CHAPTER I

THE CONCEPTUAL FRAMEWORK

The concepts that have been used in this thesis belong to the area of food and nutrition, population and production of foodgrains. All these are essential to arrive at the meaning and the nature of the concept of self-sufficiency in food. It is necessary to appreciate their relationship if the objective of self-sufficiency is to be achieved.

1. The concept of Self-Sufficiency.

Self-sufficiency has been a frequently and widely discussed subject in the context of India's food policy but without much serious attention and attempt to describe it. The Chamber's Twentieth Century Dictionary defines a stage of self-sufficiency as "requiring nothing from without"- in the context of a food situation, the obvious inference from this would be a stage of national food situation when, and where, the country as a whole produces its entire requirements of food, which is sufficient to maintain its population. It thus refers to a stage of sufficient availability of food through domestic production; it is, however, different from sufficiency, which may include borrowed, bartered or bought food to reach the optimum level of availability. Self-sufficiency need not necessarily include the right type of food or the actual quantities available in the consumption areas within the country or the quality of food required to maintain the ideal nutritional levels of human diet. " The idea of self-sufficiency implies a level of consumption which may mean according to existing level, a level necessary for normal working efficiency, a level comparable or equivalent to that of developed western countries, or a level considered adequate or good from the nutritional and health points of view." To determine the level thus
becomes a pre-requisite for any attempt to achieve self-sufficiency.

The determination of the level of consumption presupposes an identification of the nature and the types of food available on the basis of their values in terms of physical requirements. Food may be required by man basically for four purposes namely survival, work, health and pleasure. All available food could be classified in these four categories, although one man's meat may be another man's poison, depending on the dietary habits resulting from sectional or regional differences. Thus while ice cream may be good for pleasure, and rice good for survival, there still may be deficiencies that could be made good only by wheat or milk. Further, while a kilogram of wheat may be good for work and may be available, it may be quite deficient in providing a sound health due to lack of sufficient vitamins and proteins. In other words, the sufficiency in one may not necessarily mean sufficiency in the other, and mere quantitative adequacy need not necessarily lead to a qualitative sufficiency. Each one would therefore determine its own level of consumption and thus provide its meaning of self-sufficiency. We may thus say that while an adequate availability of food necessary for survival may lead to subsistence self-sufficiency, that for work may lead to caloric, that for health to nutritional and that for pleasure to wastage self-sufficiency.

Self-sufficiency is thus normatively relative. In view of the wide difference in their levels of consumption, the varieties of food and the relativeness of the concept, any serious national endeavour towards the objective must be preceded by a clarity in the objective itself. And in this process a distinction has to be made between that which is ideal and desirable but not possible, and that which is possible as well as desirable. It is only after this is done that an assessment of a realistic demand of food
could be worked out and steps taken to meet it. For
determination of this level a critical analysis of the
ethics, dynamics and economics of the concept is also
required, so that the vagueness could be substituted by
clarity and the concept could be converted into a con­
crete and meaningful goal of national endeavour.

The ethical basis of the concept of self-suffici­
ency is inherent in the national objective of a 'welfare'
State believing in a 'socialist pattern of society'
and 'democratic socialism'. It is the moral obligation
of a welfare State to aim at ensuring a full and square
meal to each of its citizens. In its dynamics, it has a
purely physical connotation of being a stage of equil­
ibrium amongst the requirement of food, the availability
of food and the production of food within the country.
Towards this end, it may seek to have a long-term pers­
pective and a short-term approach— the former aiming
at an ideally nutritional level of food intake, compri­
sing of various types and varieties of food and food­
grains substitutes, the latter aiming at an estimated
requirements of food, mainly foodgrains, based on the
traditional dietary habits of the bulk of the popula­
tion at a tolerably reasonable level of consumption. The
economics of the concept refers to the framework of time
and the cost of achievement, as also the cost-benefit
ratio of investment required to achieve it.

Self-sufficiency, seen from these angles, becomes
a fairly intelligible concept. It is a positive concept
in so far as in the achievement of its objective, it
negates the predominant thinking in the ancient Hindu
philosophy of self-denial as a means to satisfaction
of wants and postulates a conscious effort to increase
the supply of food in the country by increase in production—
it stands for satisfaction of wants are rather than cur­
tailment of consumption. It is also a dynamic concept,
in so far as it moves forward with time and requires
constant and careful consideration and review at various
stages of the endeavour of increasing production. Its dynamism is also revealed by the emphasis on human effort and the implied stress on it as a means of attainment of the aim. Its relationship with the cost of inputs in terms of money and time makes it a relative concept; the fact that it is calculable in terms of its likely cost and probable time makes the task easy to identify areas, formulate policies and engineer strategy to achieve it. A description of its dimensions also includes, apart from a quantitative measurement within a particular time and cost, a qualitative appreciation, since the changes brought about in dietary habits, income levels and nutritional awareness, more likely than not, affect the complexion and the contents of the objective.

It may be added, however, that self-sufficiency in food means only in terms of output of food production, and not in terms of inputs to production, although that may also be visualised as a related and desirable aim. Further, the achievement of self-sufficiency will not necessarily be a panacea for all the distortions and defects of the Indian food situation; there still remain the problems of equitable distribution, timely movement and reasonable price of available food. Mere adequate production in the country does not mean adequate availability in every nook and corner and to every citizen. Still further, drawing up of plans, after an appreciation of the problem, and mustering of resources thereafter, may not necessarily lead to the attainment of the objective or its attainment within a desirable time-cost focus.

In India, foodgrains constitute 80% of the human diet; they also constitute two-thirds of the total agricultural production. They bear thus the main burden of demand for food. These foodgrains comprise of the two principal crops of rice and wheat and the coarse grains like sorghum, barley and millets and pulses. While the level of subsistence and the level of wastage may not be desirable and the level of nutrition not
possible of achievement in the foreseeable future, the only level possible and desirable seems to be the caloric. And in view of the predominant position of food grains in both the consumption and the production patterns of the country, and the serious limitations in expanding the production prospectively of food substitutes like milk, fruits, meat etc., the burden of self-sufficiency is bound to fall on these foodgrains. The national objective of self-sufficiency in food would, and should, be therefore construed to mean self-sufficiency in foodgrains to achieve the level of xxx caloric sufficiency.

The first step towards concretization of the objective of self-sufficiency in India involves the identification of the nature and the extent of the problem. There has to be an elaborate study of the current level of consumption of the population and the requirements of an average individual to maintain him at a subsistence level of consumption, at the average level of health and at an ideally nutritional level. It has also to encompass an appraisal of growth rates in population and foodgrains production, followed by an assessment of the potentials of growth in production and of checks on population. Since this objective is to act as the beacon for the optimal bridge between production and population, time and cost projections at different levels of requirement, the stages involved in the process and the alternatives available in the modalities and the instruments, have also to be considered, analysed, and decided upon. The next and the final step is the estimation of the requirements of men, money and materials in other words, of organization, finances and inputs, and the formulation of the strategy to be used to make them available at appropriate stages in requisite quantity. The realization of the objective presupposes a technique of mobilization of resources, deployment of finances and calculation of a cost-benefit ratio. It is only at this stage that the concept of
self-sufficiency becomes a programme of action, and it is only through such a series of steps that formulation of food policy becomes a meaningful exercise.

It may be pointed out that the entire process involved in such an evolution of a food policy towards self-sufficiency is a ramp and not a fleet of stairs, inter-related and inter-dependent, the movement from one step to another being invisible and dissociatable and made up of a number of permutations and combinations based on present and guided rates of population growth and existing and increased rates of growth in food production. The translation of the concept into an achievable objective, thus, envisages an interconnected action involving an identification and assessment of the problem, the choice of a broad policy objective or objectives and detailed programmes, the formulation of a physical, financial and organizational strategy, and finally a determined and conscious effort to implement the policies and programmes. In this connection, also to be considered are the conceptual developments in the fields of nutrition and demography, which determine and condition the policies and strategy, both in its long-term perspective as also in its short-term approach.

2. The Nutritional Factor:

The nutritional factor in food, to the identification and formulation of a uniform norm and its application to different foods, to obtain their food values in terms of such common denominators like proteins, calories and vitamins. A nutritional norm aims at an assessment of an adequate diet in terms of calories to ensure a level of physical health for normal work and in terms of vitamins and proteins to ensure an agreed level of physico-mental health, basing itself on the ideology—'a sound mind in a sound body.' By the juxtaposition of the conversion-process of foods into food values with the calculation-process of
requirements of food values for a healthy human being, it arrives at a food packet, which is calorifically or nutritionally adequate for the individual, and by a further process of calculation, for the country.

The science of nutrition, thus, makes a distinction between a physically adequate diet, a calorifically adequate diet and a nutritionally adequate diet. The first refers to a subsistence level necessary for survival, the second to a normal level required for work and the third to an ideal level desirable for health— the three being at a wide distance on the scale of hunger. Hunger has meant different things to different people. To some it has meant starvation from insufficient food, to others it has covered the whole range of conditions from acute and extreme starvation to what is called hidden hunger or malnutrition, arising from lack of food of the right type. The physical sensation of hunger is known to everyone and is easily appeased by any edible food taken in sufficient quantity— but such a diet will not necessarily provide all the nutrients that a man needs. The aspect of quantitative inadequacy of the diet is known by the term 'under-nutrition', while that arising from deficiency of one or more essential nutrients in the diet is known by the term 'malnutrition'?

Thus, adequacy of diet may denote different things at different times and places— in famines it may mean adequacy for sheer survival; in poverty, it may mean the level of subsistence; in affluence it may mean fruits, animal fat and meat; in developed Western countries it may mean a much higher level than in the under-developed Asian countries; in China it may mean adequacy of rice and in Pakistan adequacy of wheat, depending on the food habits of the populace. A calorifically adequate diet, on the other hand, but for the differences in the requirements of calories etc. on account of geography and climate between different
regions of the world, speaks of similar standards applicable to different climes, countries and people. A nutritionally adequate diet takes into account the complete physico-mental health, supported with vitamins, proteins and other protective elements to give a person good health. It thus provides a common calculating device and makes the understanding, assessment and appraisal of different diets and foods easy and certain. Since the science of nutrition makes a distinction between food for survival, food for work and food for health, the calculations of total food requirements of the population based on nutritional or calorific co-efficients will be different for different regions and different countries.

Inadequacy or hunger in either shape, but more so in the former, produces poverty, which in turn creates conditions of hunger, setting thus a chain reaction. Eminent economists, novelists and sociologists have emphasized this 'Culture of poverty', which tends to perpetuate poverty from generation to generation - the cruel legacy of poverty being passed from parents to children. Nutrition as a guide to food policy assumes thus a significant importance in the assessment and solution of the problem of food for work or for health. In the statement to the Press, on the World Food situation on 3rd February, 1973 the Director-General of F.A.O., A.M. Boerma entreated: "Under ideal circumstances, with a certain supply of a sufficient variety of food, Man's instincts in their natural state and the accumulated experience of the ages, would be a sufficient guide as to what one should eat. But under civilized conditions with a food shortage in most countries, or even where food is abundant, with
much of it subject to processes that deprive it of its health-giving virtues, the science of nutrition is the only safe-guide to dietetics and the only basis for a food policy."

A food and nutrition policy thus can be described as being a complex of educational, economic, technical and legislative measures designed to reconcile, at a level judged feasible by the planner, the projected food demand with the forecast of food supply on the basis of calorific or nutritional requirements. These measures have not only economic but also social impact; they are directed at palliating distortions detrimental to the public interest between what the consumer desires, what he can obtain and what he needs physiologically.

3. Population, Land and Underdevelopment:

Since the objective of a state, and specially of a welfare state, is the creation of conditions for the availability of sufficient food for each of its citizens, a consideration of the demographic characteristics of the country becomes a sine qua non of any realistic food policy. While the science of nutrition provides a measure for the calculation of adequate requirements of food for an individual, the science of demography provides an instrument for computation of adequate requirements of food for a whole country. To have a scientific approach, it has to have a knowledge of the past trends and behaviours of population, a perspective of the future growth, both in terms of size and content, and an idea of the legitimate requirements of food likely to arise therefrom; it also has to have a conception of the tools and levers available for the moulding of the demographic factor suitable to the needs of the emerging situation. It must, in short, look into the theory and the practice of the demographic aspect.
The theory of demography first had its conception in the writings of the ancient Chinese, Greek, Roman and Indian thinkers. Confucius considered that too many people in a given area or nation will reduce the economic productivity per worker, influence the general level of living adversely and result in strife and conflict. He conceived of an ideal relationship between land and people, which when disturbed or deviated from would result in dislocation of the economy, and believed that one of the functions of the Government was to bring optimum population by moving people from over-populated to under-populated areas. Plato and Aristotle spoke of an ideal state where the number was large enough to be self-sufficient, but not large enough to make governance difficult. Aristotle advised this limit to be fixed by calculating the chances of mortality in the children, and of sterility in married persons, and added that the neglect of this subject "is a never-failing cause of poverty among the citizens; and poverty is the parent of revolution and crime." Cicero, short of people, touched upon this subject with the intention of devising ways of stimulating the increase in population, disapproved celibacy, defended reproduction and recommended rewards for births. The Indian sages spiritualised celibacy but, considering a birth to be the result of divine action, forbade any effort at control of population.

The Medieval thinkers of the West, in need of more numbers, followed the Romans in their conceptions on population and saw no reason to advocate or practice population control by human effort. The only two thinkers of importance were Ibra Khaldun (14th century) who developed a cynical theory of population change, and Giovanni Botero (16th-17th century) who suggested that no matter what the size of the population, man continues to reproduce at about the same rate,
which could result in serious consequences wherever there were limits to the capacity to find subsistence. It was only in 1798 with Thomas Robert Malthus that a population theory got a real start. Malthus enunciated the doctrine:

"I think that I may fairly make two postulates. first, that food is necessary to the existence of man; second, that passion between sexes is necessary and will remain nearly in its present state."

Assuming then, my postulates as granted, I say, that the power of population is indefinitely greater than the power in the earth to produce subsistence for man.

Population, when unchecked increases in a geometrical ratio, subsistence increases only in an arithmetical ratio. A slight acquaintance with numbers will show the immensity of the first power as compared with the second.

Malthus thus pointed to the existence of a direct relationship between population and food and the divergence in the trends of their growth. Since then the conceptualization in the field of demography has continually stressed the desirability of a population-food equilibrium, as a measure of public policy. Whether one may consider population explosion as a cause of food problem, or population growth as a major factor determining cultural development, or come to a conclusion that there is a world wide movement towards a population equilibrium and that the world population crisis is a phenomenon of the 20th Century, all agree that population and food are intimately related and therefore population policy must be an integral part of public policy on food.
Contribution of land & agriculture:

As for land, its primary utility lies in its being the major source of food-larger part being of foodgrains-for human consumption, the process of obtaining known as agriculture, which is the science and art of cultivation of the soil, including the gathering in of all crops. It produces food, feed and fibre and is the foundation of manufacture and commerce. In terms of number of men engaged and the value of net output, its contribution to national economics of underdeveloped countries is tremendous.

The contribution of agriculture in the process of economic development is in three forms namely aggregative, structural and international while defining economic growth as a sustained increase in a nation's total and per capita product, most often accompanied by a sustained and significant rise in population. Professor Simon Kuznets stressed the aggregative aspect as suggested in the large and rapid shifts that occur in the economy, structural aspect in the relative importance of various industries, regions, economic units, classes etc. and international aspect in the shifting of a nation from the under-developed to a developed stage utilizing the appropriate channel of international trade, finance and communication. Agriculture, if it grows itself, makes a product contribution to the economy; if it creates products for others, it makes a market contribution; and if it transfers productive resources to other sectors, it makes a factor contribution.

The transition from a stage of under-development to a developed economy is known as the process of economic development. Economic development, a socio-economic concept as its caption suggests, refers to the growth
of an economy, from a lower to higher level of production and consumption of goods and services, irrespective of whether it is by conscious or unconscious human effort and whether it takes place in a free, planned or controlled milieu. The process may involve a number of stages indicated by levels of income, consumption and production in which may be the conventional five stages, stated by Rostow, or some countries may skip over some of the stages as Gerschenkron pointed out, or there may be further sub-categories of each stage as S.R. Sen has divided the 'take-off' stage. In under-developed economics, it is largely the state of agriculture and the level of utilization of land that determines the stage and the pace of development.

The development of a country is often intimately connected with the state of its agriculture; proper utilization of land resources is essential to its well-being and agriculture normally forms the backbone of its economic strength; a depressed agriculture is a millstone running round the nation's neck. The result of the non-utilization, to the optimum level, of the production capacity of land results in the perpetuation of under-development—the characteristics of an under-developed economy being low productivity and incomes, primitive methods of agriculture, insufficient food intakes, low levels of living and mass poverty, high rates of births and population growth and insufficient land and economic system.

The relationship between a country's land and the numbers inhabiting it and the stage of its economic development has been a subject of sharp controversy ever since Giovanni Botero posed the problem. Two centuries later Malthus thought that he had found a scientific answer to the problem. More than a century and a half has passed since then and it is generally admitted that Malthus was not so scientific after all. There has been since then a growing
realization of the interconnection between population, food and development, and thinkers after thinkers have concerned themselves with the studies of demography as a part of sociology, economics and even politics. While it is accepted that, in view of the fact that the continuation of any human society depends on its ability to reproduce itself biologically, growth of population is a normal feature of human history, it is also realised that left to itself, population growth can be abnormal and disproportionate to the growth of food supply, the latter being largely limited to the supply of land and its utilization. It is increasingly being established that the size of the population and its rate of growth have tremendous impact on the stage and the process of economic growth of a country and that a rate of growth faster than that of food production would result in a state of over population, which, while eating into the vitals of the economy, creates a vicious circle of hunger-poverty-underdevelopment-poverty-hunger. The size and the rate may negate the entire efforts towards proper utilization of land resources and consequently jeopardize the efforts at economic growth of a country.

4. Optimum Population

The concept of optimum population is the direct result of the appreciation of these connected issues. Optimum population is precisely the right number of people to exploit the resources of an area for an indefinitely continuing period of time and under any given technology. By inference such a population would produce as much per capita as possible without impairing the resource base unnecessarily and hence enable each individual to
realise his human potentialities to the maximum. It is plain that in as much as the resource base and the technological state determine the optimum, its precise amount will vary from place to place and from time to time. In its essence, this concept is synonymous with the concept of self-sufficiency—the objective in both being an ideal land-population relationship—the difference being in the approach, the former taking an econo-demographic path, as against the agro-economic one of the latter. It admits the direct relationship between land, people and economic growth—the requirement of land being dependent on area and its productivity, the size of population being related ideally to the capacity of land to feed it, and the stage of economic growth being conditioned by the interaction of the forces of population and land—and goes into the policies and strategies of shaping and controlling the population to suit the requirements of a country—the control of nature, pestilence, war and disease, as Malthus spoke, being no longer relevant, desirable or effective. In the short, it identifies the problem of population being one of more numbers than a country, in its existing or prospective stage of growth, can adequately feed.

A policy of population, as a concomitant of food policy, has, therefore, to aim at achieving an optimum population at various prospective periods of a nation's cruise through developmental stages and has to encompass within its framework both the qualitative and the quantitative aspects of change and control. Ideally, population policy involves
the examination of past and current demographic trends and their causes; an appraisal of the future demographic changes implied by these trends; an evaluation of the social and economic consequences of expected patterns of change, in the perspective of what is regarded as the national interest; and finally, the adoption of measures designed to bring about desired changes or prevent undesired ones.

Under present political, cultural and technological circumstances, the principal focus of efforts to influence population trends necessarily centres on the control of fertility. For food purposes the main object of a sound population policy has to be assessment and projection of population levels so as to enable calculations of requirements of food for their consumption. In other words, mere numbers are not relevant for food, what is relevant is their food consumption capacity.

The objective of a population policy does not remain confined to a regulated growth of population within reasonable limits, thereby curtailing the demand for food, but also extends to the assessment of such demand for food in a realistic manner and to make future projections not only of population levels but also resultant food demands, depending on the nature and the level of food requirement. We have already seen that in the given circumstances a reliable as well as desirable objective of self-sufficiency for India at least till the end of the century cannot but mean caloric self-sufficiency largely through foodgrains. Assuming this to be the case, an assessment of food demand will mean assessment of demand for foodgrains based on certain caloric requirements, by different age and sex groups, in the country. This is necessary since the
food requirements differ on account of age and sex differences. It is necessary therefore to find some standard consumption unit and some formula of counting the population at any given time into standard food consumption units.

Some attempts in this direction were made by Dr. Radha Kamal Mukherjee, Dr. Aykroyd and Baljit Singh who allotted weightages as under:

<table>
<thead>
<tr>
<th>Ages</th>
<th>Man value per head</th>
<th>Ages</th>
<th>Man value per head</th>
<th>Ages</th>
<th>Man value per head</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-15</td>
<td>0.7 Adult Male</td>
<td>1.0 Male</td>
<td>1.0</td>
<td>14</td>
<td>14 years.</td>
</tr>
<tr>
<td>Male above</td>
<td>1.0</td>
<td>Female over</td>
<td>0.8</td>
<td>Female over</td>
<td>0.85</td>
</tr>
<tr>
<td>15</td>
<td>1.0</td>
<td>14</td>
<td>14 years</td>
<td>14 years</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>0.93</td>
<td>Child 12&amp;13</td>
<td>0.9</td>
<td>Child 10-14</td>
<td>0.75</td>
</tr>
<tr>
<td>above</td>
<td></td>
<td>&quot; 10&amp;11</td>
<td>0.7</td>
<td>&quot; 5-9</td>
<td>0.5</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>&quot; 8&amp;9</td>
<td>0.6</td>
<td>&quot; 0-4</td>
<td>0.35</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot; 6&amp;7</td>
<td>0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot; 4&amp;5</td>
<td>0.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Noting that these were either too vague or too detailed to be correct and that female sex and old age also had an impact on food demand that they did not adequately cover, an AME (Adult Male Equivalents) calculus has been developed and is being put forward for the conversion of population into food consumption units known as AME. By identification of the adult male as a person between 15 & 44 years of age, by emphasizing the changes in food requirements before and after this age-span and by relating the age-structure to both sexes at every level, the AME calculus makes the weight-ages more realistic and dependable.
To facilitate a realistic calculation of mouths to be fed and the total requirements of food, the use of a calculus of Adult Male Equivalents, in place of a mere numerical size, as a standard is both desirable and necessary.

The calculus is based on the assumption that the requirements of diet of an individual in similar conditions may vary on account of two major factors of age and sex— it takes the risk of not taking into account the highly fluctuating and unreliable factors of stage of health, mental level and the extent of physical labour that also go into the making of the requisite food packet for an individual— and that these requirements could be averaged by the classification of the population into a few reasonably homogenous consumption groups. The classification for one country may not necessarily be applicable to another, nor for that matter, of one region to another, since climate, geography, dietary habits, incomes and levels of living, stage of economy, all contribute to the probable requirements of food for an individual. One could, however, fairly assume this average to be of national applicability in India in any case, being nearer than any other norm of calculation.

With these reservations, an 'adult' denotes a person between 15 and 44 years of age,
the age-group based roughly on the average capacity of in-take of food in normal Indian conditions of life. Since a person includes both male and female and since a female, even in similar situations of work, normally consumes less than the male, the word 'male' has been added to further quantify the capacity of intake. The rest of the population is categorised in two age-groups and weightages given to them, so as to make them convertible into 'adult males' for computation purposes. The 'Adult Male Equivalent' thus becomes a standard formula for reducing the population to a particular size, where its food requirements can be easily and fairly accurately calculated. The division of total population into homogenous consumption age-and-sex groups, the allotment of weightages to each group, the conversion of these groups into Adult Male Equivalents, and the computation and calculation of requirements of foodgrains is, thus, what the concept of 'Adult Male Equivalent' stands for.

The benefit of this concept of AME is the availability of a common yardstick, where the chances of error are less in economics than in mathematics; the benefit of this calculus is that it provides an easy converter-cum-reckoner of population and its food demand at any given period of time; the value of both lies in accurate forecast of future food demands at particular rates of population growth.

The field of projecting the trends of growth in population poses much more problems than the field of calculation of requirements of food for it. The same is the case with supply of
Although it is generally realised that for a plan of socio-economic development to be successful a reliable assessment of the dynamics of population growth is essential, forecasting of population has been an area where still there is a lack of a dependable tool. Population forecasting is not a simple matter. Available techniques do not permit reliable projections to be made 10, 20 and 50 years ahead.13 While during the last quarter of the century, there has been a great improvement in the quality of projections made, and population projections have indeed been made, largely they are for the sake of making mathematical projections only. As a result a number of projections depending on differences in rates of growth have been made by demographers. Very few of them however categorically point to a particular level likely to be reached by a particular year and it is a planner's dilemma to choose from the many projections available.

As regards projections of growth of feedgrains production, there is a serious problem of unreliability and inadequacy of agricultural statistics. The data on area and yield specifically, inspite of the introduction of sophistication and implied objectivity, continue to be an area where much is still to be done. There is also the problem of choosing the base year and the period for calculating the past trends. And of course there is the problem of assessing the impact of technological changes and responses of land and the farmer to new changes.

The projections of rate of growth in population and production are relevant for feed planning for future, since they give an idea about
the possible levels of demand and supply and the resultant gap, if any. It is obvious that if these two parameters indicate violent disturbances, the entire food planning would be affected. It must, however, be pointed out that in these fields lurk the dangers of wishful thinking and pious hopes and it is here that a practical and cautious approach, more than conceptualization, is needed.
References


2. P.V. Sukhatme, Feeding India's Growing Milliains (Bombay: Asia Publishing House, 1965), p. 27, says: Under-nutrition means "an inadequacy in caloric intake which if allowed to continue for a long enough time results in either loss of normal body weight for the same physical activity or reduction in physical activity for the same body weight or both." Mal-nutrition means "the lack of inadequacy of a particular or several essential nutrients, such that if made good, the clinical signs of specific deficiency diseases are eliminated and, further, with appropriate increase in the intake of nutrients, the subclinical signs associated with poor health are also removed."


6. Augustus, presented legislation that encouraged marriage, allowed women with three or more children to wear distinctive dress and gave fathers preferential treatment in appointment to public office. (O.V. Glass, Population Policies & Movements in Europe, Oxford: Clarendon Press, 1940, pp. 95–97.)


10. "There is no evidence of a population thermostat which automatically shuts off population before disaster intervenes. It would seem that population must be a conscious rational process on the part of any society wishing to avoid overburdening its resources." (Ibid., p. 105)

