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THE SEGMENTS OF THE WORLD POPULATION AT NUTRITIONAL RISK

By Leonard Boy.

I find it useful to distinguish four aspects of "the problem of malnutrition" and four corresponding tasks:

PROBLEM	TASK
1. the existence of people currently malnourished	the identification and treatment of the malnourished
2. the existence of people in situations which are characterized by an unacceptable risk of malnutrition	the reduction of the number of people exposed chronically to the risk of malnutrition
3. trends and forces which increase the numbers at risk of malnutrition	reducing or offsetting those forces which make for increase in the numbers at risk of malnutrition
4. lack of sensitivity and/or effective response by society to the above realities	improving the sensitivity and responsiveness of society to nutritional deprivation

N.B. While I constantly use this four-fold breakdown I am constantly reformulating it. The present version is not offered as in any way definitive.

This paper discusses headings 2 and 3 though its concern is strongly with heading number 4.

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THOSE CURRENTLY AT RISK OF MALNUTRITION

We might, conceivably, seek to identify all those individuals currently at risk of malnutrition. Indeed, some programs do just this. They use some criteria for determining who gets food stamps, or a ration card, or food for work, etc. The criteria used typically include socio-economic demographic or locational criteria which define categories of people believed to be in need and which provide tests of whether specific individuals are to be counted in the categories so defined. In practice, the criteria used are varied and situation specific. An answer to the question: "who are the people at risk of malnutrition?" might therefore be in the form: "people who meet the following criteria." or, "people in the following categories:"

But how do we discover what these categories are? As ever, we can make observations and develop theories using each to prompt, test and refine the other. An interesting example of such a process and of its product, is one that was carried out in Bangladesh.¹ Here the attempt was made to identify administrative units (thanas) with a high famine risk. 'Thanas were assessed in terms of characteristics which can be seen to be either a) risk of trauma (drought, flood, cyclone and river erosion), or b) characteristics which make for lack of resistance to trauma (population pressure, food supply deficit in normal years, lack of alternative employment, low crop yields, inaccessibility, unreliable farm input supply system). Some thanas are shown to be exposed to more than one class of risk and to have several characteristics which make them non-resistant to shocks or less able to recover from them. The application of this classification shows a very varied pattern of constellations of problems calling for equally varied responses. What this classification does not do, however, is to identify which categories of people or households within each of the vulnerable thanas are vulnerable.

Nor does it, therefore, reveal whether or not there is a need for a variety of responses to meet specific classes of individual or household situations. Also, it does not reveal that there are some people at risk even in thanas which are not, overall, classified as vulnerable.

Clearly, the basis chosen for classification determines whose risks are attended to and whose neglected, which categories of risk are differentiated and which are lumped together. Clearly, too, the basis for categorization may be operationally congruent with some administrative and organizational patterns and incongruent with others. What this implies is that we need to design classifications which relate to specific administrative structures and to management rules designed for responding to actual or threatened traumas.

In general, however, our response to the existence of at-risk populations will take the form of a) measures to reduce the risk of the trauma to which they are exposed (drought, flood, disease, unemployment, fall in real incomes, etc.); b) measures to make them less vulnerable (improve normal nutrition status, increase wealth and income, stabilize food supplies and prices at desirable levels, strengthen or augment social support mechanisms, crop insurance etc.) and c) measures to speed recovery (relief and rehabilitation measures). Thus, our tasks are: to determine the nature of the trauma faced by different people, to explore how the threat of trauma might best be reduced; to find ways of raising people's capacity to withstand trauma; to design a system for responding appropriately and effectively to specific threats and experiences of trauma.

In reality, however, the method of inquiry commonly used in planning for food and nutrition goals does not encourage this. Typically, the focus of investigation and analysis is on nutrition status, the identification of specific nutritional disorders and the quantification of their

incidence and prevalence. This is generally attempted by means of sample surveys of total populations which relate anthropometric and biomedical observations to such demographic and socio-economic data as family size, income and environmental sanitation. However, these may not be efficient or even necessary data for understanding the risks to which people are exposed or for the design of appropriate action. Also, prior to the collection of data, we need information in a form which may not be readily processable. Especially, we need stories about people's conditions and how they got that way. We need to know what traumas threaten people and how people react to trauma. From this we might learn what might be done to prevent or mitigate the shocks which result in malnutrition. Different things might need to be done by or for different categories of people. In order to generalize and to design appropriate measures it may be important to know the incidence and prevalence of different categories of people and risks. Thus, surveys may be called for. But the sampling frames and content of surveys used as part of such an approach are likely to be very different from those of the conventional nutrition survey. Generally, too, they will also be designed after we have gained an understanding of what needs to be done rather than in order to gain such an understanding.

TRENDS IN THE NUMBERS AT RISK

If we succeeded in identifying all those at risk and took steps to reduce their vulnerability, we might discover that the numbers of those "at risk" continued, nevertheless, to increase. In general there seems to be good reason to expect trend increases in the numbers of those at risk. In order to predict the numbers, and categories, of those who will in future be at risk we need to be able to conceptualize and analyse the system which generates people who are nutritionally at risk. We need to know not only what categories of people are at risk, but also what it is that puts people into these categories. Again, understanding

requires both observation and theorizing. My own observations produce some repeated scenarios: families who have inherited, or will inherit, too little land on which to survive; landless or sharecroppers displaced from reliable dependency on a landlord by a new technology or market opportunities or by the availability of cheap casual labor or by landlord's attempts to avoid land reform legislation; rural or urban migrants, jobless and no longer able to rely on the support of their families or patrons in distant villages or to follow their families' previous way of life. It is among such people that malnutrition--both chronic and episodic--is especially to be found.

Such observations as these can be refined, tested and used for theorizing to provide the basis for the design of action. What is needed is an effective conceptualization of the processes which generate economic and social displacement of the sort described above. (I use the word displacement because I am talking about people who cannot find a place in economy or society). Attempting to build models of the 'displacement' process is a good way to check observation and analysis against each other. It is, also, perhaps, essential to providing an understanding of where the behavior of the socio-economic system might be modified to reduce the unwanted results.

The accompanying diagram proposes a system conceptualization of the processes which generate households which are unable, reliably, to provide the means of their own subsistence in the Machakos District of Kenya.² (A comparable formulation conceived with North India in mind can be found in Joy and Payne.) This tentative formulation could be of value, even in its present form, as a presentation with which alternative system conceptualizations might be compared. It provides the basis for a dialectic to improve our understanding of those forces which are most

important in generating malnutrition and of how we might intervene to modify their workings. It could also be quantified and used for computer simulation--either of the system as a whole or of some of its subsystems (e.g., land allocation mechanisms; the rates of creation of new households and the factors governing these; local/temporary casual labor migration; technological change; impact mechanisms, etc.). Whatever the level of quantification or complexity used, these simulation models are essentially nondisciplinary. They do not confine themselves to the questions or variables of any one discipline. They attempt to model systems which generate the phenomena that we wish to control. The systems thus modelled are defined by these phenomena and the state variables by which we choose to measure and observe them.

The choice of state variables is critical. (For a discussion of some models which do not use malnutrition as a state variable, and of their usefulness in policy making, see Joy, 1978, pp. 114-118.) It will be noticed that in the example shown here nutrition status is modelled directly. However, it might be appropriate instead to use "displacement" as the state variable defining the system to be modelled (or the assumption that "displacement" is a condition in which the risk of malnutrition is high). If this were done the concept of "displacement" would need to be defined by criteria that are observable, and tested for its relationship to malnutrition. The definition used would need to be specified to suit particular contexts and described by characteristics capable of quantification. These specification tasks should promote reflectiveness about the true nature of the concern which gives purpose to our modelling and about the performance criteria appropriate as the signals to which the management of social action should respond.

Apart from their general value in providing a systematic framework for analysis in the design of social action there are many particular

applications of such modelling which could sharpen policy analysis. Models could be run to explore alternative possible scenarios, to learn how, and by what processes, possible events--controllable and uncontrollable--might affect these scenarios (for example, with reference to weather patterns; technological innovation; different levels of population growth; specific demographic changes such as delayed marriage; specific development projects; changes in customs and transactions modes; market forces etc.) The special value of such modelling is in the understanding it provides about the factors important in determining malnutrition as an outcome of the system. This should greatly sharpen understanding of the sorts of action that will be relevant and effective in pursuing social goals. Moreover, publishing the scenarios that such models generate can stimulate debate about issues and help to improve the articulation of goals. If our concern is to improve society's sensitivity and response to malnutrition, as I think it should be, it is important that those whose actions it is intended to influence should be involved in discussions which are part of the process of model building. This is necessary especially to obtain credibility--to ensure that the realities perceived by decision makers are accounted for in modelling (Johnson). This does not mean involving administrators in the technicalities of model building (Swanson). Nor does it mean that models should be no more complex than decision makers can comprehend. (Would that we ourselves could fully comprehend our own models!) The value and influence of a modelling project may not be determined by the rigor or polish of any report in which it culminates, nor by the quality of the analysis, or the "correctness" of its recommendations for policy, but rather by its impact as reflected by improvement in: (1) decision makers' articulation of purpose; (2) their conceptualization of the system which generates malnutrition (and how it might best be managed and stimulated to secure desired change by those with power, or

potential power, to initiate action) and (3) the resulting action and its effectiveness in securing attainment of desired goals.

IMPLICATIONS

An approach to the design of action to care for those currently at risk would start from an analysis of the capability of specific administrative systems in terms of their sensitivity to signals most relevant to warning of the imminence of trauma (flood, drought, unemployment, etc.) and of their ability to respond appropriately. This implies analysis of the risks faced by different groups and of their ability to withstand, and recover from, the shocks to which they are exposed. It implies the design of measures, including routinized administrative or community responses, to prevent, cushion, or in other ways reduce the impact of these shocks and of their threat. This is a significantly different approach from, say, that taken by the FAO, UNICEF, and WHO to 'nutritional surveillance' (FAO/UNICEF/WHO). It is also different from that taken in the search for projects which 'create employment' or 'raise farmers' incomes' without discrimination about the needs of people in different low income situations or insight into the significance of vulnerability and dependency as characteristics of poverty and deprivation--characteristics which vary considerably in their specific manifestations and in what might be done about them.

Longer term planning needs to be focused on the process of 'displacement', attempting to slow the process, or avoid accelerating it, where mechanisms for absorbing the displaced are inadequate. Specific concern for absorbing the displaced would also be a prime focus of planning in both the long and the shorter terms. This concern needs to be reflected in a broad view of possible actions embracing innovation in social

mechanisms--perhaps at the community level. To see the problem, or solution, simply in terms of optimal resource allocation runs the risk of overlooking a wide range of relevant actions.

National strategy would evolve from a process of attempting to incorporate proposed and actual responses to specific local realities and problem perceptions and to reconcile their general equilibrium and dynamic implications. It would attempt to articulate guidelines for the orchestration of many separate, sometimes localized, actions and responses and the multiplicity of objectives to which they are directed. Nutrition goals would need to be reconciled with many other concerns.

Marxists would argue that the above approach would simply secure band-aids for social sores which are an inevitable consequence of the capitalist system; that, at best, it would alleviate the worst deprivations but allow the system to adapt and survive with other basic ills untreated. I am aware of these arguments and understand that, more generally, I appear to make a presumption that a wider and deeper understanding of how our human ecologies generate malnutrition could lead to steps to correct this. This is, indeed, broadly what I believe.

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Notes:

1. The study was undertaken by Johns Hopkins University International Center for Medical Research. The information reported here is taken

from a map and accompanying text produced by Bruce Currey of the University of Hawaii, 1978.

2. The Machakos District of Kenya has, approximately, an area of 6000 square miles and a population of one million. The heart of the Machakos District is a hilly area where rainfall is good to fair in quantity and reliability and where many crops from coffee and bananas to maize and beans may be grown. As one moves to the edges of the District, however, one loses both quantity and reliability of rainfall. Formerly, the population was to be found almost entirely in the upper areas but, with a population growth rate of 3.3% per annum, the margin of cultivation has been extended into the lower areas to provide, at best, an uncertain living. At the same time even the steepest slopes are now being cultivated in the hills and many live on inadequate holdings. Cash cropping and the development of commercial holdings is being encouraged and there is, generally, a breaking down of traditional social interdependencies and of ties through land and livestock--ties which traditionally provided some insurance against bad years. Migration, short and long term, has become a feature of the area leaving many wives as head of household and responsible for cultivation of holdings. However, the prospects of reliable wage employment are poor. Certainly there is little nonfarm employment in Machakos. Thus, there are many forces at work to create households unable to support themselves: especially, population pressure on land (which is too poor to justify investment with known techniques) and the breakdown of traditional mechanisms providing long and short-term support. The flow chart amplifies these points somewhat and suggests that there are important feedback loops in the system. It

is conceptualized for the purpose of understanding how it affects the emergence of malnutrition. It leaves many black boxes which are labelled rather than specified. The task of specifying these and their inter-relationships should provide a discipline for improving both observation and theorizing. What is so difficult to convey in flow chart form is the mechanisms and dynamics of structural change in this system. It is clear, however, that the phenomena which concern us relate to a system which is not adequately described by purely economic variables.

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