor justified. The explanation for the degree of malnutrition was sought in the excess or deficit of nutrient

consumption compared with requirements. If there was an excess, the problem lies in sanitary conditions. If there was a deficit the cause is the sequence of the nutrient flow.

I would like to comment on the adoption of an intervention cut-off value at the 40% rate of malnutrition among the population under six years of age, because it ignores the fact that each degree of malnutrition at each age level requires different actions.⁵ Those who criticize the economists for their decisions made on the basis of aggregate data usually have good reason. Would the same criticism be applicable to this case? If we ignore those communities in which the malnutrition rate is less than 40%, are we not just postponing the intervention? Why could we not continue to study the communities until we find preventive actions which might prevent the community reaching the cut-off value?

I am very much concerned about calculating the nutrient gap based on the assumption that the population of the community is homogenous. This is never the case. Some individuals show an excessive nutrient intake, others a deficit. This is true even within any given family. Why, then, is the consumption of nutrients is greater than requirements, are measurements directed unilaterally towards the search for solutions only within the health sector? It is not clear whether or not, in the case of deficit, the actions are directed exclusively towards food, ignoring all aspects of health status. Some clarifications are needed about these matters.

Simplicity, time savings, and economy of costs, which seem to be the aims of the model, may cause it to fail as an instrument for diagnosis and the establishment of priorities. Poverty, the basic cause of malnutrition, is generally associated with ignorance, size of family, poor housing, sanitary conditions, and a very limited access to basic services. For the majority of the population in the lowest income brackets these features are almost inseparable. They all interact to cause the food and nutrition problem. Analyzing the model in the search for causes, identification of priorities and decision making, we realize that it separates several of these factors as if they were independent variables.

Some affect the quantity and quality of the consumption of nutrients and others the health status. Some are priority fields and others not, or *vice versa*.

At the community level, general wealth and income affect the technology and productivity of the family in their production and storage of food. They also affect their demand for and supply of food from or to other communities, their purchasing power and their storage of food. These factors are all related to the nutrient flow. But, on the other hand, the family level of income also determines the physical and sanitary conditions of their accommodation, the possibilities of supplies of drinking water and the suitable disposal of excreta, all of which are important factors in the health status of the family. The educational level and the beliefs of the mother have a great influence on the food purchased, its preparation and the distribution of nutrients within the family. It is also important in relation to hygiene and handling of food, the prevention of infections and parasitic infestations and the health care of the child during its early years.

I feel, unfortunately, that the model separates the inseparable by directing the diagnosis and the definition of priorities along mutually exclusive paths. It is necessary to discuss the conditions for application of this model at the community level. According to Dr Wilson's presentation, the model has been used in the diagnosis of six communities in Colombia and Chile. It is necessary to know:

- What is the essential information necessary for its application.
- Kind, number and dedication (full-time, part-time etc) of professionals from outside the community employed in each case.
- Equipment and materials used.
- Procedures for securing community cooperation, and its organization in each case.
- Preparation and support of community leaders.
- How to integrate this community level approach with regional and national development planning.

I wonder how many communities in Colombia have been studied for as long a time as Candelaria, and on how many of them the information

required for the application of the model has been compiled? What is the cost of medical and paramedical personnel employed during the previous studies and the implementation of the model? Would equivalent human resources be available to complete the same studies for at least 10% of the Colombian communities? To what extent is replication possible? How much time would be required and at what cost? If these applications have been linked with regional and national planning, why has the system not been applied extensively?

The possibility of massive application of this model as a Community Approach to Food and Nutrition Policy Planning brings to mind the Joint UNICEF/WHO study on *Alternative Approaches to Meeting Basic Health Needs in Developing Countries*. It studies the characteristics of the poorest populations of the world - rural, nomadic, urban slum - and their severe problems. The first part of this study provides guidelines on how to prepare policies given the social, cultural and economic conditions of the target population and the limitations imposed by the political systems and power structure of each type of society. The case studies on Bangladesh, China, Cuba, Tanzania, Venezuela, Yugoslavia, India, Niger and Nigeria included in the second part of the study, suggest, by analogy, how far away we still are from having operational approaches to food and nutrition policy planning for action at the community level.⁶

This action must be inserted in a community development system, adjusted to the peculiar lifestyle of the population, its economic, ecological, social, cultural, and political conditions. This system should be developed with the community, and be based on its own resources (people, work, technologies, priorities, organization, and self esteem). It should incorporate the beliefs and values that condition community behavior and respect the prestige of the leaders. Perhaps, in the past, we have been intervening with mainly foreign criteria, instead of starting from the way in which the community perceives itself, with its priorities. Perhaps we have been operating for the community and not from and with the community.

The circumstances of the poorest

communities and their isolation from the government networks of agricultural extension, public education and health services, etc, provide a *raison d'être* to those, such as Dr Wilson, who proclaim the need for planning from the base, with action carried out by the community with support from higher levels. It follows that whatever is planned will only be valid if:

- Its daily implementation is integrated with community institutions.
- Functions and responsibilities for the implementation are well defined.
- The attention is focused on specific actions.
- The whole plan fits the values, interests, resources and capabilities of the community.

We, who work in food and nutrition policy planning at the national level, need to reconsider our approaches and methods in view of these realities. We must learn to combine the macrolevel approach with the needs and circumstances of the microlevel. The implementation of the National Food and Nutrition Plan in Colombia, such as it is currently operating, seems to combine both approaches. It is possible that an important methodological contribution will emerge from this experience.

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Strategies for the reduction of malnutrition

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The topic of issues related to the design and implementation of strategies capable of reducing malnutrition is especially challenging – even depressing – because of the huge gap between the rhetoric expressing noble intentions to eliminate world hunger and malnutrition and the actual situation. Little progress has been made in the five years since the Massachusetts Institute of Technology conference on ‘Nutrition, National Development and Planning’, which raised high hopes that nutritionists, economists and development planners would reach agreement on a fresh and more effective approach to promoting the goals of national development with increased emphasis on improving the nutrition and health status of the populations of developing countries.

Perhaps five years is too short a period in which to expect significant progress. In that sense, the picture is even more depressing if we consider the launching thirty years ago of the Food and Agriculture Organization (FAO) under the leadership of Lord Boyd-Orr with the goal of eliminating the ‘lifetime of malnutrition and hunger’ which was and still is the fate of a large fraction of the human species.¹

Most observers would agree that with a few exceptions Taiwan and South Korea, the ‘city states’ of Singapore and Hong Kong, probably Malaysia, and perhaps Costa Rica, Venezuela and a few other Latin American countries among mixed economies, and China and Cuba among fully socialist economies – the magnitude of the malnutrition problem in low-income countries has probably increased in the past five, fifteen or thirty years. In brief, population growth and associated problems, such as shrinking farm size and increased displacement from the land, seem to have increased the number of persons experiencing malnutrition to a greater extent than economic and social progress has reduced nutritional and other dimensions of poverty. That conclusion is reinforced, of course, by the indications that in most developing countries income distribution has become more unequal, so that average per capita figures are now an even less reliable guide to the nutritional status of the lowest-income groups.

Alternative approaches

There are obviously many reasons for this failure to achieve significant progress in reducing malnutrition in the great majority of low-income nations. It seems to me, however, that one very important reason has been the failure to arrive at a workable consensus concerning strategies that are both feasible and effective. There is even disagreement as to whether the formulation of ‘strategies’ is a useful way to approach the problem. In one of the most influential additions to the development literature of the past decade, Little and Mirrlees² have asserted that the term is nothing more than a euphemism to justify sloppy thinking. Thus they speak disparagingly of ‘hunches, dogmas, doctrines or strategies’, that lead to unsound choices which waste scarce resources and frustrate development.³ The Little-Mirrlees *Manual* and the equally well known *UNIDO Guidelines*⁴ emphasize the need for a more rational approach to project analysis so that investment decisions will be guided, in so far as possible, by quantitative assessment of the net social value of alternative projects.

Both approaches represent a significant improvement over project analysis based only on market prices, and in principle are flexible enough to allow for the consideration of equity as well as output objectives. Their application to the analysis of industrial projects appears to have particular value because of serious consequences of the unsound policies and investment decisions so commonly associated with import substitution strategies to promote industrialization by highly protectionist measures. The underpricing of capital, foreign exchange and the investment decisions that have typically encouraged a lopsided pattern of development, with growth concentrated in enclaves of large capital-intensive firms, have frequently exacerbated the problems of unequal income distribution and of underemployment and unemployment.

I will argue, however, that a focus on the design and implementation of strategies is a useful approach to the problems of eliminating malnutrition and fostering

agricultural development. For our purpose, a 'strategy' is best defined as a set of related policies and programs designed to achieve a certain objective or combination of objectives. It is worth noting the similarity between this definition and the standard definition of 'system' as used by systems analysts, i.e. 'that a system is a set of parts (components or activities) coordinated to accomplish a set of goals'.⁵ The programs undertaken to implement a strategy will include a number of specific projects, and it will be useful to apply cost-benefit analysis or other techniques of project evaluation to some of those individual projects. There is a prior need for agreement concerning the nature of the strategies to be pursued and the type of policies and programs that will be most effective in implementing them. Otherwise, there is little likelihood that the projects identified and prepared for evaluation will be appropriate for attaining the objectives of the strategy.

The next section addresses the difficult problems that must be faced in defining criteria to guide decision making with a view to the design of strategies for the elimination of malnutrition and other aspects of poverty in rural areas. The later sections deal with the choice of policies and programs to be included in 'production-oriented strategies' and 'consumption-oriented strategies'. This rough two-way classification is used for the sake of clarity, and not to suggest any invidious comparison between the two types of strategies which, in fact, should be thought of as complementary. In an important sense, however, production is a primary concern, for the obvious reason that there can be no consumption without outputs to consume. On the other hand, in a given country at a given point of time it may be more appropriate — i.e. more effective or less costly or more feasible — to attain an objective such as the reduction of malnutrition by altering the pattern of consumption rather than by increasing total production.

A country's pattern of food consumption can, of course, be altered either by changing the interpersonal distribution of income or by modifying the content of consumption. A slight addition to the quantity of iodine in the diet to eliminate goiter in iodine-deficient areas is an important example of the second type of change in a consumption pattern which would involve little or no change in total output or in income distribution. However, there are few instances in which an approach to nutritional improvement based on 'the iodine model' is likely to be effective in eliminating malnutrition. It should also be emphasized that in designing production-oriented strategies, it is essential to consider the effects of alternative policies and programs on the pattern of agricultural development as well as the rate of increase in farm output.

Choice criteria and reaching a consensus

The considerable difficulty encountered in reaching a workable consensus concerning strategies for the reduction of malnutrition and other aspects of poverty is

in part a consequence of a general and intractable problem: the lack of satisfactory criteria to guide decision making with respect to investments in 'human resources'.⁶ Little and Mirrlees acknowledge that cost-benefit analysis is subject to considerable limitations when applied to sectors 'such as health and education, where the measurement of benefits is especially difficult'. They suggest, and correctly I believe that the same principles apply in the sense that 'choice between projects in any sector should be made on the basis of the present discounted value of the [social] benefits less costs in each year of the project's existence, provided sufficiently plausible estimates can be made of the benefits and costs'.⁷

The problems which must be faced in quantifying benefits from nutrition and health projects are indeed formidable. How does one quantify the benefit associated with avoiding blindness by the prevention of xerophthalmia or of deaths averted by preventing or correcting protein-calorie malnutrition? One might try to estimate the lifetime loss of productivity resulting from blindness. The 'economic loss' is, however, only part of the human loss; indeed vitamin A deficiency that resulted in an infant death rather than blindness might entail a smaller 'economic loss'.

Although in liability cases, courts often place a dollar value on human life, I wonder whether meaningful solutions are possible in the context of a social cost-benefit analysis. It could be argued that a very high value should be assigned because 'life is priceless'. But because of severe resource constraints a defining feature of a less developed country is that 'it cannot afford to do a lot of things that it cannot afford not to do'. At the opposite extreme, a Garrett Hardin or Paul Ehrlich might conceivably argue that in the absence of effective family planning, infant deaths which slow the rate of population growth are a 'second best' solution to having prevented the 'excess births'.

Limited value of conventional criteria

Some advocates of nutrition intervention projects have argued that a major research effort should be made to find ways to overcome those special difficulties so that nutrition projects can be justified by cost-benefit calculations in order to compete more successfully in the budget allocation process with agencies seeking funds for factories, new roads, dams, etc.⁸ Others, who are convinced that there is no satisfactory way to quantify the benefits associated with nutrition programs or projects, argue that the emphasis should be placed on cost-effectiveness analysis; but that approach leaves unresolved the problem of choosing the alternatives to be compared.⁹ Both cost-benefit and cost-effectiveness analyses are of limited value in guiding decision making with respect to alternative strategies, a set of policies and programs, or integrated programs designed to achieve multiple objectives.

The problems which arise because of the limited value of conventional criteria for project evaluation are

accentuated when the choices to be made concern strategies aimed at the reduction of malnutrition and other forms of deprivation associated with poverty. Lasswell's well known definition of politics as 'who gets what, when, and how' emphasizes that these are basically political decisions and require a measure of agreement concerning normative issues as well as in the interpretation of positive information. Those considerations underscore the difficulty and the importance of defining choice criteria to guide decision making with respect to the design of both production-oriented and consumption-oriented strategies for the reduction of malnutrition and other aspects of poverty which can elicit a workable consensus. It is well to recognize that unless decision making and resource allocation are based on the analysis of specific, quantifiable projects, one 'runs the risk', as Joshi puts it, 'of making too great a demand on the wisdom and judgment' of those responsible for adopting and funding the policies and programs which constitute a rural development strategy.¹⁰

It should also be emphasized that even when formal, quantitative techniques of evaluation are possible and useful, they need to be supplemented. Thus Helmer and Rescher, in their essay *On the Epistemology of the Inexact Sciences* stress the critical importance of 'reasoned methods of explanation and prediction' which take account of many types of evidence. This is essentially the approach to food and nutrition planning which is outlined in Chapter 5 of the Report prepared by the Ninth Session of the Joint FAO/WHO Expert Committee on Nutrition.¹¹ However, there is no explicit discussion in that document of choice criteria or of the problem of reaching consensus.

Defining choice criteria

The principal thesis of this paper is that useful, though necessarily imprecise, choice criteria can be defined which will facilitate the task of mustering the political, administrative and budget support required to implement the most essential policies and programs to be included in production-oriented and consumption-oriented strategies for rural development. This can be done by paying explicit and serious attention to the design of such strategies using 'reasoned methods of explanation and prediction', supplemented by careful analysis of various types of evidence, including the experience of countries which have been reasonably successful in eliminating malnutrition and other manifestations of poverty.

I start with the premise that in this, as in other areas of development, it is necessary to follow a sequential approach and that a key requirement of the art of designing and implementing effective development strategies is to maintain an 'appropriate' balance among the various components or activities undertaken to advance economic and social development. My emphasis is therefore on trying to identify a minimum set of policies and programs which justify a very high priority in strategies for rural development and elimination of rural poverty. I am concentrating on the special prob-

lems of 'late developing countries' which face severe resource constraints, where the bulk of the population still depends primarily on agriculture for work and income, and which have very high rates of population growth and an age structure and other sociocultural characteristics which make the task of slowing population growth a difficult one. This does not include countries such as Argentina and Chile and oil-rich countries such as Saudi-Arabia and Iran. This is not meant to imply that such countries do not have serious problems of malnutrition, but the nature of their problems and options differs quite drastically from countries such as India, Bangladesh, Indonesia, the Philippines, and Nigeria (where resource restraints remain severe in spite of the considerable easing of the foreign exchange constraint to development as a result of rapid expansion of petroleum exports).

The focus here on problems of rural development and the elimination of rural poverty is prompted primarily by the numerical dominance of rural population in these late developing countries and the fact that the rate and pattern of agricultural development has enormously important direct and indirect effects on economic and social progress in such countries. I believe that a shared understanding of certain basic characteristics of this subset of developing countries, of the nature of the constraints that they face, and the major objectives of their national development programs can provide a basis for a workable consensus concerning the most essential elements to be included in their production-oriented and consumption-oriented strategies.

Major development objectives

Although the full set of development goals would vary from country to country, most developing countries have expressed various degrees of commitment to three major objectives: the achievement of self-sustaining economic growth, the reduction of poverty, and the curbing of population growth. It might be objected that reducing fertility is simply a means of facilitating increases in per capita consumption; but in recent years many developing countries have adopted the goal of assisting and encouraging families 'to have only that number of children they can adequately rear, educate and support'.¹² The characteristics of these countries, the constraints which they face, and the implications of those characteristics and constraints must be considered in more detail.

Although this analysis is limited to the problems of 'late developing countries', this still represents a large fraction (perhaps as much as two-thirds) of the world's population; and among and within these countries there is a great deal of diversity. Nevertheless, the structural and demographic characteristics which they share and the nature of the problems which they face make it possible to put forth certain propositions which apply broadly to most, if not all, of those countries. Five inter-related characteristics, constraints, and implications appear to be especially important.

Strategies for the reduction of malnutrition

Scarcity of capital, government budget resources, foreign exchange, and trained and experienced manpower. This severely limits the range of development activities which can be undertaken and administered effectively at any one time. That is, of course, why it is essential to follow a sequential approach to agricultural and industrial development, to the expansion and improvement of educational facilities, to the development of a country's economic infrastructure, to the reduction of malnutrition and preventable illness, and to the improvement of housing, latrines, and water supply for household use, to mention only some of the most crucial ingredients of economic and social progress.

The dominance of farm households in the total population and labor force. This has significant implications for the choice of strategies for rural development; and the dominance will persist into the twenty-first century because of 'the arithmetic of population growth and structural transformation', i.e. the combination of agriculture's initial weight in the total labor force and the rapid rate of growth of the total population of working age means that, for some time, the rate of growth of the farm workforce will not be much less than the rate of increase in the total workforce. Several decades at least will be required to reach the turning point when the absolute size of the farm labor force begins to decline.

Unprecedentedly high rates of population growth. These compound the difficulty of increasing per capita consumption and per capita availability of social services. The fact that the population of working age is also increasing at 2½-3½% per year in most of the countries in question makes it extremely difficult to expand employment opportunities, including opportunities for productive self-employment in agriculture, rapidly enough to reduce underemployment and unemployment.

Indeed, there is clear evidence that in a number of Asian countries, notably Bangladesh, India and Indonesia, the growth of the farm population is leading to the progressive subdivision of already small farm units, and also to a substantial increase in the number of landless, or virtually landless, farm laborers. Even in an African country such as Kenya, development problems are being aggravated seriously by population growth currently estimated at approximately 3½%. One manifestation of the growing pressure of population on the land is the out-migration of farm households from congested areas of high potential to semi-arid areas, where land is still available but families have great difficulty meeting their subsistence needs because of low and erratic rainfall and frequent crop failures.

This situation is illustrated dramatically by census data for Machakos District. Between 1932 and 1948 the population in the high-potential farming areas of Machakos increased by 48%. Between 1948 and 1963 it increased by another 35%. During the same two intercensal periods, the population of the marginal semi-arid farming localities in Machakos increased by 21% and 30%. Be-

tween 1963 and 1969, however, when the high-potential areas registered an increase of only 12.6%, the semi-arid localities experienced an increase of 70% during the six-year period because of rapid in-migration.¹³

Importance of pursuing agricultural and industrial strategies which expand employment opportunities. This is underscored by the above characteristics. Given the economic and political constraints which limit the scope for programs of income redistribution, the reduction of poverty through increasing the income (both subsistence and monetary) of poor households must be an integral objective of development. In fact, the proposition that both output and equity considerations should influence the design of growth strategies is the second major thesis of this paper. Supplementary consumption-oriented strategies also have a key role, but in the long term the most essential requirement for achieving higher labor incomes and more adequate consumption of food and other goods and services required for health and productivity is a rate of growth in the demand for labor that exceeds the rate of increase in the supply of workers seeking jobs or better income-earning opportunities.

Reduction of expressed fertility through the spread of family planning in rural areas. This can thus be expected to make a major contribution to the success of both production-oriented and consumption-oriented strategies for the reduction of malnutrition and other manifestations of rural poverty. Reducing fertility is of immediate importance because of the nutritional and other health advantages associated with a reduction in the average number of children per family and the improved prospects for achieving more complete and more adequate coverage of rural households in the provision of educational, health, and other social services. In the longer term, the resultant reduction in the rate of growth of the population of working age can be expected to improve the employment prospects for all members of the labor force, especially for unskilled and semi-skilled workers. In addition, slowing the rate of growth in the number of workers seeking jobs can be expected to increase returns to labor directly, because of the more favorable supply/demand situation and indirectly because of improved possibilities for increasing the level of investment per worker in terms of both physical and human capital.

Important interactions

A further proposition to be emphasized is that some of the interrelationships between different aspects of rural development are enormously important and development strategies need to take account of those interactions. In fact, one of the shortcomings of a project-oriented approach to rural development is that it fails to take account of some highly important complementary interactions among different components or activities. With regard to agricultural development, one of the

important lessons which has been learned all too slowly during the past twenty years is that agricultural extension activities are of little value without research programs which generate feasible and profitable innovations to extend. At present the emphasis on interrelated, complementary activities to be included in 'integrated rural development' programs often is carried to an extreme because of a tendency to assume that a wide range of supporting services — research, extension, credit, input supplies, roads, health facilities, etc. — should not only be simultaneously available but should also be administratively integrated.¹⁴ Because of the scarcity of resources, including administrative capacity, such a comprehensive view of 'integrated rural development' generally means a heavy concentration of resources in limited areas at the expense of achieving broad coverage and involvement of the entire farm population.

I argue below that there are especially cogent reasons for administratively integrating the delivery of nutrition, health, and family planning services, but I suspect that is one of the few instances in which the potential benefits of synergism between related activities is great enough to justify the considerable cost involved in achieving administrative coordination and integration. The more general requirement is to give due weight in the design of strategies for agricultural and rural development to the multiple and interrelated objectives of social and economic development.

Formulation and implementation — diverging views

Before concluding this discussion of choice criteria, I would like to refer briefly to two recent statements about the formulation and implementation of food and nutrition plans which illustrate the importance of the issues raised above. Just a year ago, in a symposium at Berkeley, Dr Martin Forman directed his attention to the formidable problems of securing the implementation of nutrition programs. He illustrated these problems by discussing a hypothetical 'composite case' of 'how one might design a strategy in nutrition'.¹⁵ The 'good, average, balanced program' that he outlined included the following components:

- Food aid from the USA would be utilized to develop or expand a school-feeding program and a maternal and child health program.
- A national nutrition education program would be undertaken to complement the feeding program.
- Wheat flour would be fortified with lysine, vitamins, and minerals.
- An effort would be made to introduce new nutritious foods with emphasis on weaning foods and on upgrading the nutritional quality of beverages and other snack foods.
- Short-term training of mid-level personnel would be undertaken to improve the administrative capacity for carrying out the above.

The other example relates to the view of 'food and nutrition planning' outlined by Joy and Payne in a publication

in the FAO Nutrition Consultants' Report Series,¹⁶ which represents a drastically different approach. Their starting point would be to identify 'specific people' within various functional groups of the poor who are suffering from severe nutritional deprivation and then devise development plans for various local areas for increasing food production and/or income and purchasing power in ways which would directly benefit the individuals or groups thus identified as having serious nutritional problems.

The basic assumption is apparently that governments will — or should — give such a high priority to nutrition that the elimination of nutritional deprivation will in effect become the maximand in the objective function, that is to guide development planning at the national and local levels. It is further argued that households which still have nutritional problems in spite of the implementation of nutrition-oriented production strategies (including public works programs to provide supplementary income for poor families) will 'require welfare programs ...'.¹⁷

I do not propose to discuss the merits of those contrasting views in any detail. My purpose at this point is simply to emphasize the divergence between those two views and the importance of reaching agreement on criteria which will facilitate the difficult process of arriving at a workable consensus concerning the choice of policies and programs for eliminating malnutrition and other dimensions of rural poverty. However, the structural and demographic characteristics of the late developing countries, the constraints which they face and the multiple and interrelated objectives which should be furthered by their development strategies point towards priorities which differ considerably from those suggested by Forman and by Joy and Payne. This will be related particularly to the proposition stated above that a country's strategy for rural development should further three major objectives: the achievement of self-sustaining economic growth, the reduction of poverty, and the slowing of population growth.

One important implication of this view is that nutritional or other programs undertaken for purely humanitarian reasons do not merit as high a priority as programs which are effective in simultaneously reducing poverty and promoting self-sustaining growth. An equally important implication is that increasing production is a necessary but not sufficient condition for reducing poverty. It is for that reason that the following section focuses on the desirability and feasibility of pursuing 'unimodal' strategies for agricultural development capable of accelerating the rate of growth of agricultural production and also of insuring broad participation of the farm population in the gains in productivity and income.

This is, of course, in contrast with a 'bimodal' or dualistic strategy in which resources are concentrated in a subsector of atypically large and capital-intensive farm units which account for most of the increase in agricultural production. Logic and the historical experience of Japan, Taiwan, China and other countries which have

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been successful in substantially eliminating the most severe manifestations of poverty suggest that effective implementation of a unimodal strategy for agriculture represents the most fundamental requirement for insuring widespread improvements in food consumption and nutrition. It also appears that broad involvement of the rural population in raising levels of living and the rising aspirations thus engendered creates a much more propitious environment for the spread of family planning than a bimodal strategy which bypasses the bulk of the farm population.

A final implication to be noted is that concern with the reduction of poverty and with the slowing of population growth directs attention to the potential importance of consumption-oriented strategies which are likely to be effective and feasible in reducing malnutrition, while simultaneously contributing to the goal of reducing fertility.

Production-oriented strategies

One of the most significant positive developments of the past five or six years has been the correction of the view that a 'protein gap' was the major nutrition problem in developing countries. Until very recently, however, the situation must have been extremely confusing to policy makers. Alan Berg has vividly described the dilemma of a Food Secretary of India bombarded by conflicting views concerning the importance of lysine supplementation or other interventions to increase protein quality or quantity v the view that 'the protein problem will solve itself if the calorie issue is met'.¹⁸ Given such divergent views among equally prominent experts in the interpretation of positive information, it is not surprising that it has been difficult to reach a consensus on policies and programs.

Although there is no unanimity, there is now an emerging consensus that, in general, nutritional deficiencies, including protein malnutrition, 'are the result of inadequate intake of food, being thus unavoidably associated with inadequate intakes of energy'.¹⁹ There are instances where starchy foods such as cassava or bananas provide ample calories but inadequate protein so that primary protein malnutrition is a major problem. There are, of course, also areas where serious nutritional deficiencies exist because of a deficit of a particular nutrient or mineral. But it is now recognized that the most widespread and serious nutritional problems, notably protein-calorie malnutrition, are a result of inadequate home production and/or inadequate purchasing power to enable families to consume sufficient amounts of food to satisfy their energy and other nutritional requirements. This recognition has directed attention to the extent to which nutritional deprivation is associated with poverty and the fact that malnutrition tends to be concentrated among poor families where per capita consumption is well below the national average.

A highly significant result of this view of the world food problem is the reinforcement of the view that the

elimination of poverty should be regarded as a major goal of national development. Unfortunately, for the reasons already mentioned in the preceding section, only limited progress has been made towards achieving a consensus with respect to the policies and programs that will be most effective in achieving that goal. The divergent viewpoints are too numerous to summarize systematically. I propose to limit this section to some comments concerning the desirability and feasibility of unimodal strategies for agricultural development as the key element in production-oriented strategies for reducing rural poverty, a subject which Peter Kilby and I have examined at length in our recent book.²⁰

Modernization of farm households

The belated recognition of the seriousness and persistence of problems of rural development has led to increased recognition of the economic and social advantages of unimodal strategies aimed at the progressive modernization of a large and increasing fraction of a country's farm households. Those advantages derive most obviously from the structural and demographic characteristics of late developing countries emphasized above.

A major implication is that technologies which require only a gradual increase in the use of purchased inputs must be emphasized if the bulk of the country's farm households are to participate in the gains in productivity and output associated with agricultural development. That is, the increases in productivity and output must derive primarily from enhancing the productivity of the farm-supplied resources of land and labor by gradually enlarging the use of inputs, such as improved seed and fertilizers, which are divisible and therefore neutral to scale. Such inputs can be used efficiently by the small-scale farm units which inevitably predominate in late developing countries.

The experiences of Japan and Taiwan demonstrate that this type of expansion path for the entire farm sector permits large increases in total factor productivity, because the new inputs complement the relatively abundant resources of labor and land.

If there is primary reliance on tractors and other inappropriately capital-intensive inputs which displace labor, the existing problems of unemployment and underemployment will be aggravated. Moreover, concentrating resources and the expansion of commercial production within a subsector of large-scale, capital-intensive farm units exacerbates the purchasing power constraint which inevitably limits the use of inputs when the number of farm households is very large relative to the size of the non-farm population dependent on purchased food. Until the relative and absolute sizes of a country's non-farm sectors have increased considerably, opportunities for employment outside agriculture cannot be expanded rapidly enough to absorb more than a fraction of the annual additions to the labor force. However, the patterns of rural demand for farm inputs and for consumer goods associated with a uni-

modal strategy can be expected to stimulate the growth of small-scale and medium-scale rural-based industries. This would permit relatively rapid growth of non-farm job opportunities because their expansion is not so severely constrained by shortages of capital and foreign exchange as is the case with large-scale, urban-based industries.*

The contrasting view that expansion and production by large-scale farm units is more efficient than a sector-wide expansion path based on widespread but gradual growth of productivity and output among small farmers has been reinforced by a tendency to confuse technical and economic efficiency and to exaggerate the importance of economies of scale in agriculture.

Needless to say, bimodal strategies receive strong political support from farm operators and others with a vested interest in a bimodal pattern of agricultural development. In a recent paper, L.D. Smith of the University of Glasgow concludes that if progress is to be made towards the elimination of poverty 'something approaching a unimodal approach seems essential in those countries with large agricultural sectors'.²¹ He goes on, however, to suggest that Kilby and I are overoptimistic about the political feasibility of governments pursuing unimodal strategies in countries where the ruling regimes 'are dominated by entrenched elites who will relinquish nothing to the underprivileged except under the duress of armed force'.²²

Perhaps we can derive some comfort from Keynes's oft-quoted remarks about the powerful influence of the 'ideas of economists and political philosophers' ... and nutritionists as well, let me add ... and his conclusion 'that the power of vested interests is vastly exaggerated compared with the gradual encroachment of ideas ...'.²³ Mounting concern with problems of income distribution and employment and with nutritional deprivation and other features of poverty is an encouraging development because some minimum degree of political commitment is an essential requirement. I submit, however, that equally or more important requirements for the efficacy of unimodal strategies in bringing about widespread improvements in nutritional status and in the general well-being of the rural population are related to whether the policies and programs adopted are administratively feasible and technically sound.

Drawbacks of Joy-Payne approach

It seems to me that there are certain features of the Joy-Payne approach to food and nutrition planning which are unlikely to pass this critical test of workability. First, it seems seriously misleading to draw an analogy, as they do, between the food problems that the UK faced during

the second world war – which Lord John Boyd-Orr characterized as 'not one of supply but one of more equal distribution of the food which is available' – and of the food problems of late developing countries. Policies and programs which reduce inequalities in income distribution can and should make a significant contribution to the reduction of poverty. Redistributive land reform is especially important. It not only insures more nearly equal access to income from this asset which is scarce and so important in most developing countries, it also increases the likelihood that the technological innovations that are generated and adopted will lead to a unimodal pattern of agricultural development. But it is dangerous to underestimate the importance and the difficulty of the task of accelerating the growth of agricultural production and of doing so by means which insure the participation of a large and growing fraction of the farm population. Even if it is politically feasible to increase the food intake of the poorest households by diverting supplies from higher-income households, that is a one-shot operation; and there is a continuing need to expand total supplies by 2.5 to 3.5% per year simply to prevent deterioration in the per capita availability of food.

We must not lose sight of the fact that the problem is not one of isolated pockets of poverty within a static population but rather one of widespread deprivation affecting perhaps 40% of a population which is increasing rapidly. Hence, my emphasis on the elimination of poverty as an integral part of strategies designed to achieve the multiple objectives of self-sustaining economic growth, the reduction of poverty, and the slowing of population growth.

My other reservation reflects doubts about the administrative feasibility of the Joy and Payne approach. They appear to be advocating a type of detailed planning of both production-oriented and consumption-oriented measures aimed at the reduction of nutritional (or other) deprivation 'in relation to specific people' on the basis of an analysis of 'how their deprivations might be prevented or alleviated ...'.²⁵ My uneasiness is increased by their apparent emphasis on an *ad hoc* approach to 'the identification and design of measures' for various local areas directed at specific target groups. That uneasiness is not allayed by their observation that 'the use of specialist consultants could do much to improve' the process.

There is also a strong emphasis on planning at the national level, much of which seems to be doubtful in terms of administrative as well as political feasibility. An especially questionable suggestion is that 'until staples are adequately available at low prices, resources should not be diverted to the production of luxury foods'.²⁶ It appears to me that such detailed, centrally guided planning aimed directly at eliminating the deprivation of specific people in specific local areas would be beyond the implementation capacity of a regime as powerful and skillful as Mao's China. At least, it seems clear that the leaders of the Peoples' Republic of China have eschewed

*Fertilizers represent a special case. Particularly for nitrogen fertilizers, the technical characteristics of the efficient production processes require large-scale, capital-intensive production units. Hence, the provision of relatively cheap fertilizers to a country's farmers is often best realized by relying on imports. For that reason alone, fertilizer represents a more appropriate commodity than food for inclusion in aid programs.

any such attempt at detailed food and nutrition planning with their heavy emphasis on decentralized decision making in agriculture and on community self-reliance.

I make these criticisms because I believe that the Joy-Payne approach diverts attention from the more realistic options confronting late developing countries. With regard to production-oriented strategies, the relevant options are agricultural development in the context of a market economy and the Chinese version of a unimodal strategy within a fully socialist economy with its rural communes, brigades, and production teams providing the structure for a highly decentralized version of a command economy. China's approach is also very pragmatic in its willingness to be guided by market prices. Interesting examples are its policy of importing wheat and exporting rice and of commissioning the construction by American and Japanese firms of ten extremely large-scale nitrogen fertilizer plants in order to take advantage of technologies recently developed in Western countries which have a decisive cost advantage in producing a product that is critical in the current phase of China's agricultural development.

Components of effective unimodal strategy

On the basis of our analysis of agriculture and structural transformation, including close examination of the experience of Taiwan, Japan, and a number of other countries, Kilby and I concluded that in the design of an effective unimodal agricultural strategy, priority should be given to five components:

- (1) Strengthening the research base;
- (2) Influencing the size distribution of farm operational units to curb tendencies towards a dualistic size structure with subsectors using drastically different technologies;
- (3) Expanding and improving the agricultural infrastructure;
- (4) Promoting the diffusion of technical knowledge and wide access to internal inputs;
- (5) Improving systems of agricultural taxation and rural welfare, for example, public health and nutrition programs, together with policies and programs that will accelerate the lowering of birthrates to levels compatible with sharply reduced death rates.²⁷

It is not at all surprising that those priorities appear to be reflected in the actual pattern of agricultural development in Taiwan and Japan because our thinking was influenced a great deal by our study of their experience. I am intrigued, however, by the fact that the list seems to also fit China's priorities rather well, except that the action to improve agricultural taxation has taken the form of provisions to insure a rather high rate of capital accumulation within the rural communes and their subordinate units.

Although I have concentrated on areas of disagreement, I want to make it clear that there is much in the Joy-Payne report which I find valid and useful. The eloquent argumentation for giving greater emphasis in

development programs to the goal of reducing deprivations such as particularly serious forms of malnutrition which would make the most significant contribution to social welfare, should help to muster increased support for production-oriented and consumption-oriented strategies for the elimination of poverty. Their emphasis on a functional classification 'to relate nutritional deficiency patterns to spatial, ecological, socioeconomic and demographic characteristics' of the population should be of considerable value in determining priorities. Their focus on the need for better understanding of the functional significance of different types and degrees of malnutrition – and similarly for various health problems – should encourage research which will provide valuable guidance for consumption-oriented strategies, to which I now turn.

Consumption-oriented strategies

The problems which complicate rational choice of measures to be included in consumption-oriented strategies for the reduction of malnutrition and other forms of deprivation are not limited to the lack of agreed criteria to guide decision making. Such strategies potentially embrace a wide variety of measures aimed at directly reducing deprivation by altering consumption patterns, particularly among low-income families. Programs to redistribute income directly, rather than reducing inequality by restructuring the patterns of economic growth so as to increase the availability of income-earning opportunities and returns to labor, are additional measures which fall within this category. Included also are efforts to promote family planning because of the direct nutritional benefits of reducing the number of children in a family and of better spacing of births and because of the indirect effects of a lower rate of population growth in facilitating increases in per capita consumption of goods and services.

Even limiting attention to nutrition measures, the number of possible intervention programs is great. Relevant examples are:

- School feeding programs.
- Supplementary distribution of food or nutrients to infants and small children, pregnant and lactating women, or other target groups.
- Food fortification.
- Multitiered pricing systems such as India's fair price shops or food stamp schemes.
- Direct rationing of staple foods.
- Development and introduction of new foods such as Incaparina or Vitasoy.*

There are also a number of significant opportunities for non-food or environmental interventions which may have more impact on nutritional status than some of the nutrition interventions. The Report of the NAS Study

* In the paper mentioned above, Forman mentioned the now incredible fact that at one point AID established a separate office specifically for the promotion of FPC; the current generation of students probably does not even know that the acronym stands for Fish Protein Concentrate.

Team on Nutrition considers five possibilities in that category: water supplies, the intrauterine environment, the neonatal environment, lactation and breast-feeding, and infectious disease – and of course parasite infestation should also be mentioned.

Choice of consumption-oriented measures is further complicated because external donors such as AID, UNICEF, FAO and the World Food Program, and private agencies such as CARE have often played a major role in the initiation of nutrition intervention schemes. It is my impression, for example, that the prominent position of school feeding programs among nutrition interventions in developing countries is a fairly direct consequence of the inducement of foreign aid and the fact that a number of donor agencies have favored this technique because of their familiarity with school lunch programs in their home country.

Preference for school feeding schemes has undoubtedly also been influenced by the availability of a school system and teachers to administer the program, thus avoiding the organizational problems involved in reaching pre-school children and pregnant and lactating women, groups which would otherwise merit a higher priority.

Given this multiplicity of options and the absence of any agreed choice criteria, it is not surprising that there have been marked differences of opinion even among nutrition experts in setting priorities. Thus the Report of the Ninth Session of the Joint FAO/WHO Expert Committee on Nutrition takes a rather skeptical view of direct interventions, especially supplementary feeding programs.²⁸ In contrast, the Report of the NAS Study Team on Nutrition assigns high priority to supplementary feeding and other direct interventions, and proposes an ambitious research program to try to overcome the intractable problems of applying cost-benefit analysis in the evaluation of such programs. This position seems to be justified by two main considerations: substantial funds are currently being allocated to those programs and even though such programs may have certain shortcomings, 'this should not obscure the legitimate short-run improvements possible'.²⁹

Integrated approach

My treatment of this complex and difficult subject will concentrate on one particular approach, ie integrated programs for delivery of nutrition, health, and family planning services. It appears that the arguments advanced by Taylor and Mitra at the 1961 MIT Conference concerning the potential advantages of an integrated approach have clearly had more influence than any other proposition put forth at that conference.³⁰ The idea received strong endorsement in the Report of the Ninth Session of the Joint FAO/WHO Expert Committee on Nutrition which noted that 'linking health, nutritional, and family planning services ... is likely to increase the attractiveness and effectiveness of each. In particular, the attitudinal changes resulting from reduced infant mortality and improved nutrition and health are likely to increase receptivity for the idea

that family size can, and should, be determined by conscious choice'.³¹ More important, there is a small but growing number of programs being carried out which already provide evidence concerning the feasibility and effectiveness of an integrated approach. I hope that the following discussion will give some attention to a few of these programs, including the Narangwal Project in India, with which Carl Taylor has been associated, and Project Compassion in the Philippines which has impressed me as representing a particularly well conceived and promising methodology for introducing an integrated program.

The third and last major thesis of this paper is that among consumption-oriented measures, the design and implementation of this type of integrated program for the delivery of nutrition, health, and family planning services in rural areas should receive first priority in late developing countries. I will limit myself to a few summary comments in support of this proposition; A.J. Meyer and I have dealt with the subject at length elsewhere.³² I attach major importance to the proposition that focusing attention on the potential contribution of integrated programs aimed at the multiple objectives of improving nutrition and reducing ill health and promoting the spread of family planning can increase significantly the prospects for reaching a workable consensus. Particularly in the late developing countries where resource constraints are limiting and nutritional and health problems are most serious, nutrition and health activities in rural areas currently have little impact, reaching only a small fraction of the population, and commonly missing the lowest income groups with the most severe deprivations. Because of its clear relevance to two of the major objectives of development, there is a realistic possibility that the launching of integrated programs could muster the political, administrative and budget support required to achieve wide coverage of the rural population.

The synergism between the three types of activities means that developing a methodology and creating an organizational structure, including local community groups, for implementing an integrated program can be expected to result in greater cost-effectiveness than separate nutrition, health, and family planning programs. Because of serious manpower and financial limitations, the initial composite package to be included in an integrated program will have to be very restricted; but this type of program lends itself to a sequential approach, whereby the range and quality of services provided to rural households can be progressively expanded and improved as existing constraints can be overcome through training programs, on-the-job experience and enlarged resources, provided from within the local communities as well as from the central government, as the programs demonstrate their value.

Ongoing and future research in the fields of nutrition and health can make a major contribution in guiding decision making with regard to the modification and strengthening of such programs. But much can be accomplished in insuring sound design of such programs

and of methodologies for their implementation through consultation among nutritionists, medical and public specialists, social scientists, and administrators directed at reaching a consensus on the initial objectives of integrated programs.

I am keenly aware that difficult problems are likely to arise in securing the political, administrative, and budget support required for the introduction of integrated programs and in connection with their design and implementation. I trust that we will be able to consider some of those issues in the discussion. Their potential advantages appear to be so significant, however, that a very high priority should be given to encouraging and assisting efforts to design and implement integrated nutrition, health, and family planning programs.

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- 30 C.E. Taylor, 'Nutrition and population', in *Nutrition, National Development, and Planning*, edited by Alan Berg, N.S. Scrimshaw, and D.L. Call, Cambridge, Mass, 1973. Asok Mitra, 'The nutrition movement in India', *Ibid*.
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Discussion

Peter Hakim (The Ford Foundation)

Dr Johnston has presented a compelling strategy for arranging rural production and incomes, and I suspect that if it were followed in many of the late developing countries it would probably result in reductions in poverty and malnutrition as well. It can also be seen as a strong pursuit

of continent-dominant strategy; it is a suggestion for change and it is critical.

However, there are some problems with this strategy. For instance, why are the continent-dominant strategies in most third world countries so different? Paul Ganderson, a political economist who writes about Latin America, has presented development strategy as basically a determinant of how benefits of development are allocated to different groups in a society. This is of particular interest to people

concerned with nutrition and poverty because it relates to the results of different development strategies on the allocation of goods, services and food in a society.

The basic question is what shapes a country's development strategy? To answer, one must know how social, economic, and political decisions are made in the country. As yet, there really is no definition of what is 'politically feasible' under different circumstances. There is talk about political will or political commit-

ment, but it does not reach the heart of why certain decisions are made under certain circumstances. Programs such as school feeding projects can be initiated in almost any country, while other programs or policies are introduced in only a few countries, and some particular changes are impossible in all but a few countries. It seems to me that the political scientist or public policy analyst really can make a contribution here but, like the economist, the political scientist uses models of political decision making which are generally poor predictors of the most critical subjects. Nonetheless, they are sometimes useful in explaining certain patterns of decisions.

It should be recognized that no single model can really explain any decision. Let us consider three models: the unitary or national model, the bureaucratic policy model, and the social conflict model. The unitary or national model treats the country as a single unit. It assumes that there really exists an entity called China or Argentina or Kenya. That entity has interests which can be objectively stated, and the decisions that come out of that country reflect those interests. This type of model is used mainly in discussing foreign policy decisions and I suspect that it is really useful in explaining only a small number of issues.

The other models introduce the notion of competition among different groups within a national society and really begin to suggest that there is no such thing as Argentina or China as an entity with interests. Rather, a country is made up of different groups or institutions with different interests, and policy outcomes are a result of competition between these different interests.

Consider the bureaucratic model. It is useful in understanding, for example, how universities work, in that there are bureaucratic units, departments, institutes, etc., within a university that compete over budgetary allocations. And it is difficult to identify the interests of the department of nutrition, for instance, with the interests of the university as a whole. The bureaucratic model assumes that government decision making is somewhat autonomous from the social system. I suspect

that it is this model which dominates the interpretations of the shifting priorities among government agencies. In other words, the government can decide on those shifting priorities somewhat autonomously.

Most international organizations tend to intersect with foreign governments precisely at the bureaucratic level, and change is often brought about simply by grants from an international organization given in return for the setting of certain priorities by a government. For instance, the provision of Public Law 480 supplements to an agency that manages a school feeding program increases the influence of that agency. Funding from international organizations also tends to give more legitimacy to certain activities. In general, the bureaucratic model seems to be useful for some governmental decisions and policy outcomes, but it really does not explain development strategy.

A different sort of model is needed to understand some of the more basic decisions, such as those concerned with agrarian reform. This model also rejects the notion that a country is a single entity and that government policy decisions are made autonomously. It really says again that there are different groups in a country with different interests and that there are social, economic and political relationships among these groups that often characterize a certain dominance and dependence. In a developing country, these groups tend to be rather stable. There are the small farmers, middle-sized farmers and large farmers, each with interests that tend to conflict with one another. In urban areas there are industrial workers, marginal laborers, and white collar workers, also with different interests.

Some of these groups have more power, more influence, and more input in government decisions and sometimes they form political parties or stable coalitions when their interests are sufficiently similar. It is interesting to study these coalitions and their participation in the political process. For example, from the turn of the century in Latin America there has been an expansion of the process to absorb new social groups into the political process. The old political elite was replaced by middle-class elements as a result of expansion of the state bureaucracy. The growth of industry produced in-

dustrial workers who occasionally formed organizations in rural areas and began to participate in the political process. The formation of labor unions and the social organization of left-wing political parties which began to have some access to political decisions were paralleled by the extension of health care services to organized workers.

This suggests that our work is not likely to be influential on the major fundamental structures. We are more likely to have some small influence in the way elite groups within the bureaucracy operate to shift priorities, but we have little influence over the groups which decide the major allocative issues.

Jyotirindra Das Gupta (University of California)

Dr Johnston has discussed the importance of policy and program generation, which are high-priority issues in developing a conceptual design. However, the wide area of political action intervening between the well worked-out design and the terminal accomplishments is sometimes not appreciated when the focus is on design. This is especially true in poor countries where most of the initiatives for development come from the public authority which is the most well organized instrument of action.

In the preceding discussions, there was an implied glorification of plans and an implicit identification between plans and planners. It is my feeling, at this point, that a good plan document can only provide some aid for policy making. To what extent policy makers are willing to buy the ideas and follow them through will depend to a large extent on whether or not the designs actually fulfill the priorities of the political authorities. Those political priorities are more important than the actual designs from the planners. This is why political authorities buy the services of certain types of planners and dismiss the services of certain other types of planners. Political authorities tend to reserve the right to emphasize certain aspects of development as opposed to others. For instance, why does India emphasize a nuclear policy rather than a poverty policy, or a nutrition policy?

Policy analysis, then, is addressed to the links between public policy

authorities and the targets to which the policies are directed. The political structure must be related to the social and economic structure which provides the environment for the actual activation of the policies. This is important because poverty is not simply an economic condition of low income, low purchasing power, or low employment utilization; it is also the condition of social subjugation. There are certain social authorities which benefit from the perpetuation of this poverty. The political control system is a monopoly control system; it helps perpetuate the social condition of subjugation. How else does one explain that the poverty situation has been expanding in most of the countries that have been implicitly or explicitly discussed here? If the emphasis on poverty reduction is so relative to recent trends, it is worth analyzing the reasons why political authorities woke up so late. How serious is their current perception of the mood to eliminate poverty and to mobilize both the political and economic resources that are actually needed to achieve this end? How wide is this shared perception? It is not simply a question of the central government's perception (particularly in the case of a country like India); the state and local governments and the extragovernmental, informal political authorities also share in the official perception of the

need to abolish poverty.

It must be recognized that underdeveloped political systems are managing problems of development, and the political capability of such central governments tends to be extremely limited. A realistic design for development must take account of the sources of action beyond the formal central government on which attention has so far been focused. To be more specific, let us assume that the central government in a country such as India is receptive to this sort of design. Given the current base of political support for the regime, what degree of commitment can we expect from the political authorities as a whole, from the country government down to the local government? Assuming that the commitment is forthcoming, we must ask whether or not the adoption of this design is likely to improve the security of the political authority. If it does not, then the design is wrong.

As the political authority gradually alters the structure of benefits and reaches newer groups, it is important to ask if the capability exists to bring these new beneficiaries into community participation and into a link between community organization and the national organization? If these newly organized resources can be linked with the national political system, they can provide a new basis of support which will

make it possible for the political regime to shift gradually from its old basis of support.

The mere transfer of subsidies from the rich to the poor peasants is not sufficient to accomplish this organizational task. This is a tall order for any political regime - we have been giving tall orders to most of the underdeveloped countries without realizing how fragile their political authority is in these initial stages of development. If we had a sense of comparative political analysis, we would see that historically political authorities have not relied on only one homogeneous type of support structure; they have been able to shift their support structures among a variety of social classes. Both revolutionary and non-revolutionary regimes have the capacity to learn if they are so motivated, or if they are pressed to do so. It is this learning capacity of the regime that we can explore to understand the political conditions of action which can make possible the realization of our programs.

The question of design must be related to these questions of active possibilities, because merely generating intellectual concern around the design will not be of much help. This area of action is pre-eminently political and, by investigating it, we can consider what is possible in practice and what is left for us to do.

Systems approach to nutrition planning

S. Venkitaramanan

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This discussion focuses on the strengths and weaknesses of a systems approach to nutrition as revealed by a study undertaken in Tamil Nadu, a state in India. The study commenced late in 1970 and the report was finalized in 1973.¹ My use of the Tamil Nadu study for this purpose is not meant to imply a bias in its favor.

Tamil Nadu Study

Tamil Nadu accounts for approximately 7.5% of India's population. Its population increased from 33.7 million in 1961 to 41.1 million in 1971. The state ranks second in literacy in India. The population lives in 443 towns and about 14 000 villages. According to one estimate, the availability of calories and proteins per capita per day in Tamil Nadu was 73 and 88%, respectively, of the all-India figure.

The objectives of the Tamil Nadu Systems Study were:

- To identify, describe, and analyze a nutrition system – those conditions and forces in Tamil Nadu which appeared to be the principal determinants of the diets of preschool children in selected family income classes.
- To identify possible points in the system which appeared to be susceptible to modification in order to achieve significant changes in these diets and, therefore, in the survival rates of the children; and to describe the action programs needed for this purpose.
- To identify the possible points or elements in the system that could sensibly relate nutrition, via increased survival rates, to socioeconomic areas such as family planning, general economic development, and quality of life.
- To limit the above analysis to those parameters most relevant to proposed solutions to nutrition problems in Tamil Nadu.
- To propose specific action programs related to solutions of nutrition problems in the state which

could be undertaken by the state government, by private Indian organizations, or by bilateral assistance organizations.

It was expected that the study would encompass the subsystem of agricultural production, processing and consumption and that it would help provide answers to questions relating to aspects of agriculture, food processing and distribution, and consumer needs and preferences as they affect nutritional intake of target groups. The aim in the initial stage was to build up an analytical model to stimulate and test hypothetical nutrition interventions and select the most effective of these.

The study was developed jointly by USAID, the government of India, and the government of the state. The expatriate experts in charge of the study interacted closely with the government agencies. An interdisciplinary project team, incorporating experts in economics, statistics, biology, nutrition, food technology and anthropology, was organized. The work plan of the study incorporated collection of primary and secondary data with regard to each of the three subsystems of production, processing, and consumption.

The consumer subsystem was more thoroughly studied than the other two in that a data base of five thousand families was analyzed in four rounds of data collection. Data was collected concerning the agriculture subsystem, and the food processing sector was thoroughly surveyed. Two food product related interventions were tested in the field: take home food tests examining the effectiveness of 'take home' delivery to reach the weaning infant; and an evaluation of two products from a continuous cereal processing (extruder) installation. Ongoing feeding programs (the state is a pioneer in institutional feeding programs) were also evaluated.

The project team was, in effect, treated as part of the coordinating group on nutrition of the Tamil Nadu government in that it reported to the chairman of this group, the Secretary for Social Welfare. Other members

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of the group were the Secretaries of Agriculture and Food, Health and Family Planning, Education, Rural Development, and Finance and Planning. As the work progressed, the project team members were requested to participate as *ex-officio* observers in the planning activities related to nutrition. Their work was reflected in the state's perspective plan for nutrition.

Summary of findings

It would be impossible to do justice in a summary to the wealth of nutrition information collected during the study. The main findings were:

- The median fell at 80% of caloric needs met, and the major deficiency was in calories, not protein.
- The target group requiring special attention was the adolescent female. Traditional practices were counter-productive to survival. Cultural constraints on food behavior were significant and improvement of nutritional status was found to be essentially a problem of behavioral change.
- Nutritional status of target groups was not truly income-related because of intrafamily distribution.
- Rural/urban variables, educational status, and caste were important determinants.

The solution to the nutrition problem among the target groups involved not only improved income, but it also involved delivery systems, appropriate nutrition education of family elders, and a supply and proper identification of survival foods.

The study concluded that to modify the dominance of the culture in the policy direction of a greater survival rate, the state must see that the weaned child is fed. A take home food delivery system, although amounting to a family food subsidy, did not appear to insure survival of the weaning infant. Child development centers (already planned) which would provide a package of services in addition to food, appeared to be an approach to an answer.

Limitations of the systems study

The construction of a complete systems model and a comprehensive systems analysis was not completed during the study. This was due partly to conceptual differences among the experts and partly to the complex nature of the problem. The task of data collection and questions of methodology so dominated the project that operational conclusions and advice became secondary. Systems analysis in the sense of producing (elegant) models became the prime focus.

The interrelationship of agricultural production and nutrition was touched on in a general way, but the more complicated questions of small farmer tenant/farm labor nutrition were not dealt with. Considering the importance of the government food procurement and rationing system in ensuring the nutritional status of the vulnerable groups, it is surprising that the study did not devote more detailed attention to this aspect.

Is systems analysis the right method?

Hoag defines systems analysis as 'a systematic examination of a problem of choice in which each step of the analysis is made explicit wherever possible'. Following Hoag's approach, I would contrast systems analysis with a manner of reaching decisions that is largely intuitive, perhaps unsystematic, in which much of the implicit argument remains hidden in the mind of the decision maker or his adviser. Systems analysis so defined is inevitable for decision making in any field.

The problem arises when we go further and try to obtain a full systems study or description. The nutrition system is a global system: almost all human activity can be related to nutrition. The Tamil Nadu study found that nearly 70% of the activity in the state was related to nutrition. Is it possible to wait for solutions to the problem of nutrition until a total systems study is done? Indeed, we are caught in the conflict between what is feasible and what is desirable. What is desirable may postpone a decision on what is feasible.

Global studies

Nutrition actions (not necessarily interventions) are needed immediately. Malnutrition is a clear and current problem. Overelaborate studies only postpone and confuse the decision making process. It should be possible to undertake incremental studies—partial studies built on existing knowledge—concurrently with operational programs. Decision makers in developing countries who feel that malnutrition is a pressing problem are impatient with suggestions for studies. They feel that the field has been overstudied. This emotional reaction should be noted: the time taken to do the studies and the relative innocuousness of their conclusions makes it all the more valid.

Computer models

The state of the art is such that we cannot and should not embark on creation of overambitious analytical models in this field, where cultural variables are very large explanatory factors. Systems analysis devoted to computer-based simulation of the nutritional system is not feasible in my opinion. The behavioral interactions are too complex to be fed into such a system.

Cost-effectiveness analysis

In studies of nutrition problems, systems analysts have emphasized the importance of costs and effectiveness of alternative solutions. In this sense, any rational process of choice involves a discussion of costs and effectiveness. Here we must define what we mean by alternative nutrition actions and target groups.

Is a program of pulse-growing a nutrition action or an agricultural activity with a nutritional emphasis? Similarly, are we to focus on the target group of the nutritionally vulnerable or the productive survivors in

the labor force whose productivity has to be preserved? Do we have the tools to measure the relative costs and effectiveness of allocating resources to sustain a laborer nutritionally as compared to a child at risk? How do we take into account the declared preferences of society at large (which may be different from revealed cultural preferences) in favor of the latter? Or, are we to determine cost-effectiveness in a narrower frame of reference? Are measures of effectiveness available, especially when we consider the nature of infections and environmental factors which may affect nutritional status? We are groping for answers to these issues.

General questions

Nutrition planners must face the question, 'Are you not trying, under the garb of systems analysis, to take over all planning?'. Nutrition touches so many sectors of economic activity that such a question is relevant.

Nutritionists operate within a narrower frame of reference than general planners, and, at the same time, seek to influence almost every sector which the general planners command. This has been the dilemma of the health or social welfare nutritionist. From this point of view, a systems analysis approach to nutrition flushes out the linkages between nutrition and various sectors of economic activity. Improvement of nutrition is then seen as originating from a coordinated, multisectoral effort. The systems analysis of nutrition planning is an important stage in the sensitization of general planners to the urgency of the problems and opportunities of nutrition-oriented efforts.

Reference

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Discussion

James Pines (TransCentury Corporation)

I am substantially in agreement with the preceding paper; however, I would like to emphasize several points. First, the Tamil Nadu study neglected the time requirements within which decision makers operate and it thereby lost credibility. Whatever the virtues of such studies, they are unlikely to be relevant to policy determination in the light of their multi-year requirements.

Second, instead of seeking to model 'the nutrition system', analysts should identify a small number of key relationships (eg disaggregated food balances, income and least-cost diets, production and autoconsumption) likely to be useful for nutrition planning, and model them. This would permit better prediction of intervention outcomes and satisfy most of the analytical requirements for planning at far less cost.

Third, more useful than systems models would be an emphasis on building into all project activities the information systems necessary to produce continuous monitoring and evaluation of data. Prompt feedback and speedy adaptation of plans to what is learned would be more useful to policy and program than waiting for completion of systems studies and thereafter relying on simulations.

Victor Smith (Michigan State University)

I am in agreement with Dr Venkitaramanan's paper and the statements of James Pines. The paper teaches us several lessons. One lesson is that even the systems approach can be ruined by poor execution. Technique cannot substitute for the artist, and the method cannot substitute for the skill and judgment of the practitioner. It seems to me the systems approach was the umbrella under which Dr Venkitaramanan's group went out and collected large volumes of useful data on consumption, agriculture, and food processing. But data collections and surveys were around long before the systems approach became formulated and named.

Another lesson is that the failure of the systems approach was perhaps not accidental. The model was not completed, and since there was more concern over data collection and methodology than getting the problem solved, several important sub-sectors of the system were neglected. I do not know, however, that there is anything in particular about the systems approach that makes it more subject to that sort of failure than many other methods. The systems approach, as it was applied in Tamil Nadu, was a large-scale operation, and, therefore, inherently subject to delays.

It should be noted that the failure to use some general, systematic

model also has its faults. Dr Venkitaramanan suggested in many cases we would do better to use incremental or partial studies. I agree, but we do not really know if the incremental study is going to be satisfactory until the general study has been done. It is a phenomenon among economists that one group analyzes from the demand side and another from the supply side, and after a certain time they finally agree that there are two sides and both should be in the model. I feel there is a need to have all sides included.

I would like to discuss some cases in which partial analysis or no analysis led to certain economic development actions that were directed ostensibly towards solving nutrition problems. I think the actions were incorrect, and I came to this conclusion after using the mathematical programming model to analyze the agricultural sector of Nigeria. Under the broad definition of a systems model that Dr Venkitaramanan mentioned, this could have been considered a version of systems analysis. It was a summary model of the production, transportation and consumption system of a Nigerian agricultural sector. It provided for movement of goods from one region to another, for some international trade, etc. It was not an optimizing model. The purpose was to discover which of the various agricultural activities in Nigeria were efficient sources of nutrients and to show the relationship between agricultural pro-

duction and nutritional consequences. Setting up the problem as a general equilibrium model made it possible to compare each activity and each technique with all the available alternatives.

There have been several pleas today for models of this sort. However, the agricultural economists in general have no interest in them. It is easier to discuss my model with nutritionists, who may find the approach unusual but at least the subject is not offensive to them. In designing the model, I was more interested in the technical relationship between inputs required, resources available, outputs and nutrient requirements than I was in the operation of markets. That is essentially heretical. The model required that certain nutrient levels be attained in each of the six ecological areas of Nigeria defined for the purpose. The objective function was the income that could be obtained by selling products of those resources that were not being used to feed Nigerians. It was an efficient model in the economic sense, because there was no waste of income-producing resources, but its objective was to provide adequate nutrition.

There were three cases in which the standard partial analysis led to economic development activities that were ill-advised (according to my calculations). At that time there was a protein problem in Nigeria and young children were suffering from kwashiorkor and marasmus. So the US government, via USAID, sent a maize breeder to southern Nigeria to develop a high-lysine maize with a better protein content. But nobody troubled to find out whether indeed lysine was limited in the Nigerian diet. It was not. Methionine or methionine-cystine was limited, and the improved high-lysine maize was lower in methionine than the native maize. I was told later by the person who developed the high-lysine gene that there was also a high-methionine gene which could just as well have been used. Since we had just finished successfully breeding a high-lysine maize for Colombia, the natural thing to do was breed a high-lysine maize wherever we found anyone who grew maize. (Of course, Nigerians do not use very much maize and when it is used for infant feeding it is soaked so long that the protein fraction is lost.) The Nigerians gave

up a potential quantity of calories that was costly to provide in favor of an essential amino acid for which there was no apparent need.

Second, the Nigerians, with aid from the USA and perhaps other countries, were spending a good deal of time and effort in improving their traditional animal industries. The model that I worked with considered the traditional animal industries as an option. Only one of the modern animal industries was efficient in the sense that the nutrients it provided cost less than they would have cost if they were provided by other combinations of foods available in Nigeria. In general, we were encouraging the Nigerians to put resources that the poor Nigerians desperately needed for food into the production of food for animals that would be highly welcomed by the well-to-do Nigerians. It was a clear case of a transferred income, but it was not going in the right direction.

Finally, the cowpea is one of the legumes being used as a means of increasing the protein composition of the diet in Nigeria. This is not very promising. In some parts of Nigeria the cowpea is simply not efficient at all nutritionally even its improved varieties. The problem is that Nigerians need calories as well as protein and the cowpea does not have a good yield under Nigerian conditions. There are definite limits in Nigeria as to the amount of land one can shift to the production of cowpeas. The calories lost by turning an acre of land into the production of cowpeas would cost more to replace in other ways than the protein gained. This sort of situation can be covered with the right model. Very few models of this sort have been set up, but it can be done. One needs a system that contains the whole set of alternatives.

Several other sorts of information came up in the course of this systems analysis. There were a number of cases where existing crops and production activity had considerable nutritional merit - a great deal more than was recognized by the agricultural development planners. One was millet, which is a basic food in the north and an extremely promising nutritional possibility in the eastern region. The Easterners did not know how to use it very well, but they were learning rapidly. After the Nigerian civil war they knew a lot

more about it, because many of the fortunate Nigerians came back to the eastern region from the north and brought the skills and knowledge necessary to make effective use of millet. That fitted beautifully into the nutritional needs of the Nigerian diet in the area.

Another crop was soybeans, which they were growing for export. They did not eat the soybeans themselves because they did not know what to do with them. This was unfortunate, because the nutrients in the soybeans were far more valuable, in terms of the costs of providing those nutrients in other ways, than anything they could sell the soybeans for.

How may one increase the income of Nigeria without reducing the nutrients available? One obvious answer is to add a little more to acreage and export crops. That will add income and make the necessary adjustments to maintain nutrient levels. According to the model, it was possible to increase Nigerian income more by expanding the production of certain standard food crops than by expanding the production of the export crops.

In conclusion, I would like to say that this kind of systematic approach did provide, in my judgment, a very useful method of integrating the consideration of nutritional questions with the development of agricultural planning.

C. West Churchman (University of California)

I am a philosopher, not a nutritionist, and I have a mental picture of you nutritionists out in some dry, dusty part of the world deprived of nutrients. I was wondering what you characters do for sustenance in these deprived areas. No doubt you bring along your own. Doris Calloway once said that the malnutrition problem in the world is just as bad, or worse, than it ever was, and the academic community ought to be able to make a contribution. I was so astonished by this that I perked up my ears in encouragement and hope, since my main philosophical problem has always been the following: is it possible to secure improvement of the human condition through intellectual effort?

At one time in the West, in the nineteenth century, it was thought

that the answer was obvious—science and technology had indeed improved the human condition by facilitating longer and healthier lives, better education, etc. I think that now there is good reason to question whether or not the evidence that was taken in the nineteenth century to be so conclusive in this regard was really legitimate. Can the intellect establish the means by which our lives are better than they would have been without the use of the human intellect? Since you are all interested in one specific aspect of that problem, I find your discussion absolutely central in my own particular philosophical interest.

I have come to feel that I do not understand many of the things that have been said so far, and that I must understand them better before I can begin to communicate. For example, it was said that you go into a country, establish that there are nutrition problems, and then try to intervene to improve the nutritional status of the people. I do not understand that at all. In the work I do, if there seems to be trouble in a particular social system, one does not necessarily go in to remove the trouble. Your area may be different. I spent the summer with librarians in Australia and they did not question the fact that 90% of the collection was never used, but the answer was not to go in and increase utilization or to throw away the 90%. Neither response was appropriate. I am not trying to be critical; I am just confused, and that is a good state to be in for a philosopher. In fact, philosophers are very distressed when matters become clear and definite.

Now, there is a distinction to be made between these two approaches. These two efforts both deal with social systems, but they approach the whole problem of dealing with social systems in quite dramatically different ways. Systems analysis can be contrasted to systems design or holism. Systems analysis is essentially an attempt to understand how to design components of the social system so as to serve given objectives. That is the major problem of linear programming, for example, and non-linear programming, and all the models that we use in operations research. These models are not usable unless some kind of agreement has been reached on what we are trying to accomplish in the

system, and which components will enable us to accomplish our objectives. That is where systems analysis essentially begins. Systems design, on the other hand, comes long before that stage.

I think there are two central questions in systems design or 'holism'. The first is who should be served by the system we are talking about? The answer is never clear. The question can often be subdivided into the priority system. Part of the question is, who are the people who are now benefiting, not necessarily consciously, from the malnutrition status of the present world? There are people who really benefit from it. This seems to be a critical question.

The other question is what can be implemented? Implementation and client go well together. One reason why systems analysis turns out to be an enemy is that it often proceeds to generate options for decision makers which can in no way be implemented sensibly, and if they were implemented would lead us to worse situations than if such action had not been taken.

To compare systems analysis and systems design, I would say that they tend to get in each other's way and actually become somewhat antithetical, because systems analysis is academically respectable and systems design is not. Systems design has no straightforward, well established way of answering its basic questions of who should be served or how the implementation process should be carried out. It is not academically respectable, because this depends on a certain philosophical, systemecological approach to inquiry. We have no well established way of arriving at the deep problems of systems design.

Systems analysis in principle is based on what academics call an explicit theory. Systems design is not 'theory', in the usual sense of the word, because it uses judgment, and judgment is a specific conclusion for action made in the context of strong disagreements. Its best application is in the law where our courtroom procedures are carried out in exactly that fashion. This has led many a systems designer to suggest advocacy planning as the best way of planning. We have still too little experience with that to know how well it would work.

Systems design, as compared to

systems analysis, makes no distinction between objective and subjective. I have a literary friend in German literature, who, when discussing objective and subjective, said 'I always thought the opposite of subjective was objectionable'. From a systems design point of view, where we are trying to look at things in a broad way, the classical distinction of objective and subjective does not appear to be very useful. I always thought that judgment underlies all of science. I think the remark was made that judgment as compared to science often comes to conflicting conclusions. I would have thought that everybody recognizes that scientists do indeed come up with different conclusions in the same experimental circumstances. The point is that our conclusions should not vary so much as to wipe out anything significant. The hope in systems design is that judgment will be used in the context of disagreements and that judgments will differ, but they will not differ to such a degree that we have nothing to offer. Systems analysis, in my experience, does not recognize that there are basic moral and ethical problems in human systems that need to be addressed. Systems design recognizes that this is the major concern.

What are the ethical problems of the nutritional system, if there is such a system? One seems to be an ethical judgment that a suffering child has a right to expect implementation once the analyst has done his work correctly. So I will return now to the implementation problem. It can be judged in several ways. One might say that the planner or systems analyst is finding the correct action for the community or the nation to undertake, and the question is how can it be carried out? That is one approach. There is a literature called 'change-agent' literature (which many of you must be familiar with since you use one of its favorite terms, 'intervention'), which assumes there will be intervention if a study has been done correctly: the only question is how to intervene. The fact that it does not sound different from Machiavelli is germane to the point. Machiavelli was only interested in how the Prince could go into action without losing his head. The change-agent literature assumes that to be the case.

Systems approach to nutrition planning

From the systems design point of view, the question of implementation is deep and complicated and, as yet, unanswered. What right do academics have to try to get the decision makers to act on their recommendations? What is the moral right, given that we recognize in our deepest hearts that we are subject to enormous errors

even though we do the best job possible? Error is our haunting ghost. When we are accepted and taken seriously we are faced with the question, should we be taken seriously?

Now philosophers love circles, and this brings us back to my original question: is it possible to improve

the human condition through the human intellect? My last question was, should we implement nutritional plans and to what extent do we have the right to do so given that we are part of that system in most cases? The answer to that question depends on the answer to the first question that I asked.

Intersectoral food and nutrition planning

Leonard Joy

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My advocacy of 'intersectoral food and nutrition planning'* has the following concerns: first, to draw attention to what I believe to be a critical part of the explanation of the present inability of planning and policy making to reduce malnutrition; second, to indicate what needs to be done if my diagnosis is correct. It does not presume that there is any one perception which is valid everywhere. Instead, it suggests questions to be examined in the approach to improving action.

Weakness in the formulation of policy objectives

Planning fails to take effective steps to reduce malnutrition because it fails at the outset to state effectively what the nutrition problem is and how it arises. The reason for this is to be found, *inter alia*, in structures and processes of planning which do not permit or encourage such statements to emerge as a necessary stage in planning. I wish to convey what I mean by illustration from experience with Kenya's Special Rural Development Planning in the early 1970s. I could as well have illustrated the same points from several other countries.

In one district in Kenya which, it was calculated, had ten years previously reached the limit of its population-bearing capacities given its techniques of cultivation, there were reports of explicit and overt malnutrition. The data were scarce, but there seemed to be both a chronic problem and current incidents of widespread malnutrition associated with dry years, poor harvests, and particular people in particular parts of the area. When I was there, land registration was in progress and, in the one location that had been surveyed, 70% of the families were revealed to be without claim to legal title to land. As legal titles to land came to be conferred, these people would technically become squatters.

Thus, while there was no evidence of malnutrition in terms of data showing intake deficits, or specific clinical

symptoms, there was sufficient reason to suppose that there was indeed a nutrition problem, existing and threatening. A plan had been drafted for the district which was characteristic of such plans. It was a catalogue of measures: measures to improve coffee cultivation; to introduce hybrid maize; to introduce potato growing; to introduce exotic dairy cattle; to organize ranching schemes; to organize vegetable marketing, and so on. What was lacking was any statement of how these measures might ease the problems which the district seemed to have: the existence of people who were displaced, who had no land holding, and people who seemed to be in desperation, some of them apparently malnourished.

Unable to find work, it seemed that some of them were burning down the forest for charcoal which they sold to get food. The plan recognized the forest burning as a problem and proposed licensing the activity to responsible commercial enterprise. But it did not address the other problems directly. And when the plan was examined it seemed that the proposed measures were unlikely to ease these problems: indeed, some might be expected to aggravate them.

Now this was not because the government or the planners were uninterested in these problems. The planning ministry had specified that the planners were to take as their planning guidelines for this district a number of objectives, including: raising farmers' incomes, generating employment, increasing food production, and improving nutrition. The fact is, however, that objectives stated in this way are insufficiently specific to be operationally useful. Thus, nobody asked which farmers' incomes needed most to be raised; nor did anyone point out that there were those who were without land. Nobody asked who needed to be found employment, nor whether it mattered how food production was increased. Nor did they ask what might be meant by 'improving nutrition'. Thus it was easy for planners to feel that a dairy scheme which produced milk must be 'improving nutrition' and 'raising farmers' incomes'. But if, in fact,

*As, for example, in the report written jointly with Philip Payne and published by FAO.¹

land which had been intensively cultivated through the employment of the landless was put to grass, if people were put out of work, if the milk then produced (with less labor) were sold two hundred miles away in Nairobi to people already adequately nourished, then there was going to be more malnutrition rather than less as a result of increasing the production of milk.

So there is a problem of failure to specify objectives effectively. In the above illustration, they were not specified effectively in two ways. First, objectives (ie the statement of tasks which had to be fulfilled in order to address the problems) were insufficiently specific. Second, the tasks which were defined (ie plan measures) showed a mistaken perception of the origins of the problem: they showed that it was believed that producing more food, perhaps producing more nutritious food, would result in better nutrition.

A statement of national objectives might reasonably be vague and general, but if it is to be of value in planning it must be given specific content.

Weakness in the identification of measures

The central government provides not only the general statement of objectives but also, through its ministries, notions of measures which might be promoted. A hybrid maize program has been developed for another region – why not try it here? The same applies to the coffee development program, the dairy and cattle programs, and many other programs on a check list of offerings to be considered from the ministry of agriculture.

There is nothing inherently wrong with a check list of possibilities, but there must be some way of assessing their relevance to meeting objectives and of generating other ideas for relevant action. In reality, effective criteria of relevance are not developed and relevant action is not identified. Nobody asks what the problem is, nor if the plan will really deal with it. Instead, planning starts with proposals from the ministries (sectors) which reflect preconceived ideas about their roles. Ministry representatives seldom sit together to define the collective tasks and to redefine the roles of each ministry in addressing these.

I have argued, with Philip Payne, that a sufficiently specific planning brief for the reduction of malnutrition requires us to define the deprived, and the nature of their deprivation, in a way that recognizes different categories of people, each category needing different policy measures. For this purpose, the category 'infants between six and twenty-four months' may be insufficiently specific. In Iran, for example, there are infants in that age group among nomads, and among the unemployed carpet weavers of Isphahan. It seems likely that different measures would be required to address their problems, so treating them as a single problem would lead to ineffective planning.

But planners need to know more than 'who is malnourished, in what ways, and why'. They need to know how the problem is evolving numerically, quantitatively

and qualitatively. And they need to understand what forces are governing this evolution so that they may have an adequate perception of how it might be controlled and what the alternatives are. I would argue that we need to be able to understand this, and that the investigation into this question will lead to improved understanding and better appraisal of action proposals.

I am not arguing that we have to have comprehensive information before we can begin to do anything. I am sure that is clear from the FAO Report.² We do need to recognize that many measures are likely to be more significant in affecting the generation of malnutrition than simply those that we identify as being specifically nutrition-oriented. And we need to analyze the impact of proposed measures on malnutrition.

Decomposition in planning and administration

I would argue that the process and structure of government planning and decision making normally does not encourage or allow asking questions in the way that I feel they must be formulated if we are to make progress. Thus, we must ask what needs to be done if the government machine is to consider appropriate questions. This is not a matter of the level of sophistication of analysis in answering questions: it is a matter of asking the right question in the first place.

Governments do not include, in my experience, a ministry of nutrition – and I am not advocating that they should. That is not the solution. But without a ministry of nutrition, there may be no body or agency whose administrative responsibility is to take an overview of the problem. Instead, specific ministries have preconceived ideas about their duties in perceiving and addressing the problem. So the ministry of agriculture thinks that its job is to produce more – or more nutritious – food, and it will have views about the activities which are within its proper sphere. The ministry of health will similarly see a range of activities by which it may address malnutrition, and will be concerned especially with how to enlarge and improve these programs. Other ministries will be conscious of activities through which they may bear on the nutrition problem and they may also seek to improve and enlarge those activities. But there may be no mechanism for appraising the effects of the various measures undertaken by the various ministries, separately and together: no concern within government to assess the nutrition impact of government action. I argue that, if there were, it would generally discover the inadequacy, or even harm of the measures pursued.

Provision for such appraisal, then, is necessary.* It would provide the focus of a search for more effective

*The Appendix to this paper, extracted from the Joy-Payne Report,³ indicates what we find relevant to defining where an oversight body might be, what its terms of reference might be, what its powers and its capabilities might be. These notes are offered not as a prescription, but to indicate the nature of a possible proposal for establishing such a body.

and relevant action. It would also provide and guide the administrative harmonization and management of policies and programs. It is thoroughly unsatisfactory to have one ministry managing a food price and ration policy which is frustrated by another ministry's commercial policy with regard to imports and exports, which in turn frustrates the food production drive of another ministry, and so on. This is more a problem of administration than of what we normally call 'planning', although it poses the question of how to ensure that administration is directed by strategy guidelines.

This is only one of the decomposition problems within planning and administration. The other major issue is the local-national problem: how to make a number of area plans into a consistent national plan, and *vice versa*. If planning needs to be more problem-explicit, more people-oriented, more local-oriented, then it must have a decomposition algorithm, both analytical and administrative, which allows the generation of plans at the local level, but puts them together in a national whole with a consistent overall policy and strategy. In general, neither the analytical models used by economist-planners nor administration through national ministries (sectors) serve us adequately.

But this is not simply an analytical and administrative problem. Planning and administration are part of the total political process, and we are recognizing that this political process needs to be seen not simply as a process of central government, nor simply as the arena for nutrition advocacy. We need to be aware of the dominance of political processes, but not simply to emphasize the need to find reasons why cynical politicians can be sold the idea that they will strengthen their power bases by promoting nutrition programs.

We need also to appreciate that the attack on malnutrition may presuppose mobilization of the total political system. Planning and administration can do little without political support. If, in India, an attack on malnutrition were launched from Delhi by administrative programs which delivered food, provided health care and school lunches with all measures directed from the central and state governments, such a program would miss the mark. Resources would be diverted, and the program would be subverted except where there was adequate political support right into the villages.

Yet, even poor villages in India need have no malnutrition now. Villages generally have the resources to ensure that nobody is malnourished and that people have basic rudimentary health care. But the mobilization of village resources to these ends requires the acceptance of community responsibility to reduce deprivation. There is thus a decomposition problem here too: how to relate communities to the bureaucracy in planning and administration. Clearly, there needs to be a national strategy with national political support which also mobilizes and involves political support at the community level. And this has to be linked into administration and planning. I have stated these propositions

baldly: they require elaboration and qualification, but these issues seem to me central to a discussion of what planning can do to reduce malnutrition.

Implications for planners

If the above arguments are correct, then statements of national objectives should be improved in two ways: first, they need to be elaborated in relation to specific problems, or planning tasks, in relation to specific people in specific places; second, they need to be derived from such specific statements and express the themes that emerge in the aggregate of the specific statements. Planning should be both 'from the top down' and 'from the bottom up'.

Such an approach to the identification of people-specific, locality-specific objectives, or tasks, implies a different role for ministries from that which they are normally accorded. They need to participate in the articulation of objectives and tasks by standing back from their ministerial views of their roles, and the problems they deal with, to join with others in asking what the problems 'really are'. They should expect their roles to be defined by problems and the tasks identified as addressing these problems, not by preconceived ideas about what is appropriate from each ministry, nor by precedent.

Acceptance of these dicta would have profound implications for the distribution of power within the government bureaucracy and, especially, it would imply loss of power by the central offices of ministries. (Perhaps this is one reason why progress is slow: it is resisted.) More power would shift to regional (district, local) offices and communities which would have budgets and recruit the services of the ministries. Ministry budgets would depend on the demand for their services.

Procedures for identifying action to achieve objectives and carry out tasks should be improved and need more attention. What is critically required is more analysis of the link between specific actions and their outcomes (in this case, their impact on nutritional status). Trends in nutrition status and the forces driving these trends, must also be analyzed. Such analysis requires an investment of capability and responsibility at the national level. But it is imperative that the analysis should not be concerned solely with aggregates. It must also be concerned with the nutrition status of specific regions and of categories of people, as well as with the impact of programs and policies on their status.

If effective analysis of this sort is allowed to have an impact on planning -- national, sectoral and local -- it should inject into the overall planning process a concern for the sustained reduction of deprivation. This should profoundly modify the emphasis on optimizing resource allocation, and the pricing criteria used for this, towards greater concern with measures for mobilizing communities behind national objectives and values.

Such concern would require that planners be more explicitly part of the political and administrative process

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ulation is to look at its health parameters, especially morbidity and mortality rates. While morbidity registration is faulty or non-existent in developing nations, death registration is sufficiently reliable to measure improvements over time. Mortality within the first and second years of life is an important parameter, since energy-protein malnutrition primarily affects children of those ages. If breast-feeding extends into the second, third or fourth year of life, the mortality within that age group is also extremely relevant.⁷ In Table 1, an arbitrary scale has been devised to class population groups according to mortality figures.

Other ways to utilize mortality figures have been proposed. For instance, the ratio of infant mortality to one to four year old mortality is a valuable tool for judging nations in relation to each other and in terms of their economic development.⁸ Prospective field studies

The nature of the nutrition problem

My interest in the problem originates from the fact that I directed a long-term prospective study in a Guatemalan Indian village.^{1,2} Over a ten-year period, we were able to study the appearance of EPM in a population which numbered 1000 at the beginning of the study and 1500 at the end. The incidence of EPM was 13 per 100 in the first year of life, 27 per 100 in the second year, and 9 per 100 in the third. Most of the malnutrition was of the marasmic type.

According to the Gomez classification,^{1,3} however, 85% of the children were below the third percentile of the Denver standard by eighteen months of age -- a finding which contrasts with the visitor's observation of children (admittedly small in size) running around with smiling faces. To classify most of these children as malnourished as a result of comparing their weights with those of their peers in developed societies (Boston, Iowa, Denver) is

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and less evidently efficiency-minded technocrats. It will not be good enough for planners simply to take account of 'distribution objectives'. Poverty is not simply defined as 'income below a certain level'. It has different flavors and differently experienced deprivations; it subsumes different categories of misfortune calling for different responses.

Planning for the long-term elimination of malnutrition must focus on the productive absorption of growing populations and the control or offsetting, of those forces which are displacing people from the land. This point has not been argued above. However, one of the major reasons why planning fails to reduce malnutrition is because it fails to perceive with sufficient conviction that malnutrition is the consequence of the inability of many diverse societies to find productive roles for all their members. Development strategies will need to set this as an objective. But an attempt simply to generate more overall employment may not sufficiently meet nor define this need.

In practice, analysis of the processes generating landlessness and unemployment is likely to reveal the extent to which these derive from policies which fundamentally reflect the political-social-economic system and the ethos of the prevailing government. Recognition of this poses fundamental questions about the political role of the planner. One possible aspect of his role might be precisely to provide the dialogue on objectives and values and the ways that these are reflected in planning decisions.

Clearly, there will be limits to which planners can promote reflectiveness by governments about the values they are pursuing. Clearly, too, there are likely to be constraints limiting the range of responses to the existence of malnutrition. Planners may not be able to overcome these constraints, but they need not simply endorse, by the abstraction and aggregation of their planning procedures, government inability and unwillingness to face the specificity and reality of human problems, or to make explicit the values behind planning decisions.

Implications for sectoral approaches

If my hypothesis is correct, the pattern of evolution of the agricultural sector is itself, in many countries, at the heart of the nutrition problem: families are being displaced from the land and not absorbed in alternative productive employment. Producing more food will not ensure that displaced and unemployed families are fed: neither will 'reaching down to small farmers'. It is essential, while increasing production, to make the poorest productive. Planning must be for 'demand' as well as 'supply'. Planning needs to be for consumption rather than production. It will, however, require consistency between the vectors of consumption, demand, income, employment and supply. But the achievement of a consistent set of these vectors which is also compatible with an acceptable vector of individuals' consumption through time may require major changes in development

strategy – especially marked in rural development strategy. In my experience, agricultural ministries are insufficiently sensitive to the implications and trend results of their strategies for individuals and communities.

There are limits to what health care can do to make the poor productive, but it might do much to alleviate the experience of disease-malnutrition. Where linked to family planning it might also, given other preconditions, do much to alleviate trends in malnutrition where family size, spacing and overall demographic pressure are aggravating features. Moreover, to return to an earlier theme of this paper, health care may be a good focus for the development of community responsibility which might later address poverty-employment concerns.

But it will not be enough to improve sectoral (ministry) approaches. There must be some overall review of the problem – as it exists and as it is evolving – and the process and structure of planning and administration must make explicit provision for this. This overall review activity is the feature of food and nutrition planning which would make it 'intersectoral'. The required characteristics of such an overall review are that it should be reflective about both means and ends, and that it should be able by its resources and ultimate authority, and by its approach, effectively to provide direction to many specific efforts.

Implications for systems analysis

If systems analysis is to be used to propose strategies for reducing the emergence of malnutrition, then it must model the emergence of malnutrition. The way in which consumption, production and distribution are modeled is critical. Global models and specific national and regional models have not so far modeled displacement, nor have they been disaggregated to specify the malnourished.

Perhaps of even greater significance is that they should be used as an integral part of a planning dialogue which asks: what is this problem of malnutrition that worries us so? By what 'state variables' can we recognize and monitor it? Why is it of such concern? Whose behavior has to change for the problem to be eased? Whose initiatives are required for such behavioral changes? In other words, the analysis should seek to promote planning as an inquiring system: inquiring about both means and ends, not simply generating plans to maximize levels of proxies (eg GNP) – remote and wildly unsatisfactory proxies for our true concerns.

Implications for governments and agencies

The structure and process of planning and administration may be key reasons for the absence or ineffectiveness of food and nutrition policies. The diagnosis of how and why policy formulation is ineffective may be of prior concern in improving administrative action. Determination simply to 'speed up the action' may be ineffectual or counterproductive.

Governments may need help with initial analysis, stimulus to act, identification of needed action, commitment through agreement with agencies, follow-up material and technical assistance, etc, but they need most to build their own capability for effective action. A style of evolving contractual relationships between governments and agencies is necessary, which starts from a joint analysis and shared view of why and how decision making is weak and proceeds through a sequence of government actions and, perhaps, invited agency assistance to build national capability, rather than simply producing action plans or advice. An 'intersectoral', problem-oriented perspective is essential for this.

References

1. Leonard Joy and Philip Payne, *Food and Nutrition Planning*, Nutrition Consultants' Reports Series, No 35, FAO, Rome, 1975.
2. *Ibid.*
3. *Ibid.*

Appendix

The terms of reference of a nutrition planning unit should provide ultimately for responsibilities which might be formulated as follows:

'With the authority and on behalf of the Prime Minister's Office:

- 1 To define the nature, magnitude and causes of malnutrition at present and as it seems likely to develop in future.
- 2 To propose nutrition objectives and priorities and to assist in the ranking of nutrition goals in relation to other development goals.
- 3 To identify strategies and measures relevant to the reduction of malnutrition and also strategies and measures which seem likely to aggravate malnutrition.
- 4 To appraise ministry and area programmes for their impact on nutrition.
- 5 To report, through the Secretary of the Plan Organization, its findings with respect to the above.
- 6 To assist ministries and area planning teams in the design, appraisal and selection of nutrition programs.
- 7 To monitor (or to arrange for independent monitoring to the extent appropriate) the impact of various measures – explicitly nutritional and otherwise – on nutrition status and on the achievement of national nutrition objectives.
- 8 To propose and undertake measures to build capacity for data collection and analysis in order to carry out the above functions.'

For such a unit to operate effectively, it must have authority to require responses and information from

ministries and agencies. It must also be able to influence ministries' budgets (in the Plan Organization or the Ministry of Finance, wherever they are determined), either by supporting the promotion of measures to improve nutrition or by the critical review of measures which adversely affect nutrition. Because of this the nutrition planning unit needs to be headed by someone with *de facto* status higher than that of ministry heads. It must be answerable to, yet serve on its own initiative, the plan organization. It must have its own analytical resources including, if it is to advise ministry or area level planners, consulting capacity. And it must itself be financially independent of other ministries – with its own budget.

Initially, on the establishment of such a unit, attention is likely to be given primarily to the first two items listed in the terms of reference. As the unit gains experience and capacity, it will work its way down the list – though it must give prior attention to building its own capacity.

Item 4 will require liaison with ministry and area planners, and this would be facilitated by designating officials in the ministries or area planning teams through whom such liaison should normally be conducted. Such officials might well be seconded for periods in the nutrition planning unit, perhaps exchanging with counterparts in the unit, the better to understand each others' jobs. It is intentional that the structure proposed does *not* include a permanent interministerial coordinating committee, for experience suggests that such a committee is not the way to secure a critical overview of the problem and that it is more likely to result simply in interministerial bargaining. Such a committee might from time to time be convened, however, for liaison over specific issues. The skills and experience sought in members of the unit should clearly be dictated by the kinds of work they are expected to do. The director should preferably be someone with planning experience: an economist with special training for the assignment. It would be desirable to include on his staff a nutritionist, an economist/agricultural economist/econometrician and a statistician.

The nutrition unit will need to be serviced by a data collection and analysis unit. In some countries, data collection and analysis units, laboratories concerned with food analysis and government and university groups concerned with research and training in nutrition have been reorganized into a single nutrition institute. Such an institute could provide a technical service to the nutrition planning unit, and carry out research and development on a contractual basis with funds being made available from the budget of the unit.

Discussion overleaf

Discussion

James Pines (TransCentury Corporation)

I fully agree with the emphasis in the preceding paper on using 'functional classification' as a tool to consider problems in more specific and disaggregated terms. I also feel that it is important that the expressed concern for a 'reduction of deprivation' as a goal of planning be distinguished from the less political, more analytical task of identifying efficient interventions in relation to whatever goals are specified. Political 'nutrition advocacy' needs to be separated explicitly from the review and analysis that are the typical tasks of the consultant or planning staff.

The point was made that the structure of government planning is not conducive to the appropriate presentation of nutrition planning

problems. However, there was no indication of what could be done in spite of the unsatisfactory planning context. More care might have been taken in distinguishing long-term counsel (eg 'modify the structure of planning') from suggestions for doing nutrition planning more effectively where sectoral planners approach problems from their narrow, specialized perspectives. Whatever the limitations of present planning structures, I think nutrition planners could present a common language and methodology for 'nutritional review' that would also be useful in encouraging sectoral coordination in relation to nutrition goals. Community-level coordination of this sort seems feasible under almost any planning system, if only the local field staff shares the common nutrition planning language, goals and methods.

Concerning nutrition as an income problem, I have the impression from the paper that reducing malnutrition is really one element in the broader

problem of rural development, including size and distribution of income. I quite agree that effective rural development (if ever achieved) has important consequences for nutrition improvement, and I share the view that there is still need for a separate nutrition planning discipline that considers not only income distribution, but also the other requirements for assuring that increased output of nutrients actually improves nutrition. The milk example suggests the need for nutrient flow analysis and the related planning for channeling nutrients more effectively to the nutritionally deprived.

The emphasis on linking national planning with community intervention was useful. I like to think of national policies and resource allocations as providing a context within which local planning and action take place. The context offers opportunities and establishes limits, but effective decentralized efforts can influence nutrition impact in a broad range.

Data requirements for food and nutrition planning and policy analysis

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It is extremely important to talk about data and information systems because the topic has great relevance to the activities that agencies and other institutions might be carrying out in relation to nutrition planning. I would make a strong plea that the subject of data and information systems is not regarded simply as a technical appendage. It is a subject which deserves consideration in its own right. It seems obvious that a data system which is related to a planning process will reflect the current system and the ideas that lie behind the process. Yet, it is worthwhile making this statement, considering the history of data collection and the efficiency of existing data systems that are often used in traditional planning activities.

If we accept that nutrition planning cuts across planning concerns as it does traditional factors sectors, then it is obvious that we have to adopt an entirely different approach to data collection systems. It is my view that this is a sensitive point at which one can begin to establish a dialogue with governments about the nature of the problems they face and the nature of the administrative systems necessary to deal with those problems successfully. This seems to imply that we must resolve data collection systems as an integral part of planning approaches.

Defining the nutritional situation

One aspect of data collection which has been emphasized in the FAO Report Number 35¹ is the need to define the nutritional situation in terms of specific groups and types of people, the so-called 'functional classification' approach to defining the nutrition problem. As there was a particular question about this, it would be useful to discuss it further. The question of practicability was raised. Is it a practical approach, a detailed classification of all possible types of people within the population? How much is it going to cost? Is it going to be practicable to design? The obvious and rather irritating an-

swer to this is that it literally depends on who you are, and it is really a question of the level of aggregation and disaggregation which is relevant to a particular country's situation. The ultimate functional classification would describe each single individual in the population in terms of a specific situation: that would be the ultimate level of disaggregation. The problem is to know the right level of disaggregation for any particular situation.

This is where a number of important questions arise in relation to how one starts to define a nutrition problem in a particular country, and how one sets up a dialogue which would result in a definition of the primary groups of people who are likely to have severe problems. There is a project proposal to carry out an investigation of this kind in El Salvador. It suggests initially an extremely simple type of classification which concentrates on the number of classes of people. Ideally, this would go along with a discussion with planners about the interventions which are available, practicable, and relevant.

Role of agencies and academics

It seems to me that we need to return to a basic and fundamental question in nutrition planning. Is there a body of discipline which we can reasonably describe as 'nutrition planning'? If so, can it be sufficiently well described to permit us to address the question of what is to be done by agencies and academic institutions? We have to remember there is a current demand not just for nutrition planning in general, but also for what is described as 'national nutrition planning' or 'integrated food and assistance planning' for the formulation of national food and nutrition policy. The word 'national' always seems to appear on these statements in the press. I think we should begin to ask ourselves how the process of nutrition planning relates to the national process. We have talked about nutrition planners and we have discussed the sort of people that they might be. Clearly we

Data requirements for food and nutrition planning and policy analysis

did this because we are concerned that it may be necessary to generate more of these particular animals. So we should ask ourselves the above question, and at one level the answer is clearly positive – there are people engaged in the business of sensitizing sectoral planners to nutrition issues and providing technical support for them.

Pragmatic approach

At this point, perhaps, we could adopt a very pragmatic approach to what ought to be done by agencies and by academics, and an attractive pragmatic approach could be that we simply consider the range of skills and experience of individuals who are currently involved in these activities, and we can try to generate more such people. In other words, we could get into the business of the supply and demand of nutrition planners. We could discuss strategies for training and exposing people to relevant situations, for sensitizing countries to the needs for people of this sort, and for making openings and opportunities for them in the general planning process.

This seems attractive, because first of all it is incremental. It also meets the needs of immediacy: the fact that there are immediate situations that require the proposal of immediate intervention measures makes it absolutely essential that we should have such individuals. It paints a picture of the nutrition planner as an entrepreneur. He has a background in planning and knowledge of nutrition, and he communicates with a wide range of other planners. The suggestion is that there should be a large number of such people: however, there is a sense in which many of us feel that this approach would not be adequate.

Suppose programs were developed to result in the practical involvement of the nutrition planner in something like 80% of all other planning activities. How should we regard this? Is it really just an exciting demonstration of the range of activities and initiatives that the entrepreneurial nutrition planner has available to him? Or is it something that should be deeply disturbing? It opens up new opportunities, but it also opens up dangers. One ought to ask, what is the nutrition planner's view of the development process as it is operating in a community? Does he have a view at all? Is he concerned with the whole process of development or do we simply say he is a very useful sort of person to have around the place?

Sectoral approach

Another cause for uneasiness arises when we start from the sectoral approach, and it makes little difference whether we start from agriculture or from health. We rapidly discover ourselves facing the same issues again. Dr Hrabovszky gave us two examples of the problem and he gave us one solution: the seat-of-the-pants approach to the question of the planner's influence over policy decisions. The vision that came to my mind was of a conjuror who asks someone to select a card at random from a pack. We, of course, know very well that he has some control over which card is going to be chosen. The

question is, what guides the planner's, in this case the conjuror's, choice of that card? He would always take the Queen of Spades anyway. This does not seem an adequate basis for devising appropriate strategies for development.

The second example that Dr Hrabovszky gave us was a plea to the nutritionist planner to make a better contribution to defining objectives in terms of high-risk groups, and this raises intersectoral problems. It suggests that the nutritionist might be asked to develop an index of nutritional status which could be combined with other indices of welfare or disability to produce a single figure which could then be optimized. But of course, the question arises as to how one weighs the components, and this leads us straight back to the problem of values. What is the nutrition planner to do in this situation? Is he just to be an advocate of nutrition improvement as against other kinds of improvement, other elements of deprivation, or does he have some formal basis for holding a dialogue about values?

In his presentation on the health sector, Carl Taylor began by asserting that nutrition concerns were contained in the areas of health and agriculture. Nobody disputed that statement at the time, but it very quickly showed that effectiveness depended upon community commitment and that integrated programs were necessary. Again we must ask in what way and by whom are the problems of conflict of interest and power within and between communities going to be resolved? Is the health nutritionist planner going to be the one who resolves them, who defines the power and interest group in affecting leakage, for instance? What kind of strategy does the nutrition planner use when he is confronted with the problem of unequal agricultural resource potential in different regions and between different communities?

Unresponsiveness of total system

The third cause of my unease stems from the earliest discussions – the suggestion that the total system is unresponsive to the kinds of changes that planners feel free to make in their own domain. There seems to be a powerful argument for the pragmatic entrepreneurial planner approach, that we just generate a lot more of these animals and leave them to their own devices, even if their initiatives have little effect. At least they will be able to maximize on the intervention's side. If the system has a powerful buffering capacity, then differing overall planning strategy would not seem so very important.

There are several powerful arguments against that view. The first is the humanitarian argument, which is related to the time lags in adjustment. The facility to change the composition of the poverty groups provides a stimulus for mobilizing commitments. It is likely that in some countries the will to carry out major redistribution planning exists, but the capacity is lacking. In other words, there are structural and administrative constraints to effective application of poverty-process planning. There is another reason: out of all the poverty concerns, nutrition is the most sensitive and potent in

mobilizing commitment. But it will not continue to be very potent for very long. Something should be done fairly soon.

All these thoughts lead me to suggest the following procedures. We could meet the demand for more effort in national nutrition planning, or integrated nutrition planning, by concentrating on the pragmatic approach. We could discuss ways in which institutions and agencies could replicate the existing nutrition planners, the entrepreneurial animals, and then we could agree this is what we could call 'national nutrition planning'. Or alterna-

tively, we could seek to develop and provide an expected background statement defining the concept of nutrition planning as part of the total strategy in putting together a development plan. It seems to me that these are the alternatives we now face.

Reference

- 1 Leonard Joy and Philip Payne, *Food and Nutrition Planning*, Nutrition Consultants' Reports Series, No 35, FAO, Rome, 1975.

Concluding thoughts

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Much of what was discussed at the beginning of this conference I did not understand, but by the fifth day my comprehension was greatly improved. The level of concentration demanded has been tiring, but at this point I feel elated rather than depressed. When we began, we thought that information retrieval should minimize irrelevance. Thank God we have come to a period in which an enormous amount of irrelevance is necessary in order to learn. Instead of continuing to use the idea of relevance as a measure of retrieval, we have simply dropped it, or most sensible people have. So I am not in the least disturbed that a number of the things that happened in this room were irrelevant to me. There was a learning process taking place and I benefited by it a great deal.

The question of whether or not it is possible to secure improvement in the human condition by means of the human intellect was presented earlier. Now the emphasis is on the word 'secure'. It is possible to change the human condition upward; we do that in many different ways, but unfortunately we do not secure its upwardness. It tends to degenerate and decay. It is similar to the learning process that students go through. I teach statistics, and Churchman's law is that the half-life of statistics for most students is about three months. They do know a little bit of statistics at the end of the course, but three months later they do not know anything about it.

I was puzzled at the beginning when people began asking whether or not there was a malnutrition problem. That there might not be one seemed rather odd, until I understood what was meant by that question. The real question was whether or not there might be a route other than intervention towards the non-malnutrition state. That route might be political. For example, I was

considering that if the world were governed by a uniform version of socialism, which would be a political change, could one speculate that the malnutrition conditions would disappear? This question really asks if we know enough now, technically, about the malnutrition problem so that if the world were run in a more equitable fashion, and if the availability of resources necessary for nutritional behavior, rather than malnutritional behavior, were assured, then the malnutrition problem could easily be solved. I do not know the answer. Apparently it is not solved in the USSR; it might be in China -- it does not matter. That is the nature of the question, and if it is correct, we may have to take the political route.

It has also been suggested that the route might be social, meaning that there are certain social customs that block the removal of malnutrition. Some of my students think that the problem is basically psychological. The human psyche should be converted to much less greedy forms of behavior; greed fosters malnutrition; we need to have a psychological revolution. It has already been argued here that the cultural mores of a village may be the problem.

Education has not been stressed here, and I would say that we must understand more about how people are educated in nutrition. What is the proper educational process *vis-à-vis* the nutritional problem? There was an implicit assumption that there is a condition of the human body which is clearly recognized as being unsatisfactory which is produced by the nutrition behavior of the individual. If the nutrition behavior is modified in a certain way, the condition will disappear. Another assumption seems to be that it is ethically desirable to remove the world malnutrition problem permanently. Whatever has been the priority of the politicians, we know with great conviction among ourselves that it is ethically desirable to remove mal-

nutrition forever, if possible. We have not discussed how it would be made permanent, and maybe that is too ambitious. A last assumption was that there are two classes of individuals. There are those who have malnutrition more or less by their own choice – they know better, they have the resources, and they have been educated, yet they still do the wrong thing. We are not interested in them; we are interested in those who suffer malnutrition that is forced upon them.

I am a philosopher, and philosophers are interested in causation. Much of the literature in philosophy deals with how we know that x causes y . If the cause of something is known, then the explanation of it is also known, but we go beyond that. We are not just interested in the causes of malnutrition: we want to identify those causes which we think we can manipulate in the hope that the phenomenon will change because we do not like it.

Here I must relate my story of cholesterol, which may be out of date at this point. I used to have a high cholesterol level. Sheldon Margen was my physician, and he said to eat certain food and take certain pills. Five years later I had taken a lot of pills and tried lots of different diets and the cholesterol count was still as high as ever. I found out that the reason why physicians were recommending this procedure was that a number of studies had been made that showed that there was a higher incidence of stroke and coronary in people with high cholesterol and triglyceride levels than there was in a group with lower values. Then an article appeared which looked at those who had been treated by doctors. All of a sudden it occurred to them to ask whether or not cholesterol counts had decreased in people with high cholesterol who had been treated by doctors versus people with high cholesterol who had not seen doctors.

The first group was the manipulated group. The answer was no, there was no significant difference in cholesterol-lowering between those who had been treated and those who had not. That impressed me, because in my lifetime I have manipulated systems, I have succeeded in implementing a number of things, and in many of those cases I have gone back to see what happened. What had happened was not necessarily a change in what I was after. So it may be that the very act of manipulating generates its own causal changes which make things worse, or do something we do not understand.

So, as an individual and a philosopher, I am interested in your area because you are manipulators, interveners. You do make changes, and the question is whether that sets up new causal changes of which you ought to be aware. You cannot assume that, just because your processes are changing nutritional behavior, they are necessarily good.

That leads to a fourth point: what should a non-nutritionist, academician like myself do about malnutrition? I do not see that my role (as it has been here) is mainly to tell you about the relationship of philosophy and systems design to your problem,

although that is part of it. I know it is important to set up political forces, set up a nutritional interest, but I just cannot see myself doing that. I am introverted and I do not want to do that, so what do I do? I think the Dionysian versus the Apollonian distinction makes sense. Dionysus believed that you must touch that which you are to learn – the Dionysian learning process means going out into reality, into the village. Apollo, on the other hand, shot his arrows from a distance, which we now have translated into the objective observer who does not get involved. I think nutritional activity is Dionysian and Apollonian, but for me it will have to be Apollonian.

It occurred to me that you were very pre-Socratic in your thinking. So I need to give you a little lesson on the pre-Socratic age. It was one of the most fascinating ages in the history of philosophy. In fact, Nietzsche wrote a book in which he more or less said that Socrates ruined philosophy, that philosophy was on the right track in the pre-Socratic age. They felt then that what they really wanted to do was understand the basic reality that made up the world.

Thales seems to have started it. He is quoted as saying that everything is water. It may have been that he was impressed by the fact that water readily changes from solid to liquid to gas. That stimulated many thinkers, who began wondering what it was – was it air, earth, fire, whatever. It seems to me that, by analogy, you are in this pre-Socratic age wondering what the world of nutrition is really like. Is it basically education, or politics or economics?

In that group of pre-Socratics there was a person who I think was the greatest of them all. His name was Anaxagoras and he said that in everything there is everything except intellect (roughly translated). That is to say, no matter how small the particle, there are all versions of reality in it. It means that in any significant real problem, there will be all other problems, except intelligence or intellect. That may not be found in a problem, yet we are trying to get it in there.

So I think when the problem of malnutrition is pursued hard enough, one finds all sorts of the world's problems. As the problem of malnutrition begins to unfold, there is the problem of education. There is no better way of looking at the problem of education than through nutrition. It is a clear area, and it has a lot to do with the human being and how he learns in this world. It also is a good way to look at psychology, to begin to understand the human psyche through nutritional behavior. It is also a way of understanding more about religion. I think that there has been a lot of religious spirit here. Religious spirit occurs when the human being becomes deeply involved in the totality of nature. I believe that securing improvement through the problem of malnutrition is only possible if malnutrition is regarded religiously. It is the religious feeling that we have towards creating a world of nutritional behavior: a world in which we human beings react properly with respect to the things we eat.

Concluding thoughts

Martin Forman

This is a workshop to *further nutrition policy analysis*, and I underline that thought because I think it should govern this discussion. It seems that in the development of social programs of any kind, a sequential pattern usually emerges. First, there is an awareness of a problem, but with that awareness alone nothing much necessarily happens. The awareness has to be translated into commitment if there is to be any program action. Promulgation of regulations, conferring of authority, budgeting of money and assignment of manpower are some of the actions which represent commitment.

In many places around the world in the 1910s, the 1920s, the 1930s there were malnutrition problems, but, generally speaking, there was no international awareness of these problems. International agencies were set up, more people were spending time in the field and more people were interacting with one another. People also became involved in the International Committee for Nutritional National Defense nutrition surveys, which suddenly created an increasing awareness that there was malnutrition in the world.

However, there was not yet enough concern to get people excited to the point of action. Concern began to grow in the mid and late 1960s, when several things happened. Some research reports indicated that there was a link between nutrition and physical and mental development. Eventually, someone (was it not a minister of agriculture or planning in India?) used an expression about 'the possibility of generating a generation of idiots'. Concern about malnutrition began to emerge, and it was highlighted and increased by the fact that people in the mid 1960s began to become more aware of the prospect of famine. Many people began to worry about the balance of population and food production and there was an abundance of UN studies, AID studies, books, and so on. Still, not a great deal happened, although nutrition questions appeared more and more on the agenda of various meetings.

As for commitment, it would seem that we are now at the threshold of commitment in a number of countries. Perhaps the World Food Conference helped to promote public policy statements and the creation of posts and budgets for nutrition purposes expressed as policy goals. Nutrition advocates (and I use that term rather than 'nutritionists' because there are others than nutritionists who are advocates) have begun to stir up planners, policy makers and politicians. They challenge them as to why there is no commitment and why they have not been doing more. The response has been an acknowledgement of the problem. The policy makers believe some of the things they hear. They are not hard-hearted and they have no lack of concern for people, but they note that the nutrition advocate community cannot agree on their recommendations. The lack of consensus is confusing, and it is difficult to come up with hard cash in this situation.

The planner also seeks in vain for evidence that proposed programs will achieve the desired effect. But

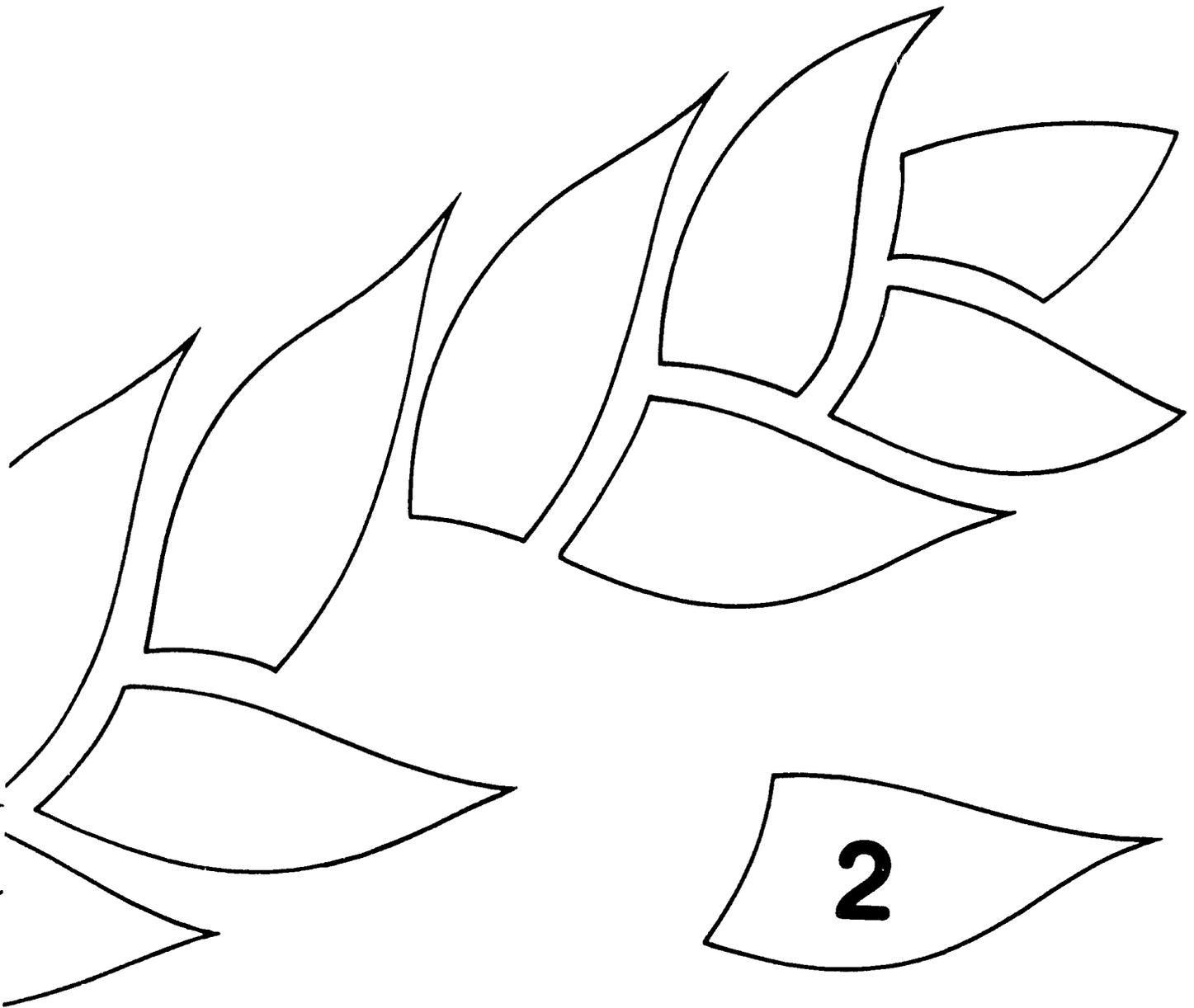
the nutrition advocates do not have this evidence. We have to be pioneers. Planners also find us naive about costs. On a large scale, the programs proposed would need large amounts of money, and where is that money going to come from? We nutrition advocates cannot yet answer this. In some frustration we look to planning to provide some of these answers, to help us in an organized, systematic way to cope with the idea of costs and to provide evidence that some things do work as they are designed to. Planning is expected to be based on objective analysis, and not simply on the opinions of individuals, whoever they are. Presumably, if planners go through certain analytical procedures they will find reliable answers. That is a considerable challenge, but I think it is what is now being required of planning.

There are now a number of countries which are taking steps to plan. In the Philippines, there is an expressed commitment on the part of the President, a bureaucracy and budget has been established, a host of programs initiated, and there is an attempt to improve planning. In Thailand there is a clear desire to do similar things. In Indonesia there is a planning commission and programs have been outlined, carefully thought-out and submitted for World Bank support. In Bangladesh a nutrition plan is being drawn up. In Pakistan there is a nutrition planning syndicate which has proposed an ambitious program. I do not want to go through the whole list of countries initiating action but it includes India, Morocco, Zambia, Ghana, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Costa Rica, Ecuador, Dominican Republic, St Lucia, Trinidad, Colombia and Brazil all at some state of developing some rational systematic way of looking at nutrition problems and policy making. The point is that nutrition planning is a reality; people are working on it and are going to work on it, irrespective of what anybody here does. But in these countries there are people looking for help who do not feel absolutely sure of themselves. They still feel that somebody else has something that can be of use to them. But whose help are they to seek?

Nutritionists are not trained for this: they feel uneasy and they feel there are others who have these kinds of skills. That leaves mainly economists and planners of one sort or another: operations researchers, general planners and health planners who presumably have these types of knowledge and skills. We are still at an early stage in recognizing that different people will have to work together, and we have not yet discovered how.

I do not think we should exaggerate the degree of tension or the lack of give between the disciplines of economics and planning on one hand and nutrition on the other. As in this meeting, there has been less disagreement between nutrition-oriented people and economics-oriented people than there has been among the economists themselves. If this meeting were a meeting on nutrition, not nutrition policy, the arguments would be among nutritionists. It always happens, and we should not lose sight of that fact because there is a sincere desire to work together.

symposium



Keynote address

S. Venkitaramanan

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There is insufficient concern for malnutrition. Decision makers who readily accept as an objective the need to produce more food for export think twice before accepting the reduction of malnutrition as a basic goal. The idea of better nutrition as a major policy goal has yet to be adopted by national and international agencies.

Why is this so? Why do we still have to advocate better nutrition as an important concept and as a planning task? I had a discussion with one of the financial partners of an agency which finances the World Bank, and he said, 'If you can produce a proper cost-benefit analysis which will justify governments borrowing money in order to invest in nutrition, I will support it'. I asked him, 'Do you ask the same question when it comes to deciding for better animal nutrition?'. He said, 'No, the cost-benefit analysis has been done. Better-fed animals give a better return'. It seems that, if there were a market for human slaves, nutrition projects would be readily accepted in the councils of the world.

Agricultural development is accepted as a goal, as is increased food production, but when one tells the agencies that better quality of food is also important, they seem unable to support this objective. Rate-of-return criteria which reflect the values of the marketplace are an impediment to better nutrition in the world. If this conference can tell the peoples of the world that better nutrition is good in itself, and that it does not have to be justified by cost-benefit analysis, then I think we shall have accomplished something.

Keynes has performed a great service by focusing on the concept of effective demand, but he has also done a disservice. When people talk in terms of what the consumer wants at a certain price, they may fail to realize that some peoples' effective demand may be deficient because of lack of income. Macroeconomic discussions of aggregates and averages obscure the nutrition problem. They concentrate on such magnitudes as 'two hundred million tons of national grain production' or compare the average per capita calories available with the average amount of calories that a person needs. But it is often a secondary concern whether

or not the people actually get the calories they need. We should point out that even if a country has, on a per capita basis, sufficient protein or calories, there may be masses of people who eat less than they need. We should attempt to convince policy makers of the need for specific concern for the poor, for the nutritionally deprived. We may accept the criticism of the radicals that this is a second-best solution. The best thing might, indeed, be to reorganize society, but shall we do nothing until that is done?

Nutrition has for too long been a prerogative of nutritionists and health people. Every health ministry thinks that it is meeting nutrition concerns by having a small nutrition division tucked away somewhere. We must challenge this and place nutrition where it belongs -- at the center of planning. A nutrition unit in a single ministry cannot fully come to grips with the task of raising the nutritional status of the deprived. It makes little sense to speak of a 'nutrition plan'. We need national plans informed by nutritional objectives.

We hope, here, to achieve some concrete progress in defining steps by which we can influence the formulation of plans which are guided by nutritional objectives and in developing methods for appraising their success. I hope we can energize the international community to become aware of nutrition as an important coordinating principle of planning and development. But we should do it quickly, and in practical ways, not in terms of models and theories. Models and theories have their place, but I have time and time again gone to countries to discuss studies and surveys and models and I have been asked, 'What do we do to fill the bellies of these people who are still starving? Can you suggest something for us to do in the next two or three years?'. So let the model builders build their models, but let us not delay action.

We need to be concerned for the political justification of nutrition programs. We need to know that 'nutrition' is often misunderstood as meaning feeding programs. Nutrition should *not* be equated with feeding programs. Nutrition is improving the effective avail-

Keynote address

ability of food to everybody according to their needs. We must convey this message to the decision makers. It is important to show that good nutrition is necessary to the efficiency of other investments that the world is making in human capital, in schools and hospitals. We should also remove the impression that nutrition is 'just' a consumption goal: better nutrition means that people will have better lives. The great goals of

humanity are themselves achieved only through better nutrition. Finally, we must emphasize that concern for implementation should focus on the fact that people at the lowest level have to be involved if implementation is to be successful. If any success has been achieved so far, it is not because of theories, but because people have realized that children need to be better fed and have acted together to this end.

The nature of the nutrition problem

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This paper attempts to conceptualize malnutrition from an ecological point of view. One definition of malnutrition, a term that in Spanish can be rendered by either 'desnutricion' or 'malnutricion', is:

a pathologic state usually induced by an insufficient consumption of food, and, therefore, by a lower calorie intake than required during a prolonged period; it manifests itself by physical, psychologic and biochemical alterations, by lower weight for height increments and by a deficit in height as compared to well nourished children.¹

This definition is unsatisfactory because it suggests that malnutrition is solely the result of lowered food consumption, wholly disregarding other components in the complex web of causation.

A more realistic definition might be the following: 'malnutrition is a pathologic state due to a deficient availability of essential nutrients at the cellular and tissue level during a prolonged period; it manifests itself by physical, psychologic and biochemical alterations', etc. This broader definition allows for situations where an adequate amount of food is consumed, but the organism is still malnourished.

The classical and still accepted - definition of malnutrition illustrates just how firmly established is the concept that food is the main factor in the genesis of malnutrition, even to the extent that it has been customary to equate malnutrition with under-alimentation and malalimentation. This philosophical misconception has greatly affected the evolution of scientific nutrition, and has been detrimental to the orientation of teaching, research and nutrition planning in developing nations.

The cause and effect relationship between food and malnutrition has influenced programs of control and prevention. It has also misdirected research, leading scientists far afield from what now seems obvious: namely, that malnutrition is not a purely biochemical and biomedical problem, that its origins are rooted in the structure and organization of family and society,

and that its control and prevention cannot be accomplished by the provision of food alone.

A wider study of the social sciences (particularly anthropology) and a better understanding of primate biology and animal behavior indicate that good nutrition is a natural occurrence resulting from the interaction of the host with its natural habitat. Malnutrition is brought about only as the result of a congenital defect, an acquired injury, or a drastic perturbation of the ecosystem such as drought, fire or climatic variation.²

There is reason to believe that such a situation must have prevailed during the time man was a tribal hunter and gatherer. He probably had a complete and varied diet. He was also quite free of microbial pathogens. In fact, human 'virgin' populations, free of tuberculosis, respiratory viruses and other debilitating agents, have been found. American Indians and South Pacific Islanders were free of measles and smallpox until they met with Europeans.

The beginning of endemic malnutrition in man occurred along with the organization of large, densely populated, sedentary societies which depended almost entirely on one or two foods, generally cereals. This mono-diet was highly susceptible to fluctuation by man-made and natural conditions and allowed increased opportunities for the persistence of pathogenic agents. Population density has been an important factor in determining endemicity of infection which flourishes in situations of crowding, poor housing, and deficient environmental sanitation.

At various times in history, weather fluctuations, plant diseases and depredation have affected the available food supply. Together with epidemic disease, natural disasters and warfare, these factors served as periodic checks on population growth, particularly up to the nineteenth century.³ Chronic malnutrition (which is often a consequence of infectious disease) and infection itself eliminated the weakest at any time of the year, but often seasonally. From the beginning of civilization, the interaction of malnutrition and infection has been the

ulation is to look at its health parameters, especially morbidity and mortality rates. While morbidity registration is faulty or non-existent in developing nations, death registration is sufficiently reliable to measure improvements over time. Mortality within the first and second years of life is an important parameter, since energy-protein malnutrition primarily affects children of those ages. If breast-feeding extends into the second, third or fourth year of life, the mortality within that age group is also extremely relevant.⁷ In Table 1, an arbitrary scale has been devised to class population groups according to mortality figures.

Other ways to utilize mortality figures have been proposed. For instance, the ratio of infant mortality to one to four year old mortality is a valuable tool for judging nations in relation to each other and in terms of their economic development.⁸ Prospective field studies in India and Guatemala have identified the interaction between malnutrition and infectious disease.⁹ Mortality in nearly all types of infectious disease is greater in nations with prevalent malnutrition. The accepted interpretation of this fact is that a debilitated or malnourished host is less capable of fighting off an infection.¹⁰ So, the comparative study of cause-specific death rates (in the case, for example, of diarrhea, whooping cough or measles) is important. However, little use of this resource has been made, except for the PAHO International Study of Childhood Mortality.¹¹

Special care should be taken in interpreting mortality figures when they are influenced by factors which are not dependent on nutritional status. Thus, tetanus neonatorum may account for 10-30% of neonatal deaths in certain regions, or hyperendemic malaria may cause premature death in a certain season of the year. On the other hand, the lack of health services and hydration for children in rural areas is responsible for deaths among well nourished children suffering from bacterial or viral diarrhea.

Physical anthropometry has been the most used and abused tool for assessing the nutritional status of a general population. Measurements have ranged from height and weight to skinfold thickness and bone maturation; in some studies, as many as twenty variables have been included. Much of the data collected were never (and perhaps never will be) properly analyzed. With few exceptions, the contributions have done little to clarify our understanding of the value of anthropometry in assessing malnutrition.

Table 1. Mortality scale to assess malnutrition in the community.

Mortality per 1000		Mortality level	Nutritional status
Infant	1-4 years		
< 20	< 1	Very low	Very good
20-39	1-2	Low	Good
40-59	3-5	Fair	Fair
60-79	6-9	High	Deficient
80+	10+	Very high	Very deficient

My interest in the problem originates from the fact that I directed a long-term prospective study in a Guatemalan Indian village.¹² Over a ten-year period, we were able to study the appearance of EPM in a population which numbered 1000 at the beginning of the study and 1500 at the end. The incidence of EPM was 13 per 100 in the first year of life, 27 per 100 in the second year, and 9 per 100 in the third. Most of the malnutrition was of the marasmic type.

According to the Gomez classification,¹³ however, 85% of the children were below the third percentile of the Denver standard by eighteen months of age - a finding which contrasts with the visitor's observation of children (admittedly small in size) running around with smiling faces. To classify most of these children as malnourished as a result of comparing their weights with those of their peers in developed societies (Boston, Iowa, Denver) is both unjust and impractical.

The Gomez classification was developed twenty years ago as a means of dealing with children admitted to the hospital for treatment of malnutrition (kwashiorkor was very prevalent in Mexico in those days) and was *not* intended to apply to the general population. Moreover, its use is limited by the high incidence of low birth weight in rural and lower-class urban populations. It is estimated that not less than twenty million low birth weight infants are born each year throughout the world.¹⁴ In developing nations, the frequency ranges from 15-30%,¹⁵ but the real magnitude is unknown since there are no adequate data for most countries. Studies in the Guatemalan village mentioned above revealed an incidence of 40%.¹⁶

What are the implications of low birth weight in the assessment of malnutrition by means of the Gomez scale? Figure 1 shows that children tend to remain in growth tracks defined by birth characteristics, even when they are adequately breast-fed.¹⁷ Therefore, the weight-for-age criterion is too stringent when applied to children with low birth weight, particularly in the first two years of life. The inadequacy of the weight-for-age classification is further evidenced when one examines the growth curves of individual children (Figure 2). Malnutrition occurs during and immediately after episodes of infectious disease, but the child may have been in a state of adequate nutrition before or after, growing at a normal rate while still manifesting a deficit in weight for age. The greater the number of disease episodes, the larger the cumulative weight-by-age deficit. But the child may be generally healthy and well nourished between repeated disease episodes. In fact, most children surviving infancy and early preschool age are adapted to the environment; they exhibit adequate hemoglobin values, adequate weight for height and a low mortality.

A survey conducted in 1966 in thirty Costa Rican rural communities established that 57% of preschool children were malnourished;¹⁸ the data pertaining to weight for age and weight for height are combined in Table 2. While the rate of 'malnutrition' increased with age according to the first criterion, it decreased (and was always lower) in terms of the second. Obviously, a sys-

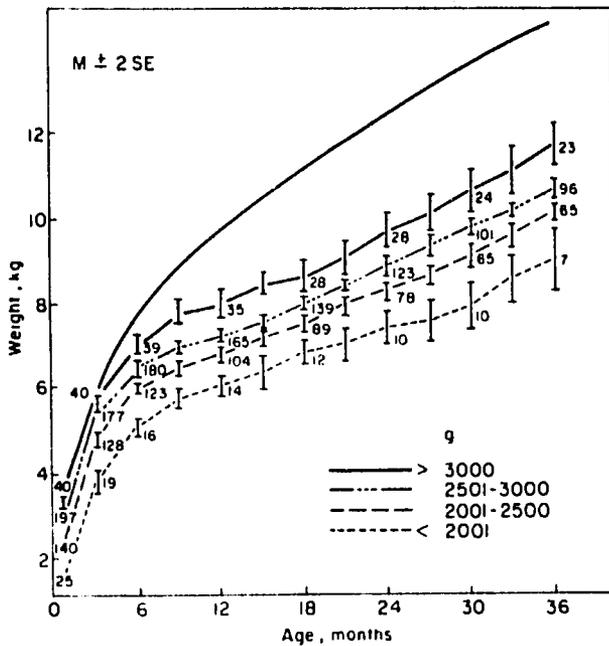


Figure 1. Mean growth curves.
Cohorts of children defined by birth weight, from birth to three years of age. Two standard errors are shown. The numbers in the curves indicate the number of cohort children measured at each point. The upper curve is the IOWA standard of Jackson and Kelly.

tem is inadequate which indicates that malnutrition increases with age and which shows malnutrition and mortality to be inversely correlated.

Nine years later a new survey was conducted in the same communities. Data examined by the Gómez classification led to the conclusion that there had been only an 8% improvement in nutritional status during that interval (Table 3). This finding was incompatible with an observed 51% reduction in infant mortality, and a 70% decline in the one to four year group.

Interestingly, the relationship of weight for height did not improve. In general, there was an increase in the prevalence of 'wasting', i.e. a deficit of 20% or more in weight for height,¹⁹ meaning that children were more slender in 1975 than in 1966. This apparent deterioration in nutritional state during the nine-year interval

can be accounted for by a marked increase in the height of preschool children of all ages (Table 4). The prevalence of stunting among preschool children decreased from 17 to 7%. The greatest difference was noted in infants; since no marked changes have been recorded in birth length,²⁰ the trend actually reflects better nutrition and health care for infants in recent years. Changes in height correlate better with the reduction in childhood mortality noted above (Table 3).

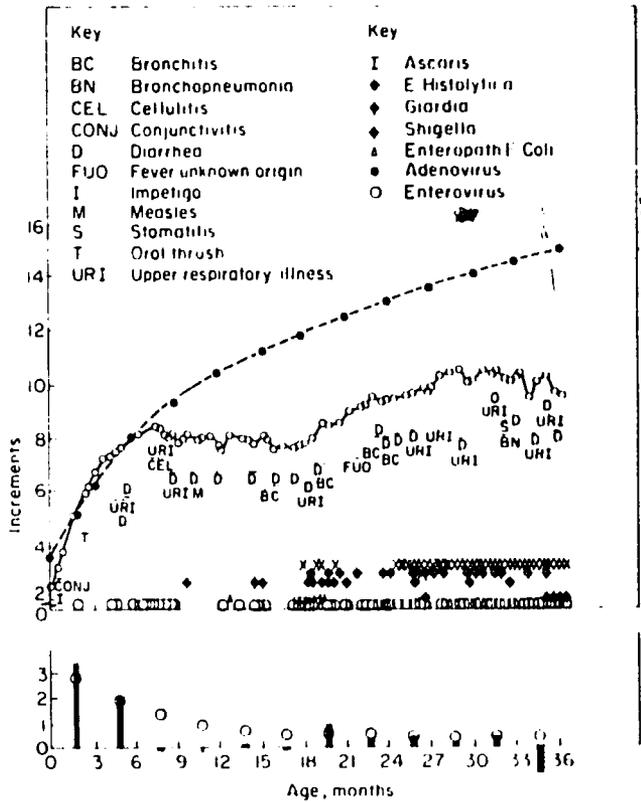


Figure 2. Growth curve of an individual child.
Observed from birth to age three. The child had deficient birth weight but the growth rate was adequate during the first seven to eight months. Thereafter, the combined effect of poor food supplements and multiple infections resulted in deterioration of the nutritional state. It should be kept in mind that the child was acutely malnourished each time he had a severe infectious disease, particularly diarrhea, measles and respiratory infections.

Table 2. Nutritional status by two criteria, Costa Rica, 1966.

Age, years	Number of children	Underweight ^a		Overweight ^b	
		Weight/Age	Weight/Height	Weight/Age	Weight/Height
1	132	41 ^c	29	11	13
1	142	65	22	3	7
2	172	58	22	2	8
3	165	55	17	2	7
4	180	64	21	3	6
5-9	796	67	16	3	8
10-14	661	72	10	4	22

^aLess than 91% weight/age or weight/height
^bMore than 110% weight/age or weight/height
^cPercentage of children

Table 3. Malnutrition and childhood mortality, Costa Rica, 1966 and 1975.

Year	% 'malnourished' ^a		% 'stunted'	Mortality per 1000	
	II+III	I+II+III		Infant	1-4 years old
1966 ^b n= 791	13.5	57.5	16.9	65.1	6.3
1975 n= 1910	12.4	52.5	7.2	37.1	1.9
% Reduction	8	9	57	51	70

^a Gómez classification
^b The same 30 villages

Table 4. Height deficit by age ('stunting'),^a Costa Rica.

Age, years	1966 n= 791	1975 n= 1910	% Reduction in 'stunting'
1	4.6	1.3	72
1-4	19.4	8.7	55
Total	16.9	7.2	57

^a 90% height for age

Table 5. Nutritional status by degree of 'wasting' and 'stunting',^a children 0-5 years old, Costa Rica.

Survey year	Number of children	% Height/Age		% Weight/Height	
		<91	91+	81+	<81
1966	791	<91	91+	80.9 ^b	2.2
1975	1910	<91	91+	85.7	0.9
		91	91	6.5	7.1
					0.7

^a Wasting = deficit in weight/height; stunting = deficit in height/age

^b Percentage of children

Table 6. Recommended calories and protein and NDpCal%.

Age	Calories	Protein, g	NDpCAL%
6 months	880	12	5.3
1-3 years	1360	16	4.6
4-6 years	1830	20	4.3

Source: *Food Fortification, Protein-Calorie Malnutrition*, FAO Nutrition Meetings Reports Series, No 49, WHO Technical Report Series, No 477, Food and Agriculture Organization and World Health Organization, 1971.

It seems that height for age is the best single indicator of nutritional changes among population groups in countries undergoing transition. The major advantage of this criterion is that its application requires little equipment. The disadvantage is that the age of children must be known with some accuracy; however, this is feasible in most developing nations.

Ten years ago, a system was developed to assess the nutritional status of children taking height and weight into account.²¹ More recently, a similar system introduced the concepts of 'wasting' and 'stunting'²² thus allowing populations to be classed in groups with different priorities for intervention planning. For instance, the

children examined in the Costa Rican surveys of 1966 and 1975 were grouped as shown in Table 5. Eighty one percent of preschool children in 1966 and 86% in 1975 were well nourished, figures which contrast sharply with those obtained with the Gómez classification.

About 1% of the children were actually suffering from malnutrition, and required immediate nutritional rehabilitation. While there were 16% stunted children in 1966, only 6.5% were found in 1975. Stunted children seem normal in every respect.²³ The rate of wasted children increased from 2 to 7% in nine years, but this figure should be interpreted not as a deterioration of nutritional status within the population, but as the effect on weight for height brought about by an increase in body length.

Finally, a word should be said about two other indicators of nutritional state: food balance sheets and dietary surveys. Food balance sheets have only limited value because they utilize averages which may mask differences in consumption within a given population. The magnitude of this limitation is proportional to the range of class differentiations within the society. In Costa Rica, for example, this type of study showed an excess of calories and protein when imports were added and exports subtracted from the total food production. This excess availability was greater for protein than for calories; the 'availability/need' ratios were 2.3 and 1.2 respectively.²⁴ The food available would be enough to maintain an adequate level of calorie and protein consumption throughout the population - an important fact in relation to Costa Rica's potential self-sufficiency. Like most developing countries, Costa Rica exports high-calorie density food (such as sugar) and excellent protein (meat and fish) to maintain a great part of its balance of payments.

While dietary studies appear to be useful, they are also cumbersome, particularly when dealing with small children for whom the information is both limited and more important. Changes have occurred in the interpretation of dietary information in recent years. According to the FAO/WHO recommendations,²⁵ 5% of the total calories derived from biological utilizable protein in the diet (NDpCal%) is adequate for the organism (Table 6), provided that the caloric needs are satisfied.²⁶ For children in tropical regions, the NDpCal% could be slightly higher.²⁷

A study in Costa Rica (Table 7) showed that diets of rural campesino children have NDpCal% in excess of these acceptable levels,²⁸ a similar situation holds for

The nature of the nutrition problem

the diets of Mayan Indian children living under extreme poverty.²⁹ However, calories are deficient in the diet of Costa Rica (Table 8), and in the Guatemalan Indian village, where no protein deficiency was noted³⁰ after the data were treated by the Sukhatme approach (Table 9).³¹

The assessment of malnutrition through dietary surveys provides valuable information, but is limited by the fact that other results are incongruent with those obtained by the use of anthropometry. Localities where 80% of the diets are deficient may have only 60% of children 'malnourished' by the Gomez classification, and only 10-30% by weight for height. If the more realistic height for age relationship is applied, the disagreement is even greater. A probable explanation is the apparent overestimation of nutrient requirement recommendations, causing exaggerated 'deficiencies'.

Table 7. Nutrient intake by Costa Rican children, 1966.

	Age, years			
	1	2	3	4-5
Calories	981	947	1030	1003
Protein, g	32	98	29	27
% Animal protein	77	58	60	45
NDP/Cal ²	10.4	9.5	9.3	8.8

Source: V. Valverde, G. Arroyave, and M. Flores, 'Revision del aporte calorico y proteínico de las dietas de poblaciones de bajo nivel socioeconómico en Centroamérica. Existe un problema de proteínas?' *Arch Latinoamer Nutr*, Vol 25, p 327, p 327.

Table 8. Nutrient value of diets of preschool children, Costa Rica.

	Costa Rica.	
	1966 n= 75	1974 n= 144
Calorie deficient	86 ^a	76
Protein deficient	44	32
Calorie adequate	14	24
Protein adequate	56	68

^a Percentage of children.

Source: V. Valverde, G. Arroyave, and M. Flores, 'Revision del aporte calorico y proteínico de las dietas de poblaciones de bajo nivel socioeconómico en Centroamérica. Existe un problema de proteínas?' *Arch Latinoamer Nutr*, Vol 25, p 327.

Table 9. Adequacy of the diet of weaned children by weight, Santa Maria Cauque, 1964-1970.

Age, months	Number of children	Protein	Calories	
			Adequate	Inadequate
24	14	Adequate	3 ^a	9 ^b
		Inadequate	0	2
36	30	Adequate	15	15
		Inadequate	0	0

^a Three children had diets adequate in proteins and calories at age 24 months.

^b Nine children had diets adequate in proteins but inadequate in calories at age 24 months.

Also, caution is advisable when comparing surveys conducted in different eras because the calculations may have been based on different sets of recommendations. The FAO/WHO recently lowered its recommended protein levels,³² although the matter seems unsettled.³³ It appears plausible that children could grow well with fewer calories than is now universally accepted,³⁴ and changes in this parameter might well be observed in the future.

Other indicators of a nutritional state are the rate of literacy, the level of hygiene, income and other socioeconomic characteristics. Socioeconomic conditions and the level of sanitation have been found to be related at the regional or local level with a prevalence of malnutrition.³⁵ Although the indicators may be sensitive, they have not been extensively used; additional research might well be undertaken in this area.

Extent of malnutrition in the world

No generalization can be made on this subject because the nature of malnutrition varies from region to region. In the past, we thought that unavailability of food at the national level was the common denominator. But since any limitation in food availability primarily affects the lower social strata, nations typically believed to suffer from chronic food shortages may actually have enough food to satisfy the needs of the population. In fact, during the recent food and energy crisis, increased per capita food consumption was shown in India.³⁶ However, this did not ameliorate the nutrition problem because inflation and other phenomena prevented the neediest segment of the population from increasing its food intake.

Furthermore, an understanding of malnutrition-infection interactions demonstrates that infection is probably one of the most important components in the causation of malnutrition. Figure 3 shows the diet chart of a typical child whose level of calorie consumption was decidedly deficient, but began to improve after weaning. An episode of diarrhea resulted in a drastic reduction of caloric intake.

During convalescence, the caloric intake may remain low. The high exposure of weaning infants to respiratory and intestinal tract infections afflicts most children with successive bouts of infectious disease, each one actually representing an episode of acute malnutrition because of the profound dietary and biochemical alterations involved.³⁷ Thus if the rates of infectious disease (particularly diarrhea) were reduced, food would become more available and utilizable, resulting in the elimination of much of the malnutrition.

Differences in the food habits and growing practices are important, particularly in regions of Africa and Latin America where the main food sources are tuberous crops which are low in protein in relation to caloric density. Social, economic, cultural and biologic factors are also important variables which account for differences in the nature of malnutrition; they may vary according to

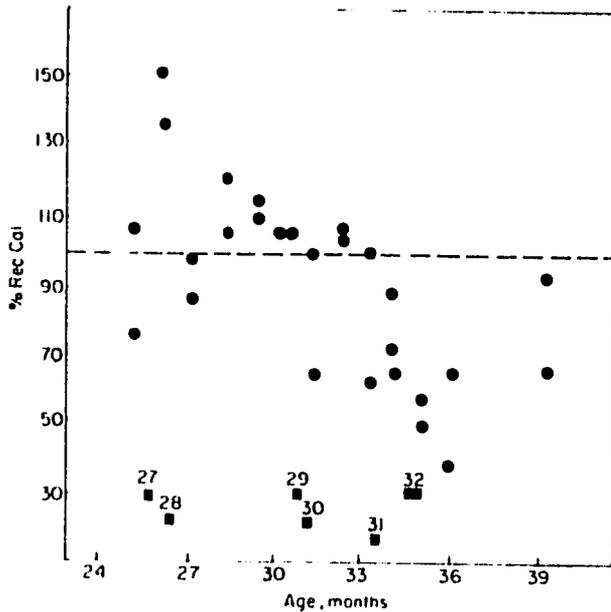


Figure 3. Diet history of a particular child.
The calories consumed per week are expressed as a percentage of the FAO/WHO requirement. (*Energy and Protein Requirements*, WHO Technical Report Series, No 522, Food and Agriculture Organization and World Health Organization, 1973). Little deficit is observed after weaning, which in this child was at twenty-four months of age; soon after there were several calorie restrictions, always associated with the occurrence of infectious diseases. Each dot is a dietary study in this particular child.

country and region and must be taken into account in nutritional planning and national development.

The magnitude of the nutritional problem has been distorted by the emphatic use of the Gómez classification and dietary surveys in the past. My own feeling is that the problem is less severe than originally believed.³⁸ If accepted, this notion should inspire some optimism in planners and politicians. Instead of finding that half the population of the developing nations is malnourished, the figure drops to 25-35% by weight for height and to not more than 15% if the stunted are excluded from the group of malnourished children. What is badly needed is careful reexamination of available data, and the use of such novel classification schemes as that proposed by Waterlow and Rutishauser.³⁹ Continuous evaluation of nutritional state should be given a high priority in developing nations, particularly those where interventions are being planned or practised.

Misconceptions in nutrition planning

My message is that the overemphasis on food and general disregard of other factors has led to an exaggeration of global malnutrition. This faulty outlook has negatively influenced nutritional planning, and was in part responsible for the earlier belief that protein was the main deficiency in the diet of poor people,⁴⁰ a view which initiated the chain of mistakes in nutrition intervention programs.

Case studies inevitably point up the meagre accomplishments of existing food programs. These failures have resulted from misconceptions concerning etiology, recommendations of inadequate food supplements, and the inability to recognize the importance of infection, social inequity and other factors. Not infrequently, politicians utilized equivocal information which was then used in ineffective food programs to mobilize voters.

Nutritional planning was usually directed towards an increase in food production, with no consideration for land tenure, wages or food prices. Increases in food production brought about through the Green Revolution generally favoured the large producers, with few real benefits for the people most in need.

High-yield, high-nutrient cereals produce a 'mirage of nutrition well being', since the children who are in greatest need benefit little from the greater availability of such cereals until adequate education and technology become available to the rural areas. The adaptation of plant varieties often requires a prolonged period of adaptation to the new terrain and its microbiota.⁴¹

A rise in income – whether through industrialization, mechanization of agriculture or international efforts – does not necessarily solve the problem either. When such a goal was set for Latin America, through an international pact, the excess income generated in most countries clearly ended up in the hands of elite groups and multinational enterprises. In Costa Rica, the lowest-income group has continued to share less of the gross income during the past decade, while the middle classes have recorded a favorable increase,⁴² the lag persists after more than fifteen years of the Alliance for Progress.

For some time, nutrition planners have been obsessed with food distribution programs. Although their systems analysis approach is excellent (along with their good will), the programs are almost always set in motion without any real consideration of the basic logistical questions which must be answered if the food is actually to reach the target populations. Such basic factors as the geography of the region, its communication systems, the availability of electricity and scattering of the houses are the main obstacles to success, even at the lowest levels.

For instance, Table 10 shows the distribution of the population in our small country. Twelve percent live in

Table 10. Population distribution in Costa Rica, 1973.

Size of community	Number of communities	% Population	% Cumulative
<50	837	1.1	
50 -	1 712	10.6	11.7
200 -	1 135	18.9	30.6
500 -	375	13.6	44.2
1 000 -	164	16.2	60.4
5 000 -	16	6.5	66.9
20 000 -	5	8.3	75.2
50 000 +	1	24.8	100.0

Population = 1 871 780

Source: AITEC- DINADECO- AID

Table 11. Scattering^a of rural population in Costa Rica, 1973.

Distance, m	% Households
500	36
500-999	24
1000-1999	21
2000+	19

^a With reference to nearest school

Source: AID/AITTEC

communities comprised of sparse households and numbering less than a hundred persons. An additional 19% have populations between 200 and 500, but live under the same conditions of deprivation. The rural population comprises 31% of the national figure, and includes all villages and communities with less than five hundred people.

One serious problem is a lack of or deficient means of communication. Table 11 indicates that 40% of all children live in households located one kilometer or more from the nearest school, a place where a food distribution center is likely to be set up. There is evidence that less than 15% of the food currently distributed in Costa Rica actually reaches the target group. The fact that a village must have electricity, piped water and a road in order to establish a food distribution center has limited the effectiveness of the program.

The difficulties in deciding between alternatives for action (particularly when cost-effectiveness is considered) present an obstacle to nutrition planning. Studies of cost-effectiveness of various programs have revealed unexpected results. For instance, a greater availability of jobs leads to an increase in income which inevitably results in a sharp drop in breast-feeding. The resources needed to feed children with whole or powdered milk are often greater than the increased income produced by the jobs. Similarly, policies designed to stimulate food production may actually induce significant increases in the price of food.

Some authorities believed that nutritional policies should be directed towards target groups through some sort of food stamp program which would provide the food needed to eliminate dietary deficiencies. Table 12 shows that 60% of a sample of campesinos in Costa Rica had monthly incomes of less than \$ 70, which is not

Table 12. Level of income by occupation, Costa Rica, 1972.

Monthly income US\$	Percentage of workers with income		
	Agriculture	Industry	Urban employees
-35	21 (100) ^a	0	0
36-70	59 (79)	32 (100)	21 (100)
71-105	16 (20)	38 (68)	46 (79)
106-140	2 (4)	22 (30)	21 (33)
> 140	2	8	12

^a Cumulative percentage

enough to purchase local food to feed a family of six. This contrasts sharply with \$800 average per capita income in the country at present, and argues eloquently for the use of a holistic approach in the planning and execution of such programs.

If one is to reach sparse populations like those of Costa Rica, programs must be extremely aggressive. Planning should incorporate the skills of scientists, specialists, lawyers and politicians. The emphasis should be towards an overall improvement of the environment, beginning with community organization which will allow the people to participate in both planning and execution, and eventually to finance part of the intervention. Sanitation should be given a high priority, particularly in the areas of housing, safe water supply and the protection of children against common communicable diseases.

The food program itself is as important as the issue of sanitation. The aim is to increase local food production in order to provide a surplus for intervillage commerce. Food distribution at the local level cannot be accomplished with the present infrastructure in most countries of the world, and requires innovative research both in food technology and in operational procedures. Food supplements must be based on local foods (or similar ones) prepared in known or hitherto unknown forms (probably precooked), with specific instructions as to how they should be handled written in the vernacular. Target populations should be the nursing and the newly weaned child, along with the pregnant and lactating mother.

In Costa Rica, an ambitious program started two years ago, called 'The Program of Social Development and Family Allowances'. It is supported by high taxes on consumers which are then invested to improve poor rural areas. At present, the program has forty million dollars one hundred million dollars is projected by 1980. The approach is holistic, with an emphasis on nutrition and the prevention of infectious disease. It includes betterment of environmental sanitation, education and family planning. Most important is the fact that community participation has received special attention and is already yielding good results.

I would like to close by saying that we should look at the malnutrition problem from a point of view quite different from that of the past. We should begin with the village, the sparsely populated community. Those interested in city slums must focus their attention in a similar way. We must examine the prevailing nutritional status as well as other needs of the people, employing novel criteria and maintaining an ecological attitude. We must determine what needs to be done to improve nutrition, health and welfare. Then we must discover the best way to apply present knowledge to ameliorate and eventually solve the problem; we must continue research into different approaches. In the meantime, we must evaluate the nutritional status of developing populations at frequent intervals, characterize target groups, and be able to define or modify interventions in an unbiased and wise manner.

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Discussion

Moises Behar (WHO, Switzerland)

There seems to be some confusion about assessment of nutritional status. The data obtained from food balance sheets, socioeconomic studies, biochemical analyses, anthropometric measurements, clinical examinations and dietary statistics provide different parameters which can be used to assess the nutritional status of individuals or groups. However, they actually measure different aspects of the epidemiology of malnutrition and different points in the natural history of the disease. Some can be used as indicators to assess the nutritional status of individuals, but more are valuable for assessing the nutritional status of population groups.

Dr Mata discussed anthropometric measurements, for instance. A single measure is not particularly useful, and the nutritional status of an individual cannot be determined by just measuring him once. The obese or the emaciated can be detected, but for that one does not need anthropometry. It is not clear what standard to use for individual levels between these extremes, because only distributions of population groups are available. The individual measurements can be useful for population groups, but they cannot indicate how, why or when the malnutrition situation occurred only who was involved.

I think we have a tendency to confuse these. At the individual level, growth must be used. At the group level, we may find, for instance, that 40% of the individuals are below the third percentile of accepted standards. We cannot say that 40% of that population is malnourished now, but we can say that at least 40% of that population has been affected at some time. This explains the apparent contradiction that affected populations increase with age. It is cumulative, and although the present malnutrition may be decreasing, different parameters are being measured and must be correctly interpreted.

Bengoa, for instance, proposed some time ago that just one parameter, height or weight, could be

measured on all children as they reached seven years of age. With time and just the one measurement, it would be possible to determine how many children had been affected by malnutrition – not just the number malnourished at the time of measurement. This is an epidemiological concept. The point is that most of the parameters used for assessing the consequences of malnutrition are not very pertinent, although they are useful indicators. Death, disease or size is used, and I think this is the result of our orientation to health. I do not believe that bigger is better, or that excretion or creatinine is important. We should be concerned about function, and this has been forgotten. Measurement of the state of nutrition of population groups in functional terms is what matters.

I agree that malnutrition is not only a food problem, and that infections and other environmental stresses are important as ideological components of the picture, but the importance of the dietary aspects should not be neglected. Concerning the so-called controversy of calories v proteins, I believe the controversy exists for those who take extreme positions. Confusion has been created in the past few years by those who say that proteins are important and those who say that we should forget about proteins; calories are important.

Dr Mata indicated, for instance, that calories have been the determining factor for children in Mayan communities that he has studied. Why do these children not eat more? They have in their homes all the foods they would like to eat, yet they are calorie deficient; they are starving voluntarily. Something is wrong. My hypothesis is that anorexia is a common problem in these children because they continually suffer from infectious diseases. There is also the problem of caloric density or bulk of the available foods – they cannot eat enough to satisfy caloric requirements. Finally, there is the probability of a dietary imbalance, including the protein/calorie ratio which may limit the total intake.

So the problem cannot simply be stated as a lack of calories. This should not be interpreted as a position on the protein side. Before I am convinced either way, I would like to see hard experimental data to

prove that more children of two to three years of age can be properly nourished with practically only corn tortillas and the water in which the beans for the adults and the other children have been cooked. This subject is of fundamental importance and I think it should be the basis for our planning.

Michael Latham (Cornell University)

Dr Mata has succeeded in raising important issues and creating controversy. My first comment concerns the impression that nutritionists are squabbling over whether or not we really know what malnutrition is. There is in my opinion more basis for agreement than disagreement on this issue. Second, Dr Mata clearly decided, I assume deliberately, to address himself only to the problem of protein-calorie malnutrition (PCM or EPM). He ignored other important nutritional problems, such as vitamin A deficiency, which is a major cause of blindness, nutritional anemias which are prevalent, endemic goitre, cretinism and many other vitamin and mineral deficiencies.

Regarding his suggestions on the use of anthropometry as a means for the evaluation of nutritional status, I agree with his criticism of weight for age and the Gómez classification used as a single criterion for the measurement of nutritional status. However, the use of weight for age is valuable under certain circumstances, particularly with longitudinal studies or when following the growth of the individual child. I am sure that if Dr Mata were evaluating the progress of a marasmic child in hospital he would look at the gain in weight of that individual child over time. So, in serial measurements weight becomes the simplest and most valid measurement to use. Ten years ago, at the meeting in Cambridge on calorie/protein deficiencies, I presented a paper which was highly critical of the Gómez classification and weight for age as measures of malnutrition. I have often suggested that if we know weight, height and age we can distinguish three different versions of malnutrition: acute protein-calorie malnutrition and acute or chronic malnutrition. Waterlow terms these

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three conditions wasting, stunting, and a mixture of the two. One of the difficulties which is confusing for doctors, health workers, and especially planners is that percentage deficits in weight and percentage deficits in height mean different things. An eighteen month old child who is 70% of his height for age would, in fact, have not grown at all since birth, whereas an eighteen month old child who was 70% of his weight for age could have a deficit of maybe eight months of growth. Weight alone would not indicate whether most of the stunting had occurred in the first or last half of his life, or if it was spread over the whole period.

I think that is the point Dr Mata was making and I would agree with it. But I disagree with his interpretation of the significance of a high percentage of older children who are normal in their weight for height, but are stunted in height, and therefore have low weight for age. Dr Mata suggested that these children are normal or of little concern. These are the children whom I categorize as having past chronic malnutrition, and whom Waterlow terms 'stunted'. They surely provide evidence of previous infections or deficiencies in the food supply or in society. Just because a group of children is not now acutely malnourished, not below normal that those children have never been through a period of malnutrition in their lives.

Dr Mata used Figure 1 to show that low birth weight children grow at a slower rate than those with a higher birth weight. This is accepted, but it should also be accepted that a high prevalence of low birth weight infants is itself evidence of poor nutrition of the mother and of the child *in utero*. That figure also shows a greater loss of children in the lowest compared with the highest weight curve. I suspect some of these losses result from deaths, some of which may well be attributed to malnutrition. Anthropometric surveys are inevitably made on surviving children, and provide no information on those children who did not survive.

Dr Mata was absolutely correct when he said that people have erroneously used the Gómez classification on weight for age to try to evaluate benefits, for example,

from supplementation programs. An evaluation of a feeding program using this criterion has often shown a poor result because an improvement in weight for age is difficult to achieve, and perhaps undesirable, if the majority of the children have a normal weight for height, which is often the case. But this is not a criticism of the tool: it is a criticism of the use of that tool - it continues to be misused frequently. Weight is a useful measure if used longitudinally, and therefore taking serial weight measurements, as is being done extensively in the Philippines, is a valuable means of evaluation. When one is looking at measurements over time to evaluate progress of individuals, weight might be a better parameter than height since weight changes more rapidly than height.

Dr Mata suggested that using either weight for height or height for age, rather than weight for age, can markedly reduce the apparent percentage of malnourished children in a community or nation. But that simply redefines malnutrition as current or acute malnutrition or wasting, and disregards stunting. As stated above, past chronic malnutrition or stunting is evidence of a problem of malnutrition and/or infection having previously slowed the growth of the child.

Having disagreed with Dr Mata about his interpretation of anthropometry, I would like to say that I agree completely that malnutrition is mainly related to deprivations and to poverty, and that these aspects have been ignored. The important relationship of infection to nutrition is obviously a key. I share his reservations about the use of food balance sheets, and I agree that the political climate in a country is of very great importance to planners. The poor countries of the world that have largely solved their nutritional problems are, as he said, the socialist countries, such as Cuba and China. It is a pity that we see so little representation from these countries at important meetings such as this. We could learn so much from them. I am sure there are good reasons, but I think their absence is regrettable. How useful it would be to be able to have a case study from a socialist country which has managed to reduce malnutrition, infectious diseases and infant mortality rates without major rises in income levels.

I once had a professor who, whenever we quarrelled over a *post mortem* at clinical pathological conferences, said, 'Interpretation varies; facts remain'. We have varying opinions and interpretations here, but the child knows that it is malnourished. If we planners are to proceed in convincing our decision makers of the importance of solving malnutrition, we must resolve among ourselves these problems which Dr Mata has raised.

In the Philippines, the administration had a mandate from the highest level of decision maker to produce a national program. Our first step was to decide to look for the problem, and how to define the degree of our problem. We chose the tool of weight for age, because age was easily obtainable and weighing scales were available. Now, if I were to agree with Dr Mata, I would have to exchange the 26 000 scales for height boards - and we have found height more difficult a measure to obtain than weight. Dr Mata has shown a ten-year correlation between mortality and weight for age, so why not just look at the mortality? If it has gone down significantly, the program must have had some nutritional impact.

There is a question about the Gómez classification: are the second and third degree children sick children? The answer is that a second degree indicates a potentially sick child, and the third degree indicates a sick child. So when the Gómez classification is used, there should be a decision that an underweight child is a sick child requiring some intervention. I would add to Dr Behar that it is not only who is suffering from what that is important, but also what can we do about them? The 'when' is today. That is what matters now to the planners.

Finally, on the subject of the Green Revolution, it has suffered from disorderly management in the past, but it should not be dismissed on this basis - rather, it should be reformed. Farmers must be shown the value of what they are being encouraged to plant. The meaning of the Green Revolution must be made clear, and appropriate examples must be set.

Philip Payne
(London School of Hygiene and Tropical Medicine)

In discussion yesterday about the problem of providing a nutritional orientation for development planning, someone said, 'Well, we can all agree that there are things that we do not like which relate to deprivation. We do not like people to have to live in inadequate housing, or to have to eat inadequate diets or to endure inadequate health provision'. Nutritionists are saying, in effect, 'There is something else we do not like: a condition which is the end result of the operation of quite a large variety of social and environmental factors. We call it malnutrition'. Many of them would further suggest that there is a scale or spectrum of states of nutrition, ranging from 'adequate' through 'marginal' to 'mildly malnourished', definitely 'malnourished' and, finally, 'severely malnourished'.

The concept of nutritional state as being a precisely definable and measurable scalar quantity seems to have been adopted generally, and I would say rather uncritically, much in the same way as has 'state of health'. Quite frankly, I do not understand what is meant by the terms 'partially', or 'marginally' malnourished, any more than I can understand 'partially' or 'marginally' dead as a meaningful description of an individual's situation. The only definition which seems to me acceptable is that malnutrition is a state characterized by the failure of one or more of the functional aspects of an individual's activity or responses, the cause of which can be ascribed wholly or partially to a restricted consumption of a nutrient or of food energy.

I prefer this to Dr Mata's definition in terms of 'physical, psychologic and biochemical *alterations*', because alterations may simply be a feature of adaptation. For example, an individual may have a low capacity for physical work because of adaptation to some relatively benign environment. Such an 'alteration' would not necessarily constitute lack of survival fitness, and could not reasonably be regarded as malnutrition. Another individual might have the same physical work capacity, but as a result of restricted food supply, and might properly be described as 'malnourished'. The adverse

effects of this latter situation might be a high level of risk of death or illness due to chance fluctuations in supply, severely limited options for change (nearly all alternative activities lead to even higher risks), or diminished possibilities for leisure or cultural activities.

Dr Mata has provided another example. The child belonging to a tribe of hunters and gatherers with a low population density may be well adapted to its environment, but have slow growth and small stature by contemporary US standards. That child may not have a high resistance to crowd diseases, but could only be said to have a functional impairment (reduced immune response) if, because of changed social circumstances, it became more frequently exposed to a range of infective agents. Again, therefore, whether or not the child should be said to be 'malnourished' depends not just upon its physiological state (of growth), but upon whether that state of adaptation carries a penalty in terms of an inadequate functional response to a specific environmental stress.

The concept of malnutrition is thus seen to be intimately related to the notions of adaptation, of 'fitness' for a particular environment, and to various kinds of risks attached to inadequate functional responses. The idea of nutritional status as a scalar quantity, then, has meaning only in terms of scales of levels of 'risk' of the consequences of functional failure. In addition, as well as referring to different kinds of consequence, eg failure to achieve necessary work output, susceptibility to disease, death, etc, the scales of risk could never be fixed either as between communities or over time.

Failure to understand this problem is, as Dr Mata has pointed out, giving rise to anomalous situations, and for the nutritionist, there is a clear indication here of the urgent need for research.

Up to now, indicators have always been scaled in relation to so called 'normal standards' ie the values of, for example, weight for age, or weight for height have been judged relative to the range of values found in a standard population which is presumed to be healthy. In reality, all that this does is to allow us to estimate the likelihood of making false positive diagnoses, ie of class-

ifying as malnourished individuals who are simply genetically small, or underweight, but otherwise healthy.

Perhaps the worst feature of the misuse of normative standards has been that they encourage the tendency to exaggerate the magnitude and extent of nutrition problems, and here I am in total agreement with Dr Mata. To overestimate the number of the malnourished by including all children who fall short of US growth standards, or to estimate food deficits in terms of the numbers of families consuming less than the average recommended intake, as has recently been done in a World Bank report on malnutrition and poverty, is to run the risk of inflating the problem to a point beyond the reasonable resource capacity of many poor countries to solve. Perhaps we can be realistic but not discouraging. If it is accepted that some child deaths could be avoided by better nutrition, that families should not have to face the risk of hunger, and that people should not have to live on diets that fall below any reasonable standard of palatability or social acceptability, then we can make use of existing indicators of nutritional status to identify such people and to make some assessment of their relative degrees of need provided we understand and admit the limitations of the measurements. In other words, planners do not need to wait for the results of further research: we shall, however, need to do better in the future.

Doris Calloway
(University of California)

I would like to address the issues of valuation and poverty-oriented planning. There has been much discussion of nutrition indicators and the measurement of nutrition state. Philip Payne argued that we should attempt to divorce quantification aspects from value judgments concerning this state, and I would like to make a counter plea—we need to keep conceptions of value uppermost in our minds during all stages of planning. How should society value the various indicators and levels of malnutrition? I doubt that a mother looking at her dead baby really cares very much if he was at the third centile of weight for age, or height for age, or

weight for height. How do planners take account both of the living malnourished and those that did not live at all: are the dead a percentage of the barely alive? I was startled to hear Dr Mata refer to the prevalence of malnutrition as being 'only 15%'. If I said, 'Only 15% of the population in Berkeley has smallpox and does this not show great progress', I would properly be thought daft.

Evidently, we continue to value nutrition state differently from health state. As malnutrition and its sequelae do not appear to be contagious, there is less motivation for people who do not suffer from it to be concerned about its prevalence among the deprived. Good nutrition is undervalued because the benefits from correction of malnutrition are viewed as accruing only to those afflicted, and because it is thought to be costly to achieve. So there is less compulsion for planners, who must demonstrate the worth of programs, to focus on nutrition than on other social welfare schemes. It seems to me that we must work to correct present conceptions, to increase the value placed on nutrition, and to bring it to the forefront of the minds of people who have the power to institute desirable change.

Considering poverty-oriented planning, the ideal solution would be an ethical revolution, so that those who have would be willing to share with those who have not. I do not believe that the ethical revolution will come to pass in my lifetime, but surely programs can be implemented in the short term that will, at least, improve the lot of those living at the most abysmal levels of deprivation. If we accept the view that has been put forward, i.e. that socioeconomic indicators (such as low literacy rate and inadequate sanitation) are as good as the more conventional biological indicators, then we must conclude that if we eliminate poverty we shall have solved the most critical nutrition problems. If that were true, this meeting should have a different focus. We are here to talk about nutrition planning as a specific entity, not just poverty-focused planning with nutrition fall-out. I think if we attempt to force malnutrition into one mould and to define it as a uniform feature of poverty, we will have difficulty in making progress.

Poverty itself has many different

faces: it is not the same for migrant workers harvesting sugar beets in Colorado, sharecroppers in Mississippi, or Indian children at the White River Apache reservation. They are all poor, but they are different sorts of poor. They have different problems, with different causes that can be differentially diagnosed. There are different ways in which their poverty can be remedied. Malnutrition is perhaps the most pervasive and scarring feature of their deprivation. If we simply addressed their poverty, without keeping in mind that our primary objective was to eliminate malnutrition, we would be in danger of recommending programs that might be less efficient in reducing malnutrition than alternative poverty-reducing schemes. The programs might even work against the nutrition state of the marginal people who form the pool from which the recognizably malnourished emerge.

Sheldon Margen (University of California)

So far there appears to be no uniformity of opinion among the nutritionists here, and yet there continues to be a common thread among us. Each discussant, and I include myself, is speaking from his or her own bias. I was particularly struck by the emphasis in the preceding paper on the problem of diagnosis, how the problem arises, how it is changing, and what needs to be done. However, I felt that the problem of formulation (or definition) was not given sufficient attention. In other words, what is the question and who is asking the question?

As a nutritionist, I am interested in the ways we have attempted here to define the problem, but at what level is the problem to be defined? Dr Behar pointed out that the answer might be quite different, depending upon the level and nature of the question. There seems to be considerable confusion over the definition of the problem. By the Western scientific method we must define it with scientific accuracy for scientific purposes. In the past, the idea of malnutrition was simply expressed as hunger, but hunger is purely subjective and we must be scientifically objective. Furthermore, the state of malnutrition can be defined in terms

of undernutrition, overnutrition, disnutrition, and quantitative nutrition. In my estimation, the most appropriate definition of malnutrition, based on a single biode, the human, is 'an impairment of the state of health due to nutritional causes'. But even within this single psychobiological unit (man), there are extreme complexities, ranging from the definition of health to interactions with the biosystem. These complexities may or may not be associated; they may or may not be causing the malfunction of the biode.

Dr Mata said a great deal about the problems involved in defining growth disturbances and whether or not they can be attributed to malnutrition. Malnutrition cannot always be diagnosed because frequently there is no reference point. We are dealing with a continuum, and there is no way to know at precisely what point along this continuum an individual may pass from one state into the other. In fact, the continuum may be artificial, as is the division. This is a major difficulty. Malnutrition is further complicated by the fact that the effects are related to degree, intensity and duration of malnutrition. The effects may be manifest throughout an individual's life as a result of past occurrences or may recur at various times in reaction to stress.

We are making a value judgment when we accept that the consequences of malnutrition are bad. We believe that health is desirable, not only for the individual but also for society, but do we really in fact accept all of these statements? In spite of some of Dr Venkitaramanan's expressions of optimism, I am not convinced that many societies actually demonstrate concern for the problems which we are concerned about in our respective countries, and I emphasize *our* because I think we are as guilty as anyone. I do believe, however, that concern of man for man is changing, and the concern for hunger and malnutrition is becoming a more important social issue.

So far, I have considered malnutrition of the individual and its effects upon psychobiological man. To examine the conditions of malnutrition from the perspective of the social context in which it occurs, as did Dr Mata, is to operate at quite another level. Problems in this area

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can no longer be defined, and certainly not solved, by individuals. Interdisciplinary group efforts are needed; none of us can supply 'all of the answers'.

What information do the planners want from the nutritionists? Why have the planners, administrators and politicians taken the problem out of the hands of nutritionists? I think that this is potentially extremely dangerous, but it is obvious that nutritionists have been of little help in defining the problem, let alone in solving it. Dr Solon said that planners want knowledge of the type, extent and distribution of malnutrition.

Planners often fail to realize that they themselves are actually involved with decision making, although they state that most of the decisions are made by people 'higher up' in the political hierarchy. The planners are dealing with decision making that involves the weighing of values. Unfortunately, the idea that scientific methods can always be applied to planning has crept into their thinking, and one of the most common 'scientific' techniques that has been advocated is the so-called 'cost-benefit analysis'. Nutritionists are often asked to justify malnutrition problems in the form of cost-benefit ratios so that decisions can be made in favor of those programs having the lowest cost-benefit ratio.

I propose that this approach is as dangerous in nutrition as it often is in other states of deprivation. A risk-benefit ratio should really be considered, because the value judgments in the area of malnutrition and deprivation are probably more important than those in any other planning situation. In terms of cost-benefit analysis only, a childhood mortality rate of 50% favors reduced population growth and lessened pressure on resources. It costs less to have more children die. It is still not a proven fact that those who survive malnutrition will be any less competent adults as a result, despite the fact that they might be consequently smaller in size. But bigger is not necessarily better. Planners often require 'genuine scientific evidence' that malnutrition *per se* has adverse effects on a country and its social system, but very little is known about the effects of malnutrition on the competence of the individual. Even though there may be no specific quantitative answers, nu-

tritionists can make a value judgment and say that malnutrition is evil.

Recently, a remarkable book resurfaced after a disappearance of some fifty years. It was written by Sorokin, the father of sociology in the USA, and is entitled *Hunger as a Factor in Human Affairs*. It was originally published in Leningrad in 1922, describing the famine in the USSR. It was totally suppressed by the Communists and only recently re-discovered. In words more eloquent than any I have ever heard, Sorokin states that behavior directed at procuring food or stimulated by malnutrition can be designated as 'the behavior stimulated by food taxes'. The theoretical proposition which emerges is that the more time, energy and activity a man must spend in procuring food, the less time is left for actions stimulated by other determinants. The percentage of the food taxes acts in the total sum of human activity is directly proportional to the size of the obstacles to obtaining the means of proper nutrition.

Leonardo Mata

It is extremely regrettable that so much attention was paid to the so-called 'protein gap' in the past, but it would be dangerous now to go to the other extreme. I hope I did not give the impression that I am of the other extreme. The protein craziness is responsible for the practice in some of our centers in Costa Rica of giving children a diet containing 300-400% of the protein requirement, but only 70% of the caloric requirement, and almost no fat. But the problem will never be corrected by just giving empty calories. Bulk, microbial contamination, and the psychological effects of food are also important.

With regard to Dr Latham's and Dr Calloway's comments, I believe that, with struggle and pain, we can eradicate 50% of malnutrition. Planners must realize that program revisions are necessary, particularly in countries that have already had intervention programs for ten years without results in weight but with results in other parameters. It would not surprise me if, in five years or less, Dr Solon accepted another criterion in his program to insure its survival. Politicians are interested in showing changes.

On the subject of the Green Revolution, I do believe it accomplished a great deal, but my criticism concerned its overall impact as a terminal solution for the problem. I meant to imply that it is not the technology or the philosophical concept or the scientific development that is important, but the way that they are applied.

Concerning measurement of the effects of nutritional status on function, I think it is welfare health as a whole and not nutrition that should be characterized, either at the individual level or, better, at the national level. In countries in transition, like Costa Rica, new problems emerge as some nutrition problems are solved. So in the long term, examination of mortality, morbidity and economic paralysis will provide more information on nutritional situation than will measurements of weight and height.

Comments from the floor

James Levinson (USAID) discussed five points from Dr Mata's presentation that might have created misunderstandings.

- There was a possible misconception with regard to the height-weight issue that we might think we can dispense altogether with weighing children, even as a means to identifying children who are at risk.
- Comments about the extent of malnutrition reflected the situation in Latin America, but those concerning nutrition-infection interactions might have done a disservice to the severe malnutrition existing in South Asia and the Sahel, for instance.
- This was the first association here of nutrition planning with the notion of food supply-oriented solutions. Everyone, therefore, would have their own definition of nutrition planning.
- There have been many problems with food programs, but is this a reason to dismiss the concept as inherently ineffective? This is a highly controversial subject. We should not take off the bandaid until we have dealt with underlying disease.
- Programs aimed at employment and income generation may not have been highly effective, but

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again this is no reason to dismiss them as altogether useless.

Urban Jonsson (Tanzanian Food and Nutrition Council) felt that problems within a nation were the result of the problems between nations. He did not agree with

Dr Mata's statement that social and economic parameters should be included in planning but were difficult at present to define and apply. He felt, rather, that too many people did not want to see these parameters included. How-

ever, the malnutrition problem should be conceptualized in its socioeconomic and political context. Dr Jonsson would agree with Leonard Joy that often the means for alleviating malnutrition lie outside the area of nutrition.

The concept of nutrition planning

Introduction

Martin Forman

Department of Nutritional Sciences, University of California, Berkeley, CA, USA

Over the past three decades or so, there has been an emergence and continuing growth of the concept of planning as part of the social and economic development process. Primarily, there has been a recognition that development itself is extremely complex and that it might benefit from planning. There has also been frustration and dissatisfaction with the way in which social and economic development has progressed, and there has been a recognition that it might be useful to take new approaches. Third, and often overlooked, is the fact that donor agencies, like the International Development Banks and some of the bilateral AID agencies, have made planning a requirement for foreign assistance. So today, the planning concept is being applied on a widening scale – on the national level, the regional level, local levels, and on a level embracing more than one country. Planning has emerged as sectoral planning, and also as intersectoral planning. There is a compelling argument that this systematic, logical and objective process is better than the previous approach.

In the past five or six years, the concept of nutrition planning has emerged in a number of developing countries and in some developed countries. The reasons for this are similar to those for the emergence of growth in planning *per se*. There is now a broader recognition of the complexity of the etiology and treatment of the malnutrition problem and, hence, there is a need for a systematic approach to it. Dissatisfaction and frustration with inefficient programs in nutrition have led to the feeling that nutrition planning could offer a more

positive, systematic and objective approach, but this concept is still at a very early stage of development.

The nutrition section of the World Food Conference of two and a half years ago recommended that all countries should have a food and nutrition plan, and the United Nations should develop some scheme to provide assistance with formulating such plans. As yet, there are really only just a few countries involved in nutrition planning (the Philippines, Indonesia, Pakistan, India, Iran, Zambia, Thailand, Chile, Colombia, Brazil, Costa Rica, Honduras, and Jamaica), but there is a trend in that direction. An observer of this trend immediately realizes that nutrition planning means different things to different people, and perhaps this is as it should be at this stage of the game. Agreement can hardly be expected when no one has yet been able to demonstrate a model having substantial impact on the problem.

Unless and until that happens, I think we should not only permit, but also encourage, a number of people to flourish in their own way in different places to find out what will work. However, if we are to communicate, we should at least share some views of the definition of nutrition planning. This is a major objective of this Symposium. Our plan is to work in small groups with people of varied experience and background using data from actual country situations to explore the nature and process of nutrition planning. Before we analyze the process, however, we must be sure that we share a view of the concept. We hope that this session will provide the basis for such a shared view.

The concept of nutrition planning

Leonard Joy

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It is not the purpose of this paper to establish a dogma about the meaning of 'nutrition planning'. In the next few days we shall each reveal how we think the problems of specific situations should be approached.* It would not be desirable at this stage to rule out of order any particular approach on the grounds that it did not conform to some preconception of what 'nutrition planning' should be. My purpose here is to review *procedures* followed, or advocated, *for defining social action appropriate to reducing malnutrition*, and to provide a conceptual framework for the analysis of these various approaches.

It will be seen that in defining my purpose in this paper I have given an implicit definition of planning (italicized above). I have also, necessarily, both bounded my subject and begged some questions. I have separated 'planning' as an activity which precedes the substantive actions which it aims to direct. But this is a conceptual distinction, and in practice we shall later need to qualify this implication. I have also failed to define 'social action' and the 'malnutrition' it is aimed at reducing. I would again wish to leave these as broad concepts without imposing, as far as possible, preconceptions of what they might encompass.

We are all agreed that malnutrition is undesirable and that it is desirable to seek ways of reducing it. We are probably agreed that the malnourished cannot be expected, simply by their own efforts and by their own initiatives, to become adequately nourished: if malnutrition is to be reduced, then some sort of social action is required. Our concern for nutrition planning appears to be a concern for ways of identifying and designing actions to reduce malnutrition and to assist in making decisions in the choice of such actions. But it is also

more than this in so far as we are also concerned to avoid actions which would increase malnutrition.

We should note that our concern to reduce malnutrition may not be unqualified. Reducing malnutrition is unlikely to be the sole policy objective, and it is conceivable that reducing malnutrition may have costs which are unacceptable. It is also conceivable that we may have prior concerns – 'development', the reduction of poverty – which, being effectively addressed, would also reduce malnutrition. If it were true that the best attack on malnutrition were through a general drive for development (aggregate economic growth or through a general strategy of raising incomes to the poor), there would be no need to have special concern for nutrition objectives, for they would be taken care of by planning for these other objectives. If it were 'largely true' then it would be necessary simply to include minor activities (programs) to complement the major strategy. But if it were not true, nutrition objectives would be in conflict with other objectives, and would either be rejected, or comprised, by them or would dominate our concerns and thus lead to the rejection or compromise of other objectives.

It is not within the scope of this paper to discuss the compatibility of nutrition and other objectives, but, in practice, our attitude to nutrition planning, and especially to the range of instruments we see as relevant to nutrition planning, will be affected by our view of this. Some will see 'nutrition planning' as necessarily subsuming all aspects of government policy – from land settlement and reform, urbanization and industrialization, prices, taxes, subsidies, and external trade, to school feeding schemes and nutrition education – while others will see it as concerned only with measures whose narrow and specific purpose is 'nutrition improvement'.

We do not need to generalize about the aspects or instruments which should be covered by 'nutrition planning'. When we consider our case studies we shall ask, in relation to specific situations, 'What actions are

*Following the presentation of the two keynote papers, the Symposium adjourned to small groups to undertake case studies of specific situations and to discuss the approach to policy making and planning to reduce malnutrition in these situations.

relevant to, and necessary for, reducing malnutrition?'. We shall also need to ask 'What implications are there for the attainment of other possible policy objectives?'. In this way, we shall implicitly define 'malnutrition planning' as whatever is necessary for preparing action to reduce malnutrition without prior judgment about the range and scope of such action.

In reviewing approaches to nutrition planning, I shall use the convenient distinction made by Faludi¹ between 'the theory of planning' and 'theory in planning'. First, I shall review the theory of planning as it relates to 'nutrition planning'. In doing so, I shall necessarily be concerned with the theory of planning more generally. Nevertheless, since alternative approaches to nutrition planning can be distinguished by implicit or explicit differences in their approach to the theory of planning, it is important to undertake this review. The second part of the review will be concerned with 'theory in planning', ie implicit and explicit theories of the nature of malnutrition and of the way that it might be controlled.

The theory of nutrition planning

The concept of knowledge, especially when applied to planning, is about perception rather than 'fact', and a survey of the state of knowledge is a review of perceptions about planning and about what, if anything, can be done for planning to be effective.

Planning is an activity that is pursued by individuals and by organizations: from social organizations and business firms to government at many levels — community, urban, agency, ministry, regional or national levels. Mostly, I shall be discussing government planning at different levels. A major part of the discussion on planning is about how to relate the various planning efforts which take place at different levels and by different bodies. Another part concerns the relationship between private and public planning. Yet another important question is how to relate planning processes directed at different time horizons, and an aspect of this is the question of how to relate the choice of broad strategies to the identification, design and implementation of specific, usually budgeted, activities.

I have had available to help me with this review Burkhalter's *Critical Review of Nutrition Planning Models and Experience*,² and this has proved invaluable. I shall not choose the same issues as the center of my commentary as those that most concerned him, but inevitably I shall refer to issues that he has reviewed. Among the topics which he has reviewed at length is a critique of 'rational planning' and I think it desirable to comment briefly on this topic at the outset. One aspect of the attack on 'rational' or 'rationalist' planning is the presumption that governments might choose not to plan. Much of this literature seems to have confused planning with the exercise of mandatory controls. This seems to be the impact of the, particularly post-second world war, debate on whether planning should be sustained in peacetime.³

Government attitudes to planning

Clearly, governments can decide whether or not to espouse particular instruments of policy and, especially, they can choose between mandatory measures (prohibitions, licenses, quotas, requisitions, taxes and subsidies) and inducements (research, extension, marketing and infrastructural improvements). They can also decide how, and how much, to invest in analysis for decision making. However, in general, they cannot decide that they will not stop and think at all about decisions without being totally inactive or capricious. It is true that one school of thought has argued against massive investment in central planning and for greater investment in the day-to-day management of government activity, especially with respect to rural development programs.⁴ However, even this plea for learning-by-doing, and for concentrating on doing, does not deny the need for government to consider the overall and longer-term effects of its policies and programs. So, if governments cannot choose not to plan — not to think responsibly about government action — the question is how best might they plan.

However, while governments cannot totally avoid planning, they can avoid action, and planning, with respect to specific problems. Governments can certainly decline to act with regard specifically to malnutrition: they can also avoid analyzing the problem, how it is affected by government activity, and what government might do about it. Our concern is with the reduction of malnutrition and with the improvement of government action to this end. We need to give content to the concept of improvement of government action and to ask how this might best be achieved. This includes asking how far and in what ways we need to be concerned explicitly with nutrition.

Defining effective planning

How do we judge whether planning is effective or deficient? We must first decide whether better decisions, leading to more effective action, are possible, and we must argue that they would be better overall, not simply in those respects that immediately concern us. We cannot expect to find rigorous tests by which we can assess the validity of alternative proposals for improving planning. We can only look for convincing arguments. We should certainly examine the performance of alternative approaches where there is evidence. However, decisions which are the most reasonable do not always produce the desired result, so that the quality of decisions is not always readily judged by their effects. We do not expect to find an approach which can be guaranteed to succeed. Moreover, an approach may be reasonable in principle but subsequently poorly articulated in practice.

Thus we need to appraise a specific planning experience, not only for its general approach, but also for the quality of its execution, noting, however, that these may be in some degree interdependent. An approach will be inappropriate if it cannot produce good

results with the resources available. And it is the appropriateness of alternative approaches in particular situations that must concern us. Thus, we need criteria for matching approaches to situations.

It is possible that a planning approach may be good in some respects and lacking in others. Thus, it might be based on a first class analysis of the nature and causes of the problem, and even understand what action is appropriate, but be lacking in understanding of what is required to bring about the necessary actions. This discussion highlights the distinction referred to above, that between the analysis of the planning process and the analysis of the system which planning is intended to modify. In our concern for nutrition planning we are anxious to understand both the process by which decisions affecting nutrition are taken, which we seek to improve, and the process which generates malnutrition and which planning seeks therefore to modify. These processes are interrelated. Appraisal and improvement of 'nutrition planning' must consider both.

I have already referred to the criticism that has been directed at 'rational planning' and considered one aspect of this. The central criticism, however, has been that 'rational planners' have failed to concern themselves with the administrative process that they were seeking to influence and have consequently failed to achieve the effects for which they planned. A further criticism on the same lines is that they have failed to concern themselves with influencing the behavior of others, non-officials, or with an understanding of that behavior and how it might be influenced. Government, it is argued, cannot be seen as a device for pursuing national objectives. It must be seen as a process of reconciling the conflicting objectives of different individuals and agencies.

The result of this process governs 'who gets what and when'. It may produce criteria which define 'the national interest' in terms of policy and planning objectives, but these criteria are seldom spelled out in a way which makes them operationally useful. Yet planners cannot themselves ultimately define these criteria without also becoming decision makers, but they may influence the criteria eventually adopted. Because these criteria govern 'who gets what and when', they imply inter-personal comparisons which economists traditionally attempt to avoid. Their avoidance of this issue is a major reason why economists have attracted the criticisms made of rational planning.

We may be persuaded that rational planning does not and cannot result directly in action which achieves its intentions if it does not:

- Concern itself with eliciting responses by individuals, including administrators, and agencies, public and private. This requires a sufficient understanding of how they behave and how desired behavioral change might be induced: a theory of how behavior might change in response to government actions.
- Embody the choice criteria of the decision makers

or reflect or become the *de facto* process of choice or conflict resolution. This requires that the planning process be harnessed to the exercise of power. Yet in many countries it cannot be assumed that there is any power, least of all in the government administration, which will have its way all the time.

Planning which guides action backed by power can be directly effective. Where planning does not guide action its effect may be indirect: it may be one of the influences which qualifies the exercise of power elsewhere or the resolution of conflict. Its role is likely to be some mixture of these two. Thus, the effectiveness of planning will need to be judged in part by the extent to which it is an influential political force. 'Were plans realized?' may not always be a relevant question.

Strategy for improvement of planning

A strategy for improving planning must understand the system it seeks to modify: both the government system, 'administrative and political', which produces decisions and actions, and the social-economic-ecological system which generates the phenomenon that concerns us – malnutrition. The first is a subsystem of the second.

How, then, do the various approaches to food and nutrition planning perform with respect to their apparent understanding of these aspects? How can we develop a strategy for improving planning in specific situations – and food and nutrition planning in particular? How can we achieve better government decisions?

First, we must diagnose what is wrong. One approach is to ask 'What would constitute better decisions?' and 'What would be required in order to achieve such improvement in decision making?'. The rationalist contribution to answering these questions starts by assuming that the model of good decision making which is appropriate for an individual is a relevant model for organizations including agencies, ministries and national governments. It compares the existing government decision making process to a postulated ideal decision making process in order to indicate where changes are needed. While this could lead to prescriptions for improved planning, it could also simply explain why planning must have its limitations since prescribed changes might, for many reasons, be unrealistic.

There is apparent general agreement about the steps involved in an ideal decision process, judging, that is, by the similarity of the stages of such a process discussed by various authors. Some authors subdivide these stages (or tasks) so that as many as twelve may be found to describe the process.⁵ Berg⁶ lists eight tasks, but these include 'iteration' through the stages and 'presenting options to the decision maker'.

An analysis of the stages listed, however, suggests important differences of emphasis. Key elements common to many presentations are: problem definition and formulation of objectives (these twin aspects are not always distinguished); identifying relevant actions for pursuing objectives; and proposing alternative actions for

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consideration. Sometimes 'identifying relevant actions' is equated with 'diagnosis' or 'causal analysis' and is not always distinguished from 'proposing alternatives'. 'Designing specifications' is sometimes omitted as a detailed extension of 'identifying relevant actions'. 'Predicting the consequences of actions under consideration' is not always seen as prior to the 'comparison of alternatives'. Generally, the task of the planner is seen as 'providing an analysis of alternatives for the decision maker⁷ who makes the final choice.

There is strong agreement about the importance of effective problem definition. The way problems are defined is seen greatly to influence the way in which solutions are approached. Thus, some authors have pointed out that seeing the nutrition problem in terms of 'vulnerable groups' (defined, for instance, as infants, pregnant and lactating mothers) tends to the identification of programs addressed specifically to these age-sex categories rather than to the households or communities where these groups are at risk. It tends to obscure the need to distinguish subsets of problems within these demographic categories: seeing the problem in terms of infant marasmus and kwashiorkor tends to the identification of measures to treat these conditions which do not reduce the emergence, or even the recurrence, of these symptoms. But this takes me into the discussion of theory *in* planning, that I have reserved until later.

Implications of problem definition

What is important here is to consider the implications of problem definition for the theory of planning, ie how planning might best be conducted to secure effective problem definition.

There seem to be grounds for believing that failure in problem definition is significant in explaining the failure of planning to result in more effective action. There seem also to be many reasons why this is so.

First, there are political reasons. It is often not politic to define problems precisely. There are generally international and internal reasons why politicians and governments do not wish to put too fine a point on the nature of the problem, and do not therefore press for this to be done. Even where political support is sought through the expression of a concern for malnutrition, the problem is unlikely to be precisely defined, and even the malnourished are unlikely to be very precisely identified. Political rallying cries cannot be precise without risk of losing emotive appeal and of increasing divisiveness rather than gaining general support.

Thus, planners may not have very precise briefs: indeed their briefs may need considerable amplification if they are to be operationally meaningful. Even planners needing to formulate working problem definitions may feel constrained from expressing these explicitly or, even, from attempting definitions explicit only for sharing among themselves. Not surprisingly twin themes which recur in the planning literature are 'political commitment' and 'nutrition advocacy'.⁸ However, as Field points out,

there has to be political advantage in nutrition as a platform and political power if commitment means taking on other powerful interests.

Second, there are administrative reasons. No country has a 'ministry for nutrition', nor would it make sense to have one. Instead, separate ministries are involved in activities which have nutrition concerns. Thus, ministries and agencies tend to have 'activity-oriented' views of the problem. Each is responsible for a range of activities: clinics, extension programs, food fortification, additives, crop production — and sees its job as one of improving (some would add 'expanding') these activities. There is a presumption that their activities are relevant to addressing the problem.

This, say the critics, is not good enough. There needs to be some diagnosis of the problem at a supraministry level, and a determination at that level of the nature of the activities which are called for and thus of the roles to be played by different ministries. The need is seen to focus ministry and agency concerns upon a wider view of the problem than they commonly have.

Thus, some writings emphasize the need for 'Intersectoral food and nutrition planning'.¹⁰ It is said that (a) the nutrition problem cannot be effectively dealt with by assigning parts of the problem to separate ministries who plan independently and also that (b) the most significant policy actions affecting the state of nutrition are those not directed specifically at nutrition objectives. Field,¹¹ however, is scathing about the idea that when the separate ministries do not function effectively they are likely to be made to function more successfully by attempts to coordinate them. It might well be added that overall coordination implies overall power.

In addition to political and administrative reasons for poor problem definition there are analytical issues, and these are considered below.

In trying to assess how policy decisions might be improved we shall, no doubt, need to see how, and by what processes, problems and objectives are formulated, and to assess whether there are weaknesses in problem definition which can be repaired.

Problem definition and its corollary, the formulation of objectives, should, according to rational planning logic, properly be the basis for the identification and design of action. We shall need to investigate the procedures by which hypotheses are generated with regard to the actions likely to be relevant to meeting objectives. It is indeed an important task of our study group discussions to consider whether these procedures are deficient and whether they might be improved.

Identifying actions

The way we proceed to identify actions for reducing malnutrition will govern the demands we make for improving our data. The data we seek, and the use we make of them, will largely define our approach to nutrition planning. However, this in turn has implications for the nature of the data support services required for

nutrition planning which may imply changes in existing administrative provisions. This raises issues especially concerning current discussions about 'nutrition surveillance',¹² and the relation of data and analysis to the administrative process.

Identifying classes of relevant actions and selecting a specific design for action are the start and finish of a process of elimination in which all but one of a large number of possible specific actions are eliminated. Some planning procedures get no further than the beginning of this process and fail to generate specific action proposals; others start from specific proposals which do not result from any explicit elimination process or wide-ranging view of options.

Where action proposals are generated it is not always through the conscious consideration of alternatives, and planning procedures do not always encourage this. In some countries specific proposals may be subjected to selection criteria, but by methods which do not require explicit choices between alternative proposals with comparable objectives. The application of cost-benefit or cost-efficiency criteria can have this effect, for the emphasis is not so much on 'is this the best way of doing what we are trying to do?' as on 'is the rate of return, or impact per unit of budget allocation, high enough to justify inclusion?' Not only does this fail to emphasize the need for consideration of alternatives (unless impact or rate of return is too low); it also presumes on the relevance of the definition of benefits and costs in the efficiency criteria being applied. (This again is a matter of theory *in* planning and comes later in this discussion.) If the lack of consideration of alternatives, or of systematic procedures for their elimination, as the basis for choice is regarded as a weakness, then we may need to look at the structure and process of planning as well as the analysis used in planning. But these are closely linked.

Recorded planning experience gives little evidence of attempts to predict the consequences of proposed actions: especially, there is little analysis of the likely impact of measures on nutrition. The absence of such attempts could, perhaps, reflect a reasonable judgement that analytical resources are too scarce, or that there are too few data to analyze, or that the initial plan is expected to be greatly modified in the light of experience so that attempts to predict outcomes are academic. When cost-benefit or other appraisals are undertaken, then assumptions, if not predictions of outcome, are necessary, but these seem more generally to be based on hoped-for targets of performance than on attempts to analyze and foresee outcomes. However, we might reasonably ask: 'How far should planning attempt to analyze the likely impact of measures on nutrition status?' and 'For decision making or advocacy?'

The authors who discuss the planning process in terms of stages of rational decision making, such as I have considered here, use these concepts for one of two related purposes: either they are offering guidance to those who would plan (for example, Berg), or they are

offering a checklist for the diagnosis of weaknesses in specific planning situations (for example, Joy). The implication is either that it is possible and desirable to get the planning process to approximate this ideal or that, in so far as it does not, the planning process must inevitably be less than wholly rational. Improvement, however, is equated with increased rationality, but this equation is disrupted or, at least, seen to be in need of qualification.¹³

Most authors note that the planning stages are not presumed each to be completed in sequence; that iteration between stages is necessary. Some, however, appear to believe that the outcome of the planning process is, in effect, a draft plan of which alternative chapters or paragraphs are offered for comment by 'the decision makers' and referral back to the planners. Furthermore, while most stress that planning is a learning process, some seem to mean that planners learn in the course of planning, and others seem to mean that planning is, or should be, that analytical activity by which government administration matures its perception of problems and possibilities and considers its response to experience and events.

Those who see plans as equivalent to 'orders of the day' from the general staff to the troops emphasize the need for plans to be flexible. Those who see them as 'position papers', written in the course of a continuous administrative process, emphasize the need for planners to assist the administrative process (to be integrated with it) and avoid wasting skilled manpower in hypothetical exercises which, if taken seriously, inhibit the process of adaptive control. There is a problem, it seems, that plans are also, if not solely, political platforms which have both the power and the inertia of a mandate.

These brief notes are offered not as an adequate discussion of much studied questions, but in order to list topics on which questions might properly be raised in later discussion. It may be that it is important to resolve some of these apparent differences or qualifications and to pursue their implications for the planning process.

So we seek to improve nutrition planning (ie the design of social action to reduce malnutrition), thus influencing the process of government decision making from within government. There is clearly room for doubt that it is the quality of analysis which constrains improved action. Yet we might argue that effective analysis of the problem is desirable. We need to know both what might be done to tackle the problem of malnutrition, and why what might be done is not done. It could be argued that if there is failure at this level there is no need to ask, 'Why are the necessary steps not taken?'. However, it is noted that even the actions decided upon are not often taken very effectively.

Thus the empiricist has challenged the theorist-planner and argued for less planning and more management. When management is improved, then will be the time to invest in planning. This view depends on the assumption

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that what has to be done is either obvious or can be learned in the course of implementation. Both these propositions can be challenged. Some would argue that the actions which have in the past been espoused as obviously appropriate have been futile, even harmful.¹⁴ It has further been argued that measures can be so fundamentally misconceived that there is nothing to do but start again; that no process of learning-by-doing can succeed from fundamentally false starts. Again, it has been argued that the learning process within administration can be ineffective for many reasons—especially that culture, or criteria for promotion, do not encourage subordinate staff to provide critical analysis and reporting.

Among the reasons cited for failures in plan implementation, however, must be noted that mentioned by Field: that it is at the implementation stage that plans may often be, and indeed are, most readily subverted by those whose interests have not carried weight in the planning process.

This is closely related to the argument that planning can only seek to induce changes in personal or corporate behavior by changing the consequences of that behavior: especially by making feasible and rewarding that behavior that government policy seeks to induce. This argument carries the corollary that planning needs to be enlightened by an understanding of why people do what they do and how people might be induced or enabled to do what is desired. Joy¹⁵ has argued that a major weakness of planning is its lack of analysis or understanding of these issues.

The considerable record of failure of nutrition interventions has led many to ask in desperation 'What can we do, or tell governments to do, in order to reduce malnutrition?'. Such a question suggests that it is possible to generalize about nutrition problems in different countries and that measures which have achieved nutrition goals in one country can be adapted for use in others. This may be true, but it raises questions about how planning processes might respond best to other countries' experiences and appraise their significance for their own situations. This is a matter, again, of both 'process' and 'analysis', and perhaps the answer is 'improve planning'.

Weaknesses in the planning process

From among the propositions considered above, we may summarize those basic to the diagnosis of the weakness of the planning process. Planning may fail to reduce malnutrition (improve nutrition status of population) because:

- *Plans being produced, no serious attempt is made to implement them:* (a) they may not be operational in the sense of defining what action is to be taken by whom; they may fail to be reflected in the budgetary process; and/or (b) they lack the support of those who control the power to act.
- *Attempts to implement plans are ineffective:* (a)

because components of the overall plan are inconsistent; (b) because of fundamental design errors, plans are inherently not implementable: errors may be irredeemable or there may be no capacity for learning and adapting; and/or (c) because of management deficiencies; and/or (d) because implementation is subverted by those whose interests have been overlooked or discounted during planning; or (e) because implementation is subverted by people (farmers, manufacturers, traders, consumers) who do not behave as the plan implicitly or explicitly required them to behave—their behavior was not understood and accounted for in planning.

In addition to these arguments we need also to consider cases where:

- *Plans are successfully implemented but goals are not attained:* (a) plans 'work' but are not relevant or are, in sum, inadequate to achieving goals; problem definition or measurement, causal analysis and identification of relevant measures are weak; and (b) goal-oriented adaptive control is weak or unproductive where initial orientation was basically wrong.
- *Stated goals are attained, but these seem not to contribute effectively to attaining objectives:* Objective premised on inadequate problem formulation or diagnosis (for example, kwashiorkor, cured in individuals, persists in population).

The above outline may be used as a preliminary troubleshooting chart for the analysis of weaknesses in planning systems which are directed at nutrition objectives. It can be used, therefore, to develop strategies for improving 'nutrition planning' (ie planning for nutrition objectives) or for assessing the limits to the possibilities of nutrition improvement through planning.

Domain of nutrition planning

However, not all planning is directed at nutrition objectives. This may either be because nobody cares, or because it is not felt necessary to plan to improve nutrition *per se*. Here, we must remind ourselves that there are many domains of planning even within government, and that there are questions for discussion with regard to the domains of planning in which nutrition objectives should especially be pursued. We should further ask 'How should the planning in different domains be related overall?'. Clearly, it is important that somebody should care. But is it important that this concern be reflected in explicit nutrition-directed planning at the national level, and/or at a more disaggregated (area) level? Or is it sufficient if it is the concern of one or more ministries, or of specific programs within ministries, or of relief agencies? *Whose job is nutrition planning?*

It was suggested earlier that the most significant policy actions affecting nutrition status might be those which are, conventionally, not directed specifically at nutrition objectives. This further suggests that actions

taken for non-nutritional objectives – and thus judged by non-nutritional criteria – may aggravate malnutrition. If this were true, then it would be especially important to examine the nutritional consequences of such actions. Economists seem inclined to argue that, while it may be true where maximizing the growth rate is the dominant objective and planning criterion, new approaches to growth with redistribution would make it unnecessary to have specific concern for nutrition with respect to actions not designed explicitly to achieve nutrition objectives.

No doubt, planning which succeeded in raising the real incomes of the poorest to the point where they could enjoy adequate, secure subsistence plus basic sanitation and health care would have struck at the root of the nutrition problem. However, first, while the elimination of poverty is no doubt a desirable objective, it is clear that it will not be achieved in a hurry. In the meantime, the more modest aim of reducing, in the short term, the worst features of malnutrition in a way consistent with the longer-term sustained reduction of malnutrition and poverty requires a careful blend of short- and long-term measures which can be achieved only if nutrition is an explicit objective in overall strategy. Second, a general planning strategy of reducing poverty – perhaps, *inter alia*, by creating more jobs in total – may not meet the need of some particular classes of people among whom malnutrition is a particular problem.

What this argument says is that the poverty problem, like the nutrition problem, is not homogeneous: the measures needed to meet the needs of different groups may be different and specific to those groups. It also says that priorities need to be asserted, and that nutrition status may be both a criterion of need and an index of success. (This seems to reflect the World Bank approach to making project analysis sensitive to nutrition objectives.) Third, while income levels may be a good indicator of probable incidence of malnutrition, it follows neither that malnutrition is simply correlated with income nor that the feasible, or optimal, measures to deal with malnutrition are the same for all those with the same low incomes. However, these are all issues in need of further discussion.

It would seem to be not difficult to point to strategies which overall are aggravating, or failing effectively to reduce, malnutrition. Their existence is the *prima facie* case that is offered for the introduction of nutrition objectives and planning criteria into policy making at the national level and with regard to measures not directly nutrition-oriented. Concern for nutrition might, in any case, be one aspect of an overall approach to the reduction of poverty – poverty seen not simply as a low level of income, but as a complex of deprivations of which nutrition is one of the most significant.¹⁶

More on intersectoral planning

The view that the national nutrition problem is likely to be heterogeneous, requiring specific measures for specific

people, is linked to the view that the national problem is not susceptible to analysis in its variety wholly at the national level. Burkhalter reports that the literature frequently points to planning that is 'frustrated by lack of data, ignorance of local complexities ... Decentralization is called for'.¹⁷

Here we are into what economists call the decomposition problem: how to break down a complex problem and solve the parts of it so that the total of partial solutions is a solution to the whole. The national planning problem is too great to be seen as a single problem for a single planning body: too many different problem situations, too many interests and objectives to be reconciled, too many agencies. Yet each aspect of the total problem is highly interdependent, so that some orchestration of the sum of planning activities is necessary. How can this best be achieved?

More on commitment

The need for commitment to the reduction of malnutrition is seen as a prerequisite to successful planning by many writers. Lack of commitment is also diagnosed as the chief reason for the failure of planning. However, while commitment may be necessary for successful planning, one might reasonably ask 'How much planning is necessary if there is, in fact, commitment?'

Paradoxically, there seems to be at least one country, China, which is committed to the elimination of malnutrition and which seems largely to have succeeded in this objective without evidently laboring over nutrition planning in the way generally conceived of in the literature under review. Perhaps, as in wartime Britain, China's secret of success is in the equitable distribution of basic foods made feasible by full employment and a non-corrupt administration operating through the use of mandatory powers. But these are conditions which may not be acceptable, or may not exist, in many places today, and which make planning both necessarily different in role and, perhaps, also limited in impact. Evidently, malnutrition may be eliminated at a cost and two questions we might pose are: 'By what alternatives? At what costs?'. It seems unlikely that the costs will be adequately accounted for by conventional cost-benefit procedures.

A major argument of this section is that if we wish to improve planning we may need to change the structure and process of planning. This may not, however, be readily feasible. Changing the structure and process of planning means reallocating power, control and responsibility within the administrative system and the opportunities for access to bureaucratic influence by politicians, individuals and groups. There may not be enough 'commitment' to secure the changes needed. Consideration of this observation throws light on what we mean when we speak of commitment.

Theory in nutrition planning

I shall now turn to the use of theory *in* planning. If the above discussion of the theory of planning is valid,

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theory in planning needs to provide especially:

- A basis for effective problem formulation.
- A basis for linking action to objectives; which implies...
- A basis for predicting the effects of alternative interventions.
- A basis for selecting between alternative courses of action.

Practical planning requires that theories be practical for application.

Problem formulation

The nature of the nutrition problem has already been discussed in Dr Mata's paper, but there are three aspects of its definition for planning purposes which might especially be noted here. First, there is an important distinction to be made between treating the problem as one affecting individuals who are malnourished and exhibit dysfunction, and treating it as a condition of populations which results in an unacceptable risk of dysfunction in some individuals. Second, there is an important distinction between concern for dysfunction, actual or potential, and concern that people should be adequately fed. Adequate intakes are a means to reducing dysfunction, but they may not be the sole, nor even the most important means. Furthermore, measures to improve intakes may not be very significant when taken alone. The third aspect which merits comment is time. The nutrition problem exists now, but it is also evolving, and our statement of how we see the problem – and thus how we formulate our objectives – needs to refer not only to present concerns and intentions, or even to ultimate objectives, but also to how we see the evolution of the problem and how we seek to modify its pattern through time. We shall almost certainly be concerned that our actions should have long-term, sustained, impact in reducing the problem.

Problem formulation is necessary for the formulation of policy objectives and goals. But there are analytical problems of relating nutrition objectives to other objectives and of asserting priorities within the field of nutrition and health.¹⁸

Problem diagnosis and identification of measures

While problem formulation deals with statements about what it is that concerns us and policy objectives with what it is that we are trying to change, problem diagnosis deals with understanding how the problem arises, how and why it is changing, and what needs to be done, or not done, if objectives are to be attained. The theoretical basis of such understanding may not be explicit in all planning but it must be, at least, implicit. Nor does the application of theory imply the construction of formal models: they may simply underlie the thinking which leads to the identification, design and choice of policies and programs thought to be relevant, or the calculations on which predictions of nutrition status are formulated.

Nevertheless, there have been a number of quite

explicit models constructed, quantified and applied to planning for nutrition objectives. I review here some of those most familiar or accessible to me. In doing so, I am aware that I overlook many, often unpublished, which would have merited mention and review. My main purpose must, however, be to raise questions which need to be asked of these models and a comprehensive review and balanced appraisal is not feasible for this paper. I apologize to those unmentioned and to those whose mention describes their efforts with less than justice.

Explicit modeling and implicit theorizing

For the most part, the explicit use of theory in nutrition-oriented planning has focused primarily on ensuring an adequate food supply. In this section, I review the following works which seem to me to focus on this issue:*

- The contribution to Indian planning by Berg and Muscat.¹⁹
- The Tamil Nadu planning exercise as reported by Cantor Associates, Inc.²⁰
- The Nigeria simulation model reported by Manetsch *et al.*²¹
- The linear programming models for Nigeria reported by Smith *et al.*²²
- The Korea simulation model reported by Rosmiller *et al.*²³
- The Colombia programming models reported by Daines²⁴ and Sutton.²⁵
- The Country Perspective Studies by FAO, of which the Zambia study is one example.²⁶

Berg and Muscat. In 1968, these authors estimated the requirements of the Indian population for specific nutrients (protein, vitamin A, etc) and for calories. They then calculated the deficiency in current and projected supplies, listed the alternative foods from which these nutrients might be supplied, and estimated the costs of increasing the supplies of these foods. The foods considered included both conventional and unconventional (eg fishmeal). Linear programming† was then used to answer the question, 'What pattern of increments of supply of the listed foods would meet the aggregate nutrient needs of the Indian population?' The answer was used to provide food supply targets incorporated into the plan.

Joy²⁷ noted a number of objections to this approach, of which the most important to quote here is that planning for the availability of adequate total supplies,

* This review must inevitably be superficial, since many of them are highly complex and technical and have digested vast quantities of data.

† A computational technique normally used to maximize the attainment of objectives (or to minimize the cost of the attainment of a target) in situations in which the problem is to determine the pattern of activities that is optimal given the constraints and costs of these activities and their potential contribution to the attainment of objectives.

even at lowest cost, does not ensure that people are in fact able to purchase their needs. Posing the problem in terms of supply amounts to a diagnosis of the problem as one of an insufficiency of available food. Whatever the truth of that diagnosis, it would not, of itself, be helpful if the cause of the inadequacy of supply were in turn an inadequacy of demand to call forth the needed supply or even if, the supply being produced, it could not be purchased by those in need. This point is now widely recognized in the literature.²⁸

What seems to be required, though generally this seems not to be explicitly recognized, is a pattern of production which generates *both* the desired pattern and level of demand and a (matching) pattern and level of supply. This needs also to be acceptable in terms of costs which might be incurred in the non-achievement of other objectives and, of course, to be the most desirable of alternative ways, if any, of meeting the nutrition objectives.

Tamil Nadu study. Like Berg and Muscat, this study also attempted to provide minimum-cost supply targets, but on the basis of a considerably more comprehensive and detailed study of foods, the nature of their production costs and of the consumption constraints imposed by food habits on possible solutions.* In addition, it recognized the 'distribution' problem and attempted to find answers to the question, 'How might supplies be channeled to those in need?'. It also recognized that this problem had two major components: how to get food to families, and how to ensure its effective distribution within families.

Overall, the study is of a food system seen as three subsystems: the agricultural production subsystem; the food processing and distribution subsystem; and the consumer subsystem. However, the systems were not modeled to simulate their actual behavior or to explore the effects of alternative interventions. Instead, comprehensive data collection regarding all aspects of these systems was carried out and data were analyzed, in part, by correlating variables (eg education and caste with intakes) to generate hypotheses of causal relationships which might have policy implications.

Thus, the implicit theory of the study was that nutrition status is determined by food supplies, their processing and their distribution between and within families. The output of the study included a proposal for a pattern and level of required food supplies (though this was not derived from or linked to any proposals for changing supplies or of estimates of the likely impact of such proposals) and a commentary emphasizing the many factors affecting family consumption patterns and the significance of cultural factors among these. Intervention programs, it stressed, must be designed to take

account of these. It did not attempt explicitly to model the distribution process or interventions in that process.

Nigerian studies. Nigeria has been the subject of intensive study by Michigan State University (MSU). The central concern has been agricultural development strategy, but, within this, food and nutrition concerns have been explicit. Initially, the studies took the form of reports on a series of topics treated separately. Subsequently, however, the material gathered was used to create a simulation model of the agricultural sector, the purpose of which was more to appraise the approach than to provide analysis directly for policy formulation.

The modeling exercise recognized explicitly that only one subset of problems could be analyzed by any one simulation model. The MSU team therefore 'componentized' their basic model and used components in constructing further models to analyze a series of problems. Among the simulations performed were those which showed the consequences of different development paths for the agricultural sector not only for such variables as national income and foreign exchange, but also for those pertinent to nutrition including, especially, food prices and the supplies of calories and nutrients. However, no modeling was explicitly undertaken to explore the consequences of alternative development strategies on the nature and extent of malnutrition.

Smith, a member of the MSU team who has worked for many years on the application of programming to nutrition problems, has formulated a number of linear programming models concerned to establish feasible patterns of farm output which might be adopted as production targets to meet nutritional needs and other policy objectives. A feature of these models is disaggregation to the regional level within Nigeria and the establishment of 'efficient' regional production targets and activity patterns.

Again, however, while these targets are intended to provide an adequate supply of calories and nutrients to meet population needs, there is no provision within the model for checking that food supplies will be matched by a pattern of demand that will ensure distribution to meet everybody's needs. Nor has the effect of different strategies on the pattern of demand been explored. Moreover, the aggregation of farms, even at a regional level, presumes on the feasibility and acceptability of the farm level changes in farming patterns necessary to secure the aggregate targets.

Korean Agricultural Sector Model. This was also developed by MSU following experience with the Nigerian model. It models agriculture within the national economy. It is complex and comprehensive, in the sense that it takes account of a wide range of variables and their interactions, and allows a considerable number of policy options to be simulated. It is, however, highly aggregated and, although it simulated demand and prices as well as supplies, the degree of aggregation of these

* The study used production function analysis and household consumption studies to estimate coefficients for the linear programming model.

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variables seems to preclude the direct assessment of policy impact on those on the margins of nutritional adequacy.

A subsidiary model -- the Grain Management Program Model -- has been developed for the analysis of food policy with respect to such issues as: high v low price policies; dual price policies; controlled market prices; import programs; food subsidies and the management of food stocks. This models supply and demand interactions and the interrelationships between different food markets. It is not possible to determine from the published report the extent to which rural and urban consumers have been disaggregated so as to reflect the impact of policy measures on the food consumption of particular income or occupational categories. In principle, such modeling is clearly possible, but it might require significant elaboration, for example, with regard to the demand for, and incomes of, rural wage labor as these relate to grain prices.

Columbia Models. These have features in common with some of the models described above. Daine's linear programming models are not intended explicitly to analyze the nutritional implications of agricultural production patterns, but rather to explore the relationship between alternative production patterns and employment, GNP and farm profits. As with other models, it is highly aggregative: for example, production input constraints are aggregated into twelve (monthly) labor supply constraints, six land type constraints and four credit constraints for the whole farm sector. As with other models, one output is a postulated food supply for each policy strategy, ie that which is to be met while pursuing the objective to be maximized (employment, GNP, profits) for each run of the model.

Suttor's linear programming model, on the other hand, is designed to contrast the implications of a strategy which maximizes the net value of production of the farm sector with a strategy which produces the nutrient requirements of the population at minimum retail cost. Not surprisingly, perhaps, the minimum-cost diet indicated by the solution is one which is not in fact being eaten and is unlikely to prove acceptable. While, as with other models of this type referred to here, there may be much to discuss about its specific formulation (how requirements are set, tastes allowed for, foodstuffs defined, etc) it shares with the others the failure to relate the answer to the question, 'What pattern of food supply would meet population requirements at least cost?' to the question, 'Should we attempt to induce such a pattern of production and consumption and if so by what specific measures?', and to relate these in turn to the question, 'Is this the best way to plan for improving nutrition status and reducing malnutrition?'

Perspective Study of Agricultural Development for Zambia: Food Demand and Nutrition. This study

again centers on the task of estimating desirable food production targets. While other studies explore the implications of such criteria of desirability as 'minimum cost', 'maximum contribution to GNP', 'maximum employment', 'optimum foreign exchange implications', etc, the FAO study uses as the criterion of desirability a level of supply equal to the estimated level of market demand at constant prices, plus the estimated production retained for farm household consumption. Thus, the analysis is not concerned for the supply conditions of different foods (except to distinguish home-produced from imported items) or the relative feasibility of increasing supplies of different foods.

Demand is, however, disaggregated by provinces and by four consumer groups: urban, townships, rural monetized and rural subsistence (which are not further subdivided by income class). Extrapolations of demand are made using assumptions of population growth for, and transfer to, each consumer group and by the analysis of household expenditure data derived from a detailed household survey. The Report contains a section which offers proposals for food policies most of which, however, seem only indirectly to stem from the analysis.*

Summary. The above works have featured in common:

- ① None directly models nutrition status as an explicit variable determined by other system changes.
- ② None sufficiently disaggregates farmer categories (including landless) or income categories to permit the analysis of the impact of policies on (identified or presumed) marginal groups.
- ③ The models are either behavioral but highly aggregated, or non-behavioral.
- ④ Each assumes that the major task for ensuring attainment of nutritional adequacy is to determine the food supply, pattern and level, required for this (though the Tamil Nadu study analyzes cultural and other factors without modeling them).
- ⑤ Population is exogenously determined and governs labor availability and food demand requirements.
- ⑥ Population growth is not modeled as one determinant of the number of people unable to subsist, nor does this variable appear as an output of any of these models.
- ⑦ Some of the models do predict the consequences of alternative policies, but not directly their effects on malnutrition.

*For example, 'Efforts should be made to bring the rural subsistence population into the money economy by helping them to grow and sell the food needed by the urban population.'

Urban development planning should include the creation of green belts and the setting aside of allotments for family kitchen gardens by means of which low-income town dwellers can supplement their diets.

Production should be diversified to make the diet in Zambia less dependent on the chief staple, maize, and avoid repetition of the near-famine of 1970-71 when the crop failed.'

- Some test predetermined hypotheses about the relevance of classes of policy action on outcomes of prior interest (eg foreign exchange implications); none is intended to generate hypotheses about relevant intervention points for the control of nutrition status.
- No non-economic variables which might affect nutrition status are simulated within these models.

While some of the models are explicit about the inter-relationship of supply and demand, in no case is this interrelationship so modeled as to explore the implications of alternative policies on the nutritionally at-risk or to generate hypotheses about measures relevant to improving their condition. Generally, too, they are non-specific about policy measures, although the Nigerian and Korean models are considerably more specific than the others and the Grain Management Program Model is, exceptionally, wholly specific about the actions under consideration.

It should be noted that there is now a large literature reporting agricultural sector planning models of the sort reported above. Generally, these have not been directly concerned for nutrition. Many of them might, however, be readily used – sometimes with minor modifications – to serve purposes similar to those discussed above. Among these, one which is especially worth noting is a model by Biggs of the Purnea District of Bihar, India²⁹ which analyzes, *inter alia*, the effects of policies on both food supplies and their distribution among the population. Traditional transaction modes, as well as market transactions, are modeled, and the model shows the likely numbers not adequately provided for under alternative strategies. In this respect, while not explicitly intended for food and nutrition planning, the content of the model goes further than those discussed above in specifying a causal theory of malnutrition. Indeed, in the way that it relates supply and demand, in its disaggregation, its focus on the lowest income groups, and in its accounting for both traditional and modern transaction modes, it is considerably more advanced.

Yet another study by Mellor and Mudahar³⁰ provides an unquantified conceptual framework for the simulation of 'interactions between agricultural and non-agricultural sectors with a focus on the impact of modernizing agriculture on production, consumption demand, income distribution and the potential levels of employment in the various sectors of the economy'. While this is not applied to specific policy analysis, it provides a basis for such analysis which could readily be explicitly nutrition-oriented. In the presentation of the model, consumers are disaggregated into seven expenditure classes (which are also land-holding classes) whose food consumption would also be modeled.

Another presentation which also provides an unquantified conceptual framework, but explicitly focuses on the emergence of malnutrition, is by Joy.³¹ This similarly relates to India, but it is formulated in terms of a village rather than the agricultural sector, and

postulates nutrition status as the outcome, especially, of demographic evolution in relation to farm holdings, technical change, market forces and health environment. These forces, particularly, are seen to govern the number of households with inadequate land resources and wage earnings, including remittances, the level and pattern of farm inputs and outputs and their distribution and, thus, to determine the number of families unable to secure subsistence. It is argued that the framework provided offers the basis for identifying measures relevant to reducing malnutrition and for quantifying the effects of various measures, trends or events. The implicit theory of this model is that demographic, economic, technological and social change affect 'displacement' from, or 'absorption' into, productive employment – cash or subsistence – and social care, and that this process is most critical in governing the number of people who cannot afford to subsist.

More pragmatic approaches and their implicit theories

Pines also implies a comprehensive theory of the determinants of nutrition status.³² He presents a framework of analysis of factors which could influence nutrition status. This indicates a series of items under each of three subsystems which directly affect nutrition: the Food Supply Subsystem; the Food Processing and Distribution Subsystem; and the Consumer Subsystem. Less directly, nutrition may be affected by items in related systems, including the Domestic Economic System, the Health Care System, Demography, Foreign Economic System and Government Administration System.

However, while this provides a valuable checklist of items to appraise for their possible impact, it does not allow the prediction of the effect of the workings of the system as a whole as it governs nutrition status. Thus, while the existence of interrelationships between variables is noted, it is not possible, even conceptually, to trace the impact of, say, specific measures to increase food supplies upon nutritional status or to predict changes in status in the absence of new measures.

Nevertheless, what the presentation lacks in adequacy for systems simulation it gains in greater comprehensiveness and the specificity of its interest in nutrition compared to many of the models discussed. In practice, the application of the framework described in relation to Ecuador concentrates on interventions to food supplies (legumes, milk, and fish), fortification (of wheat), a food distribution program, and credit and irrigation programs.

Thus, the approach suggested by Pines leads to concern for both supply and demand issues. Overall, however, it lacks a theory of priorities: it does not say which interventions will be most significant in affecting malnutrition, nor does it have a theory which, even in principle, would resolve that question. We can ask how much impact particular interventions might have, but we cannot use this framework to trace the impact through the system. Its approach to the identification

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of relevant interventions is through a checklist of issues to be applied in a specific examination of the condition of the malnourished which is itself not derived from an integrated theory of the causes of malnutrition in populations. This is not, however, to argue that such an approach might not be more effective in practice than total system analysis or conceptualization especially if the systems used overlook important aspects of the causes of malnutrition or if they are defined in too aggregative a manner.

A recurring theme in the literature is the need to define who is malnourished and to distinguish subsets of the malnourished for whom different action needs to be designed. An attempt to systematize such a disaggregated approach is that by Joy and Payne³³ who speak of the need for a 'functional classification' of the malnourished. They advocate an approach which works from the particular to the general: identifying categories of malnutrition (defined in terms of the action relevant to tackling each category of problem, and of the characteristics of those to whom the action is relevant) and then determining the size of each population category so defined. The total of malnourished within a country would thus be covered by defining all such subsets of the total problem. Subsets of the malnourished so defined would necessarily overlap in so far as there were some actions which were more widely relevant than others.

In the application of this approach the following sequence of questions would be posed: (1) What is the nature of the nutrition problem in the observed group? (2) What might feasibly be done within the household to improve nutrition/health status? (3) What social action is relevant to inducing the proposed behavior changes within the household? (4) How far would this reduce the problem? (5) What are the constraints to further improvement by the household? (6) What action could relieve these constraints: within the immediate community? within the wider administrative entity? nationally? internationally? This sequence seems, also, to be what Levinson advocates when he speaks of 'working backwards', and it is clearly consistent with his advocacy of the use of 'typical profiles'.³⁴

It should be contrasted with the reverse procedure of working from the general to the particular, as with socioeconomic surveys. These commonly start with an analysis of the socioeconomic correlates of malnutrition using as socioeconomic variables not those which are postulated as relevant and discriminating through direct observation of the problem under consideration, but abstract, convenient or arbitrary variables and class limits in the hope that they will provide the correlations sought. It may be questioned whether, without prior observation, it is likely that such an approach will identify key variables and class intervals appropriate to discriminating subsets of the problem. It is certainly likely that they will be wasteful in their demands of sample size and that field observation will be further

required to establish the nature of the causal relation implied in correlations which may be discovered. These are not arguments against socioeconomic surveys, however. They are arguments for starting with a more detailed analytical definition of the problem or a subset of it - and for using surveys to establish its generality and variability.

A disaggregative approach could have severe limitations if it did not move from 'partial equilibrium' and 'micro' analysis to 'general equilibrium' and 'macro' analysis. It clearly also needs both a 'micro' and a 'macro' theory of malnutrition. At the microlevel, the emphasis is on the understanding of why people do what they do and on the analysis of constraints on behavior and the way in which behavior, and constraints on behavior, determine nutrition status. At the community and national levels, the emphasis is on a systems understanding of the factors leading to the emergence of malnourished of various categories. As a planning approach, it emphasizes the complementarity of local level and national planning and stresses the need for both to be directed explicitly at reducing malnutrition, the need for an understanding of how and why the problem is evolving and for analyzing the impact of government actions on the nutrition status of those identified as 'malnourished'.

Johnston³⁵ has doubted the practicality of such an approach in the common situation where planning resources are scarce. Instead, he argues for a broad-based strategy of agricultural development, stressing the need for an adequate level and pattern of food supply, complemented by the establishment of rural medical care networks in which health care is offered together with nutrition (education, food supplements, etc) and family planning activities. While it has indeed to be demonstrated that a disaggregated analytical approach can be incorporated into practical administration it has also to be shown, first, how a generalized strategy can be translated into locally and nationally relevant specific actions; second, whether simply aiming to get at the mass of small farmers and increasing aggregate employment will in practice address the needs of the worst-off families among whom malnutrition is likely to be found; and, third, the extent of the contribution that can be made to reducing malnutrition and disease by health care at different levels of poverty.

The concern for population growth, to which Johnston pays particular attention, is a major theme in the theory of causation of malnutrition. There can be little question that malnutrition is aggravated by population growth, but the nature of the interrelationship which is perceived defines the nature of the planning approach which is required. Meadows³⁶ and many others, see the relationship in terms of the inability of food supply to keep pace with numbers. The implication of this view is an aggregative approach to policies to try to contain population growth and boost food supplies. If, however, the problem is seen as one in which the growing population leads to a growing number of people without land

or productive employment, then policies need also to find means of absorbing these people productively.

Clearly, the way in which population growth relates to nutrition status needs to be understood. The way that the relationship is conceived has implications for the way in which policy formulation is approached. Cassen³⁷ appraises the state of knowledge about the relationship between population and development and casts doubt upon some common beliefs about this relationship.

The above discussion is an attempt to examine some analytical approaches thought to be of significance in problem diagnosis, and thus of use also for the identification of relevant measures, for their design, and for the prediction of their impact. There is a great deal more theory that might properly be reviewed, especially as it relates to the design of intervention. A thorough review would require a comprehensive appraisal of the state of the social and natural sciences and their capability in this field, and this is clearly beyond the bounds of this paper. It seems worthwhile, however, to consider the use of theory in planning domains other than government -- as government has been implicitly viewed so far in this paper. One merit in doing so is that it illustrates the point that economic theory is not the only theory of relevance. Before doing so, however, at least a brief reference should be made to theory in the choice of interventions.

I have already commented on cost-benefit and cost-efficiency analyses as their use relates to the theory of planning. Seeing them as theory *in* planning, I would note that the comparison of alternatives, through evaluation or appraisal, is seen as necessary to choice. The literature is by no means clear about the value of cost-benefit analysis for nutrition planning, however. Some believe that conventional practice cannot account appropriately for nutrition objectives, yet feel that cost-benefit analysis can be redeemed by modifying the conventions; others argue that it is better to use cost-efficiency criteria, thus confining choice to a question of how ministries should spend their budgets, and yet others argue that none of these criteria is satisfactory.

Joy and Payne³⁸ argue that decisions should make explicit interpersonal comparisons and be concerned to generate certain desired patterns of consumption (and welfare) -- especially, certain increments of consumption to certain classes of people. This would imply abandoning attempts to maximize rates of return, or even to be consistent in the application of routine procedures designed to achieve equimarginal returns* in resource allocations. It should be noted, however, that the choice is not always between alternative allocations of government-controlled resources. While cost-benefit

* The equimarginal returns criterion (namely that, at the margin, the rate of return to resources in different uses shall be equal) is important to economists for achieving allocative efficiency, for it aims to ensure that resources cannot be reallocated in ways which give higher returns.

analysis might logically be extended to appraise actions which do not center on government resource-allocation decisions, this is not conventionally done and it implies major difficulties in prediction and benefit estimation.

Other domains of planning

As yet, I have barely mentioned the community as a planning domain. In practice it may well be the critical domain for our concern if we are to reduce malnutrition. The logic behind this statement is simply that it has been argued that all but the very poorest communities have the resources to eliminate malnutrition and even to provide basic health care and sanitation. Thus, the reduction of malnutrition might well be addressed at the community level and action at this level could, conceivably, be significant in complementing more general government policies.

At the community level, it is often easier to comprehend the forces at work generating malnutrition and to recognize the need for measures which directly involve social organization and social values. The role of economics and technology is qualified rather than diminished, but theory of social organization becomes evidently important. This aspect of theory is largely neglected by most of the modeling reviewed above. There is, of course, a vast literature on community development, change agents, 'modernization' and many such related topics as well as on aspects of social anthropology, social psychology and other basic disciplines which underlie these discussions. In terms of experience, there is also much to report on explicit health/nutrition approaches and recent developments in both thinking and practice by WHO and UNICEF³⁹ should especially be studied, as well as reports from diverse countries such as India, the Philippines, Tanzania, Cuba and China. An analysis of these experiences and the theory behind them warrants a separate paper.

A good deal of nutrition intervention has been initiated or supported by international action and non-government agencies. Some of this may be seen to have been largely outside government planning processes. Nevertheless, the planning of such interventions can be appraised by the same questions and criteria as suggested above. Past interventions were based on problem formulations and diagnoses which have been substantially modified. For example, protein fortification has been of little value where food intakes overall were too low.* Temporary assistance with food supplies has sometimes been invaluable, but it has also often graphically demonstrated that the heart of the problem is getting resources to the people most in need and that doing this, in a way which makes them securely productive of their own subsistence, is a more fundamental challenge even than

* But crop geneticists are still breeding for high-protein grains where protein is not the constraint and where, by doing so, they are restricting the genetic pool from which they draw and, often, paying a high price in terms of calorie yield and energy and nitrogen inputs. Fortification with vitamins or minerals, however, has been successful and significant.

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delivering emergency rations or food-for-work.

Thus, experience has revealed and questioned the theory behind intervention and urged the improvement of this theory. It has also suggested that there may be severe limits to the style and content of some interventions current five years ago and persisting even today. In itself, this has given impetus to our present discussions and raised the questions, 'How do we go about analyzing nutrition problems and finding means of their solution?' and, 'What can the international community do to assist countries develop and realize effective policies for the reduction of malnutrition?'

The practicality of theory

'There is nothing so practical as a good theory' is a valuable tautology in the present discussion, since it stresses that for a theory to be good it must be useful. A number of approaches to 'theory in planning' are reviewed above for their implications for problem diagnosis, the identification of measures, and so on. What I did not do was to ask, 'How practical is it to develop these models as a basis for planning?'. Clearly, a model which does not, when developed, do what we want it to do is not worth developing, however undemanding it is of data or expertise in analysis. For the rest, however, it needs to be noted that we are not faced with all-or-nothing choices. The fact that a theory of causation of malnutrition might practically be developed into a quantified simulation model, highly disaggregated and comprehensively cross disciplinary, does not mean that it has to be so developed in order to be useful. Conversely, if such a theory could not practically be so developed, that would not make it useless.

Thus, the question is one of how far it pays, in particular circumstances, to quantify theoretical models. I would suggest that it always pays to start by explicit conceptualization and to decide as one proceeds which elements or relationships need to be understood in greater detail and warrant an increment of quantification and sophistication in modeling. Diminishing returns may set in very rapidly. Especially, there is a problem of communicating the payoff from analysis to policy makers.⁴⁰ However, the more significant and uncertain are general equilibrium effects, the greater the potential payoff from modeling.

Whether the cost of such modeling is justified will need to be seriously considered. No doubt, justifications will continue to be found on the grounds of exploring and advancing the capability of science to deal with human problems.

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This paper has included very little direct discussion on its title theme. Nevertheless, I believe that the terrain that has been covered in the discussion provides an implicit definition of the concept of nutrition planning. It also addresses, indirectly, the question, 'Who should do nutrition planning?'. The answer implicit here is that

anyone whose planning analysis impinges on factors significantly affecting nutrition status should be explicitly concerned about this and that it should be someone's direct concern to review such matters as:

- Defining the nature, magnitude, and causes of malnutrition at present and as it seems likely to develop in future.
- Proposing nutrition objectives and priorities and assisting in the ranking of nutrition goals in relation to other development goals.
- Identifying strategies and measures relevant to the reduction of malnutrition and contributing to the appraisal of strategies and measures which seem likely to aggravate malnutrition.

and to engage in

- The design, appraisal and selection of programs to raise nutrition/health status.
- Monitoring the impact of various measures on the attainment of nutrition goals and objectives.

Where these responsibilities should lie is no, however, resolved.

There should also be a concern to be forewarned of impending crises likely to be characterized by malnutrition and to act in good time to meet them. This, while needing to be taken account of and related to planning, is, in my view, more a matter of routine administrative provision.

How can we learn from the case studies?

Following our initial plenary sessions we are to convene into study groups to discuss how policy making and planning to reduce malnutrition might be approached in the various situations presented to us. Among the questions we can ask are, 'Would the approaches reviewed here (or others not reviewed here) be useful in the situations under consideration? Do they help us with problem formulation and diagnosis, with the identification and design of measures, with the prediction of malnutrition with and without such measures, and with their appraisal and choice? Would they be practical in this administrative and social context? Would they imply changes in the structure and process of administration and are these desirable and feasible?'. Moreover, we might ask, 'In the light of our study group discussions, does this paper seem relevant?', and 'In what way is it in need of qualification?'. I look forward to our study group discussions and to your answers to these questions.

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Discussion

M.B. Namazi (Iran)

I think it would be useful to incorporate more implementation aspects into the various dimensions of planning. Professor Joy made some extremely significant points that should be re-emphasized. The first is the necessity for involvement of the people in the planning process. This includes interdisciplinary aspects, and the necessity of decentralizing planning with relation to nutrition. However, the structures involved in interdisciplinary approaches are not yet firm and effective. This type of approach can cause such division of responsibility that all action is hampered.

However, it should not be only the bureaucracy that is involved in the decision making process. In Iran, some powers of resource allocation are given to the regions and then it is not the bureaucracy but the local democracy which makes the decisions. By sensitizing the bureaucracy at the local levels to the decision making process, a chain reaction can be initiated to facilitate changing the decision making structure, which would be extremely difficult and hazardous at the national level.

Bruce Johnston (Stanford University)

I found Professor Joy's presentation so eloquent that I am tempted to accept his faith that the type of nutrition planning he described is both politically and administratively feasible. However, I am unable to sustain that faith because I find no evidence that such an approach has been applied in practice. Development planning today is generally in a state of crisis and the enthusiasm for it of the past decade has now waned. It seems that the capacity

of the human mind for formulating and solving complex problems is very small compared to the size of the problem whose solution is required for objectively rational behavior. As a result, man simplifies the alternatives to be considered. The other factor is a problem of conflict resolution, ie governments have mixed objectives; undivided devotion is hard to expect.

As for alternatives, it seems to me that since necessary conditions eliminating malnutrition involve both supply and demand, first priority should be given to agricultural development. The great bulk of the farm population should be involved in that process so that it has the purchasing power to consume the increased output. This approach has worked in a number of countries: Japan and Taiwan are two market economy examples. The People's Republic of China is an example of a fully socialistic economy which has succeeded in essentially eliminating malnutrition by such an approach. But with our understanding of the importance of nutrition and the possibilities of nutrition intervention, can we not do better than that? I think we can.

Perhaps we can move towards reaching some concrete consensus on some of those possibilities. For example, it is shocking that there are still extensive areas in the world where endemic goiter is a major problem. The solution is so simple, yet it is not fully implemented in many parts of the world. Since purchasing power is not the whole answer to nutritional problems, much depends upon feeding practices, particularly for the small children at risk. We also know that nutritional problems are aggravated by infection and disease (Dr Mata stressed this). So it seems to me that a combined effort to deal with that type of nutrition and related health problem could achieve more, faster.

Finally, it is apparent that many attempts to expand supplies, income

earning opportunities, and job opportunities are going to become increasingly difficult as rapid population growth expands the number seeking support on the land and the number seeking jobs outside agriculture. Hence, there is a very cogent case for the type of approach that Dr Solon and his colleagues in the Philippines, for example, have pioneered - an integrated program of nutrition, health, family planning and, in that case, kitchen gardens. I hope that we will be able to reach some sort of consensus on certain feasible policies and programs that can be expected to make maximum progress in resolving these inter-related problems.

Walter Santos (Nabisco Protein Foods, Brazil)

I would like to discuss some of the reasons for failures in nutrition planning. A primary reason for failure is the complexity of the nutrition problem; it is related to the socioeconomic development of political institutions, ecological systems, and so forth. Another reason is that most of the actions have been isolated and not comprehensive. Third, the results of nutrition planning depend on changing the behavior of millions of people. The need for food is made more difficult to satisfy than even the need for housing. Fourth, there is a lack of resources, mainly financial resources. Fifth, there is a lack of political will, and planners have not been supported by politicians and decision makers.

To summarize the main defects of nutrition planning, I would include first the steps involved in a decision process which Professor Joy described, and the fact that nutrition planning must be integrated into the national social economic development plan, which is not easy. Such development plans are prepared by decision makers who do not understand the language of nutrition or

the language of the health specialists, and we do not understand their language. We need to be able to communicate. Furthermore, plans should be flexible enough to adjust to available national resources including agricultural resources, food availability, food potential, human resources, technological resources, institutional resources, administrative resources and mainly financial resources. Nutrition planning also lacks political support, which is essential for the transformation of planning into action.

I am pleased to see in this audience for the first time, a philosopher. Professor Churchman opened our minds to the universal will, and made us broaden our thinking to include the relationship of our specific problems to other fields. We must realize, for instance, that politicians take action only for immediate results. Nutrition actions do not usually achieve immediate results, and some of the results are not always visible. Finally, I think that participation of the people, as was emphasized by my colleagues, is very important. We cannot impose plans. The People's Republic of China does not have a national development plan; it has the political will and the participation of the people. I remind you of the words of President Kennedy, that we have the technological means and the human resources to solve the food problem; what we need is the political will.

**Ivan Beghin
(INCAP, Guatemala)**

What we have heard today supports one of Professor Joy's frequent statements that much of the anticipated success of nutrition planning depends upon a proper definition of the problem. We must consider the time factor. I am always disturbed to see that there are many assessments of nutritional status but very few actual time projections. Dr Calloway made a thoughtful comment in underlining how much even the definition of a problem is loaded by value judgments. What is the value judgment? Professor Churchman said we fight malnutrition because we think it is wrong and that is sufficient justification. I feel that many of the

contradictions between the rationality of the planning process and what actually happens come from not understanding or not accepting that the planning process is value-loaded. If we accept Professor Joy's statement that planning is the introduction of rationality into the decision making process, then there seems to be a clash between the value judgment and rationality, but this is not so, as long as we make our basic assumptions clear. If we make our value judgments clear, we think that malnutrition is wrong and that reducing infant mortality is more important than increasing the productivity of workers. If we make those assumptions then we can introduce rationality into the nutrition planning process and succumb to contradiction.

I have been spending a significant part of my time in nutrition planning in the past few years, and I still believe, as does Martin Forman, that we do not really know if it is going to work. Among the three known ways of solving nutrition problems, two have (almost) been historically proven. The first is the model of the industrial culture represented by Sweden, Western Europe, and the USA. These countries have solved many of their nutrition problems without nutrition planning and nutrition planners through the industrial revolution movement. The same model was repeated through those countries Bruce Johnston called the 'late-comers' - Japan, Taiwan and Israel. The second model includes the socialistic countries of China, North Vietnam and Cuba. The third is rational, logical and the topic of our discussion here. We do not know if it is going to work. We have real evidence that some parts of it are not going to work.

I would like to make a criticism of Leonard Joy's paper. He did not really address the appreciation of exterior constraints to the government machinery. He did, however, mention ways to improve the government machinery, but I think even that is not enough to guarantee success. There would still be obstacles, even if individuals had access to bureaucratic influence, even if powers could be satisfactorily re-allocated within the administrative system, and even if there was political commitment.

Comments from the floor

Dr Claudio Shuftan (Meharry Institute, USA) felt that the meeting had progressed from an action-oriented keynote address to a rumination on defining malnutrition (its degree, method to define it) which implied that if we could demonstrate 10% more malnutrition or 10% less, then a government would do more about it or less about it. In his opinion, the Gomez and other methods we had been using to define and measure status gave us a fairly good idea of the malnutrition situation. The problem was government lack of commitment, not lack of knowledge. Was the purpose of the workshop to promote real change or to increase the level of sophistication of our advocacy through more accurate data and planning techniques? What sorts of significant actions should we take when we returned? Should we spend more time persuading politicians or should we work with the people? Working with decision makers was difficult. Why not increase the consciousness of the people to their problems and let them find a way to convince the decision makers? In the end, this is what moved countries and societies.

Dr Vidosav Trickovic (University of Belgrade, Yugoslavia) re-emphasized that planning could not be split from national socioeconomic structures. Some situations classified by Professor Joy as major failures of planning were, to his mind, situations where there was no planning at all. Concerning 'theory of planning', he found much to agree with in the paper but felt the need to explain why there was a lack of explicit nutrition planning in many developing countries: those who contemplated substantial changes in the level of living often mistakenly believed that nutrition would be taken care of automatically by maximizing growth and redistribution income through industrialization. He agreed that a micro approach to nutrition planning was needed if we were to raise the standard of living of those otherwise excluded from the development process.

Dr Robert Chambers (Institute of Development Studies, UK) recognized the value of approaching this subject from both public administration and economics. He also agreed with the emphasis on recognizing that nutrition

The concept of nutrition planning

planning had costs as well as benefits. The costs included the planner's time, delays to projects, and data demands. Health workers might be taken away from substantive jobs saving lives and reducing suffering to collect data which was often in practice of low quality and useless. There was a 'law of prior bias' which ensured that what came first got the most resources and what came

last got little or nothing. This explained the classical syndrome of planning without implementation. A plan which could not be implemented could not be regarded as a good plan. If planners spent more time living in villages, they might be able to devise implementable plans.

Dr Martin Forman (University of California) concluded the discussion

with the observation that some of the participants had had time to write about development and planning. They were mainly from the developed countries. But there was a large group of participants, largely from the less developed countries, actively engaged in decision making and planning, who did not have time to write of their experiences. The literature was the poorer for this.

The philosophy of planning

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I am a philosopher, and I invited two people to attend this conference without asking the chairman. I did so because they are spirits from the past, and their travel is very cheap. Their main nutrient requirements are respect and reverence, which can be supplied without any great cost. The two that I speak of are Jeremy Bentham and Immanuel Kant, and my talk mainly consists of their discussion together.

Bentham

Bentham, in the period 1780–1789, wrote *An Introduction to the Principles of Morals and Legislation*, which begins with the ringing appeal: 'Nature has placed mankind under the governance of two sovereign masters – pain and pleasure. It is for them alone to point out what we ought to do as well as to determine what we shall do'. In effect, Bentham presents an attempt to plan by means of economics, which is based on the principle of utility and on technology, and which builds the means for increasing the total utility. The famous phrase 'to maximize the greatest pleasure for the greatest number' has been translated into modern planning in many forms.

Most modern planning has its roots in Bentham. He gave us, for example, the basis of cost - benefit analysis. In the case of malnutrition, the Benthamite approach is to find ways to intervene in villages, communities and nations to increase economic value by technological means for those communities. The Bentham approach naturally makes use of models, but we have found that the problem is much deeper and much more complicated than Bentham argued in *The Principles*. At least nine elements must be identified:

- Who should be served? Nutritionists say that children up to six years old are important clients as are future generations.
- Immediate goals.
- Long-range objectives.
Ideals we are aiming for, such as a world without malnutrition.
- A measure of performance which will enable us to evaluate progress.

- The decision makers – politicians, the wealthy, the radical dissidents – and the establishment of a dialogue with them.
- Resources available to decision makers.
- The environment in which the decision makers operate, and what matters to them.
- The elements over which the decision makers have no control.

'Control', under a Benthamite approach, is a key word. We should emphasize also the stability of the plan – malnutrition problems may be momentarily overcome, but forces may begin to make matters worse. Finally, we must understand ourselves as conceptualizers, as rational individuals; we are essentially doers of good who are obedient in the Benthamite mode to the principle of utility. We try to determine which of the many available options the decision maker should use and we then try to implement it. Implementation turns out to be one of the most difficult problems, and we need a guarantee that what we try to do will not lead to disaster. There is a dream attached to Bentham's idea of a world that is economically sound. The word comes from *ecos* meaning home. We want a 'homely' world.

Kant

Now consider Kant's approach. In 1785, he wrote *The Foundations of the Metaphysics of Morals* and in 1788 *The Critique of Practical Reason*. Kant and Bentham wrote at exactly the same time, though neither one was aware of the other's existence. There is a marvellous 'synchronicity', as Jung calls it, between Kant in Koenigsberg and Bentham in London. Bentham said, 'Nature has placed mankind under the governance of two sovereign masters, pain and pleasure'. Kant said, 'Nothing can possibly be conceived in the world which can be called good without qualifications, except a good will'. He continued that power, riches, honor, even health (and even the end of malnutrition) and an abundance of pleasure without pain, all inspire pride if there is no good will to correct the influence of them on the human mind. The overriding principle that guided the good will for Kant was equity, which he described in

various ways. One of them was, 'So act that the principle of your action can be willed by a universal law of nature, applicable to all in the same way'. An even more beautiful version of that was, 'So act as to treat humanity, whether in your own person or in that of another, in every case an end withal, never as a means only'.

The message that emerges from Kant's writings in this decade is that one does not do something because it is useful, but because it is morally correct. The point is not to defend these principles because you can show that if malnutrition is reduced the world will be better off economically. The existence of malnutrition is a violation of the principle of treating humanity as an end withal, not as a means only. Kant's ideal is a kingdom of ends wherein everyone is king. The decision maker, the planner, and the client are always treated as an end withal, no distinctions. As an operations researcher, I find the use of models in Kant's world unnatural and irrelevant. He recognized the utility argument, and he did say there was a need for the convergence of the two worlds of prudence (or happiness) and moral equity.

The cancer of inequity

To summarize the state of the world, I would say that the world is a network of inequity, or that inequity is a spreading cancer into the fiber of humanity. For example, militarism is at the top because we are all caught in it. The acts of defense and war treat humanity as means only, and they are frightening. During the second world war I worked in a military laboratory. Some of the people in my laboratory were developing a bullet that would go through any armor, and a neighboring laboratory was developing an armor that would resist any bullet. No wonder that 90% of the US research and development budget goes into the military. The general bureaucracy often treats people as means only, at least in the USA. Perhaps in other countries the bureaucrats have more compassion when asked for licenses and the like. Criminal justice in this country is a clear case of misjustice or injustice. Then there are the malnourished of the world, and they are malnourished because it serves certain interests that they be in that state. They are prime examples of the treatment of humanity as means only.

It may well be that the amount of inequity has not increased, but has decreased and that we are really just gathering a more intense awareness of inequity. We are becoming Kantians in our planning and in our concerns. That is the leap I hope nutrition planning will take. Do not wait too long to realize that the main problem is inequity, not gross benefit minus cost, but the treating of humanity as means only.

Why is there such inequity? Part of the answer is obvious: greed. That is reflected in the first chapter of Bentham's book where he says, 'Pleasure is what really drives you'. But why should one person worry about another's pleasure? That is never explained. Bent-

hamites certainly do not have to worry about the pleasures of future generations. Strong Benthamites say, 'What have future generations ever done for me?' Another part of the answer is that we doers of good have built enormous superstructures that come between ourselves and the real client. The researchers themselves are often in that in-between position. Forman referred to the 'funding societies'; I call them 'surrogate clients'. We treat them better than necessary, but what can we do about it? I think we ought to take Kant seriously, that is, the problem of equity.

There is a passage in Paul's Letters that puts it well. Paul was a planner, deeply concerned about the small Christian communities in the first century, and he tried to find ways to bring those communities together. This was the essence of the Kantian message, the formation of community. Paul wrote in Romans 12, 'As in one body, there are many members and each member has different functions one from the other. Yet we being many are yet one in the body of Christ. Every one member is one of another'. That cannot be logically defined, yet it captures the spiritual side of the idea. We ought to recognize the need for morality and a religious spirit, not in the sense of organized religion, but in the development of imagination as well as conceptualization. We need to imagine hope because that is where it lies. The way to revive hope is through imagination, and love cements it all together, every one member one of another.

To show the importance of the imagery, I will mention one occasion in my life in malnutrition that was more important than all the conceptualizations I have had. Leonard Joy gave me an image of a starving man in Bihar, India, who could only move a little each day to keep in the shade of his hut. One can go on endlessly about weight and height and so on, but that image, to me, captures the situation in a much richer way.

I will conclude with two images. I threw the *I Ching* for this seminar – it is the first planning document that was ever written; it goes back to about 2 000 BC. It contains 64 models, called hexagrams, and in each case the model is supposed to represent one's situation. It also uses dynamic models, models that go from one situation to another. The hexagram that I threw was 'Splitting Apart'. It is a hexagram in which the yin goes all the way up to the sixth line, which is solid. As a planning document, the *I Ching* gives one ideas about what is happening, and it also gives one images. The image associated with this particular hexagram is the image of the fall turning into winter – the October–November image; a house split apart; dark forces overcoming the strong; a mountain above earth which represents absolute stillness and an undermining. It was a very pessimistic hexagram, but it had one moving line that moved it into another hexagram called 'Progress'. The image in that hexagram is sunrise, widening expansion, a clarity and brightening that comes at dawn, emergence from the dark mists. That was what the

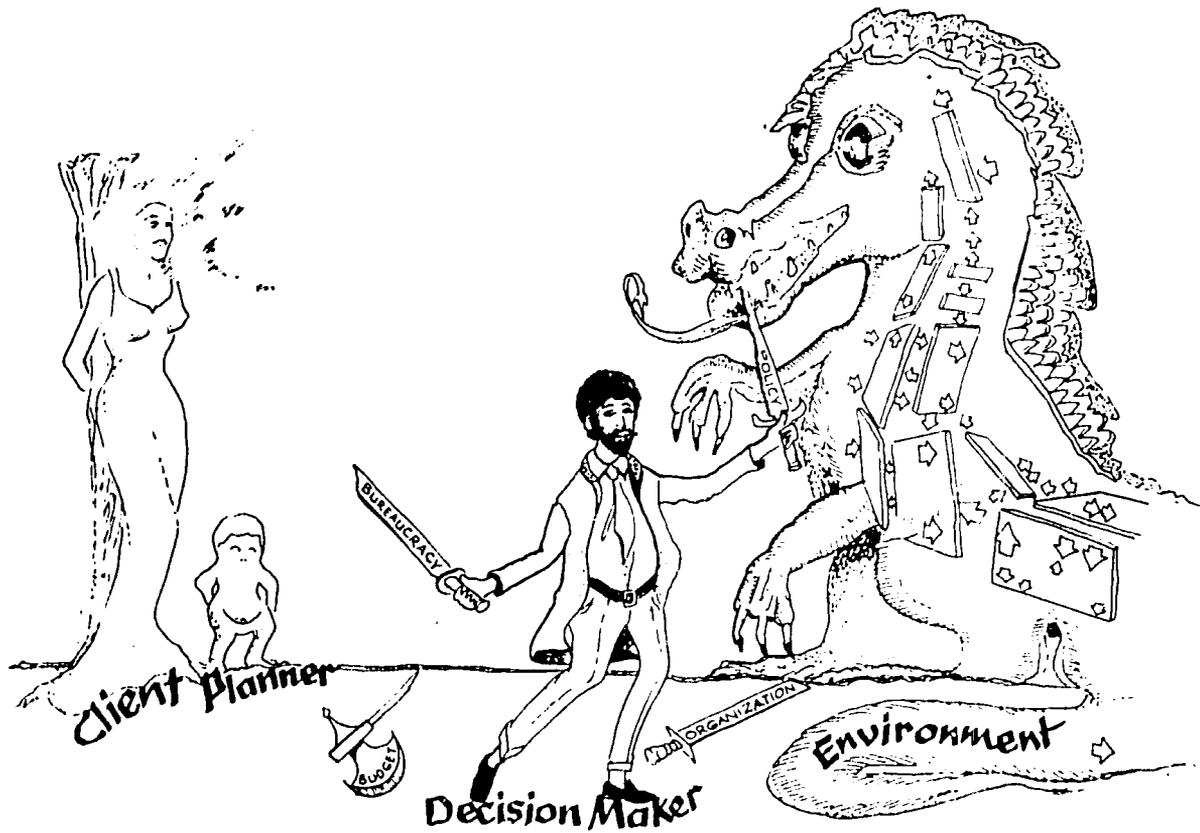


Figure 1. Image by C. West churchman. Realization by Hal Nelson (University of California).

I Ching predicted for nutrition planning.

The other image (see Figure 1) was of the client – a beautiful maiden tied to a tree. There was the decision maker, who was battling with his environment, and he had the idea that the environment was an input–output matrix. There was also a dragon. The decision maker was using weapons against this dragon – one stood for bureaucracy, and it was a little bent; another stood for budget, which was broken; one sword was organization,

but it had no point to it; finally, the other sword, which was full of nicks was called policy, and it was not having much effect. The planner was a small, weak individual in this situation. This picture told me something that thirty years of planning in the conceptual mode did not. I have finally come to realize that all that little planner over there had to do was untie the maiden and they would be able to walk away from the rest of the mess.

PLENARY SESSION

Chairman Ivan Beghin: 'The purpose of this meeting is to discuss the state of the art of nutrition planning. We are not here to reach a consensus, but many participants have expressed concern that there was too little specific consideration being given to the political system in which nutrition planning evolves. Their concern has resulted in several spontaneous meetings to discuss this topic and we have reserved time for one group to present for discussion a preliminary working paper which it has prepared.'

The politics of food and nutrition planning

A preliminary working paper on its socioeconomic context

Urban Jonsson

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Thierry Brun

Institut National de la Santé et de la Recherche Médicale, Paris, France

We feel that the following points should be made concerning this Symposium and food and nutrition planning.

First it is impossible in this Symposium to reach a consensus on the approach to food and nutrition planning. The major reason for this is that, although the socioeconomic factors involved have been mentioned, their role has not been sufficiently clarified.

Second, food and nutrition planning, like any form of economic planning, necessarily reflects primarily the objectives of the group in power.

Third, many examples exist in which the income and nutritional status of some poor segments of the population have been improved, but at the same time the degree of exploitation to which they are exposed has increased. The better-fed productive forces were used in a more profitable manner.

Fourth, although most nutrition planners and other decision makers have generous and humanitarian objectives, they are, in fact, reinforcing the existing centralized structure of decision making. Therefore, an improvement of the food situation is not a guarantee that exploitation will be decreased nor participation in decision making increased.

Finally, in the light of the above points, it is clear that we cannot agree on the content of food and nutrition planning if we do not share the same explanations of why people are poor and malnourished. In many instances, they are poor and malnourished because they are exploited and dominated. They are underpaid and they cannot control their lives. However, ecological and cultural factors can in some cases be the major causes of malnutrition.

Different socioeconomic contexts

It is not possible to construct a uniform concept of food and nutrition planning, because each socioeconomic situation will require a particular approach. Moreover, a particular nutrition planning approach will play a different role in different socioeconomic contexts. We have studied four aspects: the degree of dependence on external market and aid agencies; the degree of inequities in the distribution of resources; the degree of political mobilization of the lower segments of the population; and the degree of decentralization of planning structures.

Planning approaches will differ depending on where a country falls with regard to these parameters. For example, regarding dependency, multisectoral planning is difficult if strong dependencies exist. It is easier if there is less dependency on outside countries. Large inequities in resource distribution imply a political input, while a country with little inequity can concentrate more on the technical issues. If there is little political mobilization of the poor, efforts should concentrate on short-term and direct effects. Where there is more mobilization it is possible to plan for a longer term and include the indirect effect of nutrition programs. A centralized country has a strong need for macro-micro level coordination and planning is from top to bottom. In a decentralized country, it is possible to concentrate more on village nutrition planning.

Countries may differ considerably in these respects. If food and nutrition planning is to have any real and sustained impact on the situation of the underprivileged, the approach must take this fact into account.

Most food and nutrition planning methods consist of an iterative sequence of four activities: data analysis, diagnosis, decision making and implementation. Parts of these activities are largely based on technical and 'objective' data and processes such as selection of indicators, surveys, etc. Others are clearly political. However, even the tools used in analysis and diagnosis are not 'value free'. The planner must not only recognize the implicit assumptions and values behind these positivistic techniques, but must learn when they are and are not appropriate.

Limitations of current approaches

The food and nutrition planning approach presented in this conference has a political content, as have all other food and nutrition planning approaches. However, this political content is not explicitly spelled out. As nutrition planning influences the political and economic development of a country, the nutrition planner must be

aware of his political role. The presentation of nutrition planning as a technical tool tends to hide this important issue. Sometimes the complexity of the real nutrition problem is deliberately exaggerated to rationalize a purely technical approach. This emphasis on the technical approach also serves to justify the need for western-trained experts.

What the planners should do

From what has been said, it follows that food and nutrition planning should be designed in different ways, depending on the degree to which the government represents the underprivileged and how far it is committed to social equality.

In countries with governments less committed to social equality, it is a waste of scarce manpower resources to make plans which will never be implemented. Instead, nutrition planners should concentrate on community diagnosis, analysis of food chains, and initiation and support of community actions. At the same time pertinent data revealing the nutrition situation should be collected to sensitize decision makers and support popular demands. Nutrition planners must be politically oriented and, of course, act as real representatives of the underprivileged.

In countries with governments more committed to social equality, nutrition planning becomes a tool of overall social development. Nutrition planners can integrate their work into the national development planning. In these countries nutrition planners can actually concentrate on the technical aspects.

Conclusions

Food and nutrition planning is never politically neutral. Food and nutrition planners play a political role.

Food and nutrition planning approaches must always be assessed in a specific politicoeconomic context. A consensus of what nutrition planning should be can generally only refer to some technical aspects; their role is minor compared to that of the appropriate political design.

The objective of food and nutrition planning should be to improve the nutritional situation for the underprivileged, but it should also contribute to the upheaval of those processes in the society that foster poverty, ignorance and malnutrition.

Nutrition planning is an important field of research, but all value judgments must be clearly stated.

Foreign assistance in the field of food and nutrition planning should support initiatives in the developing countries and consider the relationships between overdevelopment and underdevelopment.

Discussion

Dr Martin Forman (University of California) commented that he was struck by the extent to which the

issues raised in the paper were issues that had been discussed in the study group in which he had participated. He asked for clarification on a point which had not been discussed

in his group: what was meant by the statement that the objective of food and nutrition planning should be not only to improve the nutritional situation for the underprivileged, but

Plenary session: the politics of food and nutrition planning

also to contribute to the upheaval of those processes in society that were behind poverty, ignorance and malnutrition?

Dr Jonsson in reply said that poverty, ignorance and malnutrition were the result of social processes – poverty-creating processes. Nutrition planning should aim at stopping, hindering, eliminating these processes and at changing their direction so that they do not generate poverty.

Dr Sheldon Margen (University of California) continued with the remark that the paper's five conclusions were virtually unimplementable. No mention was made of how to overcome the constraints. **Dr Jonsson** replied that the paper was preliminary and that the main point was that nutrition planning must be different in different countries. In some countries there were more important issues to work with than nutrition planning.

Professor Leonard Joy (University of California) felt it desirable to draw attention to the conclusions of this statement as they contrasted with the propositions offered at the meeting which initiated the discussions on the political context of nutrition planning. At that meeting it was argued that much of nutrition planning was inappropriate, ineffective, and a misdirection of effort in situations where the system, especially the market system, within countries was generating poverty and where the planning process, as part of that system, was reinforcing that structure. This was not the conclusion of the working paper, which argued that what we could effectively do in different situations differed according to the particular situation.

His experience was the same as **Dr Forman's**: that the issues raised by this paper were raised also in the case study working groups.

Professor Joy suggested that one should not be generalizing about techniques of nutrition planning but discussing how nutrition objectives can be injected into social governance and whether the pursuit of 'nutrition planning' could advance this cause and generally contribute to the improvement of the approach of government to the problems of society.

Dr Andres Mejia (Ministry of Agriculture, Nicaragua) felt that the people should be sensitized and that they in turn should sensitize their governments.

Dr Alex Mosha (Tanzania Food and Nutrition Center) said that when we worked within the system, we were just humble civil servants with orders and directives to obey, whether we liked it or not. We should realize that we were not being very successful in selling our viewpoints to the politicians. If we stepped too far out of line, we were silenced or ignored. We needed to make use of more salesmanship to convince the politicians that there was a problem.

Dr John Field (International Nutrition Planning Program, USA) pointed out that **Dr Jonsson's** statement helped to refute a former belief that with the proper technological fix on the problem, nutrition planning could be successful independent of its sociopolitical context. He also added three other dimensions to the political parameters. The first concerned the capabilities of governments. It was capability that converted commitment into impact. The second was that planning included the process of negotiation and bargaining, which was itself a political phenomenon. Therefore, the results of planning reflected a real political process that needed to be taken into account. There was also the political aspect of implementation, which was a formidable and long-neglected aspect of the whole development process. The third dimension involved system – society interaction: how the government mobilized and harnessed local energies, how it supported and induced compliance this was highly political also. It concerned the core question surrounding nutrition interventions – how were the intended beneficiaries going to respond to efforts to produce change in their midst?

Dr Walter Santos (Nabisco Protein Foods International Corporation, Brazil) said that the paper brought up the problem of inequality and exploitation existing at the national level. This concept could be extended to include the inequalities and exploitation at the international level. He felt that nutrition planning should be used as a tool to reduce the inequalities between rich and poor nations.

Dr Florentino Solon (Nutrition Center of the Philippines) felt that we were becoming too inhuman, cold-blooded, inflexible, scientific. He was glad to hear the point made that indeed the malnutrition problem

must be solved. He stressed that one country could not copy another's program: it could only apply the principle behind the program in its own situation. The program in the Philippines did not really start with a plan, but with an advertising campaign which subscribed to the slogan that 'mass follows class'. If class believed that lowly loaves and fish were important and bought them, then the masses would believe that this was good and would follow suit. He agreed that it was for the masses to pressure the government and for the government to respond.

Dr Vidosav Trickovic (University of Belgrade, Yugoslavia) was the only participant from a socialist country. He basically agreed with the document, but added that it was not only important to distinguish governments that were equity-oriented, but also to distinguish governments in less developed countries that were committed to rapid development and rapid socioeconomic change. In countries where rapid development was not a priority, it was not sufficient to reduce the job of the nutrition planner to data collection and analysis. It was these countries in particular which should coordinate nutritionists and everyone else working for socioeconomic development to produce alternative programs since a nutrition program *per se* could not resolve the problem. A restricted role of the nutritionist was also insufficient in socialist and mixed socialist countries, which had already declared their desire for rapid development. His main point was that we should not consider nutrition as separate from other goals. Unless we combined many approaches (nutrition, housing, sanitation, education, etc) we should never achieve implementation because ministers would never stop fighting over priorities.

At this point **Dr Thierry Brun** was asked to respond in conclusion. He said that he was puzzled by the fact that the participants seemed to agree to a document which argued the impossibility of reaching a consensus on a simple approach to food and nutrition planning. He was puzzled, too, that representatives of the agencies funding the major food and nutrition planning programs of the world agreed with the document. Did they really agree with the statement that, 'Food and nutrition planning, as any form of economic planning,

necessarily reflects primarily the objectives of the group in power? Did they really subscribe to the statement that, 'Many examples exist in which the income and nutritional status of some poor segments of the population have been improved, but at the same time the degree of exploitation to which they are exposed has increased. The better-fed productive forces were used in a more profitable manner'? Did they really agree with the statement that, 'We cannot agree on the content of food and nutrition planning if we do not share the same explanation of why people are poor and malnourished. In many instances they are poor and malnourished because they are exploited and dominated.'?

Mrs Miriam Chavez (Instituto Nacional de la Nutricion, Mexico) commented that politicians in less developed countries might feel sorry for malnourished children, but it was hunger among adults that moved them to action. Malnutrition led to apathy, but hunger triggered revolt. Politicians were not insensitive to this nor to the possibilities of earning prestige or of creating political

force in the form of volunteer community workers acting, in a sense, as advertising agents for the government. Nutritionists wanted to improve the nutritional status of the people, and governments wanted to show how good they were at solving their country's problems.

Dr Carlos Daza (PAHO, USA) cautioned that we should not make statements which were 'too radical' and which closed off possibilities of exploring other approaches to social problems. He felt that the statement that 'nutrition planners had humanitarian concerns but still reinforced the centralized decision making structure which ultimately exploited the masses' presented a paradox. It recognized a reality but also denied the possibility of getting some nutrition and socioeconomic planning done. He urged Dr Jonsson to comment on the application of food and nutrition planning to the design of local-level projects.

Dr Jonsson replied that the statement quoted should be seen in the light of the document as a whole and that, of course, not all nutrition planners with humanitarian object-

ives were actually reinforcing exploitation. **Dr Daza** continued that in Latin America most of the stimulation for nutrition planning came from outside agencies. These agencies should be seen by the countries only as resources; the countries must take the responsibility for their own development planning.

Dr Michael Latham (Cornell University) agreed that nutritionists had often been seen as allies of the exploiters rather than as allies of the poor. But this charge need not stick if we remained human in our professional capacities. Florentino Solon's success in the Philippines, for example, had been achieved largely regardless of political context: he had been rightly seen as concerned for, and allied with, the poor. A truly human stance at all levels of our professional activity would produce results.

Dr Ivan Beghin (INCAP, Guatemala) concluded that this was the first meeting of its kind to recognize that there could be no aseptic, objective - scientific nutrition planning. Nutrition planners were involved in political choices and political reality.

Final plenary discussion

The next session focused on the relationship between nutrition planning and general national economic development planning, the concept of community involvement, and experiences of the participants.

Dr Adolpho Chavez (Instituto Nacional de la Nutricion, Mexico) asked, 'What was development?' Was it the riches to be seen in the large cities of the USA? This kind of development (cars, buildings, technology, etc) was not possible for poor countries, but they could expect at least to attain the health level, the level of well-being, of the highly developed countries. This human aspect of development was its essence. In poor countries nutrition policy was development policy: nutrition problems comprised perhaps 80% of the problem of health and well-being. Also, these countries knew that increasing wealth was not necessarily the same as development. For example, coffee-producing regions frequently displayed hunger and malnutrition: the people were worse off than they would have been if they had produced food for their own consumption instead of producing a cash crop.

Dr Chavez thought that nutrition policy could provide not only the means for securing well-being, but also the means to give employment and other socio-economic resources to society. Perhaps self-sufficiency at the beginning would assure a better distribution of wealth and a better level of health. In many countries, inequalities and exploitation came with problems stemming from the way in which production was related to distribution and consumption. So a nutrition policy which aimed to relate production with distribution and consumption in a way which produced a favorable impact on nutrition could be an important tool to real human development.

Dr Beghin (INCAP, Guatemala) commented that it was still unclear what was meant by 'nutrition planning'. He admired the program of the Philippines, but would not call it 'nutrition planning'. He felt that Professor Joy had put it well when he referred to 'nutrition as an objective in overall development planning'. If employment or exports were increased and this did not to some extent improve the nutrition of the people, then it could not be said to have caused development if nutrition improvement were a key development objective. He suggested that a change was needed in the philosophy of government development planning to include nutrition objectives. Whose job was it to do this? It was the job of development planners of different disciplines working together. It was not the job of nutritionists; nor of 'nutrition planners'. Indeed, Dr Beghin did not believe in 'nutrition planners'. However, professional nutritionists needed to be much more involved in the process of

development planning. They needed to learn to communicate with the development planner.

Dr Hossein Ghassemi (Institute of Nutritional Sciences and Food Technology, Iran) pointed out that the conference was stimulating the process of communication between various disciplines. Some might have the impression that nutritionists were not even capable of assessing the situation in a community, but this should not be a cause for frustration, nor should it be frustrating that the pace seemed slow: the problem was complex and time horizons should be correspondingly long. We were in a period of transition moving from a classical nutrition approach towards an integrated approach. In the process, we were discarding the classic nutrition programs which did not reach the heart of the problem. However, we needed to be careful not to destroy what we had before we had found effective alternatives.

Communication was certain to be difficult during this transition period, because when nutritionists approached decision makers, the decision makers thought that the nutritionists wanted to find out who was malnourished in order to set up nutrition programs. However, the nutritionists were changing their concepts and they now wanted to unite all the decision makers and resource allocators and change the planning process for the benefit of the underprivileged. This was an altogether different approach, but it was gradually being accepted - and not necessarily for political reasons, but for methodological reasons also. We did not yet have a methodology for complex decision making which would incorporate a nutrition orientation. We were still quite unable to manage simple feeding programs. We could not simply blame governments for their lack of commitment to our objectives. Political constraints were by no means the only constraints on our attempts to improve nutrition. We needed also to note the limitations of our skills and methodology.

Dr Sirajul Hao Mahmud (Nutrition Division, Pakistan) agreed with those who felt that the overall development effort should include improvement of nutritional status. He believed that it would be wrong to suppose that nutrition planning should emerge as a separate sectoral program.

Dr Bruce Johnston (Stanford University) wanted to emphasize that nutrition was a valuable entering wedge for identifying the real problems of poverty, but it was only one of the important objectives of socioeconomic development. We should recognize that there were possibilities for achieving significant nutritional improvements under many different types of political regimes and economic systems. But we should be concerned with the political feasibility of our recommendations, particularly those relating to the mobilization of support groups to

muster financial and administrative political support for programs with a wide coverage of rural population. He believed that the linking of nutrition with health and family planning had advantages not only in cost-effectiveness, but also in mobilizing wider support for effective programs.

Dr Kamalladun Ahmad (University of Dacca, Bangladesh) said that one of the prerequisites for raising the quality of life was improved nutrition. Concern for nutritional implications should provide the guiding principle for all policies.

Dr Soekirman (Bureau of Social Welfare, Housing and Health, Jakarta, Indonesia) responded to Dr Beghin's statement about nutrition planners. He agreed that nutrition should not be in the hands of nutritionists, but he did not think that nutritionists were incapable of contributing to nutrition planning. What mattered was not a person's nominal profession but a variety of skills, including managerial and leadership capabilities, and a broad understanding of the particular political system under which planning was pursued.

Dr Michael Latham (Cornell University) considered that we were spending too much time on nutrition planning and policy and not enough on food planning and policy. Someone had mentioned that China had solved its nutrition problem without nutrition planners. Yet China obviously had a strong food policy which solved the nutrition problem. He felt that an equitable food policy might be more important than any other policy in solving the nutrition problem. He also discussed the role of the nutrition planner who, he said, had an important role in studying the nutritional implications of other policies: for example, the alternative nutritional implications of setting up either a capital-intensive development program or a labor-intensive development program; or the nutritional implications of price policies and inflation.

Dr Leonard Duhl (University of California) said that he felt this conference was a world with a language all its own, familiar to some in medicine, foreign to those in government. He thought nutritionists had two responsibilities: they had to deal with those aspects of nutrition problems recognized as within their own province of responsibilities, but they also had to understand the nutritional implications of other peoples' actions and to communicate them to others. He did not think that nutritionists did this successfully. They still needed to learn to speak the language of those in power and to work with decision makers to assert nutritional objectives. They needed also to be able to assimilate the relevant data and feed them back in a comprehensible manner to the decision makers. But the bulk of the information used by decision makers was not 'rational' or 'scientific'; it related instead to feelings and concerns of people in communities that could not be quantified. Therefore, nutritionists needed to define the problem both in quantitative, objective, scientific language and in quantitative, subjective, feeling language.

Professor Kenneth Phillips (University of California) then raised the subject of the role of peoples' organiza-

tions in need (welfare rights organizations, tenant organizations, etc).

Mr Mahinda Silva (Ministry of Agriculture and Lands, Sri Lanka) responded with some experiences from his country. Sri Lanka had for several decades been politically committed to equality-oriented policies. They had not really been thinking in terms of nutrition, but they had maintained a level of subsidization of both food production and consumption for which they had been criticized. Their policies had a basis in history. In 1932, universal franchise was granted for both men and women. As a consequence, the legislature was predominantly composed of people from rural areas and had a decisive political commitment to programs that attacked poverty and improved conditions in rural areas. About 75-80% of the population lived in rural areas, and this figure had not changed much since 1940. In this context, the country had maintained a system of food subsidies and food distribution which was humanitarian with a far-reaching nutritional focus. Recently, a program had been developed to combine nutrition objectives with the long-standing egalitarian objectives by integrating various traditionally separate planning activities and disciplines.

Mr Silva believed that this was an effective approach which should displace the idea of a 'nutrition planner'. What was required was a means of relating conventional nutritionists with economists, political philosophers, agronomists, social scientists, etc. He gave an example of unintended nutrition planning based on political philosophy. Sri Lanka imported the high-yielding IR8 variety of rice from the Rice Research Institute. It was not politically and socially suited to Sri Lanka because it could give high yields only in areas of assured water supply and for farmers who could afford very high inputs. Therefore Sri Lanka developed its own high-yielding rice which could also perform in marginal farm areas, giving a broad social spread of the benefits of the improvement. This program had the backing of a political power structure committed to equity-oriented and participatory rules. He believed that the introduction of a nutritional focus into development planning would generally require such political backing and commitment. Without it, it would fail.

Dr Ahmed Benrida (Plan Ministry, Morocco) was of the opinion that putting nutrition in the hands of the technocrats and politicians at the national level would not reach the core of the problem. People in communities should come up with plans to satisfy their basic needs and these plans should be incorporated into the national plan. The planning process was certainly about 'who gets what'. That was something that the communities should decide. Why should he, a planner, decide what was best for someone in a rural community? We could not expect national planning to solve the problem without the development of local, community, planning.

Dr Florentino Solon (Nutrition Center of the Philippines) wished to share a strategy which he had found effective. It was to put to ministries, agencies, and even

private firms, the question, 'Is nutrition not your concern?' Inevitably, the answer was, 'Yes, nutrition is our concern'. The response to this was another question: 'What is your nutritional goal?' This question usually revealed that people were not able to be clear about the answer and this led to their asking for help. In this way, commitment had been developed to nutritional goals and plans.

Mr Robert Chambers (University of Sussex, UK) noted the relationship between the focus on nutrition and the problem of the perception of the nature and extent of rural poverty. There were serious problems with our perception of this problem and there were biases in our understanding of rural situations which directed attention away from the poorest rural people. He also discussed the phenomenon of 'rural development tourism' – the brief visit which was rushed and rather formal, where only the important local people were met and there was no direct contact with the poorest. Usually the poorest and least healthy were those with the least contact with government staff and the outside world. Mr Chambers suggested that programs engaging

local staff on nutrition problems could provide not only a way for the most disadvantaged to become aware of what they could do and what they could demand from the government, but would also improve the perception and focus of programs of the government staff on this target group.

Dr Sheldon Margen (University of California) said that he strongly supported Mr Chambers' statement and added that he hoped the meeting had been educational and had contributed to the creation of an awareness of the multidisciplinary nature of the problem. He stressed that among all their other deprivations, the poor were also severely deprived of political power. Dr Margen was disturbed about elitist attitudes revealed at the conference. He thought that the critical question was how the poor themselves might articulate their own needs and demands. They were so deprived that they did not even have the resources to form associations for self-help among themselves. Kropotkin had put it well when he observed that all animal species seemed to be involved in self-help, with the possible exception of the human species under stress.

Concluding remarks

C. West Churchman

School of Business Administration, University of California, Berkeley, CA, USA

In my previous talk I invited the participation of two people from another time, Emanuel Kant and Jeremy Bentham. I regret to say that Bentham left in considerable anger after the first day, muttering something to the effect that, 'They will be sorry they forgot their economic base'. Emanuel Kant, on the other hand, really enjoyed all of the sessions and was glad the subjects of equity and humanity came up. His principle was, 'So act that you treat humanity, either in yourself or another, never as means only but as an end withal'. Much of our discussion has been an elaboration of that theme. Kant himself did not travel: he lived his whole life in Koenigsberg, and refused to move, although he was a rather famous geographer of his day and could describe locations in the world with great depth even though he had never visited them. What this says about nutritionists going out to the villages, I do not know.

I cannot really develop a theme for this discussion, but a number of ideas have occurred to me as I have listened to the conversations here. The first question that was asked was whether or not there should be nutrition planning. This sort of problem bothers the planning community in general - whether or not there should be energy planning or military planning, etc. The general theme that most of us have put forth really stems from a Greek philosopher named Anaxagoras. When the Greeks were trying to ascertain what the world was made of - air, earth, water, fire, whatever - Anaxagoras declared that in all things there was everything. That is not a bad theme for planners. As one delves deeper into the problems, they spread into all areas and therefore in all problems one is eventually led to the consideration of all other problems.

Planners often tend to neglect the fact that they are not just planning for humanity, but for life. So I would say that nutrition planning cannot stay as nutrition planning, but that it must eventually make connections with all the rest of the planning functions. Nevertheless, some focus is necessary, and malnutrition turns out to be an excellent focus for the problems of the world today. It has rich symbolic meaning - tragic symbolic meaning. I think the symbolism is maternalistic, and that is a very strong symbolism indeed for all of us, since none of us has been able to avoid having a mother. That symbolism

is with us, and it necessarily becomes a base as we begin talking about malnutrition. So this is just as much an appeal to the feminine side in all of us as it is to our thinking, masculine side.

The aspect of information should be mentioned. One of the discussion groups pointed out that the case study on Kenya did not contain very good information. One of the characteristics we have found in planning is that, as the problem broadens, the quality of information lessens and has to be supported by judgment and intuition. For example, if there is a clear and well specified objective, such as the building of a bridge across a river from A to B to handle an exact amount of traffic over the next twenty years, then it is possible to collect fairly precise information about it. Of course, the engineers do add a 100% safety factor and so on, but at least they start with precise information. Now, if I asked the question, do we really need that bridge, instead of a certain health program that we will not be able to pursue if the bridge is there, the question grows vaguer. The necessary information concerns opportunity losses. If the bridge is built, other things cannot be done. Clear information does not exist about that. The cost of this conference was not just the total travel, hotel and meal costs, etc: it cost another life that might have been for each participant. Whatever each person would have done had he or she not come here is now a lost opportunity - forever lost, incidentally. That is a cost: it is vague and the only way to obtain information of that kind which is so crucial, is through judgment.

There has been much discussion here about community, which touched me a great deal. The whole planning profession is beginning to realize that community is central to everything and that it has been neglected. It is not well understood, and it cannot really be codified. In fact, the concept of community seems to be almost antithetical to a clear-cut systems approach. I am in the process of writing a book called *Systems Approach and Its Enemies*, but the word 'enemy' is used here as it is in the phrases 'you are your own worst enemy' or 'love thine enemy as thyself'. The systems approach can no longer be looked upon as a sort of rational, well laid out plan of action. Rather, it is messy and includes enemies and identifies moral

Concluding remarks

feelings. Politics operates through feeling as much as it does through thinking; perhaps more so. There is also the community feeling or religious feeling: sharing together. There is the aesthetic, a word the philosophers do not know much about, which deals with the quality of life.

So we cannot clearly define 'community'. We do know, however, that if there is not a good strong feeling of community in a given locale, everything else we do there is in trouble and apt to fall apart. One of my students is studying boom towns which grew up in the West as a result of development. The fiber of the community was not strong enough to sustain the shock of the environment being shaken and people coming in and then leaving. Many of those Western communities in the USA suffered terribly as a result of such development. Therefore we need to find ways to include ourselves in the fiber of the community.

I would like to return to the two images I presented in my earlier talk. First, I said I threw the *I Ching*. I heard a rumor that some people doubted that I had actually done it -- I would never do that to the *I Ching*. I would never just look up a hexagram. I take that book with great reverence. The idea of reading through from hexagram one to sixty four is aesthetically horrifying to me. One must approach those hexagrams with due reverence and the respect of ritual. I did, indeed, throw it and it did, indeed, come up with that

rather gloomy, depressing hexagram of 'a mountain over earth', things fixed, undermined, and so on. I did wonder if it could be right, and then when it moved into the other one, which was 'dawning and hopefulness', there was great relief on my part.

Finally, I had a picture painted of a maiden tied up in chains and a decision maker fighting that dragon environment. I did say that there was a planner sitting next to the maiden. I was impressed by the fact that all he really needed to do was untie the maiden and forget about trying to implement through the decision maker who was obviously quite inept, since most of his weapons were not really weapons. I might say that I believe more and more in the power of imagery in planning. This immediately suggested an idea that perhaps we do not need such tortuous implementation through the decision maker and his coping with his environment. The imagery, incidentally, was that the princess kneels down and kisses that little gnomelike figure, at which point he turns into a handsome prince and off they go. That was the consequent image, because imagery always changes.

Doris Calloway asked me to conclude with a question and I am delighted with the question she asked: 'How do we unleash the maiden of malnutrition?'. I have a very simple answer which I learned from President Carter during a 'phone-in' program a few weeks ago. The answer is 'I do not know'.

The symposium in retrospect

Leonard Joy

An attempt was made to receive from participants their experiences and reactions to the March-April Symposium. This was done in September 1977 by sending out the following letter:

We are compiling a report for USAID on the International Study Symposium on Policy Making and Planning to Reduce Malnutrition held last April. It is always difficult to appraise such meetings because each individual has his own experiences. These can be very varied and they are much affected by events not on the formal program. Last April's Symposium also had few plenary sessions so there was a much smaller core of shared experience even than is usual on such occasions. It seems, too, that the experiences of the study groups were quite diverse. In reporting to USAID we would therefore like to add to the record of proceedings and the formal papers accounts of the experiences of participants. Now that several months have passed since the Symposium took place, we hope that you will have had time for reflection and that you will be able and willing to respond to this request to report your own experience.

The Symposium was organized around study groups each of which was provided with case study material of an actual situation to help focus on the questions of what nutrition planning might be in practice and how it might proceed. It was hoped that, in discussing a specific situation, people would produce their own experiences and approaches and discuss the relevance of these to the situations under consideration. In some groups this appears not to have worked at all. People seem hardly to have exchanged experiences or to have offered planning approaches for discussion. Groups were asked to see themselves as holding meetings to discuss food and nutrition problems and action to deal with them in preparation for subsequent more general planning meetings in which nutrition could be considered as one among other major topics and planning objectives for the area. An outline agenda* was offered to study groups and some groups made use of it. Where they did, some participants seem to have felt frustrated at the inadequacy and generality of the ideas that resulted. Most seemed to feel that time was too short for these study groups, also that some of the data not available for study group discussion might in practice have been fairly readily obtained. At the same time, not everybody felt that the shortcomings of the proposals offered by the study groups could be blamed on the shortage of either time or data; nor was it always asserted that in practice things would be different. Indeed, some people asserted

that in practice, planning discussions were not unlike those of the group discussions. It seems that some of the groups had difficulty in following a coherent discussion and that much time was taken up in attempts to resolve rifts between those who would go for action, those who were advocating specific forms of applied nutrition programs, those who were saying that the action required to solve the nutrition problem was nothing less than a total change in the socioeconomic system, and others who felt that something could be done to move things in the right direction but not on the basis of the analysis so far provided.

Many people seemed to have found this experience very frustrating. Some seemed to recognize that while it was frustrating it represented one aspect of the planning problem currently being faced: that what was necessary was constructive proposals for resolving or reconciling these views. Others, however, reported a new awareness of the need to avoid treating nutrition issues – even the design of applied nutrition programs – separately from wider planning and policy making. Such reactions have, however, to be set in turn against the strengthened convictions of those who believed that it was only by treating nutrition separately from general planning that one could secure effective action. The attempt to make planning for nutrition objectives part of the wider planning process was, to them, unrealistic and unworkable.

The above represents our impressions of the reactions of some of the Symposium participants. We should very much like to know how you feel, both about these issues and about how your view was affected by the meetings, especially now that you have had time to reflect. We do hope that you will write us a note, however brief. We intend to abstract the participants' comments to be included in the final report and propose to share this information with others who are planning to hold conferences on similar topics, so that they may benefit from our experiences.

We appreciate your having contributed to the Berkeley meeting and hope to continue our association. A list of participants is enclosed.

Sincerely yours,

Sheldon Margen, M.D.
Professor of Human Nutrition

Doris Howes Calloway
Professor of Nutrition and
Chairman of the Department

The letter was itself an attempt to summarize the reports reaching the organizers and to raise issues on which com-

*See appendix

ments were sought. Forty seven replies were received and all but a few were considered statements. These replies, and the reports of study group chairmen provided immediately following the Symposium, supply the material for the ensuing report.

Statement of objectives

Only five of the respondents referred directly to the letter quoted above but all agreed that it summarized the range of experiences that participants had reported. However, one added, '.... based on experience such a mixed bag of reactions can be expected. And it doesn't seem to make much difference how clearly the objectives have been stated. People bring with them their own expectations and seem to try to make the occasion fit and are invariably disappointed when it doesn't'. Maybe. But conference organizers have an obligation to make objectives clear and one respondent wrote, 'My impression is that the Symposium was not very clear about its objectives so it is difficult to comment on the results'. For the record, the objectives, which were stated in the invitation, were: 'to bring together those involved in analysis, planning and administration – planners, administrators, nutritionists, economists, agronomists, public health workers and others – to work towards a shared perception of the nature of nutrition problems and of the possibilities for improving policies and programs to reduce malnutrition'.

To at least one participant, success in meeting these objectives was to be judged by the extent to which the Symposium narrowed 'areas of disagreement so that the problems that arise because of the limited commitment of many governments are not exacerbated by sharply conflicting recommendations by international "experts"'. Judged by this criterion, he felt that 'a significant opportunity for progress was lost'. However, had this truly been the intention, the statement of objectives would probably have been differently worded.

What was not clearly brought out in the statement of objectives was the point of departure for the Symposium which had been established by the September Workshop. In that Workshop, Martin Forman's comments clearly set out a view of a historical process that needed nudging. The existence of a nutrition problem was widely recognized; concern had been generated; commitment to action was developing; countries were becoming involved in 'nutrition planning'. But what should they do now? The Workshop had posed a series of questions: Was it sufficient to plan to reduce poverty? Could this be done with conventional development strategies? What were the roles of the agriculture and health sectors in reducing malnutrition? How should they approach planning for this? How should micro analysis be integrated into macro planning? Who plans for the reduction of malnutrition? How should we conceive of 'nutrition' planning? Thus, the 'shared perception' to which the Symposium was to contribute was not to be sought in agreement about, for example, intake requirement levels or the

value of, or priority to be assigned to, various actions such as the development of rural water supplies or child feeding programs. It was, rather, to be sought in contributing to the answer to the question: 'What can be said to governments concerned for the existence of malnutrition about what steps they should take to alleviate the problem?'

At least one participant felt that this was too wide a brief and that 'perhaps it would have been wiser to devote more time to the discussion of political issues, which are at the heart of the development problem. It would also have been more productive to discuss the problem of communication among scientists of different disciplines, and between those and the people for whom development planning is formulated'. It seems reasonable to comment on this that it is not clear that progress would have been made by explicit identification of these topics as agenda items rather than allowing them to arise as part of the substance of discussions – as they certainly did. Perhaps the several comments that 'time was too short' were also saying 'we tried to do too much'. Certainly, many did believe that the time allotted for the meeting was too short. While some would have wished to have had more time for plenary sessions (including, in particular, for the discussion of study group reports) most felt that it was the study group activity which suffered most critically from shortage of time. Another view, however, was that the Symposium had brought together a great array of talent and that time was required for everyone to say what he knew. Clearly, most participants valued the opportunity to meet individuals with outstanding experience and expertise and some felt that this opportunity had not been long enough.

Scope of agenda

A few respondents saw the failure to narrow the agenda as a plus: 'The ambitious breadth of the conference was intellectually stimulating but also represented a risk: the conferees could not take home with them a neat package of conclusions'. And, related to this, another's comment that: '.... it never ceases to amaze me how many people seek *the* answer'. This same person emphasized that the Symposium should be seen as an event in a learning process, the impact of which would not have been much improved by 'doing something differently' but that 'to have changed the outcome significantly would have required the Symposium (to be) one event among several linked events'. (He envisaged individuals having work assignments, reconvening, etc.)

Several people wrote about their reactions to particular parts of the program. The plenary papers evoked little comment. Some found one or other of them 'useful', 'stimulating', 'fruitful', 'thought provoking', 'interesting'. Both papers were described as 'academic' and it was reported that field people wanted discussion of practical planning. There were complaints that these papers were not sent out well before time and one respondent maintained that it was unrealistic to suppose that people

would take plenary and other material back to their rooms to digest. Most comment was directed at the study group activity, however. Some made a point of positively expressing approval: 'the study group device itself was an excellent one'. Others believed it inherently unworkable.

Study group activity

A major issue was seen to be whether one could possibly simulate a planning experience 'in a couple of sessions'. 'Even accepting that, at the country level, planners may not have more information than we did, there are two basic differences to note: (i) national planners have a much better knowledge and understanding of their own problems and situations — no matter how deficient such knowledge may be — than we are able to absorb in just a few hours. (ii) normally, a planning session, in a given country, is not subject to the strict time limitations we faced in our meeting. I very much doubt that "planning" decisions are taken without a minimum debate at various governmental levels, involving people who, as indicated earlier, have a much better grasp of their nation's problems. The whole idea, therefore, of attempting a sort of "instant" or "crash" planning, was totally erroneous Without enough time the "shopping list" approach was inevitable. I believe that the cause of planning was not well served by the Symposium.'

Many people, however, reported that it worked for them and specified what they felt they had learned. Some of these people had felt frustration in the simulated planning exercise, but for them the frustration had been stimulating and had led them to ask whether the cause of the frustration was in the management of the study group or whether it was something to do with realistic features inherent in the planning process being simulated. However, some of those who were frustrated felt that the study groups had not worked.

Among those who felt that they had not worked were some of those who had been involved in preparing the case study documentation for their own country. Their experience seemed to be that the discussions did not concentrate on the planning task, that people could not absorb the material presented, and that the groups were too (unrealistically?) heterogeneous to be able to work together. Yet others, similarly involved in preparing and presenting their own country's material, felt that the case study experience was a good representation of actual planning experience and felt that the reasons for the failure of planning were reflected in the simulation exercise.

Overall, about half as many again were positive about their experience in the study groups as those who were negative. Some of the comments are especially worth quoting. First, the negative ones: 'The use of study groups can be an effective device if all personnel participate with the same agenda. In the work group to which I was assigned it took one full day to establish a trust

level and define leadership roles. The sporadic attendance of some of the participants interrupted the maintenance of the established trust level. The mix of participants, including planners and implementors, caused a number of hidden agendas to emerge during discussions: approval of the plan adopted by the country under study; the autocratic enforcement by some individuals that there was only one way to solve the nutrition problem; a felt need that the work group had to produce something In general I felt the work group approached the activity as an academic exercise. Through the domination of a few individuals to complete the task at hand, the discussion of experience, approaches, and their relevance to the situation under consideration did not materialize. Since no overall wrap-up was presented by each group, the frustration developed over the two days was not resolved'

'.... macroeconomic solution to malnutrition was likely to be the most effective [but we were left] with only micro issues to discuss' Also, 'a shortage of data to deal with specific malnutrition problems [and] the failure of the Symposium to establish as a datum a scientifically-based standard for "adequate nutrition" made the experience of the study groups frustrating'.

'.... the presentation and background were weak. It was immediately challenged from then on the study section was ineffectual. Everyone retreated to their established positions and voiced platitudes.'

And another which is especially worth quoting at length. 'Our work group tried the recommended approach to nutrition planning, starting with the nature and magnitude of the problem itself and moving upward to more macro levels of analysis; and we failed. Data on the problem were, for the most part, lacking. We therefore had only the vaguest sense of what we were dealing with. Moreover, we found that a malnutrition causality model (a la Morinda) was not a guide to interventions since we could infer multiple causality from the evidence but had no way to distinguish relative significance. Accordingly, the group fell back on a shopping list of so-called interventions which had little explicit reference to the case at hand. Nor did we have cost data at our disposal, not even on existing programs. In haste, the group considered only one "intervention" and that arbitrarily and so vaguely that the focal problem of malnutrition became something of a forgotten issue. In sum, the exercise portrayed nutrition planning at its worst, with a corresponding sense that maybe that's the way it always is. If this is the reality of things, then one might infer that nutritional planning, in its rational form, is not in fact a high-probability undertaking, or one that is likely to produce positive results. Several non-nutrition planners in the group charged at the end that we had been too "academic". Words like "perfectionism" and "pseudo-precision" were also used, reflecting frustration at the fact that the whole exercise crumbled into nothing.

Nutrition planning may be a process of conflict resolution, as was said several times during the Symposium. I

now believe it is a process of consensus generation as well. Our group spent an incredible amount of time just orienting itself, deciding what role to play, how to proceed, and what to do. By the time these matters were resolved (some never were), we had little time left for the substance of the exercise.

In an exercise of this sort the goals of planning and of encouraging participation are likely to conflict. Our group leader placed particular stress on the latter, and the former suffered.

Planning is not done by discussion. Our group did a lot of chatting which, however pertinent, had no real focus. This rather open-ended approach probably served as a disincentive to probing the data and information given or made available to us. We flitted along on the strength of generalities only or on the strength of some experience elsewhere, about which some slightly incoherent statement had been made. An individual would have done better working by himself.

There are all sorts of reasons why exercises of the type attempted are fraught with pitfalls. One reason is that for nutrition planning to be meaningful, one really has to know the territory for which the planning is being done. Quick introductions and a dossier of materials are hardly sufficient. Too many unresolved questions arise, especially when one gets into the operational ramifications of a particular course of action. It does not take long for the exercise itself to be discredited when the group is wallowing in uncertainties on very basic questions.

At a fundamental level, the exercise failed because nobody really had time to go over the information presented in any depth. The Symposium was scheduled very tightly, as is usually the case. My response was to work in my room after dinner, but I suspect that few people made the effort. Should the same constraints apply in the future, I suggest that the case materials be sent out in advance. Participants should then read them in the plane and then come into the exercise with some sense of the situation being addressed.

The noticeable thing about all these letters, however, is that they each report a striking list of lessons that the writers feel they learned in the process in spite of their disappointments. As we shall see, these seem to include some important insights.

One of those who was unhappy with the study group exercise would have preferred a different agenda: 'I would have felt much happier if the assemblage had first witnessed a group of five or six people working over a country case, critiquing it and then maybe going away in small groups to do it their own way'. This 'would have flushed out the polarization referred to in your letter and particularly the "everything is related to everything else, and thus we must change everything" school of nutrition planning'.

What is so interesting is that the same experiences produced quite opposite reactions. But it is also clear that different study groups produced quite different experiences. Some of the positive responses were:

'.... it is clear to us that the group failed. However, this does not mean that we wasted our time. On the contrary, the two days of group work were for me and several other members of the group extremely exciting The biggest problem was that the divergent arguments expressed on ways of approaching nutrition planning were so forceful that it proved impossible to move ahead along the lines proposed in the guidelines ... the extremely heterogeneous backgrounds, academic levels and professional experience of participants were more obstacle than asset in reaching a shared view of the various approaches to nutrition planning, or even agreeing on the identification of key issues After a few hours three subgroups could be identified: (i) "development planners"; (ii) "nutritionists"; (iii) the "silent" the "development planners" insisted that no realistic nutrition planning could very well be done in the selected area and that it was necessary, at that stage, to take macro-economic considerations into account Our time was not wasted this kind of discussion could very well have taken place in an interministerial committee; the inability of nutritionists to overcome the skepticism of development planners is a very common fact of life! this very stumbling and discord over such an argument was probably more productive and possibly more repercussive in the long run than the answering of a series of questions in a scholarly manner.'

Generally, those who felt positively about the study group exercise felt that it did bring out elements of reality which were revealing. Not all were frustrated. ('I felt it went rather well'.) Of those who were, several felt that their experience would have been better if the guidelines had been followed. (Only one person thought the guidelines inadequate, although there were complaints that they had not been referred to. Many expressed approval of the guidelines which were even described as 'excellent'.) Some, at least, of those who were unhappy were unhappy precisely because they felt that revealing planning shortcomings without providing solutions had risked giving nutrition planning 'a black eye'. The letters suggest that many people were prompted to think about why planning was not more effective and thus they came up with many relevant ideas.

Improving the effectiveness of planning

One observation seemed to be especially pertinent: 'the planning task is initially investigative; an inadequate investigative phase results in generalities of a highly abstract nature data are not a good substitute for an understanding of the process and determinants of production, ecological and nutrition problems Planning must relate to local people, their initiatives and what is sustainable by them Without the above, a general list of project programs and investments is precisely what (comes out of) planning ministries'. If this is a valid observation, then the widely reported failure of the study group to 'define the problem' could not have been solved by the provision of more data as some people

suggested: at least not by the provision of more of the same sort of data.

Several people felt that they had benefitted from an improved appreciation of the complexity of the issues, and an awareness of the present limitations of methodology to approach specific situations or to predict the nutritional consequences of planning decisions.

The idea that nutrition objectives need to be incorporated into planning generally – that they could not be pursued adequately by nutrition projects alone – is clearly one that has convinced many participants. Just four quotations must suffice here.

First, 'I am convinced that nutrition cannot be treated separately from general planning So long as undernutrition is seen simply as a medical or social security problem, the prime cause of undernutrition in many areas, namely, processes generating landlessness or unemployment, will remain untackled. On the other hand, if planning were directed at reducing deprivation the problem of undernutrition will be tackled more effectively. A national overview of nutritional problems and objectives therefore requires the joint effort of a number of ministries and governments and other departments, whose work is coordinated by a Nutrition Planning Unit at the highest national planning level'.

Second, a somewhat different version: 'The use of time for discussing "interventions" or "careful planning before action" was probably inevitable but I am becoming increasingly convinced that the sooner we can reach agreement that in fact there will be a two-track system (as Alan Berg puts it) in almost all, if not all, countries the better.'

A third respondent found that the Symposium 'confirmed my belief that nutrition is inseparably linked with a much bigger effort, that is human development'. He saw nutrition as a basic element of welfare, along with equity and justice, by which the quality of development should be measured. It was not enough to leave malnutrition to charitable intervention and *ad hoc* responses to disasters. Concern for nutrition needed to be 'a conspicuous part of the wider planning strategies Nutrition planning may have no holistic entity *per se* If we find ourselves incapable of doing all that much about engineering the content and accelerating the pace of development, we shall probably continue to find peace at palliative doings and pious pronouncements. I realize how frustrating it could be to put nutrition planning on a pedestal competing vainly with more fundamental needs and realities and recognize the need for locating the pro-nutrition points inside the bigger game of development without labeling a tag to it'.

Finally, 'As to the relationship between nutrition and planning: it is clear that nutrition is not a separate aspect of planning and policy making. Yet, in fact, one can consider nutrition problems apart from wider planning and policy making goals and then attempt to address those issues in the context of the planning process.'

However, it is not clear that the following expression is convergent with these views: 'If planning is accepted

as a way for rationalizing the decision making process then the legitimate concern is how to secure for nutrition the adequate high priority that it deserves, but not to conceive the exercise as one that starts with nutrition and which thereafter has to encompass the whole spectrum of socioeconomic policies and programs. The nutritionists and nutrition-related professionals have a very important role to play in the search for (a) raising the priority for nutrition; (b) an adequate assessment of the problem (diagnosis); (c) alternative solutions; (d) methods for evaluation progress achieved. They are part of a wider team, but not the least or most important part of it'.

But not everyone responded by reaching a personal conclusion. The following contribution tries to explain the frustration so widely experienced and concludes that it lies in disillusionment and rejection of the major espoused approaches: '.... the atmosphere was charged with tensions arising not from cautious scientific skepticism nor plain pessimism about the outcome of planning; it was rather a clear case of existential *Angst*.

The anguish of decision is probably rooted in the failure of the "developmental" doctrine which promised that food and nutrition benefits would trickle down from increasing material income (disregarding the way it is distributed). It is also rooted in the very large question mark placed before each "intervention" the *interventionist* theory has not yet received a real test in third world countries. And now, the lingering and often concealed certainty in the success of the revolutionary process, the *Marxist* doctrine, is beginning to crumble. So, there is no hope'

Is it any consolation to quote Philip Slater? '.... despair is the only cure for illusion. Without despair we cannot transfer our allegiance to reality'*

Categorization of replies

What has emerged very clearly is that there is a broad three-by-three categorization implicit in almost all comments: three categories of 'viewpoint', and three of 'response'. For 'viewpoint' there are the categories: 'holistic planning', 'revolution', and 'intervention'. Implementors generally favor intervention, but not necessarily so. Planners may advocate holistic planning to reduce malnutrition, but not necessarily so. It seems, however, that the shared perception at present is that the task is to resolve or reconcile the disputes – explicit or implicit – between these categories, or perhaps, to replace the categories.

Some reconciliation is occurring in the recognition by some of the need for both intervention and overall planning to reduce malnutrition. There seems, however, still to be a split between the revolutionaries ('the social system has to be fundamentally changed') and the rest. Even so, there is a growing expression among 'the rest' that planning and intervention are ways of promoting the necessary fundamental social changes. This seems to

*Philip Slater, *Earthwalk*, Anchor Books, 1974, p2.

have been felt especially by some study group members who were impressed with a local-level nutrition planning approach using 'outreach and upreach mechanisms ... to put the planning process back in the household where the building of a causative model [as a long range goal or next step in the planning process] makes sense ... where the planning process is not lost in statistical aggregation'. Clearly there was faith that this could promote necessary changes. It was also reflected, though less positively, in the comment: 'Surely the raising of their status [the undeserved, undernourished] cannot be considered a tactic designed to maintain *status quo*'.

There was a plea for flexibility and for willingness to relax insistence that the reduction of malnutrition needed an appropriate total development strategy: '... (we) cannot accept an "all or none" sort of approach in planning for nutrition'.

There was a conspicuous absence of revolutionary advocacy in the responses. It was as conspicuous as was its presence during the Symposium. In part, this is probably because some of the strongest revolutionary advocates did not respond to the invitation for comments, but also, perhaps, because many were more radical than revolutionary and conceded the role of planning, if not of 'intervention', in bringing about the fundamental social changes they believe necessary.

Many commented on the radical intervention in the Symposium. Even those who did not agree with the views expressed welcomed it as a part of the reality to be confronted. There were some, however, who felt that it interfered with the discussion of their concerns and one or two regarded it with anger as a deliberate attempt to frustrate the purpose of the Symposium. Perhaps we should accept the conclusion of several participants that if, because the scope of the Symposium was so broad, communication was incomplete, then at least there was now awareness of the issues that had to be resolved and of the context in which they had to be resolved.

There was also an awareness of current limitations of analysis to answer practical questions: how to predict the nutritional consequences of particular measures (mentioned earlier); how to set about 'problem definition' and the 'understanding of process' as a basis for planning; how to incorporate nutrition criteria into the wider planning process; how to appraise the nutritional implications of development strategies and define alternative strategies; how to do all these things in a practical fashion in widely different circumstances.

One question which some people felt had not been answered appeared to be, 'Who is responsible for nutrition planning?' Perhaps these people would not be satisfied by the answer provided by one writer: that nutrition planning should be regarded as a transdisciplinary problem-solving approach carried out within the wider context of planning. Or by the view, already reported, that it should be many peoples' responsibility in different branches of government (and community?) but that the totality of efforts should be regarded, assisted and appraised by a high-level 'Nutrition Planning Unit'.

The role of the nutritionist was mentioned by some

people and the impression overall is that 'nutrition is too important to be left to the nutritionists' but that nevertheless they have an important role, especially in screening populations and providing status indicators and procedures for that purpose. However, attention was not devoted to considering this issue and these reflections must, no doubt, be considered more a byproduct of the discussions than a rounded view.

What emerged to me was a broadening definition of 'the nutrition problem'. Yes, there are malnourished people, but the task is not simply to feed them. The task is also to insure that people do not get into a state in which they might expect to become malnourished. This is a more demanding task. The first task cannot and should not wait on the second. But preoccupation with the first must not divert us from the second either. Indeed, it may be a way into it. What everyone seems to seek is a way of insuring that there is effective government – social – concern for these aspects of the problem. This requires an awareness and a desire to act, but it also requires competency in analysis to identify and design action – programs, policies and strategies. One lesson that we seem to be learning is that this requires the understanding of process and the injection of this understanding into government together with an experiential awareness of the human problem and its social context. Understanding of process and experiential awareness were not communicated by the case studies. This deficiency was seen by some as reflecting a similar lack in much of government planning. How to repair these deficiencies so that we might practically and effectively incorporate nutrition objectives into planning is among the tasks identified by the Symposium.

For many people, including myself, the immediate experience of the Symposium was depressing. Analysis of reports of personal experiences and reflections on these have resulted in a feeling of having faced a reality and having learned from it in important ways. There is also a feeling of common purpose among many sincere and dedicated people. A review of participants' reflections has therefore been uplifting and I am reminded of West Churchman, who, on the first day of the Symposium, reported that he had cast the *I Ching* and that it had spoken precisely of gloom and depression followed by enlightenment. Perhaps our depression has become a necessary precursor and a true augury of enlightenment.

Appendix

STUDY GROUP GUIDELINES

Proposed Agenda for Discussions

It is not assumed that this will be rigorously adhered to.

The outline which follows is the general outline for all groups. When case studies are available specific questions can be developed from those now posed in general terms.

Session 1: Introduction

Someone from the area under discussion, or closely familiar with it, will present a view of the area which will be

both factual and qualitative. Maps and slides (or film) will be presented where possible to give a feel of life in the area as well as specifically to illustrate the nutrition/health status. (Though it is not presumed that this latter will necessarily be possible.)

Participants will already have received case-study dossiers and its contents will be reviewed and commented on as appropriate.

There will be a discussion in which participants raise queries about the area and the information presented.

Session 2: Defining the Problem

Here the aim is to exchange ideas and explore the possibility of consensus on:

- * How to go about defining and analyzing the extent and nature of the nutrition problem, including the variety of categories of problem, that may exist.
- * The value and interpretation of different indicators and other, more descriptive, data.
- * How to proceed to improve understanding of the problem, as it is and as it is developing, ideally and in this specific situation (do we need surveys? what sort? how would the results be used?)
- * How to approach the formulation of objectives, goals and priorities with regard to nutrition.

For this purpose it might be useful to start by asking the following questions (then returning later to review consensus or disagreements):

- (a) What can we say from the evidence that we have about the nature and extent of the nutrition problem(s) of the area?
- (b) What can we say, and what need we say, about the future prospect?
- (c) What would constitute a model statement about the problem for planning purposes?
- (d) How should we, ideally, proceed: to improve our understanding? to apply our understanding to the identification of new actions, or modification of current action, to improve nutrition? to formulate nutrition priorities, goals and objectives?
- (e) What qualifications to ideal procedures seem to be called for in practice in this situation?

Session 3: Identifying Relevant Action

Here the aim is to exchange ideas and explore the possibility of consensus on how we might systematically approach the identification of action which might be taken to pursue nutrition objectives. For this purpose it might be useful to start by asking these questions:

- (a) Can we list and appraise measures according to their apparent relevance to achieving nutrition objectives?
- (b) Are there current programs and policies which seem to be in need of appraisal with regard to their impact on nutrition?
- (c) Are there more systematic ways of generating ideas of action which might be relevant to improving nutrition?
- (d) Would these imply changes in planning procedures in the situation? More generally?

Session 4: Formulating Effective Action

The aim is to exchange ideas and explore the possibility

of consensus on how initial ideas of relevant action should be appraised, worked up into programs and integrated into overall plans and policies. It might be useful to start by asking these questions:

- (a) How do we assess whether a proposed measure is likely to have significant impact on nutrition status?
- (b) How do we develop an idea into an effective design for action?
- (c) Would this require changes in planning procedures (or in the responsibilities of particular ministries, or others) in this situation? More generally?

Session 5: Appraising Action Proposals

The aim is to exchange ideas and explore the possibility of consensus on how proposed measures should be appraised for incorporation into overall plans. Useful questions to focus on might include:

- (a) What is the value and practicality of cost-benefit analysis for this purpose? What actions would it not apply to?
- (b) What is the value and practicality of cost-effectiveness measures for this purpose? What actions would they not apply to?
- (c) Is it sufficient to appraise each proposal separately? If not, what should be done?
- (d) How should proposals for a specific area of the country be related to overall sector and national plans?
- (e) Is there any need to review the expected total impact of all programs on nutrition trends? How might this best be done?
- (f) What are the implications of this discussion for current planning procedures?

Session 6: Review

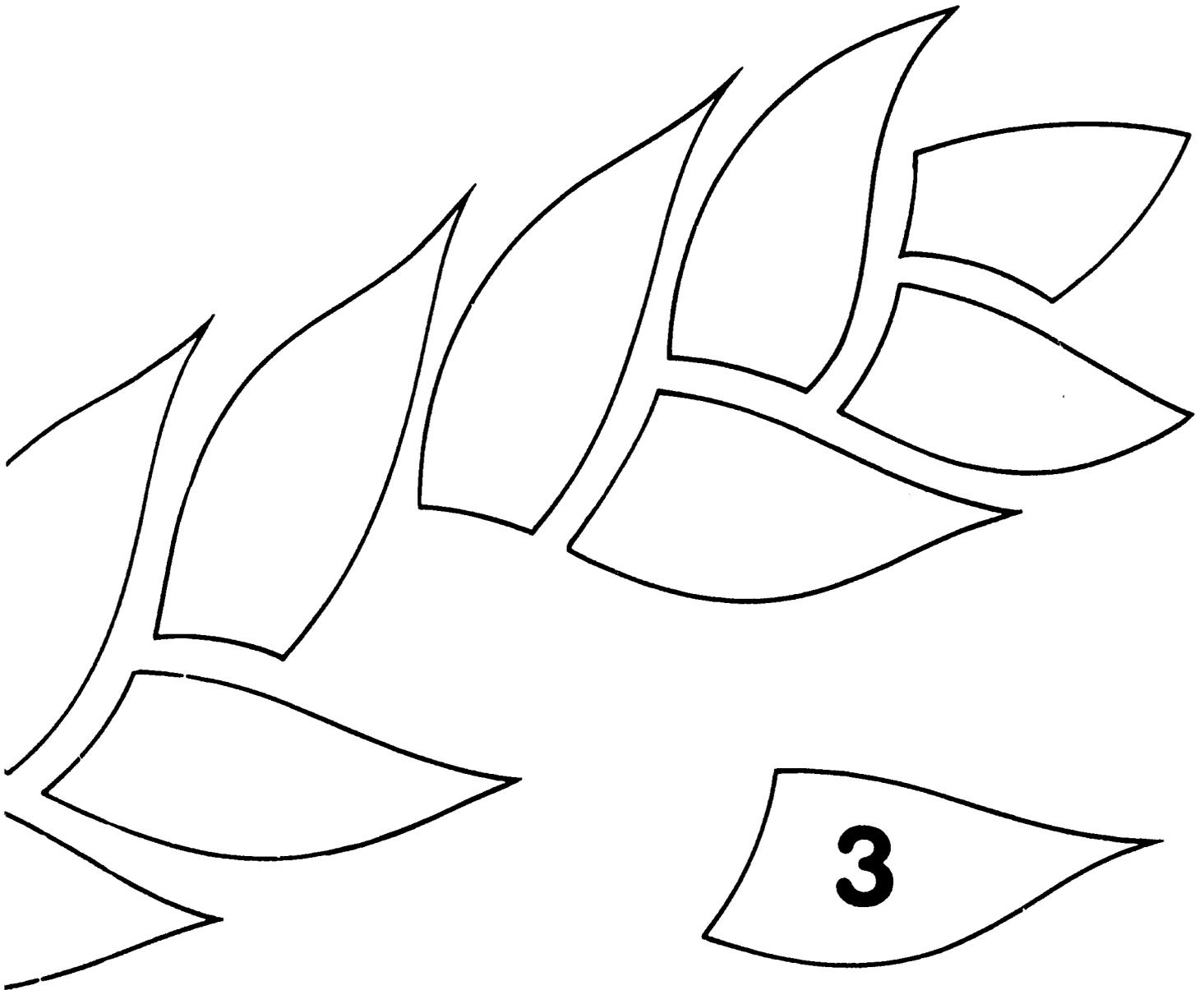
This session has two aims:

1. To ask what, so far as we can judge, is required to achieve a sustained reduction (elimination) of malnutrition in this situation.
2. To ask what has emerged from the discussions.

The second aim calls for a review of the issues raised under the statements of aims of the previous sections. It might conclude by addressing the following questions:

- * How can the nutrition problem be assessed in this specific situation?
- * What steps might in practice be advocated now to improve qualitative and quantitative understanding of the problem?
- * What would be necessary for a sustained reduction of malnutrition in this situation?
- * Can actions be identified which would be likely to have a significant impact on the problem?
- * How can the relevance and likely impact of these specific planned actions be appraised?
- * As a result of discussion, can anything be said about approaches to planning and policy making for: governments concerned to improve their national planning and programs to reduce malnutrition? international, UN, and bilateral agency roles and interventions to assist such governments? researcher's and analyst's contributions in this field?

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