It is generally believed that the growth of population outstrips the increase in food production. Derived from the famous Malthusian theory which Thomas Robert Malthus enunciated as early as 1798, this conception can be interpreted to mean that there is an indirect mechanism by which nature places a powerful check on her over-increasing population.

Historical evolution seems to have, however, belied Malthus's forebodings in progressive countries of Europe and the United States of America. But the Neo-Malthusians have found in what they describe exhausted lands and prolific motherhood of India, an example to support their theories. The same belief is manifest in the latest Census Report which tells India's story in three acts - "1921 - End of Food Surplus, 1960 - the Effort Fails, 1981 - the Appalling Prospect."

Some voices were nevertheless raised against this view at the Fifteenth Conference of the Indian Society of Agricultural Economics, held at Allahabad in December, 1954. It underlined the idea that the time had come when our programmes should not necessarily postulate a direct connection between food and population. In his concluding remarks the President opined that, almost nowhere in the world - and least of all in India - does a close and direct Malthusian connection exist between food and population.

This does not mean that there is no problem of food or even population. But their relationship in a static form, in terms of mathematical equations, is a subject to be clearly examined. The main object of this work is to study the food potential of India on a historical basis, and to investigate the validity of Neo-Malthusian theories applied to the country.
'Food' as such has a broad connotation. It has several constituents of proteins, carbohydrates, fats, innumerable minerals and the vitamins. Broadly speaking, food is energy giving or protective. Irrespective of what the experts hold to be nutritive constituents of food, the ratio between the consumption levels of these two categories is determined by the income and food habits of a particular community. As cereals in India account for nearly 80 per cent of our total food requirements, this study restricts itself only to the quantitative aspect of food and that, too, only cereals. Where-ever the word 'foodgrains' has been used, it stands only for cereals, unless otherwise qualified, although in common usage, it also includes pulses and many other edibles. The idea is to restrict the scope of the present study to avoid any diffusion of thought and closely examine the main problem.

Such a study involves an examination of three broad aspects of the question - a historical review, the future food position, and relationship between men and food. To each of these, one part of the treatise has been devoted.

The historical survey contains four chapters, which correspond to the most important dates in the food history of India namely 1921, termed as the 'Great Divide'; 1937, when Burma was separated; 1939, marking the outbreak of war; 1947, partitioning of the country; and 1952 when the epoch-making decision to decontrol food was taken by the Government.

One method to study the subject is by comparing production and consumption of foodgrains in India. But, unfortunately, figures for both of these variables are unreliable. As late as 1949 the statistics about acreage and yield compiled on the basis of complete enumeration were available hardly from 50 per cent of the area under cultivation. The method of fixing standard yields was also arbitrary. Figures for agricultural production being inadequate, it was difficult to determine whether or not food was increasing in proportion to population.
The position in regard to the data on food consumption is no better, although population statistics can be taken as trustworthy, there is no certainty about the actual consumption pattern of the people inhabiting the remote corners of the country.

Data regarding the third indicator, viz., foreign trade in foodgrains, can also help us in drawing some inferences. For increased imports of foodgrains in a country are regarded as indicative of its inability to feed its population and vice versa. In the first part, the Neo-Malthusian theory based on the quantum of net imports of foodgrains, has been examined.

Part Two deals with the future food potential of India. It is to be remembered that it is not only the narrow technical frontiers that obstruct the expansion of production. Economic factors also play an appreciable part. It has not been possible to discuss here in detail the various economic factors transforming the existing subsistence economy into a commercial economy. Factors determining agricultural productivity have all the same been divided into exogenous and endogenous ones. Chapter V dealing with rejuvenation of agriculture deals at some length with the various exogenous factors.

Among the endogenous factors—land, labour, and capital—India is available in abundance, but the supply of land is not elastic, as is also the case with other older countries. The possibilities of extensive cultivation and the allied problem of soil conservation have been examined in Chapter VI. Intensive cultivation is related to other inputs which, in the case of agriculture, are water, manure, seed and the requisite amount of labour, depending upon the form of technique. The existing water and manural resources together with their future potentialities have been discussed in Chapter VII.
Intensive cultivation can be studied scheme-wise or crop-wise. Since each of the food crops respond differently to various inputs like water, manure and seed, and there is absence of a suitable yardstick, the latter course has been followed in this study. Cereals have been divided into three main groups - rice, wheat and coarse grains which have been examined in Chapters VIII, IX and X respectively. In Chapter XI, the total food potential of the country has been studied.

An effort has been made in this part to work out the food potential on the basis of our achievements, not only in the laboratory but also in the field. But the results of only such research work have been taken into consideration as have been proved to be of some utility, and have been generally accepted.

Part Three examines the relation between man and food. Population determinants - both demographic and socio-economic - have been analysed in detail in Chapter XII. Therein population projections in the coming few decades have also been hazarded. Demography is a dynamic science. It is, therefore, risky to be prophetic in this respect.

After studying the food potential and the trend of future population, there is the question regarding the existing levels of food consumption. This has been dealt with in Chapter XIII. But calculations on this subject as already stated are a little difficult to make. There are parts of the country which have remained practically unexplored even this day. There have only been three all-India investigations which merit consideration. The Indian Council of Medical Research conducted diet surveys from 1936 to 1948, but as these were merely type studies and were not based on any sampling technique, the results can at best serve as guides. This defect has been removed to some extent in the enquiries conducted by both the National Sample Survey and the Agricultural Labour Enquiry. Subject to these limitations, efforts have been made to find out the ratio between the consumption levels of various
foodgrains. Some rough idea has also been formed about the actual quantities of foodgrains consumed both in urban and rural areas.

Population projections and food consumption levels being known, it might be assumed that an estimate of the future food requirements of the country could be obtained through a simple arithmetical process, but that is not the case. Food consumption varies from individual to individual, depending on his level of income and mode and place of living. After taking into consideration the effect of various development schemes on food consumption, future food requirements have been worked out in Chapter XIV.

The conclusions drawn on the basis of the study are then stated in Chapter XV. Some of the important tables and other problems having a bearing on the subject in hand and directly related to it have been dealt with in the 13 Appendices. The Bibliography given at the end includes almost all materials which have been consulted. It has been divided into three parts - books, reports and periodicals. It has become a little lengthy, but has been retained as such for the benefit of future research workers on the subject.

It may be added that nothing in the field of economics, agriculture or demography, is to be considered as static. The problem is required to be studied from a dynamic point of view. Our population projections and future possibilities of extensive as well as intensive cultivation may be true, other things remaining the same or still better if nothing extraordinary takes place in the social, political, economic or scientific fields. The scope of this or for that matter any other study is thus limited to that extent.

ACKNOWLEDGMENTS

Space does not permit adequate acknowledgment of all sources of information, inspiration, and assistance in the preparation of this work. Particular thanks are, however, due to my teachers, Shri P M...
Dr. K.K. Dewett and other members of the Economics Department of the Punjab University Camp College. Three experts, Dr. Gyan Chand, Dr. S.N. Sen and Prof. M.L. Dantwala, advised me on the selection of the subject and various difficulties during research. I have also had most valuable advice from Dr. R.M. Poduval and Shri S.C. Chaudhry, both of the Directorate of Economics and Statistics, Ministry of Food and Agriculture; Dr. P.K. Mukerjee and Dr. M.S. Natarajan of the Delhi School of Economics; Shri Rajeshwari Prasad, Deputy Registrar General, Census Operations; Shri R.K. Seshadri of the Ministry of Finance; Dr. C.H. Shah of the Bombay School of Economics and Dr. Vidya Sagar of the Planning Commission. Their comments led to improvements in argument and presentation, though I have maintained some points on which their opinion differed and have placed a different emphasis on a number of others.

My friend Shri K.N. Syngal, Agricultural Chemist, NEPSU, examined the thesis from the technical angle and Shri R.N. Trehan of the Publications Division, Ministry of Information and Broadcasting from the presentation angle. I would also be failing in my duty if I did not thank for the various librarians in Delhi and New Delhi, but for whose cheerful help I might have succumbed to gloom and fallen by the wayside. Shri Rajeshwari Prasad deserves a special mention in this connection. He not only placed both of his departmental libraries in New Delhi and Kanpur (UP) at my disposal but went out of his way to procure for me all the new books I needed.

NEW DELHI

P.C.B.