

H. A. Meilink/ The population factor in economic growth theory

Introduction

In this article an attempt will be made to review briefly the role of population growth in economic growth theory and to make a few critical remarks on the applied methodology and the underlying assumptions. Emphasis is laid on the possible relationships between population and economic growth in the developing countries, but also Malthus' theory and the stagnationists' of the 1930's will be discussed in order to acquire a better understanding of the development in this field.

1. *The classical economists*

A fixed supply of natural resources, especially land, which limits the productivity of a larger labour force and thus of per capita food supplies of an increasing population was the central theme of Malthus' theory. Taking the quantity of land as fixed this would lead to a confrontation of the geometric rate of growth of population with the arithmetic rate at which subsistence could grow at best. Consequently, population always tended to outrun the available supply of food products. In fact, Malthus did not say that population would increase at a geometric rate of growth. It was only its tendency if left unchecked. He assumed that 'positive' checks (pestilence, famine and war) and 'preventive' checks (moral restraint with prudent postponement of early marriages until a family could be supported) would limit population to its subsistence level. This fear for insufficient food production was based on the acceptance of the law of diminishing returns.¹

According to this law the necessary increase in food production with given agricultural techniques would force the use of a less efficient combination of labour and capital on lands already under cultivation and/or the use of less fertile lands, resulting in increasing costs per additional unit of agricultural output. It was also generally believed among classical economists that there were few opportunities in agriculture for division of labour and application of innovations, which could be realized more easily in manufacturing where they result in increasing returns per additional labourer.

Malthus' pessimism with regard to the race between decreasing returns in agriculture and increasing returns in industry was shared by most economists at that time (around 1800).

But pessimism gradually disappeared as in the second half of the 19th century it became obvious that the rapid development of technological knowledge and its application in agriculture and manufacturing (introduction of new farming methods, new crops, improved transportation, economies of scale, division of labour, etc.) did clear the way for a more than proportional growth of production, thus sustaining the increase per capita output over a long period of time. In view of these events it is comprehensible that economists lost their interest in population questions and did not further investigate possible links between population and production. Consequently from then on in economic theory population growth was treated as an independent variable.

2. *The Stagnationists*

In the 1930's the thoughts of economists (Hansen a.o.) returned to the role of population in economic theory.

This time however it was the lack of a sufficient rate of population growth that worried them. In their theory of secular stagnation, autonomous investment, which was thought to be a very important income generating factor, was assumed to be dependent on:

1. the rate of resource discovery
2. the rate of technological progress
3. the rate of population growth

All of these factors showed a slowdown in growth at that time, which contributed to the fear that entrepreneurs would expect narrower markets and declining profits with as a consequence a decline in the growth of autonomous investment. A less rapid population growth was believed to influence this process because of the resulting decrease in demand for housing facilities and public utilities. The demand for these two items in particular requires considerable amounts of investment.

Critics of this theory pointed out that although in the past population growth had absorbed a great deal of savings, population increase is not necessarily essential for the absorption of these savings. Population oriented investment can also be replaced by other forms of investment. In other words, the composition of investment may change, but not the quantity.

Now it is interesting to note that in this theory the population factor is treated as a variable influencing the demand side of the economy whereas in Malthusian thinking it was associated with the production side (diminishing returns). Nevertheless population remained an independent variable. It was only drawn into the discussions because it evidently played a role in an economic process leading to stagnation.

3. *The Leibenstein/Nelson thesis*

After the Second World War increasing awareness of the growth problems of the under-developed nations and their extremely rapid increases in population have revived interest in population questions among economists. In the 1950's, Leibenstein and R. Nelson² considered the population factor as a dependent variable in their thesis of the so-called low level equilibrium trap³ and the minimum critical effort.⁴ They assumed a functional relationship between rising per capita income and changes in population growth rates. In this economic-demographic development process four stages were identified.

In the first stage (subsistence level of income combined with high mortality and fertility) children contribute to food production whereas the cost of rearing them is very low. In the second stage death rates tend to fall with growing per capita incomes but birth rates lag behind because it takes time for social attitudes to adapt to changes (the realization lag, as Leibenstein named it). Birth rates may even rise because the ratio of productive to non-productive years per child in the first instance increases. This raises the value of a child as a source of family

income and as a source of old age security. In the third stage a level of per capita income is reached where there is a clear decline in the value of the marginal child as a source of family income because the age up to which children are trained and kept out of the labour force gradually rises. The utility value is reduced to that of a 'consumption good' (from the economic point of view). Birth rates will fall considerably, narrowing the gap between death and birth rates. This fall in birth rates is of crucial importance because 'the more rapid the rate at which fertility decline sets in, the lower the rate of induced population growth and the less the extent to which population growth absorbs potential national income gains.'⁵ The fourth stage finally shows an almost closed birth-death rate gap resulting in a modest growth in population. Per capita income is considerably beyond the subsistence level at the first stage. The economy has overcome the major obstacle to its growth, i.e. the low level equilibrium trap.

The crux of the whole story is that Leibenstein and Nelson believed that only beyond a certain level of per capita income the rate of population growth was strongly negatively influenced thus clearing the way for sustained growth. Below such a point, the community would fall back to the Malthusian subsistence level because population growth would swallow up the realized per capita income gains. Altogether it is hardly surprising that Leibenstein and Nelson came up with their theory since at that time it was clear that some developed countries (especially Japan) had experienced this kind of demographic-economic development.

The impact of this theory on the thinking about growth problems of developing countries was considerable. What these countries needed in order to escape subsistence level was a rapid rise in per capita incomes within a short period of time. And since increasing per capita incomes were believed to be strongly linked to capital accumulation (savings) according to the popular Harrod-Domar model⁶, the rich countries could help to solve the growth problems of the poor ones by sending large amounts of capital (and technological knowledge).

This development policy of a necessary minimal critical effort or 'big push' as Rosenstein-Rodan calls it⁷, is this a logical result of the awareness of the demographic-economic mechanism in the now industrialized world.

4. *The Coale and Hoover study*

Together with the refinement of economic models for planning purposes, the population factor was introduced into such models. A macro-economic growth model consists of a set of relationships among the key economic magnitudes of a national economy. This model is constructed in such a way that the effects of changes in any variable on all the other interrelated variables can be traced. It is expressed as a set of equations with known or assumed coefficients of interrelationships and the whole is susceptible to empirical application and testing.

Early macro-economic growth models assumed a population growth rate and then treated it as a parameter, having an impact on the variables within the model but not in turn determined by them. However in the Coale and Hoover study on India⁸, population size and its rate of growth played a central role. Their aim was to provide a quantitative estimate of the effect of a declining fertility on the growth of per capita income. They assumed that a prime determinant of the rate of

economic development is public outlays plus private investment (F) and that the amount of funds available for such outlays will depend on both the national income (Y) and the level of average income per equivalent adult consumer $\left(\frac{Y}{C}\right)^9$

F is broken down into

- a those outlays which equip or assist active producers and thus raise aggregate output in a relatively direct and immediate way and
- b those which serve primarily the welfare of the population as a whole and have characteristically a diluted, indirect effect on output.¹⁰

F, in turn, is related to the growth of national income via the incremental developmental outlay to output ratio — a sophistication of the more familiar incremental capital to output ratio — assumed 3 in base year 1956, but rising to 3.6 in the last year, 1986, of the considered period.

F is increased during the 30 year period through a coefficient representing the incremental propensity to save (the proportion of extra income that is saved) which was assumed to be 30%.

With these assumptions a decline in fertility (they assume a 50% reduction in birth rates to be effectuated during the period) will lower the dependency ratio, meaning that more people fall within the productive age group. Thus total and per capita income are raised. Since savings are assumed to be a function of this total and of per capita income, these will also rise, thus inducing an increase in the available public outlays plus private investment (F) which, in turn, leads to a further increase in incomes.

The outcome of their calculations is that in the 30-year period the slower population growth as a result of lower birth rates (death rates are assumed to be constant) provides an income per capita some 38-50 percent higher than would occur with stable fertility. A further 25 years of reduced fertility would yield an income per capita about twice as high as with continued high fertility.¹¹

Obviously in this model the change in age structure served to accelerate the rise in total national income and income per head because of two forces:

- 1 a larger proportion of income was available for growth expenditure.
- 2 the proportion of low-yielding or late yielding welfare expenditures in total public outlays plus private investment was reduced.

5. Myrdal's criticism

Myrdal finds fault with the Coale and Hoover model on a number of grounds.¹² His criticism centres around their interpretation of the relationship between savings and income.

In the first place, non-monetary savings are excluded which in India (the country taken by Coale and Hoover to illustrate their theory) is however of great importance. In India there are three main savings sectors: the government, individual small business and large enterprise. The personal sector accounts for about 45% of total (monetary) savings, government for most of the rest and corporations, for a small but growing share.¹³ For each of these sectors Coale and Hoover assume that the increase in savings proportionately outdistances the increase in income per head which is however open to doubt:

a. Government savings (through taxes and surpluses of public enterprises) depend on many other factors than income per head. Progressive income tax rates play a much less important role than they do in Western countries and are not effectively enforced. The future amount of government savings depends much more on the kind of tax laws, the quality of the tax administration and the political acceptability of the laws than on income per head.

b. The 30% marginal propensity to save is much too high for India; the assumption of growing savings to income ratio for individuals is quite unrealistic because of the evidence of a tendency to *constancy* of this ratio in other countries. If the more realistic assumption of constant average propensity to save is introduced then the superiority of the low-fertility projection (inducing a rise in per capita income at the end of the period) is greatly reduced.

c. The amount of savings in the corporation sector depends largely on the opportunities for profitable investment which in turn depends on a large number of forces other than the growth of income per head.

In view of these criticisms, Myrdal made a recalculation based on the assumption of a *constant ratio* of savings to income which reduced the difference between the high and lower fertility incomes by two-thirds!

A second fundamental objection concerns the proportion of funds devoted to welfare expenditures. Policies in this field, especially those relating to the capital-intensive sectors of housing and construction and the dispersal or concentration of towns and industries can have varying effects on economic growth. These variations in policy influence the capital output ratio of the welfare expenditures and the proportion of funds that can be allocated to direct growth investment. Clearly different types of policies open up a substantially wider range of income differences between high and lower birth rates.

Leaving out this policy aspect and thereby presenting a highly simplified, mechanistic working of the system of relations is misleading and can hardly be considered as a step forward in the economic-demographic field of knowledge.

There is another important objection according to Myrdal. The analysis is set in the frame of the relationship between capital input and product output. It is inherently biased towards overemphasis on investment and towards abstraction from other growth generating conditions and thus towards isolation from all policy aspects. In fact, the very simplistic Harrod-Domar equation which links economic growth to only two factors i.e. the savings to income ratio and the marginal capital output ratio, is accepted as being a relevant theory. This, however, is easy to understand since in discussions of growth problems of the Third World, the Harrod-Domar 'model' was widely accepted in those years (beginning of the 1960's). Nevertheless this concept hampers or rather prevents consideration and measurement of e.g. the effect of different levels of consumption on labour input and labour efficiency.

Also the acceptance of capital rather than labour as a powerful income generating force is not surprising since we have seen that after Malthus' time (\pm 1820) income per head in fact could steadily rise because of a process of capital accumulation that made possible considerable increases in the labour productivity. However, statistical findings, published in the 1960's on the interplay of economic and

demographic factors has influenced existing views to a great extent. Kuznets examined the relationship between per capita product and population growth through a correlation of these two variables for 40 underdeveloped countries in the period 1950-1964 and concluded 'that the rate of population growth, among the underdeveloped countries has no uniform effect on growth in the per capita product. The variety of combinations is wide, and it is this mixture of relations that naturally produces an insignificant correlation.'¹⁴ Although statistical correlations do not help us to distinguish determining factors clearly, they can at least serve to exclude claims to primacy for single factors whose effects do not prove dominant in the empirical data. Easterlin also found the same insignificant correlation coefficient comparing the two variables for 27 developing countries.¹⁵

One other important fact came out of these empirical studies. They showed that the theoretically direct relationship between capital formation (or savings) and growth of output (Leibenstein, Harrod-Domar, Coale and Hoover) lacked statistical support. On the contrary, several studies showed the relatively modest contribution of capital and labour in the process of economic growth. Kendrick¹⁶ emphasized the relatively small contribution made since 1920 by increases in capital per worker, in contrast with the great contributions made by 'hidden investments' such as the improvements in human productive capacity. Kuznets in another study concludes: 'The scanty available data suggest that increase in inputs per head of manhours and material capital *combined*, accounted for less than *one fifth* of the secular rise in production per capita in western countries.'¹⁷ Also Solow observed 'that capital formation is not the only source of growth in productivity. Investment is at best a necessary condition for growth, surely not a sufficient one.

Recent study has indicated the importance of such activities as research, education, and public health'.¹⁸ Denison, tried to fully allocate the growth of output in the U.S. among the relevant factors such as the level of education of the labour force, length of working days, economies of scale, spread of knowledge etc. and reached similar conclusions.¹⁹

Summarizing: this lack of knowledge about the contribution of specific variables and their quantitative meaning for growth processes illustrates the 'relatively primitive state of the art that prevails in the linking of demographic and economic variables'.²⁰

6. *The neo-Malthusian approach*

In spite of the statistical findings and theoretical progress in relation to demographic-economic interrelations; in spite also of the growing awareness of the great complexity of the matter among researchers; textbook writers and politicians in particular very often present the whole problem in the form of the so-called neo-malthusian version in arguing their desire to take birth-control measures. Their arguments can be summarized in the following formula

$$K = r(p + y)$$

Where K is required rate of growth of capital

r is the incremental capital output ratio (assumed to be a *constant*)

p is the population growth rate and

y the desired rate of increase in per capita income.

Assuming that population is increasing by 2% per year and $r = 3$, then 6 per cent of the national income must be saved and invested to maintain the present level of income per head. If an increase in per capita income of 2% is desired then 12% of the national income must be saved and invested, and if at the same time population is growing at the rate of 3 per cent instead of 2, then investment up to 15 per cent of the national income is required. This means that current consumption by households would have to be reduced in order to achieve the high rate of capital formation required. The 'model' shows that the higher the rate of growth of population the greater the material capital requirements needed to sustain the same rate of growth per worker and per capita product since a larger labour force (because of more rapid population growth) will require more capital just to keep its productivity from falling to a rate relative to the previous period (with slower population growth rate). Assuming further constant returns to scale and a given capital output ratio, the model is believed (other conditions assumed to be remaining equal,) to provide a simple picture of the influence of less rapidly growing population on the economy.

7. Kuznets' criticism of the New Malthusian approach

In two articles Kuznets²¹ sharply criticized the methodological framework, which in his view makes the entire analysis misleading. The effect of a higher rate of population growth is not only to require a larger share of total product to be devoted to capital formation but it also changes the age structure. The larger

Effects of Rise in Rate of Population Growth on Capital Requirements and Per Capita Consumption

	A-1 (1)	B-1 (2)	A-2 (3)	B-2 (4)
1. Assumed rate of growth of population, % per year	1.0	3.0	1.0	3.0
2. Assumed rate of growth of per capita product, % per year	2.0	2.0	0.1	0.1
3. Rate of growth of total net product, % per year (from lines 1 and 2)	3.02	5.06	1.101	3.103
4. Net capital investment required as % of net product (Incremental net capital-output ratio, ICOR, assumed to be 3.0)	9.06	15.18	3.303	9.309
5. Government consumption as % of net product (assumed)	10.0	10.0	10.0	10.0
6. Private consumer expenditures as % of net product (100 minus lines 4 and 5)	80.94	74.82	86.70	80.69
Age Structure of Population (based on UN selected data) <i>Total population = 100</i>				
7. 0-14 years old	26	40	26	40
8. 15-64 years old	64	56	64	56
9. 65 and over	10	4	10	4
10. Equivalent consumer units (lines 7 and 9 weighted by 0.6; line 8 by 1.0)	85.6	82.4	85.6	82.4
11. Private consumer expenditures, % of total net product percentile of equivalent consumer units (line 6 + line 10)	0.946	0.908	1.013	0.979
12. Total net product (assuming output of 100 per worker, i.e., per member of line 8)	6,400	5,600	6,400	5,600
13. Consumption per equivalent unit (line 11 × line 12 + 100)	60.54	50.85	64.83	54.82

proportion of the population in ages under 15 means a larger burden of dependency and thus, *ceteris paribus*, tends to lower per capita output.

But this is partly offset by the lower consumer requirements per head of the young. Therefore the term 'equivalent consumer units' is introduced.²² Kuznets assigns a weight of 0.6 for ages under 15 and over 65 and a weight of 1.0 to the population in the working age-group. He proceeds to compute the effects of a more rapid population growth (from 1 to 3 per cent) on per capita consumption and capital requirements within the neo-malthusian framework. The assumed incremental capital output ratio is 3. (see table)²³

His conclusion is as follows: 'The calculations suggest that raising the rate of population growth from 1 to 3% per year can presumably be accommodated by a reduction of about 15% in consumption per unit. Likewise with a given population growth rate, raising the rate of increase in per capita income from 0.1 to 2.0% apparently reduces per unit consumption only about 7% which would be made up in about three years!'

These results are puzzling and, as Kuznets remarks, cast doubt upon the adequacy of the underlying analytical structure because one may ask why, if this is a realistic model of economic growth, so few countries have become developed, for surely the sacrifice of a small fraction of growing consumption would hardly tax the capacity of the least developed economies and societies.

Neo-Malthusian analysis in one sense is clearly deficient because again it assumes that physical capital is the sole agent inducing growth of per capita product. Since capital formation is only a small fraction of total output, major changes in the former mean but minor changes in a large component of total output, such as consumption, and these minor changes can consequently work seeming miracles in the way of producing economic growth. No wonder Kuznets concludes, 'that a wholly unrealistic picture of the possibilities, and of the problems associated with population and economic growth is presented'.²⁴

He continues by examining the effects of a more rapid population growth rate on consumption when capital output ratio is not constant but variable, justifying this assumption with the following argument. At certain stages of growth items usually classified under consumption such as health and nutrition may be crucial to economic growth, and thus have the status of capital investment. And both the conventional and expanded capital to output ratio are influenced by *prevailing economic and social institutions* and are not fixed by technology except within broad limits. Varying the incremental capital output ratio from 3 to 5 results in an increase of about 100% in the reduction of per consumer consumption associated with an annual rate of population growth, of either 1 or 3 per cent. If it is raised to 10 there is a fourfold and a five-and-a-half fold increase in the reduction of consumption associated with respectively, 1 and 3 per cent population growth.

In view of these findings, Kuznets remarks that, 'the values to be used in measuring the effects of a high rate of growth of per capita product — for a given country at a given time — cannot be determined mechanically. No matter how rough the result will be, it does require the examination of all the conditions affecting the economic efficiency of a given country. And obviously these conditions include economic and social factors complementary to but not identical to the determinants

embodied even in the wider definition of capital in its relation to output. These factors should not be neglected and yet they are outside the conventional limits of the economic discipline'.²⁵ Thus an adequate analysis of the problems of relations between high rates of population growth, capital requirements, dependency ratio's, consumption levels and the like, would have to be extended to cover significantly different economic and social groups *within* the underdeveloped countries.

8. Boserup's approach.

A step in this direction was made by Mrs. Boserup.²⁶ She divided the (African) economy into three sectors. First, the sector located in the most backward regions where people produce for their own subsistence and try to earn some money by means of migrant labour. In these often sparsely populated areas the lack of incentives to produce an agricultural surplus is not due to land shortage but to the absence of local markets and of transport facilities. In these circumstances the motivation of the people to have large families is quite rational. Young men are needed as migratory money earners. Moreover, these young men have to clear the land under the system of shifting cultivation, while young women are needed to do a large part of the agricultural work and to raise more children. Another reason for this high birth rate is found in the existence of a very high infant mortality rate. The second sector is that of cash cropping and subsistence food production which has a less extensive system of land use. Fallow periods are usually shorter and crop rotation systems are more often applied. This sector is partly monetized, there are more schools, and health conditions are better which results in a lower death rate. However birth rates are still high and this implies that in this sector population is growing fast. Large numbers of youths, having received a few years of schooling look for non-manual jobs in the urban centres. In this sector to have many children may be advantageous because the cultivation of cash crops sometimes yields a good income, but this cultivation of cash crops is a very risky activity since crops may fail or prices collapse. In such conditions having one or more members of the family in salaried employment is a kind of family insurance against bad times. Clearly, the question of how population growth is related to output growth in this sector has everything to do with world market prices and the international trade structure. These factors should not be left out in an adequate analysis of relationships.

The third sector is the modern, fully monetized, *industrial* sector situated around the capital of the country or around big ports. These urban areas undergo an enormous growth in numbers of 5 to 6% annually because of the large migratory flows from rural areas. This growth of the labour force creates severe employment problems. But simply linking these employment difficulties to excess population growth is incorrect.

The industrialization process can be effectuated in a large number of ways involving varying combinations of capital and labour. In actual fact production and investment decisions are to a large extent politically determined. For example, the predominance of non-indigenous ownership and of expatriate predominance in higher technical and managerial staff regularly leads to choices of machinery and technology reflecting the preceding experience and serving interests in advanced

countries and thus neglecting more suitable (employment oriented) choices. A dualistic structure of economic sector (modern capital intensive manufacturing versus stagnant low productive subsistence agriculture) may be the outcome.

9. *Type of development*

According to several authors, this unlinked development is not an unknown phenomenon in the African countries of today. Robson and Lury²⁷ state, 'This growth (of the industrial sector) has frequently depended upon the establishment of a few large scale projects. There are so far few signs of the emergence of a balanced size distribution of industrial enterprises such as characterize developed areas. The tendency in Africa is for a few giant firms (state or expatriate generated) to flourish amongst a large number of very small firms. Moreover these large enterprises tend to remain enclaves. Their linkages with other branches of the economy, either as markets for inputs or as suppliers of output for further processing, tend to be limited. It would be difficult to argue that much if any of the industrial development which has so far taken place has the propulsive character of leading sectors'.

In the past few years several case studies of African countries on the links between the growth of population and production have appeared.²⁸ Most of them deal with the major policy question of the implications of rapid population growth for the demand for housing, education, employment, health and social services. Some also provide illustrations of the isolated development of national production growth and population growth.

For example:

*Cameroun*²⁹ Biyong examines, among other things, the thesis that growth of GDP is only marginally related to population growth. After contrasting agricultural output (subsistence and export population) of the six federal administrative provinces with their respective population rates, he concludes that the figures display a lack of any concrete relationship. Growth of population appeared to exercise little or no influence on the growth of this sector's output. Other factors such as development of land (only 20% of arable land is under cultivation at present), the control of plant diseases, improved technology, and the world market and internal price development are thought to be more determining forces.³⁰ Concerning the manufacturing and commerce sector the same absence of correlation was observed. In this case the existing large excess capacity in industry was responsible. Growth of internal effective demand in the considered period (1966-'71) lays claim only to one third of this excess in production capacity. Biyong relates this situation to the export, outward oriented character of Cameroun's industrial activities.³¹ Concerning this point the BCA review report comments: 'Poor people with little monetary income can participate only marginally, if at all, in modern market structures and where population growth adds primarily to this group it may not mean equal increases in effective markets for more modern consumer items. Because of this, increases in the effective buying power of consumers can, percent for percent, have a greater effect on the development of many internal markets (and hence on manufacturing and commerce) than increases in the population itself.'³² Related to this feature is the way investment funds are

formed. The growth of investment depended on other factors than population growth. High income families could save substantial amounts of sums whereas the majority of the people had no savings at all. The country's investment resources were largely generated from savings in the public sector (taxes on major enterprises), saving by domestic private firms and foreign public and/or private funds.³³

Algeria: In Tabah's study the same weak association between GDP growth and population growth is registered. The rapid growth in national production was largely due to the petroleum and natural gas exports, to the growth of a complex modern industry and the extension of modern agricultural production in all of which capital intensive production methods were used requiring relatively small amounts of skilled labour.³⁴

Ethiopia: The Bekele and Bondestam study among other things, provides projections of population and income to illustrate that growing income differentials between urban and rural areas of the country will occur. When trends are extrapolated the GNP per capita of the total population rises from Eth. \$ 156 in 1968 to Eth. \$ 480 in 1998. But income in the subsistence agriculture areas will only modestly grow from Eth. \$ 75 in 1968 to Eth. \$ 116 in 1998.³⁵

In *Zambia* according to the ECA Report 700 European families accounted for 71% of agricultural sales in 1964. The remaining 29% was contributed by roughly 450 000 African families.³⁶ This illustrates again the absence of a direct relation between the majority of the Zambian population and the growth of production.

These brief illustrations serve to indicate that an adequate economic-demographic study should involve an analysis of the type of development that has been realized in specific countries.

Another important point is the student's implicit perception of population problems. 'One can look at a crowded ghetto and say the poverty and poor health of its inhabitants are products of over-population. Therefore the reproductive behavior of the poor should be changed. Or, one can say these people would be neither poor nor sickly nor crowded if they could get the kind of social acceptance, jobs and incomes that would enable them to have better housing, food and health care. In other words, how poverty and poor people are perceived makes all the difference. Likewise the notion of over-population is more a matter of perception and value judgement than of empirical data'.³⁷

That the exact nature of the economic-demographic links is also, to a certain extent, the result of a country's ability to organize itself in order to deal with a fast-growing population, is proved by the Chinese. According to Aziz³⁸ some basic characteristics of their system are:

1. The ability to mobilize the unemployed and under-employed labour force for improving the land, building dikes, and dams, digging irrigation channels, constructing roads and simply cultivating the land more intensively.
2. The ability to diversify its activities — first within the agricultural sector to forestry, fisheries, and animal husbandry and then to small industries, using

agricultural raw materials or providing inputs for agriculture. Local communities do not have to wait for government or industrial entrepreneurs to bring industries to their areas. They develop these industries according to their own needs and priorities, train their own workers, and keep the extra value that this process creates. This permits a gradual structural change in the rural economy that is in line with the factor endowment (a surplus of labour in relation to financial capital) and provides a step-by-step technological change.

3. The government's decision to feed the people and meet the other basic needs before mobilizing any surplus from it. The surplus created was used to modernize the structure of the local community itself rather than shifted to a few urban centres.

4. The strong difference in the system of planning as compared to that followed in many other developing countries. In the latter all targets are determined in a national plan and their achievement is sought through a combination of large public investments in expensive irrigation and infrastructure projects, and economic policies to influence private sector decisions. The primary merit of the Chinese system of planning is its emphasis on maximum exploitation of local resources for meeting local needs. Central planners are seldom able to identify all the potentialities for local development, and to establish the right order of priorities.

Aziz concludes, 'The startling fact is that China has within a short period of 24 years already abolished absolute poverty, unemployment and inflation'.³⁹ This development process was possible despite the fact that the Chinese population increased with an average of 2% yearly during the 1960-70 decade.⁴⁰

The above points are not made to say that population problems are easily solved by simply copying the Chinese strategy. However they do illustrate that studying population questions is a more (complicated) exercise than just assuming some highly simplistic macro-economic formula.

Conclusion: This brief review of economic thinking on the population question shows that the macro-economic apparatus used in growth theories by itself is still insufficiently developed in order to handle this very complex problem. A study of the relationship between demographic and economic factors should include some broader aspects of social organization in addition to the familiar economic variables.

Notes

¹ This law implies that as equal increases of a variable factor are added to a constant quantity of other fixed factors, the successive increases in output will, after a point, decrease.

² H. Leibenstein: *Economic backwardness and economic growth*. John Wiley and sons, London, 1957, and R. Nelson: *A theory of the low level equilibrium trap*. *American Economic Review*, December 1956, pp. 894-908.

³ High fertility, high mortality at a low level of per capita income.

- 4 An injection of capital leading to sufficient investment for sustaining economic growth.
- 5 Leibenstein *ibid.*, p. 168.
- 6 See § 5 for the details of this model.
- 7 See for a synthesis of theories of underdevelopment: B. Higgins. *Economic development. Principles, problems, and policies.* Norton & Co., New York 1968 pp. 343-360.
- 8 A. J. Coale and E. M. Hoover: *Population growth and economic development in low-income countries*, Princeton, New Jersey, 1958.
- 9 In calculating the population in terms of equivalent adult consumption, children under 10 are considered as 0.5 each, and women of 10 years and over as 0.9 each.
- 10 Coale and Hoover, *ibid.* p. 259.
- 11 Coale and Hoover, *ibid.* p. 334.
- 12 G. Myrdal: *Asian Drama* 1968 Penguin books, Volume III, appendix 7: Approaches to economic effects of population changes, pp. 2063-2075.
- 13 G. Myrdal, *ibid.* p. 2073.
- 14 S. Kuznets: *Population and economic growth.* Proceedings of the American Philosophical Society, 1967, p. 191.
- 15 R. A. Easterlin: *Effects of population growth on the economic development of developing countries*, *The Annals of the American Academy of Political and Social Sciences.* January 1967, p. 106.
- 16 J. W. Kendrick: *Productivity trends in the United States*, Princeton University Press, 1961.
- 17 S. Kuznets: *Modern economic growth.* New Haven Yale University Press 1966, p. 491.
- 18 For example, R. Solow: *Technical progress, capital formation and economic growth*, *American Economic Review*, 1962, pp. 76-86.
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