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POPULATION AND MIGRATION FACTORS IN RURAL DEVELOPMENT

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IT is necessary to identify, for convenience of analysis, the main elements in the economics of migration of labour from agriculture to non-agriculture from the point of view of its impact on rural development. In my judgement there are three main elements that should engage our attention: (1) the impact of migration on total agricultural employment; (2) the impact on production; (3) the impact on net productivity per worker in agriculture seen in relation to net productivity per worker in non-agriculture, both of which, as determinants of the level of national income, act and react on each other in the process of economic growth.

The absolute level of employment in agriculture is a function of three variables: (1) natural growth of the agricultural population (X); (2) level of agricultural employment at a point of time (Y); and (3) migration of labour from agriculture (Z). Agricultural employment in the final period will thus be $X + Y - Z$. If $Y = Z$ the level of agricultural employment will remain stationary, a fact which is borne out by empirical evidence. If Y is greater than Z , the level of agricultural employment rises in spite of migration; so does the volume of disguised unemployment, depending upon the effect of migration on the age composition of population. If Y is less than Z , a situation known to appear with the maturity of industrialization, there is an absolute decline in the agricultural population.

The impact of migration on production may be examined, first, in relation to agricultural production. Let us suppose that the potential production of migrants (Z) is P^1 , so that productivity is $P^1/Z = Q$. Where $Y = Z$ or Y is greater than Z and there is no absolute decline in agricultural employment, there can be no decline in total agricultural production due to migration. At the most one can conceive of the declining *rate* of growth of agricultural production under certain assumptions. Indeed, under favourable assumptions regarding the magnitude of Q and the technical transformation of agriculture there may be a rise in the *rate* of rural development.

¹ Read by D. G. Karve.

Let us consider next a more complicated, but realistic, situation. Instead of thinking only in terms of the potential production of migrants in agriculture, let us take into account the level of output of migrants in non-agriculture into which they shift. If we designate this as P^2 productivity would be $P^2/Z = R$. It is the range of difference between R and Q which sets the pace of migration. The productivity of migrants may lie anywhere within this range with Q and R as limiting magnitudes. (1) R and Q , (2) the volume of migration from agriculture to non-agriculture, (3) relative capital accumulation, (4) income formation in both sectors, are inter-dependent variables that are functionally related to the pace and character of economic development in general and rural development in particular.

Several theoretical possibilities present themselves in this context. (a) If the decline in the labour force in agriculture does not cause a fall in agricultural production, marginal productivity in agriculture will be zero. ($Q = 0$). If there is no change in agricultural technique there would be a rise in the number of working days of labour remaining in agriculture after migration. In this case migration would raise the incomes of agricultural workers and the national income by $Z(R-Q)$, or by ZR , Q being equal to zero. Thus national income increases in the same way as when unemployed workers get employed. (b) Assuming that Q is positive, but is *lower* than R , national income will rise, as the result of migration, by the difference between (1) the net value added by the migrants in non-agriculture and (2) the potential net value added in agriculture if migration had not occurred. (c) If the potential product which migrants could have yielded in agriculture (depending upon Q) is equal to what they actually produce in non-agriculture (depending upon R), the given volume of migration has no effect upon the rate of increase of national income. (d) If the former is *greater* than the latter migration retards the growth of national income.

As already said, $(R-Q)$ sets the pace of migration. In real life the volume of migration adapts itself to the varying levels of net productivity of migrant labour or the different values of $(R-Q)$ so long as this is a positive quantity. Migration from agriculture occurs under favourable conditions, on the basis of a favourable value of $(R-Q)$, in a developing economy that has a strong raw material base and a large potential source of food supply, and can thus get over the 'foreign trade barrier', while at the same time it can build up the economic and social overheads of development through massive utilization of the labour power of migrants from agriculture. On the other hand, where conditions are not so favourable and there is scarcity of real capital

(plant and machinery) due to lack of foreign exchange, and even dependence on food imports as economic development gains momentum, excessive migration would be accompanied by low capital formation, a low level of technique, and a low value of R owing to a decline in *real* capital available per head of migrant workers.

Reference may be made, at this point of our analysis, to a fundamental contradiction. Theoretically, migration from agriculture will be conducive to the maximum rise of national income as a whole, but not necessarily rural income, if $Z (R-Q)$ is maximized. Net value added being higher in industry than in agriculture, maximization of $Z (R-Q)$ may be attained by the widest possible differential between R and Q , which may mean the maximum differential between the rate of development of industry and the rate of development of agriculture and a corresponding differential between industrial and agricultural incomes. Such a situation may be sustained by a high rate of migration from agriculture. If R in terms of world prices is high and Q is relatively low, agricultural production may decline or remain unchanged (as in Sweden), with mass migration from agriculture to industry. On the other hand, where developing economies have not reached a stage of industrial maturity, the possibilities of increasing the productivity of labour in agriculture may be greater and a large volume of migration will depress R more than it will raise Q and limit the developmental possibilities of agriculture.

Rural development in the context of migration has next to be visualized against the background of capital accumulation in the economy as a whole and in the agricultural sector. In under-developed economies when labour shifts from agriculture to industry there is a rise in wages which may be greater than the rise in productivity, especially in the case of peasants with very low consumption levels. Indeed, the small increase in productivity may be entirely offset by the rise in wages, so that the rise in capital formation will be less than the rise in productivity. On the other hand, the capital cost of moving labour, in terms of even minimum levels of urban existence, is a drain on limited investible funds available for economic development.

What are the possibilities of capital accumulation in agriculture? With migration, disguised unemployment is partially liquidated. If, at the same time, the increase in money income is smaller than the rise in *per caput* productivity there would be capital accumulation. Assuming that the labour force remaining in agriculture does not increase its consumption level, the portion of the national income consumed by migrants is available for agricultural investment and

rural development which are, so to speak, financed by migration. This, however, does not happen in real life in a rural community which is not subject to external constraints. Thus, the means of consumption released by the liquidation of disguised unemployment may be completely absorbed by the labour force remaining in agriculture. Thus, the marketed surplus of food, particularly speaking, may decline and the import of the means of subsistence needed during the period of construction of the capital base of the economy, as well as imports of other capital goods and intermediate products, become inevitable, because otherwise it is impossible to prevent average real wages from falling, and the dynamism of economic development in general, and of rural development in particular, from being dissipated.

This situation has arisen in many under-developed countries. Factors such as unfavourable terms of tenancy, high pressure of population on the soil, lack of both money capital (credit) and real capital (good seeds, fertilizers, and irrigation), high profits of middlemen and adverse terms of trade between agriculture and industry, have aggravated the situation. Even in countries in which socio-economic handicaps have been swept away by radical measures there is the fundamental limiting factor of lack of investment resources in industry, which restricts absorption of the agrarian surplus population through migration. Limited possibilities of capital accumulation are characteristic of atomized peasant agriculture, irrespective of the social system under which it operates. In such circumstances the orientation of rural development would seem to be in the direction of such selective investment as would increase the intensiveness of agriculture, bring more area under cultivation (leading to migration within agriculture), spread irrigation facilities and crop rotations and practices favouring the application of more labour, &c. Such investments would very largely consist of labour inputs of peasants who are surplus to agriculture but need not migrate to urban areas, if only because urban areas cannot absorb them. Development of domestic industrial production in the countryside would also be an important safety valve in the transitional period. In all such cases of capital formation, however, it is the comparatively low *per caput* earnings which ensure the high effectiveness of investment in agriculture, but on the basis of a low level of technique.

It should be evident from the analysis presented above that the economic significance of migration of labour from the rural areas has to be understood in a relativistic sense. In under-developed countries in which land-man ratio is highly favourable to begin with, migra-

tion occurs in response to the need for settlement of newly developed agricultural areas, apart from the usual migration across settled communities for non-economic reasons. Such migration, however, ebbs out sooner or later. The tide of migration then begins to swell in the initial period of industrialization during which the industrial-cum-commercial revolution is under way. Gradually migration levels off with the maturity of industrialization. On the basis of such empirical generalization the demographer's thesis which finds wide acceptance today is that in the course of economic development, under-developed countries will repeat the past experience of what are now advanced industrial countries. Urbanization, which means modernization of attitudes and of the way of life, is part of the structural changes favouring economic development; and urbanization, if past experience is any guide, would depend largely on population shifts from the rural areas. It does not merely mean the growth of a few big cities, however, while the rest of the country is inadequately urbanized. Empirical experience shows that, as economic development is generally diffused in the entire economy, urbanization becomes a widespread process and requires a large volume of migration from the rural communities. There are certain kinds of economic activity which depend upon a social environment in which population gets locally concentrated at certain nodal points along lines of transportation—a demographic pattern that lowers the unit cost of water, electricity, and oil, and yields other benefits flowing from communication. In an under-developed agricultural economy overheads of development have to be created, but in the process the demographic structure changes on the lines of urbanization. There is an erosion of the traditional rural society, but agriculture and allied industries are modernized, through the widening and deepening of capital, which stimulates rural development.

The demographer's global view of migration as an instrument of economic development appeals to reason, based as it is on empirical experience spanning continents and centuries. However, this thesis should be subject to two reservations. First, rural migration should not be regarded merely as an induced effect of economic development outside agriculture, but as something which *contributes* to economic development in general, and rural development in particular. In other words, the economic significance of migration depends upon the primacy of the rural sector in the economy in terms of even long-run possibilities of economic development. Secondly, economic development has not followed necessarily the same path, because objective conditions have been different in different countries in

different phases of growth at different points of time. What happened in a country with a highly favourable land-man ratio and an adequate supply of capital and skill cannot easily happen within a given time span in a country which has an opposite kind of factor endowment and factor combination.

Such differences in the objective conditions may be briefly, but concretely, illustrated. In U.K. for example, the movement for raising the productivity of agriculture through growth in extension of landed estates, the intensification of the landlord's ownership and amalgamation of farms in the eighteenth century and the evolution of enclosed farms between 1760 and 1860 culminated in vast improvement in agricultural methods and in food production. As the economist M'Culloch said in 1838, while in France two-thirds of the population were employed in agriculture, in England less than one-third sufficed for a much superior system of cultivation. This implied a vast shift of population from agriculture, which was conditioned by, and contributed to, industrial development involving rural development.

In U.S.A. owing to the highly favourable land-man ratio even as late as 1860 rural population was 80 per cent. of the total. Between 1860 and 1920 the percentage dropped to 50. There was another drop of 9 per cent. during the next thirty years. Despite the steady drain of farm workers, agriculture contributed more to the national income than any other sector until about 1890 after which manufacture predominated. American experience shows the following: (1) a steady increase in the number and spread of small towns; (2) export of farm surplus to pay for imports of capital goods needed for development; (3) settlement and cultivation of a large land mass leading to a large demand for labour, equipment, and tools and stimulating a phenomenal increase in population; (4) a favourable land-man ratio despite this increase: an increase in the density of population per square mile from only 10.6 in 1860 to 51 in 1950 (compared with U.K.'s 530 per square mile and 195 even for France); (5) a steady rise in the technological level of agriculture and a rise in productivity per acre and per man; (6) in spite of this a sufficiently wide gap between agricultural and industrial productivity, reflected in the gap in *per caput* income levels; (7) 'employment in agriculture could fall by at least a quarter—perhaps a third—before output declined' (D. Gale Johnson in *Population Theory and Policy*, p. 488); (8) the difficulty of absorbing the agrarian surplus population in non-agriculture, side by side with the difficulty of raising the level of technology in agriculture (in the South) because of this surplus.

Japanese experience has peculiarities which are relevant to the densely populated Asian countries with a highly unfavourable land-man ratio. During the recent period of remarkable industrialization (1920-40) the agricultural population of Japan remained practically stationary. In the first ten years 80 per cent. of the population increase was absorbed in the tertiary sector; in the next decade 86 per cent. migrated to secondary industry. The cultivated area and the number of farm families remained stationary. Two characteristics would seem to mark the contrast between the Japanese and the western experience: (1) remarkable expansion of the *services* sector to absorb migrants, and the relatively high share of *tertiary* employment in relation to *secondary* employment; (2) industrialization not being accompanied by a decrease in the agricultural population or the number of farm families, as in western countries. There is also another distinguishing characteristic, viz., the persistence of the traditional family farm with socio-economic features commonly found in the developing countries of Asia, Africa, and Latin America, such as the following: (1) absence of hired labourers; (2) combination of farm and household; (3) non-existence of labour in the modern economic sense; (4) low socio-economic status of women in conspicuously rural villages; (5) lack of market orientation of production; (6) monotonous and unbalanced diets on small family farms; (7) the farm family bearing the burden of maintaining and educating its youth up to the productive age and retaining less than half as its successors, thus contributing to industrial development.

It is a matter for consideration whether it is the Japanese type of experience that is likely to be repeated in developing countries passing through the phase of industrialization. In some of these countries, which have a highly favourable land-man ratio, migration for occupying empty spaces and building up the overheads of economic development will stimulate rural development that will be characterized by expansion of employment and productivity in agriculture as well as the services sector supporting the *infra-structure*, subject, of course, to the limitation of the foreign trade barrier and the rate of capital accumulation. Countries which are already densely populated will share a similar experience except that, in view of the high population pressure, the necessity for the development of secondary industry will be more urgent, as in the case of Japan. To the extent to which rural exodus is limited by the slow expansion of the tertiary and secondary sectors of the economy, adjustment of the increasing population to agricultural productivity will reveal interesting trends, such as increasing reliance on heavy-yielding crops and crops

requiring more labour, and on labour-intensive crop rotations and agricultural practices, depending upon the scale of investment in the supply of irrigation and fertilizers, among other things. One interesting aspect of migration may be stressed in this context. In industrializing economies with a traditional agricultural sector, migration from the villages tends to be *partial* and *incomplete* to a considerable extent, either because the gap between Q and R is too narrow, or because adaptation to urbanization is a slow process. Thus there are farms which may be classified as a supplementary source of income. They are smaller than other farms, are primarily or exclusively meant for supplying directly the needs of the family, and their ties with agriculture are loose. On the other hand, there are farms in respect of which non-agricultural earnings are only a supplementary source of income. Possibilities of migration from agriculture to non-agriculture lead to a process of polarization. Small farms become medium-sized through investment of non-agricultural earnings or may be reduced to the level of 'allotment' holdings. In either case the situation may favour rural development in the long run. Complete migration, if it is large in volume, may, indeed, turn out to be a factor retarding agricultural development, as contemporary experience in eastern European countries clearly shows. In these countries people who remain in the villages are mostly the middle-aged and old people (Czechoslovakia finds it increasingly difficult to keep anyone under fifty in a village) who cannot work hard and fast enough and are suspicious and afraid of using machines such as large tractors, multiple harrows, and automatic potato-lifters.

C. LEMELIN, *Laval University, Canada*

Professor Ganguli's paper contains many challenging viewpoints on the general problem of population and migration as it effects the pace of rural development. Implicit in this analysis is a definite philosophy of the rural sector of a developing economy. I suggest that the following is a fair summary of his argument.

In the first section he studies migration with reference to the economic variables of orthodox economic theory. This is an occasion for discussing migration in its relation to employment, national income, prices, productivity, terms of trade, &c., and all the usual variables of micro- and macro-economic analysis.

In his second section he challenges a thesis which, he thinks, represents the view of too many demographers. His discussion on this point is the occasion for a brief reference to historical cases of economic development: England, the United States, Japan, &c.

Let us review in more detail this second section in which he states that the demographer's thesis which finds wide acceptance today is that in the course of economic development under-developed countries will repeat the past experience of what are now advanced industrial countries. This thesis would be based on a sort of dynamics of migration: first, migration within agriculture; second, settling on new arable land; third, emigration from agriculture. Only the latter trend would be directly due to the stimulus of industrialization (as opposed to urbanization), but the impact of industrialization on rural migration would decrease in intensity when the degree of industrialization is high.

Professor Ganguli thinks that the key factors are, first, a change in personal attitude, hence migration from agriculture, and second, rural development and urbanization; then, only afterwards, full fledged industrialization. He formulates two criticisms against the demographer's thesis, one based on his analysis, the other by reference to history. 'Migration', he says, 'is not only induced by industrialization but stimulates development.' This is done by successive stages, as explained above, and all three stages are important. Economic development in the past was a function of factor combination, especially the ratio of men to land, and factor endowment, especially abundance of skill and capital. Concerning the case of industrialization in England, the process of enclosure is stressed as an important concomitant of the industrial revolution and the vast shift of population from agriculture into the industrial cities.

Whenever reference is made to enclosure in England, I cannot avoid remembering the name of J. L. Hammond and his social studies: *The Village Labourer*, *The Town Labourer*, *The Skilled Labourer*, *The Rise of Modern Industry*. The sharp criticisms contained in these social studies, and even the sequence itself of these titles, give support to Professor Ganguli's thesis that adaptation to economic development must be gradual. On the other hand, I cannot avoid thinking that the industrial revolution in England in the eighteenth century was possible only because of a special international conjuncture. Without the commercial imperialism of England and the opening of the West of the American Continent, I doubt if England would have been able to achieve the rank of the first industrial power in the nineteenth century. I think enclosure and increased domestic agricultural efficiency and favourable external economies, especially imports of foods from America, have all been necessary conditions of economic progress in England.

Professor Ganguli summarizes very well the characteristic features of the development of the United States of America. First, a large supply of land causing a large demand for labour and equipment, the latter in turn tending to increase population; second, the appearance of many small towns; third, exportable farm surpluses; fourth, progress in agricultural technology; and fifth, a still greater advance in industrial technology. Except in some areas of the South still today considered under-developed, and which would deserve a special analysis, this combination of features explains the tremendous dynamic development of the country. Considering that this list of characteristics of the United States's development is definitely realistic and conforms to historical facts, I would say that it is an eloquent confirmation of his thesis of diversified and progressive development. However, the time span covered by the history of the economic development of the United States is such that one is not certain that within the relatively short time during which the leaders of the under-developed countries of the present time want to attain their objective the same conditions would achieve the same results. In other words, a theory which is confirmed along a long stretch of history is not necessarily valid within a relatively short time.

I would stress also the importance of the exportable farm surpluses. Today, keen competition on the international market is a situation that did not exist when the industrial revolution of England and the expansion of the United States towards the West were, in a sense, two complementary features of a world-wide phenomenon of development. On the other hand, I hasten to add that the present difficulties of exporting may contribute to setting the pace of development of under-developed countries at a level which will insure gradual progress and diversified development. Such a modality of development cannot be rejected lightly unless one is sure that it may mean, in practice, stagnation.

For the case of Japan, Professor Ganguli refers to the first period of industrialization, from 1920 to 1940. In the first decade, he notes, 80 per cent. of the total population increase was employed in the tertiary sector. It is only in the second decade that the rate of increase in employment in the secondary sector prevailed. The rate of growth of the population was sufficient to insure stability of the number of people remaining in agriculture despite large migrations into the non-agricultural sectors. He notes, as a counterpoint, the persistence of the traditional family farm with certain undesirable features, in particular inadequate diets, the low status of women, and the lack of a proper attitude *vis-à-vis* the market. Such features may retard the

changes which are associated with a genuine and decisive economic development, whatever the pace chosen to achieve the end.

In conclusion, Professor Ganguli reasserts his thesis emphasizing gradual changes and diversified evolution. However, I doubt whether he is right in the particular remark he makes at this point, that part-time farming may be a sound transition between traditional farming and living in cities. It is true that the part-time farmer may inject part of his non-agricultural income to improve his farm's productivity. Or he may supplement his non-farm income, and, hence, his welfare, through the use of his farm output. However, experience in the areas of marginal farming in my country indicates that over the long period, on such a type of part-time farming, there is a gradual deterioration of the condition that would make such an undertaking profitable. I would rather have a rural household system with gardens than part-time farming, which is too much of a hybrid between genuine full-time farming and rural residence.

I agree that large migrations primarily involving young people may deprive the village of an appropriate manpower base for a sound agricultural programme. In this respect, however, not only should we recommend gradual migration, but also a conscious policy providing a minimum of education both for those leaving the village and for those staying in agriculture. For the latter group, it may be necessary to provide special incentives as a counterpart for the mirage of good living and high income in the city.

I should like now to discuss the first section of Professor Ganguli's paper. 'In my judgement', he writes, 'there are three main elements that should engage our attention: (1) the impact of migration on total agricultural employment; (2) the impact on production; (3) the impact on net productivity per worker in agriculture seen in relation to net productivity per worker in non-agriculture, both of which, as determinants of the level of national income, act and react on each other in the process of economic growth.' Although this is not stated explicitly, this statement amounts to adopting a dynamic model of reasoning, using finite difference equations, and involving especially the difference between the average—or perhaps the marginal—productivity per worker in agriculture and the productivity per worker in non-agricultural activities in relation to finite changes in national income. In fact, Professor Ganguli in the subsequent development uses only definitional equations involving variables which are not always clearly defined. I think that these equations were used consistently.

For example, to use the most simplified case, employment in

agriculture at the end of a period, say Y , is equal to Y_0 , the employment at the beginning of the period, plus X , the number of people resulting from the natural growth of population, minus Z , the number of migrants out of agriculture. If Z equals X , says Professor Ganguli, Y equals Y_0 . This, I say, is being consistent with a definitional equation. However, a procedure of that sort, even when it is applied to more complicated cases, fails to give me confidence that the economic content of the conclusions is relevant and hence that the conclusions themselves are reliable for the purposes of an economist.

I think that most of the economic conclusions of the first section of Professor Ganguli's paper can be obtained in a more relevant and systematic way by using a simple model of comparative static analysis, provided that the postulates inherent in the model are properly examined, bearing in mind the particular problem with which one is concerned. In the present case, the problems involved are the process of migration from the agricultural sector into the non-agricultural sector of the economy and the impact of this variable on the other economic variables within a developing country.

K. A. ARISTANBEKOV, *Ministry of Agriculture, Khazakstan, U.S.S.R.*

The problem of population and migration factors and their influence on the development of agriculture is of great importance for a number of countries, though it is being solved differently in each particular country. For instance, in the Soviet Union, there are certain Republics and regions with considerable density of population where, owing to technical progress and the industrialization of agricultural production processes, we have an excess of labour. This labour is being absorbed both by the developing industry of these regions, and through intensification of agriculture. At the same time, part of the excess labour force is used for the development of agriculture in sparsely populated regions.

Until ten years ago, one of such sparsely populated regions with rapidly developing agriculture was the Republic of Khazakstan, where density of population was one tenth of that in the Western regions of the U.S.S.R. To give a more vivid picture, it is enough to say that in Khazakstan there are about seven collective or state farmers per thousand hectares, compared with an average of fifty over the whole Soviet Union.

Attracting labour from densely populated areas, and with the heroic help of hundreds of thousands of young people who voluntarily go to cultivate long-fallow lands in response to the call of the

Government, Khazakstan during recent years has been able not only to increase industrial output but also to cultivate an additional 28 million hectares. During the last decade, the cultivated areas in the Republic increased 3.4 times and, in 1963, reached the figure of 32.6 million hectares compared with 9.6 million hectares in 1953. Newly cultivated lands in Khazakstan yielded to the State this year more than 17 million tons of commercial grain. This is but one example showing the influence which the planned migration of agricultural population exercises on the development of agriculture.

OTTO SCHILLER, *University of Heidelberg, Germany*

Professor Ganguli rightly stressed the different forms of the migration process in the various countries according to their subjective conditions. He quoted Western industrialized countries and Japan as examples for his thesis, from which India again will differ. Some Indian experts are of the opinion that in view of the increasing industrialization of India, the rural migration will not be large enough to cover industry's demand for manpower unless the present agrarian structure, with its personal tie of the majority of the rural people to a certain piece of land, is changed radically. This is one of the arguments in favour of a planned change in agricultural structure which will effect the transition towards co-operative farming. In this way the peasants' ties to a certain piece of land will be abolished, or at least reduced, even if there is a formal right of the members to land ownership.

Experiences in the Western industrialized countries, where the labour demand of a rapidly progressing industry was covered easily by rural exodus without involving similar changes in the agrarian structure, seem to contradict the opinion of the Indian experts. We have to be careful, however, in drawing such conclusions, bearing in mind the Gangulian thesis on the different subjective conditions. That thesis, by the way, is valid also for judging labour productivity, as discussed in the first two papers of this Conference.

Professor Ganguli quoted the example of the United States, where the share of the rural population in the total population has decreased from 80 per cent. to 9 per cent. during the last hundred years. The present share of India's rural population is said to be 70 per cent., i.e. 320 million out of 450 million people are employed in agriculture. If this proportion could be reduced to 50 per cent. and 100 million fewer people be employed in agriculture, I believe that the present agricultural production would remain just the same, even without any improvement in the backward production techniques. I would

say, therefore, that it is wrong to compare the labour productivity of two countries which are in different phases of demographic development. Low labour productivity or disguised unemployment in overpopulated rural regions is not only the outcome of backward techniques but also the natural consequence of the actual demographic phase of development. An increase of labour productivity can be achieved not by simply raising the level of production techniques, but only by a continuous increase in the migration process. This, however, is also a question of time.

K. OHKAWA, *Hitotsubashi University, Tokyo, Japan*

Professor Ganguli's comments on the characteristics of Japanese experience compared with so-called Western experience seem to me misleading. First, Japanese developments should be understood in the long-term historical setting rather than in relation to a peculiar limited period of 1920-40. The period from the World War I to the end of the 1930's was a very unsettled period not only in Japan but also in other countries. The problem which we are discussing now appeared in a peculiar form during this period, which would differ from its long-term appearance. From this point of view I would say that the two peculiarities he mentions are inadequate. He mentions, first, that Japan's agricultural labour force was maintained more or less unchanged, and second, that the service sector is much more important than the industrial sector. It is true that the service sector absorbed mainly the migrated people, especially during the ten years after the war. But this was peculiar to that period. In the post-war years, manufacturing and other non-agricultural sectors, other than the service sector, absorbed many agricultural workers and its speed was rapid. The average rate of decrease in the numbers engaged in agriculture is 2 to 3 per cent. per annum. So this again substantiates my first point that even in Japan's experience the number of persons engaged in agriculture would decrease. My points are two. First, the historical phase is different in Japan from Western experience because the time of inaugurating modern economic growth came several decades later. It is quite natural to expect that the beginning of the decrease in the average numbers engaged in agriculture would come 3 to 4 decades later. Secondly, with regard to labour demand, the peculiarities of Japan's experience may be found, not in the tertiary sector, but in a very labour-intensive technology combined with small-scale establishments in industry and services. My conclusion about the conceptual framework in which we have to observe

this problem, is, first we should establish a broad universal tendency in the world common both to West and East; and, secondly, within this trend it may be possible to find out the peculiarities pertaining to Asian experience which would differ from Western experience.

M. UPTON, *University of Ibadan, Nigeria*

I would like to refer to Professor Ganguli's statement that even in countries in which socio-economic handicaps have been swept away by radical measures there is the fundamental limiting factor of lack of investment resources in industry, which restricts absorption of the surplus agrarian population through migration. He says later that in such circumstances, the orientation of rural development would seem to be in the direction of such selective investments as would increase the intensiveness of agriculture. 'Such investments', he says, 'would very largely consist of labour inputs of peasants who are surplus to agriculture.' Is there not a danger in this suggestion? If the demand for agricultural products does not expand as fast as agricultural production has expanded, is there not a danger that agricultural incomes will, in fact, fall?

MIRZA A. A. BEG, *Sind University, Hyderabad, Pakistan*

In the under-developed countries, the opportunities of employment, investment, and further expansion are concentrated in only a few locations. Even the means of transport and communications are concentrated only in and around the metropolitan centres. This has resulted in the emergence of *primate* cities in the under-developed countries, and aggravates the problem of *dualism*, leading to the dispersion of a number of viable regions in the economy. Since there are no intervening opportunities, the emigrants proceed straight to the few metropolitan centres of concentrated growth. Professor Ganguli is of the opinion that, as economic development is generally diffused throughout the entire economy, urbanization becomes a widespread process. But the experience of the under-developed countries goes to show that, instead of *generative* cities, they have only *parasitic* cities which hinder rather than help the diffusion of urbanization. It appears imperative, therefore, that the under-developed countries should not wait for the ultimate time-consuming diffusion of the effects of urbanization, but select a few smaller, but developing, towns or larger villages, strategically located, and re-inforce these growth points to bring a larger area within the orbit of development. In this way, the tide of emigration would be stemmed, and areas now devoid of

opportunities, and supposed to be a drag on the state or national economy, would not only be reactivated, but would provide the prop and much needed reinforcement to the larger economy.

U. A. AZIZ, *University of Malaya, Kuala Lumpur, Malaysia*

The title of this paper gives me courage to mention two factors which seem to have been overlooked in relation to Asia and perhaps Africa. The title is population and migration factors in rural development. I would suggest that two factors of some interest within a particular country are seasonal migration and casual migration. In many of the South-east Asian countries following the harvest, and also between the fishing which is monsoonal and agricultural work, there is very considerable internal migration. We could call this seasonal migration. The other, which off the cuff I have termed casual migration, is the situation where one has people less accustomed to the use of money who come to work for a specific sum in order to buy some goods or to pay taxes. When they have earned that sum they go back to their normal life. Why are these two types of migration important in rural development? In the first place, I think they affect our estimates of the numbers involved in under-employment. They also affect our estimates of labour productivity, and our understanding of census data. Most important, these two forms of migration, casual and seasonal, generate a momentum which may lead ultimately to permanent migration. That is, some of these people stay on in situations to which they have migrated. So I think, if we are going to use migration as an instrument for rural development, then it should have, built into its mechanism, controls to deal with these two factors.

M. PAGELLA, *University of Turin, Italy*

Professor Ganguli has explained, from a general point of view, the main problems raised in his report. He has considered migration out of agriculture towards other productive sectors, as a function of the exchange between the productivity of the workers moving from agriculture towards new sectors of activity, and the potential productivity of these workers while in the agricultural sector. This is true from a general point of view but, in a more limited sense, it appears much more complex, at least in certain conditions. In this sense, we could say that migration is, in general, the consequence of an exchange between the two forms of production which I have mentioned, while the rhythm of migration, and its effects on the

economic and rural development, vary owing to many other factors. Factors which help to determine the rhythm of migration, and its effects, will obviously be different in different countries and in different situations. They are concerned either with the characteristics of the development in non-agricultural sectors, mainly of the secondary sector, or with the socio-economical characteristics of agriculture.

This is not the place to give a complete list of all the relevant factors, but I would mention here some of the more important which I have been able to observe in Italy, a country which has been, and still is, characterized by a very remarkable and rapid rural exodus. I would remind you of the characteristics and needs, in general, of the industrial sector, the state of industrial production, the distance between industrial establishments and agricultural villages, the presence or creation of certain kinds of structure inside the country, for instance, we can see that the creation of new roads in mountain areas has considerably accelerated the rhythm of migration in these zones. Then, one can mention the agricultural structure in general, the existence or absence of fragmentation of the land; the level of instruction of the rural population, its average age, its natural growth, &c.

Finally, I would recall the particular importance of the effects produced by these factors among the different regions of the same country. If the industrial development only concerns certain regions of the country, and if the industrial position is centralized, we should probably find an unbalanced economic and rural development. Effectively, there will be a remarkable rural exodus out of regions undergoing industrial development, even if agricultural productivity is not very low. This generally can stimulate a further increase of agricultural productivity in these regions. Migration towards the industrial sector will affect the more distant regions considerably, only much later, even if agricultural productivity is very low, or if there is very much concealed unemployment. Consequently, we may observe more and more important exchanges between the agricultural productivity of industrialized countries, and the agricultural productivity of other regions. Also, there is a possibility of creating a different rhythm of rural development among the different agricultural zones of industrialized regions, because the small family farm often meets with difficulties of adaptation in the face of new conditions brought about by the rural exodus, and because of the constraints of the land structure, and by the fall in the quality of the agricultural population. Some agricultural zones of industrialized

regions, characterized by small farms, in which part-time farming cannot develop itself, may sometimes slow down or stop the rhythm of agricultural development. All this can considerably influence the general rhythm of the rural development of a country.

L. P. F. SMITH, *University College, Dublin, Ireland*

I have two brief points. First, the destination of migration is important in considering its effect on demand. If they travel far, the migrants will not buy food from the area they leave. This may be due to cost of transport or, if migration becomes emigration to another country, to agricultural protection. From the point of view of those staying on the home farms, the migrant has ceased to eat. A surplus of food may be developed without a market so equilibrium is not reached for the area, though the migrant may be better off. This is the extreme case. These changes bring, more usually, a change in the products demanded from the farm of origin. Adjustment to this change in demand may pose many problems, for example, in relation to age of population or provision capital.

Second, a point touched on in the paper, the capital which migrates with the people who leave the farm poses a real problem in agricultural adjustment. This is more apparent where the migrant becomes an emigrant to another country and, therefore, to a different tax area.

A. S. KAHLON, *Punjab Agricultural University, Ludkiana, Punjab, India*

I enjoyed Professor Ganguli's paper, but I missed a very pertinent variable in his model, which I think would partly explain meagre shifts of population from agriculture to other industries in the less-developed countries of the world. The level of skill of our farming population does not reach the level of skills required in managerial ability for jobs in the secondary and tertiary sectors or provide the needed background experience and degree of adaptability. This will not help our farming population to migrate to those industries where different types and levels of skill and background experience are needed. It is my observation that in all those areas where industrial units have been set up, such farm population as has sought employment consists mostly of those who have been pushed out rather than pulled out of agriculture. It is my considered view that we have to set up some kind of organization which will improve the level of skill in rural areas to the point where the rural population can find more gainful employment in industry, and where those who continue on the land can further increase agricultural productivity. This

would create a climate where we can pull more people out of agriculture rather than trying to push them out. Probably one of the key variables that would contribute very largely to the migration of rural population into more gainful employment in the industrial sector is very much conditioned by the kind of skills and technology we can provide to our farming population through well-developed training programmes. We need to focus attention on this facet of the problem in our future development programmes.

JAN TAUBER, *Institute of Agricultural Economics, Prague, Czechoslovakia*

I was rather surprised at Professor Ganguli's remark that the middle-aged and elderly Czechoslovakian farmers cannot work hard and fast enough and are suspicious and afraid of using machines. If the farmers are old, I think they are eagerly looking forward to efficient machines, and they are very glad when the machines arrive because they make the work easier. Czechoslovakian agriculture, however, is amongst the most mechanized; and Czechoslovakian farmers have been technically minded for many decades, long before collectivization. They do not regard machines with suspicion but with satisfaction, and wish to have many more as soon as possible. Also, I do not know why Czechoslovakia alone was chosen as providing an example of over-aged farmers, because there are many Western countries where the average age of farmers is even higher. However, the average age is not 50 years, as Professor Ganguli says, but 47 (in co-operative farms). In Czechoslovakia thousands of young specialists are coming from the universities and from all kinds of agricultural schools to serve the collective and state farms, not only changing favourably the social structure of our villages and farms but giving a new youthful character, and providing new possibilities for further advances, in our socialist agriculture.

KARL BRANDT, *Stanford University, California, U.S.A.*

Although I like the tenor of Professor Ganguli's paper I do not accept the relevance of the mathematical models he has presented. There is a good deal of wisdom in the paper, but I would advise against acceptance of the 'land-man ratio' as a valid economic concept. It was one of the early contributions of American economic geographers, but in the last twenty years nobody in the United States has talked seriously about it. This is because in spite of the abundance of land we still have, American agriculture has followed a course contrary to the supposed economic requirements of a wide

land-man ratio and in opposition to the economic theory which claims that under such circumstances extensive farming is more profitable. American farmers have intensified cultivation and reduced acreage to an extent that challenges the economic sense of this theory. The farmers were right in their decision to cultivate fewer acres more intensively rather than more acres less intensively because they changed the mixture of costs towards less fixed and more variable costs, or towards lower costs per unit of output. This is a sound general economic principle. Therefore, the farmers have done precisely the right thing irrespective of acreage allotments and supported prices. The moment land begins to have an exchange value and there is a substantial amount of 'landlord's capital' which carries taxes, farm management requires that the large proportion of fixed costs in unit costs be reduced by adding more variable costs. Often by adding more variable costs for fertilizer, irrigation, and other inputs a better income results. For this reason, therefore, I regard the land-man ratio as one of the theories applying only to the early pioneer period.

I offer a critical comment on another point: I believe our speaker would have made a more fortunate distinction if instead of speaking of 'migration' he had spoken of mobility, i.e. professional mobility—mobility of crafts, activity, or profession—and thus had left open the question as to where this process takes place and whether this involves large-scale geographical migration or adjustments within a region. With a healthy rate of industrialization you can have in rural areas without migration a decisive degree of division of labour resulting in increasing professional mobility.

In the whole concept of agricultural history we seem to have forgotten that agriculture originally was and in many parts of the world still is *the* industry of all industries and comprises the industry of transportation, the industry of construction, and the industry that builds real estate capital and production again into capital. This is still true even in the most advanced industrial economy of the United States. If today in California, which is now first in industrial and agricultural exports among the fifty states of the Union, we were to close down our farms, at least 65 per cent. of the economy of the State would fold up. We include now in our gross national product the incomes of the large fertilizer, insecticide, pesticide, and motor-fuel industries and the income of all auxiliary services for agriculture, including transportation, banking, and insurance trades. Hence we commit an absurd conceptual economic error if we say we have reduced the nation's economic effort for food, feed, and fibres from

80 or 90 per cent. to 7 or 8 per cent. We have today many more people in agriculture camouflaged in our industrial economy, just as we originally had the industries under camouflage in agriculture. Therefore, we should perhaps adjust our models and measures to the realities of the past and present.

Furthermore, there is a totally new situation in the world that nobody anticipated thirty years ago. Not only the demographers but the economic geographers of the thirties were painfully wrong in their predictions. We have today such a mobility of sources of energy that even in the tropical jungle of Malaya it is not profitable to make charcoal from the abundance of wood because petroleum and bottled natural gas make heat or mechanical energy available at lower costs to the farm community than charcoal. Today in nearly all parts of the world we have an entirely new situation concerning the location of industries and agriculture. Costs of transportation are declining. This makes industrialization possible in agricultural regions. While with all the centralized planning and industrialization in metropolitan areas there are thousands of *nouveaux riches*, there are millions of *nouveaux pauvres*. Hence we have to consider where new economic mobility takes place and what it does to the rural communities. It can go at such pace that it creates an enormous amount of needless suffering among the rural population.

Even with the greatest possible development of industry at and near metropolitan centres, for the next generation more than half of the world will still be in agriculture. Therefore, we should adjust our conceptual framework about what can be done to increase the level of real income of rural people. May I remind our friends from developing countries that in the United States during the first half of the last century agriculture not only showed more than 3 per cent. growth of G.N.P. per year but formed an enormous amount of capital which is not shown in economic statistics. This grievous omission derives from the fact that if one measures only annual output sold one ignores the rise in the equity capital of real estate wealth, which is a most vital part of the rising productive wealth of a nation. As the farmers, many of them illiterate, pushed the frontier across the American continent they were engaged in the most gigantic capital-formation process of history. They built cottages and barns, cleared land, built roads, bridges, wells, fences, and windmills.

From this I conclude that Professor Ganguli's paper can stand some amendments of a conceptual type.