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ELEVENTH INTERNATIONAL CONFERENCE OF AGRICULTURAL ECONOMISTS

A REVIEW

V. M. JAKHADE

The Eleventh International Conference of Agricultural Economists was held at Cuernavaca, Mexico, from 20th to 30th August 1961. As many as 67 countries were represented. The number of participants totalled about 560. The Indian delegation included Prof. D. G. Karve, Dr. S. R. Sen and Mr. V. M. Jakhade. The main theme of the Conference was "The role of agriculture in economic development". On the various aspects of the subject 24 papers were read. The reading of each paper was followed by discussions in the general session. In addition, twelve working groups were formed which discussed the various selected topics, in an intensive manner. In the following pages an attempt is made to give a gist of the papers read as also the reports of the working groups.

Mr. Julian Rodriguez Adame, Secretary of Agriculture and Cattle-breeding of Mexico, welcomed the delegates to the Conference. Dr. Sherman E. Johnson in his presidential address dealt with the role of agriculture in economic development and the welfare of farm people, with particular reference to the less developed countries. He stated that a world view of the present agricultural scene presented a double paradox. In many of the subsistence farming areas, despite great physical potentialities for increasing food production, there is shortage of food. On the other hand, in the commercialised farming areas, the incomes of farm people are depressed by supplies being in excess of available markets. Although some temporary relief for food shortage areas can be provided from the abundant production of commercial farming areas, the long-term solution must be sought through expansion of food production within most of the countries that are faced with shortages. In many countries, the struggle for enough food is aggravated by the rapid growth of population.

As changes are inevitable, if we prefer orderly reform, he stated, we must be willing to remove the obstacles to increased output as well as those that prevent more equitable sharing of the fruits of progress. The hopeful prospect for orderly reform is the assurance that temporary income sacrifices and payment of higher taxes will produce sufficient increases in output to make it possible for all citizens to receive higher incomes. Even those who are prosperous under existing conditions will benefit from orderly reform that promotes economic growth.

Discussing the approach to economic development, from the standpoint of the potential role of agriculture and with regard for the welfare of farm people, he said that adequate supplies of food and other farm products are essential to rapid economic development in any country. Plentiful food supplies are essential for high worker productivity and low cost industrial production. In most of the less developed countries, because of scarcity of foreign exchange, increased food demands will need to be met largely by expanding domestic food production. Early expansion of food production is necessary to meet the increased demands for food that will be generated by the higher worker incomes resulting from the construction phase of industrial and service development, in order to restrain inflationary tendencies. As workers are human beings and as human life is precious, there

is no moral justification for callousness about 'plowing under' a generation or more of farm people in order to achieve faster economic growth. Economic growth should be achieved not by further submerging the disadvantaged groups in agriculture but rather by increasing their opportunities for productive work, either in agriculture or in other occupations. This will help them to contribute to expansion of national output.

Adoption of improved technology requires additional investment in capital goods; but even more important, it requires investment in people who must learn new technical and management skills. In order to get development programme started with sufficient man-power capable of planning, managing and carrying out new enterprises and adopting new techniques, it is necessary to start intensive temporary training courses. Alongside a universal system of public education, development of research should be promoted. In order to avoid the potential conflict between the needed investment for output expansion and the pressure for more equitable sharing of the national product, he advocated that public works programmes with high marginal productivity of capital or short gestation period for increasing food production should be undertaken to provide initial employment to all able-bodied people. Alongside institutional arrangements will need to be made for encouraging voluntary savings, providing more equitable taxation and thus channelling part of the larger income into private or public investment for continued expansion. The technical and financial aid from outside, according to him, serves the purpose of a catalytic agent only and is not a substitute for mobilisation of domestic savings. Suitable land tenure reforms also need to be undertaken so as to provide independent farming opportunities to rural people. If by these measures the obstacles to progress are removed, he asserted, agriculture can become the generating force in economic development. But for realising the ultimate goal of human welfare, he emphasised the need to develop institutions that provide education, health and other social services to rural people. The process of accelerated economic development requires careful advance planning, as well as co-ordination in execution. The participation of all citizens in this effort can be secured by an assurance of eventual sharing in the fruits of progress. On this basis, patriotism and pride in achievement can become strong motivating force. But the need for temporary financial sacrifices should be emphasised.

Discussing the measures for closing the gap between the present and potential output, in the context of the shortages of management and technical skills and capital, he stated that the food expansion programme will need to be planned to make the most effective use of these resources in combination with abundant supplies of unskilled labour. Although in some less developed countries, there is scope for extension of cultivation, scarcity of management and capital may virtually close this route to expansion of food production in the early stages of development unless it is a part of a multi-purpose development programme or can be developed largely by hand labour methods. Thus the solution lies in increasing intensity of cultivation on the lands under cultivation. For this purpose he advocated the 'package programme' approach, under which farm production plans are prepared by adoption of a combination of improvements. The success of this approach will depend on the assurance to the tillers that they will benefit in better living. It will also need inducing a small group of farmers to adopt the new approach and thereby demonstrate its benefits to the rural people. This should be backed up by an adequate organisation for production, supply and distribution of farm pre-requisites, production credit on the basis of potential production and income from the improved farm plan to the majority of small operators, some methods of crop and price insurance and better facilities for transporting, storage and marketing of the increased output.

Referring to the plantation economics, he said that the farm labourers are generally paid subsistence wages. For improvement of their living conditions, consideration might be given to requirements for payment of a minimum wage, provision of minimum housing, a plot of land or a garden, access to health services and an opportunity for the education of children. According to him, the other obligations would be met by the operators of large farms in preference to imposition of land ceilings.

Discussing the problem of sub-division and fragmentation of landholdings in the densely populated areas, he said that eventually substantial income improvement for the landless workers and small farmers will need to be sought in non-farm employment. Until such opportunities are available, however, it will be necessary to provide as productive employment as possible in agriculture. In this context he referred to co-operative farming. According to him, this may remove the incentive of individual attention by the operator to his parcel of land and to his animals. Further, mechanization which follows large scale farming, will not enhance national welfare because the abundant labour will remain unemployed. Moreover, a programme of supervised credit may provide assistance in development of technical and management skills.

It has been observed that in most countries the portion of the benefits from improved technology that have been retained by farm people have flowed chiefly to the farm operator group and within that group, largely to those who have had adequate financial resources to invest in new technology. Much greater effort must be concentrated on ways of alleviating conditions of the farm operator groups which frequently are disadvantaged by improvements in technology and on improvements of conditions for the hired farm workers who still lack adequate bargaining ability. Agricultural economists have a responsibility in this behalf.

The Concept of Economic Growth

The discussion on the main theme of the Conference started with reading of the paper on 'the concept of economic growth' by Prof. Ingvar Svennilson of the University of Stockholm. In this paper he begins his analysis by drawing attention to the confusion often created by technical indices of growth constructed by economists. These indices are hardly a fuller reflection of the content of economic growth. Even supposing that production indices are accepted as the yardsticks for measuring economic growth, there is a wide variety of choice. For instance, in the Soviet estimates most services are not included. Such an attitude reflects a technocratic attitude to the concept of growth or a smaller concern for the well-being of the consumer. How important this exclusion could be is indicated by the fact that more than one-half of the national product of the United States is constituted of services. It is not that these indices could not be made comparable by their exclusion from or inclusion of services in the Soviet or American estimates respectively; but the arbitrariness of the standard by which we measure growth becomes evident. Similarly, index numbers are constructed by using a system of fixed price weights and these weights reflect the value attributed to various goods and services. If we accept the prices established in the market, this would mean that the inter-play of market forces as an expression of our political evaluations is also accepted. For instance, in the course of economic growth, labour becomes relatively more expensive and consequently the relative prices of labour-intensive goods and services tend to rise. Should this relative rise also be included in our concept of growth? Or, should we adjust the price weights from year to year? These questions are posed to indicate the arbitrariness of index numbers and the risk of accepting them without a critical evaluation as reflecting the policy concept of growth.

It should be noted that the politician's interest in growth extends much beyond what is conventionally included in national accounting. Of course, it may be possible to extend this area by including, for instance, a part of auto-consumption, as in the case of the farmer who consumes a part of the production on his farm instead of marketing it. However, such extension has serious limitations. Beyond this field of national accounts, there exists the world of "do-it-yourself" and leisure. In the agrarian societies there are large-scale activities in the form of "do-it-yourself" and auto-consumption, which are not registered as production or consumption in national accounts. Hence, the national product estimates cannot be used to represent standards of living or even productivity. Such activities as small-scale gardening, home handicraft work, hunting and fishing for home consumption, must be taken into account, if we want to explain, how despite a very small registered national output per head, people continue to maintain themselves. Even in advanced countries, the "do-it-yourself" activities continue to be significant. Pre-fabrication of clothes and food makes progress even in the most advanced countries. With rising standards of living a rising demand for more leisure also ensues. This leisure is filled in with non-commercial activities. In a consumption-centred economy, this side of growth attracts growing attention and expenditure on purposes like education, cultural and artistic institutions and sports, etc., is on the increase. Expenditure on town and country planning is partly motivated by a desire to create a milieu that enriches life outside the workshop and the office. While investment on such activities is registered in national accounts, most of the services provided by such institutions and the "value added" by private activities at home, on the beach, in the exercise of athletics, have as yet remained outside the national accounts. This aspect of growth becomes more and more important as a society approaches a stage of 'affluence' in goods and services. In fact, if this aspect of life becomes highly developed, the advent of affluence itself may be postponed indefinitely. For a man of highly developed personal tastes and interests, income will always fall short of his 'needs'. He will become less dependent on the pressure from his social surroundings and from commercial media; he will remain an 'economic man' with fairly fixed preferences. Ultimately, such a view may find its reflection in political attitudes to growth problems. The growing demand for more expenditure on education and town planning in the United States may illustrate this point.

The approach of the economist to the problem of growth has been the classical one of using limited resources as means to an end. While some of these ends may be expressed by indices derived from national accounts, others have as yet remained outside this area. The influence of the educational, sociological, psychological and physical factors on the performances of labour have been emphasized and investigated. This is another reason why the growth in production, in the national accounts sense, cannot be isolated from other social changes.

The point is that although the relation between the input of factors and output, as traditionally defined, is an important one, the economist must always be aware that he selects one aspect of the social process in order to carry through a partial analysis. However, if such a broader view of growth, which is more relevant, is taken into account this growth cannot be measured by one index. One has to realise that growth has many dimensions. Hence the idea of consecutive "stages of growth" through which all countries must pass becomes impossible to maintain. If we approach the problem of growth in a realistic way, we must accept that there are as many combinations of development in various dimensions as there are countries. A country may be 'highly developed' in one direction and 'backward' in another.

Thus, although the economist can indicate the limitations of his analysis, he can be of little assistance in posing and solving the more general growth problem in a rational way. The broader growth processes are so complicated and the aspects that can be selected are so various that only a small ground has been covered by research. Even the problems of measurement are difficult to solve. Progress can be made only by combining the methods of economics with those of sociology, political science and psychology.

The system of preferences related to the various dimensions of growth is equally difficult to rationalise. The pattern of preferences may be competitive; or, the various parameters of growth may have a supplementary position in the system of values. To illustrate, this represents a sort of choice between the various complete menu in a restaurant; it is the combination of dishes that decides the choice. This idea underlies the method that has been used in Swedish long-term planning.

Even though the economist cannot solve the problem of optimising growth, he may assist the politician by analysing the logical structure of his choice. Prof. Stennilson attempts to illustrate this task with reference to the place of education in the process of growth. A special characteristic of education is that it can simultaneously be regarded as both consumption and investment. Outlays on education may compete with other types of current consumption. On the other hand, education might increase productivity of labour and may have a general healthy effect on the technology of a country. Education has also its impact on health, birth-rates and so on. A primary task for the social scientist is to investigate these various relationships. Such research is not advanced to a stage where the fuller effects of education could be summed up.

He has formulated an equation which brings out the condition for optimum allocation of resources to education. This equation indicates the gain from increased expenditure on education, taking into account the direct effects on present and future 'consumption', as well as the effects on future growth of 'production'. Primarily, this optimisation problem is solved in two stages. First, the determination of how to use a certain outlay on education with reference to school enrolment in different age-groups, the student-teacher ratios, the size of other cost elements per student and the content of education. Secondly, the determination of allocation to investment in relation to other types of consumption and investment.

The main purpose of the paper has been to indicate how different parameters, which are related to growth, conceived in a broader sense, may be included in a decision model. However, if growth is approached in this way, it may not be possible to measure it in terms of market values, as is possible when this concept is conceived in the purely economic accounting sense. Nonetheless, we have to approach the broader views of growth that predominate in a society where economic policy is not guided by the technocratic ideas alone.

Problems of Measurement

Prof. Simon Kuznets of Harvard University in his paper on "Economic Growth and the Contribution of Agriculture: Notes on Measurement" analyses the methodological and statistical aspects of measuring the contribution of agriculture to economic growth. The aggregative aspect of growth is stressed by the usual definition of economic growth, namely, a sustained increase in a nation's total and *per caput* product, often accompanied by a sustained and significant rise

in population. In the 18 to 24 nations which have gone through economic development, product *per caput* grew at rates ranging from well above 10 to close to 30 per cent per decade; total product grew at rates ranging from 15 to 40 per cent per decade; and total product at rates ranging from 15 to over 40 per cent per decade; and with some exceptions population grew at rates ranging from 8 to 20 per cent per decade. A second aspect of growth is the structural. Large and rapid shifts in the structure of the economy are associated with modern economic development. Such shifts occur in the relative importance of various industries, regions, classes of economic units distinguished by form of organisation, economic classes, commodity groups in final output and so on. The third aspect is the international. Except the single pioneer nation, all nations participating in modern economic growth view the process of growth as a task of adopting and adapting potentials already demonstrated elsewhere in the world. No nation can grow in an international vacuum; and the process of a nation's growth involves a pattern of sequential interrelations with others—more developed or less developed. Hence the view of the changing domestic structure of a nation's economy in its process of growth can be supplemented by a view of the sequential pattern of the economic flows between it and the rest of the world. These three aspects of growth are clearly interrelated. The rise in *per caput* product, essential to the aggregative view of economic growth, in itself means a shift in consumption and saving patterns; and this in turn contributes to the shift in the industrial and other structures of the economy. On the other hand, the development of new industries and new methods of production permits a rise in product *per caput*. And the aggregate growth and certain structural shifts provide the surpluses for international trade and capital movements; while the latter, bringing the benefits of international division of labour, are in turn conducive to the greater aggregate growth of the participating nations and thus to greater structural shifts within them. Given this interrelation, it is often impossible to specify the contribution of a single sector, say, agriculture, to each aspect of economic growth; nor is it particularly illuminating to do so. For, if a sector contributes directly to the growth of product per worker, it indirectly contributes to structural shifts and greater international division of labour. It, therefore, seems preferable to consider the contribution of agriculture to economic growth jointly in all the three aspects of the process; and then examine the various ways in which such a contribution may be rendered.

In attempting to measure the contribution of agriculture to economic growth of a country, it must be remembered that since it is a part of an inter-dependant system of economy, it is difficult to precisely isolate the contribution of agriculture. Bearing this limitation in mind, the contribution of agriculture may be considered from the three different aspects; (i) product contribution, (ii) market contribution, and (iii) factor contribution.

The first type of contribution of agriculture to economic growth is that constituted by growth of product within the sector itself. This product contribution may be examined firstly as a contribution to the growth of total product and secondly to the growth of product *per caput*. With the help of algebraic equations Prof. Kuznets has shown the methods for measurement of these two aspects. The main conclusions arrived at are firstly, so long as the rate of growth of the non-agricultural sector is higher than that of agriculture, other conditions being equal, the proportional contribution of agriculture to the growth of total product will decline. Secondly, if the rate of growth of the non-agricultural sector is increasingly higher than that of agriculture, the decline in the share of agriculture in the growth of total product would be even greater. Thirdly, if it is assumed that the rate of growth of countrywide product is *constant* over time and if the rate of growth of the non-agricultural sector is higher than that of agriculture, then

either the rate of growth of agriculture or the rate of growth of the non-agricultural sector, or both must decline over time.

A more meaningful unit for sectoral analysis is the contribution of agriculture to the growth of national product *per caput* or per worker. The author gives some algebraic equations but some general statements made regarding the level and movements of the proportional contribution of agriculture to additions of countrywide product per worker, may be noted here. Firstly, this proportional contribution will be larger, the larger the terminal share of agriculture in the country's labour force and the higher the ratio of product per worker in agriculture to that in the non-agricultural sector. Secondly, to the extent that in the course of economic growth the share of agriculture in the labour force declines, there will be a continuous decline in the proportional contribution of agriculture to the growth in the countrywide product per worker, unless the rate of growth of product per worker in the non-agricultural sector falls behind the rate of growth of product in the agriculture sector, which is unlikely. Thirdly, if it is assumed that the countrywide product per worker grows at constant percentage rate the continuous shift of the labour force from the agricultural sector with its lower product per worker to the non-agricultural sector with its higher product per worker *must* be accompanied by a decline in the rate of growth of product per worker in the agricultural sector or in the non-agricultural sector, or in both. The parallelism of these conclusions to those derived from the proportional contribution of agriculture to growth of total product is obvious. These formulae could be applied to the empirical long-term records of product, labour force, product per worker—in total and for the two sectors separately—for a number of countries. Such statistical analysis would probably show in countries with high rate of economic growth, with respect of overall aggregates and consequent structural shifts, a rapid decline in the proportional contribution of agriculture from a quarter or more of the growth of total product and a half or more of the growth of *per caput* product, to a few percentage points.

The second aspect is called as the market contribution because this sector provides opportunities for other sectors to emerge by offering part of its product on either domestic or foreign markets in exchange for goods produced by them, at home or abroad. Thus, agriculture makes a market contribution to economic growth by (a) purchasing some production items from other sectors at home or abroad, and (b) selling some of its product not only to pay for the purchases listed under (a) but also to purchase consumer goods from other sectors or from abroad, or to dispose of the product in any way other than consumption within the sector. In all these ways agriculture makes it feasible for other sectors in the economy to emerge and grow and international flows to develop. In this connection some familiar trends in agriculture in developed countries may be mentioned. There is the spread of modern technology to agriculture proper, namely, chemical fertilizers, machinery and mechanical know-how replacing extensive means of production originating within agriculture itself. The need to purchase these new production goods from other sectors means an increasing marketization of the production process within agriculture. This is reflected in the increasing proportion that purchases from other sectors constitute of the total product of agriculture, exclusive of all production expenses. Thus in the U.S.A. the proportion of outside purchases rose, over a period of 40 years from 1910 to 1950, from about 20 to about 30 per cent of the gross product. Of course the proportion of gross income accounted for by purchases from other sector is clearly a crude and incomplete measure of marketization of the production process in agriculture; because the network of market transactions within agriculture are not taken into account.

The question of measuring the contribution to economic growth, however, still remains. Because the measure, referred to above, is an index of relative importance of purchases from outside to the gross product of sector and not of the proportional contribution to a country's economic growth. In addition to agriculture's contribution to total and *per caput* products, this kind of contribution has also to be measured. Clearly, this aspect implies the development of sectors other than agriculture and it could be measured by comparing the non-agricultural sectors in the country providing production goods to agriculture with all the non-agricultural sectors. In other words, the percentage of the growth in output of all the non-agricultural sectors (including the transportation and other facilities involved) accounted for by the fertilizers, agricultural machinery and other plants that provide production goods to agriculture would measure the proportional contribution which marketization of the production process in agriculture makes to the industrialization aspects of economic growth within the country. The main points to be noted in this connection are: firstly, at the initial point of time when agriculture accounts for a large share of the net output of the economy, the extent to which such product is traded with the other sectors has a major bearing on the width of the economic base which these other sectors may enjoy. For instance, in a closed economy if it is difficult to increase marketable surplus of agricultural product, it will restrict the growth base of the other sectors. Secondly, once growth occurs and is accompanied by a decline in the share of agriculture in both product and labour force, the increased productivity per worker in agriculture reflected in these trends assures an increasing proportion of marketed agricultural net product and at the same time a decreasing proportional contribution of such marketings to the total product of the economy. In brief, the market contribution of agriculture to a country's economic growth, strategic in the early periods of growth, must in the nature of the case, diminish in relative weight once growth has proceeded apace.

The same conclusion also follows from the third aspect of the market contribution of agriculture, namely, that bearing upon the type of trading partner with whom market relations are established. The market contribution to economic growth will be greater, the higher the growth inducing power of the trading partners whose co-operation through the market is being secured. It is in this connection that the contribution of agriculture to exports assumes strategic importance, because in many countries modern economic growth is a matter of following the pattern set by the nations that have gone through the process. Since agriculture, next to mining, is a sector in which natural endowments have greatest weight, it is hardly a surprise that in the initial stages of growth of many countries now developed, agriculture was a major source of exports. Thus the market contribution of agriculture in the specific context of the capacity of a country, through international trade to tap the resources of the more advanced units, is likely to be large in the initial stages of growth and bound to decline as economic growth takes roots.

The third contribution called factor contribution refers to a transfer of resources to other sectors. Such resources are either capital or rather funds for financing acquisition of material capital, or labour. In the case of the former, again, two different types of transfers may occur. Firstly, there is a compulsory transfer from agriculture for the benefit of other sectors, mainly through taxation in which the burden on agriculture is far greater than the services rendered by government to agriculture, the residue being spent for the benefit of other sectors. The measurement of such forced contributions of agriculture to economic growth is not easy; because the incidence of indirect taxes is difficult

to assess and the allocation of government expenditure in terms of benefits to agriculture and to economic growth elsewhere is complicated. However, historically, such factor contribution was substantial, both in Japan where land tax was imposed and in Soviet Union where there was forced extraction of surplus from agriculture.

The other form of capital transfer is lending or the utilization of savings originating in the agricultural sector in financing the growth of the non-agricultural sectors. Unfortunately, data on both savings and capital formation in agriculture as well as in other sectors of the economy are not available. Hence, the author has sought to indicate the order of magnitudes involved by an illustrative example. Whether or not, there will be a flow of savings from the agricultural sector to finance capital formation in the non-agricultural sector will be revealed by the comparison of two fractions: (i) the ratio of additions to product of the agricultural sector to additions to the total product of the economy, and (ii) the ratio of savings originating in agriculture to all savings originating in the economy.

Provision of labour is another form of factor contribution made by agriculture to economic growth. While this shift from the agricultural sector to the non-agricultural sector has become quite familiar, the magnitude of the migration and of the factor contribution involved has not received the emphasis it deserves. It should be noted that the rate of growth of agricultural labour force, because of its rate of natural increase, has been higher than that of the non-agricultural, almost about three times. Thus, the author has illustrated the extent to which internal migration of labour force should take place over a decade if the share of the agricultural sector in the labour force is to decline, say, from 75 to 70 per cent. Under certain assumptions, he shows that the labour force will have to be reduced by about 9 per cent of the labour force which would have been in the agricultural sector otherwise. Such transfer means a sizable capital contribution, because each migrant is of working age and represents some investment in past rearing and training to maturity. Continuing the hypothetical example, the author calculates that if in each year of the decade something like 1.01 per cent of the labour force in the agricultural sector moves to the non-agricultural sector, we have a transfer embodying outlays equal to 10.1 per cent of the total income of the agricultural sector. The figures in the example could be modified in the light of empirical data. But they seem to be realistic enough for drawing the following plausible conclusions: firstly, if we accept the interpretation of internal migration as a transfer of capital invested in human beings, this factor contribution of the agricultural sector to the growth of the non-agricultural sectors must have been quite large in the early and even later phases of modern economic growth. Secondly, if the share of the agricultural sector in the labour force and the relative magnitude of labour transfers from it declines, there is bound to be a decline even in the absolute value of the factor transfers thus made and certainly in its proportion to the stock of labour already available in the non-agricultural sector. Finally, what is true of internal migration also applies to the international movement of labour, which through the 19th and early 20th centuries assisted a number of rapidly developing countries. Such migration was often from the agricultural sector in one country to the non-agricultural sector of another. In that sense, therefore, the migration was similar to what is discussed above, except that the factor contribution was to the economic growth of another country.

The Contribution of Foreign and Indigenous Capital to Economic Growth

Prof. A. K. Cairncross of the Glasgow University in his paper shows that the past experience in regard to contribution of foreign and indigenous capital

to economic development is much less relevant to present day problems than is generally imagined. The situation in respect of international capital flows today differs in two significant respects than that obtained in the nineteenth century. Firstly, it is believed that capital transfers were a larger element in the international economy in the 19th century than at present. This belief seems to stem from a contrast between the British investment 50 years ago and American investment today. Secondly, the countries that have succeeded in industrializing themselves, obtained the necessary finance with ease; on the other hand the countries which are seeking to develop today experience difficulty in raising capital abroad. The first contrast is well-founded if only the proportion of domestic savings invested abroad by Britain and U.S.A. are taken into account, without regard to the investment opportunities to which the flow of capital was a response. For instance, during the 40 years between 1875 and 1914 about 2|5ths of all additions to the stock of capital owned in U.K. consisted of investments abroad. In fact, there were years when more than half of current British savings went to finance foreign assets. Obviously, this cannot now apply to the U.S.A., to achieve such a result the flow of investment from U.S.A. would require the entire Marshall Plan to be carried out at least thrice a year!

However, instead of comparing the leading creditor countries in the two periods, if we compare the flow of capital with the flow of trade, there is less ground to suppose that foreign investment now is on a relatively smaller scale. World trade, taking visible items only, has grown five-fold since 1913 (at current prices); and international investment including grants and all capital transfers other than repayments has probably grown in roughly the same proportion. More significant, however, is the change that has taken place in the flow of capital to the less-advanced countries. International investment before 1914 was heavily concentrated in countries that were either already regarded as advanced or would not be reckoned today as "less advanced". Whatever may be the exact figures of such investments, it was clearly far below the current rate of capital transfers to these countries. The contribution made by foreign capital to the economic development of the different countries shows great diversity. In general this contribution is far smaller in amount than the contribution made by domestic savings. Although, it is difficult to make an exact comparison, there is little doubt that the great bulk of the savings needed for growth and industrialization were generated inside each country. Analysing the relevant data in respect of U.K., France, Germany, Russia and the Scandinavian countries, the author shows that all these countries except, perhaps, Norway and Russia, generated within themselves nearly the whole of the savings needed for their industrialization. It was perhaps exceptional in Europe for foreign borrowings to exceed, even for a few years, one-fifth of net domestic investment. Of course this does not mean that foreign investment did little to change the course of events. Its significance lay not so much in the proportionate addition to the domestic savings as in its impact on the sectors of the economy that were critical to further growth. Generally, transport took the lion's share of capital possibly because it was often difficult to finance through domestic financial institutions.

Taking the case of U.S. it could be seen that by 1914 it was the largest single debtor in the world but within the course of the First World War she became a net creditor. In the early stages of industrialization in the 19th century she imported comparatively little capital. Again, Japan's foreign borrowing was insignificant throughout, except for a short period after 1903 mainly to pay for the war with Russia. On the other hand, in Canada, Australia and

New Zealand foreign capital played a much larger part. Sometimes, as it happened in Canada, just before the First World War, it financed all the net domestic capital formation. While foreign investment speeded up the development of these countries, it is more accurate to think of it as accompanying and reinforcing their growth than as preliminary to it.

Two other distinguishing characteristics of foreign investment may be noted. Most of the capital invested was transferred from European countries to countries inhabited or governed by Europeans. There were large investment opportunities and excellent security in the shape of rapidly expanding market. The harmony of interests between lender and borrower could hardly have been closer. The second peculiarity of foreign investment in those years was almost entirely financed by private investors or financial institutions and rarely by governments. The typical private foreign investment of the 19th century was in railway bonds, while the typical private investment of the 20th century is in the shares of a large oil company with assets overseas.

The failure of the underdeveloped countries of the modern world to attract large-scale private investment is also due primarily to a further contrast in circumstances that prevailed in the nineteenth century. Investment opportunities in the newly settled country were associated with resource development on a grand scale. In 1913 no less than 40 per cent of the world exports of primary products originated in the Western Hemisphere or Australasia and this enormous volume of trade was the fruit of earlier investment in which foreign capital played a critical part. In large measure, it was the outcome of agricultural development based on improved transport and wide differences in production costs. Whatever form the investment took, it rested ultimately on the expansion of agriculture on virgin soils and on displacement of European, particularly British agriculture through large-scale movements of food. On the other hand, today there exists no similar scope for commercial investment in the underdeveloped countries of Asia and Africa. These countries cannot compete in the range of food supplies exported from temperate latitudes and are largely confined to tropical foodstuffs and agricultural products. But the market for the former, although growing is relatively inelastic, while investment in the latter meets with many obstacles and is apt to be denounced as the creation of an enclave of no permanent value to the debtor country.

The process of industrialization has always required and often being preceded by an expansion of agricultural output. It is this expansion which has enabled the domestic market to grow, specialisation to take hold and industry to reach a scale that permitted mechanical methods to be employed. Even where external demand of foodstuffs does little to furnish the initial impulse, therefore, there cannot be much question of the overwhelming need to improve agricultural methods in underdeveloped areas.

The biggest sector next to agriculture in consumption is clothing and hence the development of a modern textile industry is bound to be of outstanding importance in an underdeveloped country. In the earlier stages of industrialization in fact textile industry has played an important role. The author has illustrated this with reference to Scotland, England and Wales. As late as 1900 about half of British exports of manufactures still consisted of textiles. For many other European countries the ratio was not much lower; and for Japan it was and has remained perceptibly higher. Here, again, the present position of underdeveloped areas presents a sharp contrast. Even if these countries can establish a cost advantage, the textile industries can hardly be used as a springboard for industrialization. These countries having entered the international

market late in the day can offer only the low grade textiles. They have also to reckon with strong protectionist forces. World trade in textiles has shrunk substantially from about one-third in 1900 to one-seventh or even less. Moreover in the 19th century, in the countries between which the major flows of capital took place, there were no great differences in income levels. This meant that importing countries could also depend upon large domestic market for manufactures; and this domestic market was a sufficient engine of growth. In the less advanced countries of today the differences in income levels not only narrow the domestic market but are apt to create a gap between the products of indigenous industry and the products that might be sold abroad.

Referring to the theory of international capital flows, the author doubts whether even today we have formulated a theory of investment that does justice to historical experience and the mass of statistical data that have become available. Broadly speaking, there are two different approaches to the relationship between the home and foreign investment. While some think in marginal terms and concentrate on the functioning of the international capital market, there are others who use an aggregative concept and seek to transfer to an international plane theorems originally devised for a closed system. If the first line of thought is followed a comparison between the marginal productivity of capital in different countries and relative rates of interest and profit has to be made in order to bring out the market forces governing the international flow of capital. The other line of thought leads us to examine why some countries appear to have a surplus and others a shortage of capital. The author then proceeds to analyse the problem of shortage of capital in underdeveloped countries. This shortage can be analysed in various ways. In terms of the first approach the question is one of the return to be expected from additional investment, the extent to which finance is a bottleneck in development, the availability of domestic savings and their mobilization for specific productive purposes and the terms on which funds could be obtained from domestic and foreign sources. This is the approach which the author adopts for subsequent analysis.

The second approach discusses the foreign investment as a residual in the plans of development of underdeveloped economies. The foreign investment provides a balancing element in two distinct equations, one relating to the growth of total output and the other to the balance of payments. In the first equation generally some planned rate of growth of the economy is laid down in advance, implying also a corresponding rate of capital formation. This rate of capital formation taken in conjunction with an assumed marginal rate of savings leaves a deficit which is interpreted as the resulting shortage of capital. On the basis of the prospective movement in exports and imports over the planning period a second equation is constructed to show a second deficit in the balance of payments. This deficit is assumed to be covered by loans and grants. The two deficits need not exactly coincide, since it may be possible to draw on or add to reserves of foreign exchange. But any substantial divergence between them is likely to lead to a reconsideration of the original targets and to revisions in investment and other programmes designed to reconcile the two sets of calculations. This procedure originally applied to individual countries has come to be used also in relation to the whole group of underdeveloped countries, to show on what scale capital must flow to them if their standards of living are to be improved at some pre-determined rate. For instance, the U.N. experts put the domestic savings of underdeveloped countries, including mainland China at about $5,000 million in 1949. If *per caput* incomes were to be increased by two per cent per annum these savings will have to be supplemented

by loans and grants of $14,000 millions. Of this total about 70 per cent was required for countries in Asia. Similar calculations have been made by Paul Hoffman and the G.A.T.T.

Even the current inflow of capital is not known with any precision. The G.A.T.T. report shows a total inflow rising from $1.9 billion in 1954 to $5.9 billion in 1958. One clear implication of these figures is that the current capital inflow bears a relation to the domestic savings of the underdeveloped countries that is much higher than was customary in the development of the newly settled countries. On the basis of the Hoffman estimates of savings at 7 per cent of income, net domestic capital formation may come to $12.5 billion, of which about one-third is financed from abroad. If it were possible to increase the inflow at once to $7 billion, the ratio would increase to 45 per cent. The calculations also suggest that unless foreign capital were supplied by way of grant, external indebtedness would increase very rapidly. The external public debt of 21 low-income countries listed by I.B.R.D. was increasing at the rate of $1 billion per annum in the late 50's. Debt service payments for this group absorbed 7.5 per cent of external earnings in 1958. If additional capital was supplied on commercial terms rather than by way of grants the inflow of an extra $3 billion a year would obviously have serious implications for the eventual solvency of the recipients and may indeed represent an impossible burden for these countries.

As Dr. Singer has pointed out, "public aid has been a more dependable element in the flow of foreign exchange and resources to under-developed countries than either export earnings, service payments, flow of private capital or any other balance of payments item." From about $2 billion in 1954 public aid has increased to $3½ billion in 1960. Thus the problem really is one of making the best use of foreign aid in conjunction with commercial investment.

While an inflow of an additional $3 billion would involve great difficulties *within* the low income countries either from the point of view of immediate absorption or in terms of eventual repayment burden, it would not impose an overwhelming burden on the advanced countries. If an additional $3 billion a year would allow the underdeveloped areas to take off, it could hardly be regarded as an unduly high price to pay. But, according to the author, it is not possible to buy development so cheaply. The provision of additional capital may yield a more adequate infra-structure but it rarely, by itself, generates rapid development. In the Western World, the great dynamic forces have been technical progress and widening of markets. The author believes that the other bottlenecks, skill, entrepreneurial talents, administrative experience, etc., are also equally important. This is not to be-little the importance of capital accumulation because the widening of a market rests on the creation of a network of communications which, in turn, demands capital far beyond the limits of self-finance. Similarly, if technical progress abroad is to make its influence felt, there has to be a costly outlay on education and other social services that may strain the budget of country. The point is that the pace of development may be set by the availability of finance. According to the author, this is likely to be true only if we treat as capital not only the resources that flow into the creation of new fixed assets, but also the much larger investment in the new forms of social organizations, new habits and attitudes, personal experience, knowledge and skills that is a pre-condition of continuing development. It is this investment and the effort of modernization that it represents that some under-developed countries seem to find beyond their powers.

No country would like to depend upon foreign capital when it could mobilize

domestic capital for the same purpose. Apart from any political considerations which may tell against foreign borrowing, the assumption of external liabilities mortgages its future earnings of foreign exchange while the assets created may contribute little to those earnings. Hence foreign borrowing by an under-developed economy should be capable of justification under one or more of the following three reasons: (a) It may permit a higher rate of domestic investment than domestic savings alone would support, (b) It may be difficult to mobilize domestic savings for financing of projects that are badly needed for economic development and (c) Foreign capital may bring with it other scarce productive factors such as technical know-how, business experience, etc., that can make an important continuing contribution to economic development. The case for foreign borrowing is strongest in relation to public utility investment. Hence there is no need to elaborate this. The subsequent discussion is confined to investment in primary activities, beginning with mines and plantations and going on to indigenous agriculture after a short interpolation on manufacturing.

The fear of transfer difficulties is unlikely to arise when the investment is in enterprises that are themselves the source of foreign exchange, such as mines and plantations. From the country's point of view, however, these undertakings have many drawbacks and are often dismissed as enclaves—an extension into the economy of one country of a trading system of another. In some countries where a plantation economy has been created, the incentives to economic progress were previously too feeble and plantations supply a stimulus which in course of time may become unnecessary. In countries such as Ceylon and Malaya, it was foreign enterprise which introduced the crops originally in plantation, that are now the staple exports. It also developed the mineral resources which bring in about a quarter of the total export earnings of the under-developed countries as a group. These forms of activities furnish resources that remain within the economy and that are strategic to its further development.

The bias, which is often shown against foreign investment in mining and plantations, is rarely extended to investment in manufacturing. There may be three reasons for this. Firstly, manufacturing is commonly thought of as the spear-head of economic development. Experience in manufacturing opens out a wide area of opportunities. Secondly, the linkages within manufacturing are closer and more powerful than the linkages in agriculture and mining. The growth of one industry is likely to facilitate development of others. Thirdly, the starting of a new manufacturing enterprise may be more compatible with the starting of a similar domestic enterprise or a later buying out of the foreign company. In any case the main justification for making use of foreign capital in manufacturing is rarely a domestic shortage of capital. Such a shortage can be relieved at far less cost by borrowing to pay for public utilities, since these can usually be financed at the rates charged by international agencies like the World Bank. These rates are well under half the rates of profit earned on the average by foreign capital in manufacturing. Thus, it is not because capital is scarce but because management and technical knowledge are still scarcer that countries encourage foreign enterprise to build local manufacturing plants. The corollary is obvious, namely, that the under-developed countries need to find and train men able to run industrial undertakings. There has to be throughout the whole industrial system, a power to innovate, a built-in incentive to make further improvements, a linking of personal advantage with those improvements. Of course, it takes time to progress on these lines because there is no substitute for practice and experience. Education, though helpful, is only a small part of the complex intellectual and moral endowment that has to be built up.

In the creation of this intangible capital, foreign investment has a role to

play, especially, if local enterprise is allowed to participate and training is given to the local staff.

The market for manufactured goods within the economy is limited by the low level of income per head. This again goes to underline the importance of a general rise in income-levels and of ensuring that the expansion of industry is not checked by an inelastic response on the part of agriculture. In all the countries that have succeeded in industrialization an increase in agricultural productivity preceded or accompanied the growth of industry. Even Britain and Japan did not rely heavily on food imports until a comparatively late stage. In some countries which failed to develop under favourable conditions a sluggishness of agricultural output was a principal obstacle to industrialization. The danger that agriculture may act as a break on the growth of entire economy has been recognized from the time of the Physiocrats and still dominates the plans of many under-developed countries.

Experience suggests that the forces of growth rarely originate in the agricultural sector; more commonly, agriculture adapts itself to the growth of other sectors. Agricultural development therefore requires some external stimulus. Thus, investment can contribute to agricultural development partly by way of providing this external stimulus and partly in the expenditure of capital within agriculture itself. Historically, the most powerful external stimulus has been an increase in demand arising either abroad or through industrialization at home. Since this expansion of market has been associated with an improvement in transport, investment in transport seems to be an easier and cheaper way of absorbing foreign capital. Improvement in transport may lead to greater specialization and the growing of cash crops. The expansion in trade that results is a necessary step towards economic development. Of course, the contribution of these investments to improvement of agriculture is conditioned by the thorny questions of tenure. In many underdeveloped countries the tenurial system is conspicuously unfavourable to development. It is significant that in countries like Mexico and Japan economic development accelerated after sweeping agricultural reforms. The point to be emphasized is that institutional barriers may frustrate such investment.

Thus, if the present low levels of agricultural productivity are to be raised, mere availability of additional capital may not be sufficient. In agriculture the problem is mainly one of bringing about the change in the current use of the most important fixed asset, namely, land, and persuading the existing cultivators to embark upon such a change. It is these considerations that make it important to couple the provision of capital with policies that extend far beyond finance.

The present situation is generally one in which merely the whole of the short and long-term capital made available to agriculture comes from private sources. Institutional sources of agricultural credit are almost insignificant. More important than the cultivator's dependence on private credit is the fact of high interest rates paid for it, the restrictive conditions that lenders can impose on their freedom to buy and sell and the difficulty of obtaining capital on medium or long term for carrying out improvements. Whatever may be the method the fact remains that more capital has to be fed into agriculture, made available at lower rates of interest and for longer periods of time and used in ways that will encourage productivity and thrift. In this connection two questions may be posed; Where has the government to get the money? And in what way foreign capital can help?

It is unlikely that there is any surplus of capital in urban areas. Some economists tend to assume on the other hand that agriculture must generate savings.

Such a phenomenon perhaps occurred in Japan and presumably may also be applied to the U.S.S.R. But whatever may have been the historical experience there is not much scope for a large inter-sectoral transfer in under-developed countries. If the State cannot raise sufficient revenue or float large loans at home to supply agriculture with capital, it may try to raise money abroad. But here also the decision must be governed by the competing claims of other forms of investment. The simplest arrangement is a direct government loan to finance permanent improvements in agriculture, particularly for irrigation and reclamation purposes. The spectacular example is of the Aswan High Dam project. A second possibility is to feed in agricultural credit through the central bank or through some financial intermediary enjoying governmental support. Another possibility is direct participation in the capital of development banks and other financial institutions designed to provide farmers with credit. An interesting example of this is in the Philippines where the counter-part funds derived from U. S. grants are made use of to finance the Agricultural Credit and Co-operative Financing Administration, an institution set up in 1952 to promote agricultural co-operatives covering production, processing, storage and marketing. The provision of agricultural surpluses against local currency is a further example of a capital transfer that has important effects on local agriculture.

If the object is not merely to endow the under-developed countries with the power to develop continuously but also to help them accelerate the rate of growth, a large and continuing transfer of capital seems inevitable. It is equally inevitable that this transfer cannot take place on commercial terms because if we are contemplating higher rates of income growth than have been experienced we must also contemplate higher rates of investment than were necessary in the past. Again, historically there is no reason to believe that savings-ratios will rise in countries emerging from a desperate state of poverty, not merely to the level of their more fortunate neighbours, but above them.

II. THE ROLE OF AGRICULTURE: COUNTRY EXPERIENCES

Emperically, what has been the role played by agriculture in economic development? To assess this, experiences of a cross-section of countries have been selected, *viz.*, Nigeria (Africa), Brazil (Latin America), Burma (Asia), the Uzbek Republic (U.S.S.R.), Ireland and Germany (Europe). The diversity of conditions under which these countries have developed or are developing brings out the varying nature of the part that agriculture plays in economic growth.

NIGERIA

Prof. H. A. Oluwasanmi began by stating that it has been widely recognised that permanence and stability of political and social life in the new independent states in Africa depends upon viability of their economies. These countries are desirous of effecting radical changes in their economic conditions through industrial revolution. The problem, therefore, concerns not so much the desirability of economic change as the means of establishing the pre-conditions of economic change. The paper is essentially a sectoral case study of the role of agriculture in the transformation of the African economies from a predominance of agriculture to one of industry.

In Nigeria, as in all African countries, about 80 per cent of the working population is employed in agriculture and over 60 per cent of the gross domestic produce is contributed by agriculture, forestry and fisheries. The level of agricultural productivity is low reflecting the primitive and backward character of

the techniques, methods and tools of cultivation. Per capita income in Nigeria averaged £20 in 1950-51 and for 1956-57 was estimated at £25 to £29. The build-up of social overhead capital though continued since early decades of this century, is not yet sufficiently pervasive to provide for adequate basis for sustained economic growth.

In Nigeria the shift from subsistence production which began in the early decades of this century has been characterised by two major developments. Firstly, production of agricultural raw materials notably—cocoa, palm oil, palm kernel, hides and skins, groundnuts, cotton and rubber—for export market, and secondly building up of modern systems of transportation and communication. Production of cash crops for exports provided the base for the growth of an exchange economy and development of trade both in home-produced goods and imported commodities. The proceeds from taxes on exports and imports provided the Government with liquid assets required for building up roads, power installations, railway, ports, schools and hospital and communication systems.

Since the end of the Second World War, there has been a rapid build-up of social overhead capital; new industries have sprung up; the capitalist sector of agriculture has been expanded considerably.

The accumulation of capital in the export sector of agriculture has played a significant role in post-war development and the Produce Marketing Boards have been the chief instruments for capital accumulation. These Boards whose functions and pricing policies they are expected to follow are broadly laid down by law, are charged with the exclusive marketing of major export crops. They are authorised to withhold in good years a proportion of the sale proceeds of the crops they market and use part of the accumulated reserves to subsidize producer prices in years of falling prices. During the immediate post-war years these Boards accumulated large reserves of capital which stood at £75 million in 1954. Through the Regional Development Corporations these reserves were used for development of agriculture, industry, communications and health facilities. During 1949-58 about £10.9 million were spent for development; of which agriculture accounted for £5.5 million, industry £1.3 million, communications £2.3 million. The pattern of expenditure recognizes that efficient agriculture and good means of transportation are essential to industrial development.

Agriculture and the Take-off in Nigeria

Discussing the development of industries that are capable of generating growth throughout the economy, Prof. Oluwasanmi stated that the establishment of industries with growth potentialities depends in part on effective home demand and in part on cost-supply conditions. An examination of imports between 1950 and 1959 shows that the imports of processed food and drink, clothing, building materials and motor vehicles have shown significant increases in the last decade. This indicates the home demand for these products. Beer, cement, cotton-textile, shoe and food canning factories have been established to take advantage of favourable home market. With the exception of beer and cement, these industries depend on agriculture for their raw materials. Except the beer industry, which is financed mainly by external capital, part of the capital used in financing these industries has come from the surpluses of the Marketing Boards. Thus, Nigerian cocoa, palm oil, palm kernels, groundnuts and cotton are playing a decisive role in industrial development of the country.

BRAZIL

Prof. Ruy Miller Paiva while discussing the subject in relation to Brazil stated that during the first centuries of its history (1500-1900) the Brazilian

economy was characterized by having its productive activities evolved in cycles, according to the possibilities offered by certain colonial export products, *viz.*, the sugar cycle, the gold cycle, the coffee cycle, etc. At the end of 16th century Brazil exported sugar worth £2.5 million, this amount rising to £3.7 million by the middle of 18th century. These amounts are particularly high in the context of the country's scanty population of 0.3 million and Brazil's position as the largest sugar exporter at that time. During the gold cycle, gold exports averaged from £2.5 million in 1760's to £0.3 million by the end of the century. During the colonial rule per capita exports must have been of about £2.5, while after independence (1882) per capita exports were reduced to £0.73. With the coffee boom under way, total per capita exports moved up to £2.0 during the last decades of 19th century.

Despite the satisfactory productivity achieved in the export sector, overall growth in the economy did not occur during these cycles. The country continued to present the characteristics of the colonial economy with its productive activities separated into two rather stagnant sectors, namely, the export sector with satisfactory level of income and subsistence sector with lower productivity, hardly benefitting at all from the flow of income from the export sector. Only in more recent periods has development taken a broader character and new constructive impulses have brought about a much greater rate of development within the country.

At the moment Brazilian rate of growth is favourable. Industrial production in 1959 was 80 per cent above the level of 1955, representing an annual rate of 15 per cent. In regard to electric energy, power output in 1955 was 3 million kilowatts which will reach 5 million by 1962, and to 8 million in the near future when the construction work completes; steel ingots production increased from 1.16 million tons in 1955 to 2 million tons in 1960; cement production rose from 3.5 million tons to 5 million tons between 1955 and 1960. Similar stride has taken place in the case of automobile industry, oil-refining, heavy machinery, electrical materials, ship building, fertilizers, rubber, etc.

Many factors are responsible for the contrast between the high current rate of development and that maintained in the past. Greater in-flow of foreign exchange through coffee sales is obviously one of these factors, though its importance is seriously limited by the fact that previous coffee export booms did not bring about a satisfactory overall growth rate. The general improvement of the country's infra-structure, due to the characteristics of coffee growing, as well as the increasing immigration of European settlers for agricultural and industrial works could also be cited as important elements in this modification.

The two important measures regarding agriculture which played a fundamental role in the recent change in Brazil's rate of economic growth are: measures taken to benefit coffee during the crisis of 1930 and the adoption of a system of exchange control.

In order to save the coffee growers, the Government proceeded to buy up the unsaleable coffee surpluses. In 1931 alone nearly a billion Cruzeiros were, in this way, injected into the internal economy which counterbalanced the reduction in investor's expenses which in that year were lower by 2 million than the amount invested in 1929. During this period a satisfactory level of investment of about 7 per cent of the Net National Product was maintained. The most important aspect of this scheme was that it was not based, as in previous cases, on foreign loans but on the issue of currency thereby hindering purchases from abroad and providing a stimulus to production for home market. The country recovered from crisis before there was any improvement in the prices of export

commodities. Between 1929 and 1939 industrial and agricultural production rose by 50 per cent and 40 per cent, respectively, and per capita income rose by 20 per cent. Thus, foreign trade ceased to be a dynamic section of the system. The issue of currency, besides taking care of coffee growers came to constitute a fundamental element in the recent structural modification of the economy.

The second measure was adoption of the system of multiple exchange rates through which part of the income of the export sector was confiscated and the proceeds were used to subsidize important domestic activities, so as to protect domestic market and to stimulate the installation of large industries such as automobile industry. Through this system (exchange forfeit) was effected a heavy drainage of income from the export sector (95 per cent of agricultural products) to the other sectors of the economy; between 1947 and 1958 this drainage averaged annually 130 billion Cruzeiros at 1958 prices. This is a substantial amount in the context of Brazil's gross national product at 1,289 billion Cruzeiros in 1958 and gross internal capital formation at 166 billion Cruzeiros. These figures, though approximate, indicate that this transfer was large constituting a substantial factor in the country's recent development. It must be noted that agricultural sector felt the repercussions of this measure in that there was a loss in several export commodities and despite the fact coffee was the product most penalised its production was not discouraged sufficiently and the problem of coffee surplus was not resolved. On the positive side there was improvement in agricultural production for the home market. The index of production for home consumption increased from 100 in 1939 to 203 in 1958. This increase though substantial in some respects has proved to be insufficient, *e.g.*, between 1953 and 1959 the increase in food production of 22.6 per cent was not sufficient to cope up with an increase of 14.8 per cent in population and 22.6 per cent in per capita income. Theoretically, this means an increase in demand of 37.4 per cent, if income elasticity is assumed to be unity.

Though this scheme has contributed towards raising the country's growth rate, it was prejudicial to the agricultural sector, because there was no necessary increase in the export of agricultural products and even the home market was not sufficiently provided for.

BURMA

Prof. R. M. Sundrum and Prof. Aye Hlaing in their paper examine the role of agriculture in the economic development of Burma during the British period, *i.e.*, roughly from 1800 to 1941. Prior to the advent of the British, the Burmese Kingdom consisted of a population of 5 million and the economy was based entirely on agriculture with domestic textile industry adequate to meet local needs. Irrigation water supply was available for rice cultivation in central parts; the land was abundant but cultivation extended very slowly to meet the needs of the slow expansion of population. The country, largely isolated from the world was living in a self-sufficient economy with low standard of living.

The British period is split into two—between 1800 and 1870, *i.e.*, opening of Suez Canal and then upto 1941, shortly before the Japanese occupation. Round about 1870 the entire coastal line, formerly sparsely populated, was under British occupation with nearly 3 million of the total of 7 million population. This was mainly due to extensive migration from Upper Burma indicating preference to settled conditions of life and opportunities for new economic activities. A brisk trade developed in foreign consumer goods imported into lower Burma and then re-exported to upper Burma in exchange for timber, crude

petroleum and other local products. Though rice cultivation expanded to 2 million acres, it was mainly for home consumption rather than for export. Though rice prices had risen during this period exports fluctuated between high levels at times of poor harvests in India and China to a mere trickle at other times. Rice exports to Britain via Cape of Good Hope, a long sea route, was a risky business. Thus, though the country had been opened up to world trade economic progress by way of exploitation of great potentialities was disappointing.

By 1941, the country had a population of 17 million of which 1½ million were foreigners, mainly Indians and Chinese. The native Burmese were confined to agriculture, cottage industry and domestic commerce while foreigners dominated the capitalist production sector in exploitation of timber, petroleum and other minerals and the sector of foreign trade and finance. Thus there was a clear case of 'plural society'. Roughly 70 per cent of the labour force was employed in agriculture and related occupations (mainly paddy cultivation contributing half the national product and 40 per cent of the exports), 10 per cent in trade, 10 per cent in industry and the remainder in professions and services. Of the total of 20 million acres (or roughly 50 per cent of cultivable land) of cropped area about 12 million acres were under rice. Modern rice milling was the most important in the industrial sector followed by timber milling. Exploitation of mineral and petroleum resources was done by most modern methods with foreign capital. All these were mainly for exports in the absence of home industry to absorb these sources of raw materials. Foreign trade played a critical role. One-third in value of the domestic product of 1938-39 was exported. Agricultural products accounted for bulk of the exports and of these rice was the main item constituting between 3 and 3½ million tons in volume and roughly 40 per cent of the total exports in value. The other items of the exports were forest, oil-well and mineral products. Both the exports and imports enormously increased in value roughly at the rate of 5 per cent per annum since 1870. Throughout this period trade figures show export surplus of the order of 50 per cent of the value of exports. Thus, between 1870 and 1940 the economy made a remarkable development; particularly in agricultural sector.

A number of factors were behind this dramatic progress. At the beginning of this period there was abundance of land relative to the population. The flow of foreigners was limited to a thin stream due to inaccessibility till the British rule established free conditions of migration. Soil and climate were perfectly adapted to paddy cultivation with little labour. The additional labour required for development of agriculture was provided partly by increased rate of natural growth due to public health measures and partly by foreign labour. The needed capital for clearing jungles for cultivation and processing industries was provided by western-type banks and Indian moneylenders who provided a wide net-work of retail credit. Above all the Suez Canal reduced the cost and time of transport to Europe and at the same time demand for rice in India and other countries provided a ready and growing market for as much rice as Burma could export. With all these favourable circumstances the single factor contributing the motive force for expansion was establishment of great steam rice mills. Rice mill was a heavy investment and hence it was desirable to keep it running throughout the year to make it pay; and this necessitated ensured supply of paddy. Rice milling soon adopted the system of making advance purchases from farmers, helping thereby to establish a secure market and providing incentive to farmers to expand cultivation as much as possible.

In reflecting upon the great increase in agricultural production apart from some improvement in the type of plough used and introduction of new varieties

of paddy the cultivation of soil continued to be mostly along traditional lines. There was simply no need and no attempt made to mechanise field operations. Use of chemical fertilizers was just uneconomic. While agricultural production expanded enormously productivity per man and per acre almost remained unaffected. In contrast to this modern technology was introduced and fully established in the field of industry particularly agricultural processing, extractive industries, finance, trade and transport. These constituted the capitalistic sector mostly built up by foreign investment and managed by foreign entrepreneurs and served the export sector of the economy. Domestic consumer goods industries failed to attract foreign capital.

In the 'plural society' of Burma powerful minority of foreign races had established control over key sectors of the economy. Burmese themselves barely participated in the economic progress. Burmese agriculturists dependent on moneylenders for financing annual production and subsistence had to borrow at rates from 24 per cent to even 150 per cent per annum and were led to chronic indebtedness. It is regarded that the agricultural indebtedness led to economic progress, *e.g.*, the rapid expansion of rice milling industry mentioned earlier. But by 1940 half of the cultivated land passed to the ownership of non-agriculturist moneylenders resulting in absentee ownership, with little chance of farmers redeeming their land. The landlords now sought the highest rent from the tenants who were previously owners and rents were raised to high limits with the result rice cultivators were just eking out an insecure and inadequate living in a country which was the world's largest rice exporter. On the other hand, resources produced in capitalist sector which might have been available for industrial investment in manufacturing sector, were lost to the country because they accrued to the foreigner and were exported.

Thus, the emergence of Burma as a typical under-developed country out of a long period of intensive 'development' under the influence of free international trade is the result of the process leading to dual and plural economy which is often diagnosed as the real cause of under-developement. The oft held theory of priority of agricultural development as a precursor for industrialization has failed in the case of Burma due to weakness of the inducement to invest owing to low purchasing power of indigenous people and the leakages into consumption abroad of foreigners. Furthermore, Burmese agricultural development did not provide any positive stimulus to development of the rest of the economy on the technological side or economic side. What happened in Burma was optimal tendency towards specialization along lines of comparative advantage which did not result in technical progress and capital formation, a precondition of growth. Burmese experience fits awkwardly in those stages of growth noted by Rostow. For in terms of rate of growth of national product and emergence of adequate investible surpluses the country had all characteristics of take-off into self-sustained growth. By 1941 capital formation was at the rate of 7 per cent of net national product together with capital exports of well over 10 per cent, of the net national product. But it does not seem illuminating to argue that Burma failed to take-off into self-sustained growth for lack of political, social and institutional framework; because Rostow's analysis does not provide any objective specification to regard this framework as adequate.

UZBEK S.S.R.

Prof. H. M. Jaliloff of Institute of Agricultural Economics, Uzbek Academy of Agricultural Sciences, brought out the salient features of the revolution in agricultural sector during the Seven-Year Plan period in Uzbek S.S.R. which is one of the fifteen republics which form U.S.S.R. Its territory consists of

409.4 thousand km. of which two-thirds is occupied by steppes and deserts. The flat relief of the country is helpful for development of irrigation. Decreasing the high mineral content of the soils by melioration plus irrigation is the necessary condition for agricultural development. The agricultural lands total 27 million ha. of which 18 million ha. are under pastures and grass lands and 3 million under crops. 2.6 million ha. are irrigated. In 1961 there were 8.7 million persons in Uzbekistan of which 5.4 million lived in agricultural districts.

Before the revolution, Uzbekistan was a backward colonial outskirt of Russia, which supplied raw materials and imported industrial goods.

Under the present Communist regime modern industry has developed and heavy industry plays a leading role, contributing nearly half of all industrial production in the Republic. Gross output has increased by 16.6 times in comparison with 1913 and production of large scale industry by 26.8 times. Where there was no metallurgy or machine-making, now the Republic produces both; agricultural and textile machine building are widely developed. In 1960, coal and oil output was 3,416 million tons and 1,600 million tons, respectively. There are more than 800 large and small scale electro stations producing 85 per cent of the electricity. Many light industrial and food establishments have been organised. Non-ferrous metallurgy is also developing with increasing speed.

Agriculture has also undergone basic changes. Industrialization has made it possible to supply tractors and machines to mechanise the processes of agricultural production. Uzbekistan is the main cotton base of U.S.S.R. producing two-thirds of the gross output of commodity in the country. To ensure speedy development of cotton growing it was necessary to change the primitive methods of production, which had existed before the Revolution, to new methods. This development was rapidly secured by organisation of collectives and state farms in place of lakhs of small private farms, which also destroyed the very base of feudal and semi-feudal exploitation of peasants. At present there are 170 large-scale state farms covering 30 per cent of the total cultivated area. The average size of state farm is about 8,000 ha. As a rule they were established on virgin, less fertile lands which demand large capital investment and high skill for their cultivation. There are 1,134 collective farms with an average size of 2,000 ha. of crop land and 688 ha. of farmsteads.

Irrigation is the main base of the Republic's agriculture. The irrigational network now covers 160 km. with more than 9 thousand hydro-technical works and a capacity of 7 thousand cubic km. as against 1.5 thousand cubic km. in 1913. At the completion of the 7 years' plan (1959-1965) there will be 700 thousand ha. of new irrigated lands. The cheapest electric power along with reasonable cost of irrigation of the new lands per ha. allows cotton and other agricultural production to increase without much cost and expenditure on labour. The present new and progressive methods of closed horizontal and verticle drainage used on large scale which are equipped with engineering plant will soon reach automation and tele-mechanization of water distribution of irrigation channels. Underground water will be used for irrigation along with surface water.

The general trend in cropping has been the replacement of grain crops by more productive crops, the most important of which is cotton for which the soils and other conditions were particularly suitable. In addition to this, there was a trend towards more intensive cultivation, which has been brought about by using the latest achievements of science and technology and by mechanisation of all agricultural processes; by using mineral fertilizers and by developing irrigation. The share of cotton increased from 19.4 per cent in 1913 to 44.2

per cent in 1958; the total area increased from 411,000 to 1,347,000. Besides cotton, cultivation of other industrial crops like, kenaf, jute, sesame, tobacco has also increased. Considerable acreage has come under forage crops also. At the same time production of silkworm cocoons, astrakham pelts, dried fruits, rice, etc., has also expanded. The state capital investment from 1928 to 1958 was equal to 50 milliard roubles, not counting the savings of collective and state farms used for increasing production.

The highest output of seed cotton in 1959 amounted to 3,163,000 tons in contrast to 518,000 tons in 1913, showing a six-fold increase. Mechanisation of all branches of agricultural production has been the most important factor in increasing yields. There are over 70 thousand tractors, 840 excavators, 8.5 thousand cotton harvesters and thousands of other machines. The tractor fleet contributes 42.4 per cent to the power capacities while animal traction makes 3.3 per cent. At present ploughing, planting and now cultivation of cotton and other crops are completely mechanized.

With a view to facilitating the labour of cotton growers, increasing labour productivity and saving water in irrigation, use of sprinkling equipment, portable tubings and siphons is being made. Recently cotton pickers and strippers have been developed which sharply increased economic efficiency of machine harvesting. Considerably large use of electric power is being made in agricultural operations. Extensive experiments in seed breeding and liquid nitrogen fertilizers for boosting yields and improving quality of cotton are undertaken.

The principal form of labour organisation in agriculture based on extensive use of machines is a production brigade. A complex brigade of most efficient size manages 150 to 200 ha. of cotton making utmost use of tractors, machines and implements. Cotton production per man in these brigades exceeds 20 tons. Labour productivity has increased five times as compared to 1913. Labour requirement per centner of seed cotton has fallen from 28-30 man-hours in 1913 to 6-7 man-hours in 1958. Payment for work depends on the results of the work according to the principle—equal payment for equal amount of work done. By the conditions created for efficient realization of the advantages of co-operation and labour specialization, indiscriminating evaluation of labour is eliminated and material incentive to the worker to boost production is provided for.

A very important branch of agriculture is livestock breeding, particularly karakul sheep breeding. In 1958, of the total production of 4.3 million pelts in Soviet Union 38 per cent were produced in Uzbekistan. Large karakul breeding enterprises organised on scientific lines are being established. In 1960 cattle stock amounted to 2,228 thousand heads, the increase over 1913 being 886 thousands. Similarly sheep stock increased from 3,821,000 to 8,691,000.

At the completion of the seven years plan (1959-1965) Uzbekistan will have 700 thousand ha. of irrigated land. Production of cotton by raising yields and expanding acreage and with development of technological progress will reach 4 million tons. The increase in capital investment in the Uzbek economy will be of the order of 4 to 4.5 milliard roubles or 1.8 times in the whole U.S. S. R. over the period 1952-1958. There will be subsequent development of mechanical engineering, with the expansion of machine-making industry. The production of mineral fertilizers and electrical power will be increased. The material and cultural level of Uzbek people will increase during the Seven-Year plan period.

IRELAND

Dr. J. J. Byrne in his paper begins by stating that the Irish economy presents many characteristics associated with the advanced economies of Western Europe; but a closer examination uncovers distinctive features belonging primarily to under-developed areas, not infrequently associated with stagnation and decay. Population which shrank by half during the last century is 2.9 millions, or 109 per square mile, is slowly contracting. Net emigration rates are high; 13.4 per thousand during 1951-56. Approximately one-quarter of the population is engaged in industry, but two-fifths in agriculture. The majority of holdings are small, three-quarters less than 50 acres and half less than 30 acres. The system of farming is extensive, yielding an average gross output of L15 per acre. National output has expanded very slowly. The bulk of the visible exports are agricultural. Thus, the Western European standard of living is superimposed on an under-developed pattern of production with attendant social and economic strains which are eased by emigration and drawing on external assets. The immediate concern of policy makers is, therefore, to find a more satisfactory alternative. The claim that agriculture can provide this is not new but has sharpened recently in emphasis and definition. The failure thus far may be judged against some of the economy's perennial problems, *e.g.*, low national output, balance of payments difficulties, unemployment and its counter-part, emigration.

Since 1948 gross agricultural production increased by 1.5 per cent per annum; after remaining stationary during the preceding four decades. The basic pattern of agriculture has continued to remain the same over a long time except a few marginal changes. Grassland still occupies some 85 per cent of the fertile land, corn crops 10 per cent, root and green crops, flax and fruit 5 per cent. Three-quarters of total output consist of livestock products, and one-quarter of crops and turf; cattle and calves account for about one-quarter, milk and dairy produce for one-fifth. Post-war national output has risen by perhaps one-quarter, attributable in the main to industry, which now contributes about one-quarter of the national income, approximately the same proportion as agriculture. The average income per head of population, variously estimated is from one-third to one-half below that of Great Britain. About one-third of agricultural output is exported, one-third sold on the home market and one-third consumed on the farms. Thirty years ago exports absorbed half the total and somewhat less than 30 per cent was consumed on farms. External trade, which because of the economy's small size necessarily bulks large in its economic affairs, presents particular problems. Four-fifths of visible exports go to the United Kingdom, but half the imports come from other countries. Three-quarters of visible exports are of agricultural origin and go almost entirely to the United Kingdom, where agriculture is being actively developed. Total visible exports defray only three-fifths of imports. The result is a great strain on the balance of payments. There is rarely an export surplus, save in exceptional circumstances such as war-time, when imports but not exports are severely restricted. During the 1919-39 period there was some running down of external assets resulting from the first world war; those accumulated during the second world war were liquidated by the deficits of 1947-56. For more than a hundred years agriculture has been shedding labour. While the rate of decline since 1901 is less than during the last century, it is high by comparison with other countries, and is continuing. It is most severe on small holdings and among relatives who assist on the farm and as members of the household traditionally do not receive a regular wage. Paid agricultural employees, never a numerous class, have declined in numbers very considerably since the war. Total population is declining, but has a high rate of natural increase, 9.2 per 1,000 or 27,000 per annum

in the period 1951-56. During the same interval the unemployed proportion of the insured non-agricultural population averaged 9.3 per cent per annum and net yearly emigration 40,000. Working population decreased as the higher employment in industry and services was offset by reductions in agriculture. All this was a continuation of long-standing trends, noticeably accelerated, however, in the case of emigration and farm population decline. These data show that agriculture has made little impression on the economy.

During the 19th century greater emphasis was laid on land tenure reforms. It was expected that land would support the bulk of the people and the surplus would be absorbed by industry automatically. Free trade, cheap foreign corn and rising consumption standards helped to push Irish agriculture towards meat production. Due to the British policy in 1890's of prohibiting cattle imports from Europe because of disease risk and use of refrigeration by 1900 Ireland emerged as a sole exporter of cattle tc Britain by the outbreak of the first world war. This position was reinforced after 1919 by the change in British policy of emphasis on domestic milk production. Thus, agriculture was geared closely to store cattle production which in Irish conditions signified low investment, low output and low income, low savings and low employment per acre.

Irish thought on industrial development has been protectionist and domestic. The emphasis was on employment and industry was organised to supply domestic consumer goods. Materials for manufacture other than food and drink and capital equipment had to be imported and it was agriculture's responsibility to provide foreign exchange. Export sections of agriculture became particularly precious and live cattle a main drop of foreign trade. The large numbers engaged in agriculture with their low income cut down domestic demand and scope for industrial expansion, which hindered investment resulting in flood of rural labour beyond industries' capacity to absorb. Failure to expand exports exposed the balance of payments to strain on which depended the prospects of industrial development.

Caught between conflicting consequences of an agriculture shaped by external forces and industry shaped by internal, the economy had little room for manoeuvre. It was emigration that acted as the major equilibriating agency, siphoning off labour surplus to prevailing rates of absorption. Ireland, therefore, offers little by way of headline to other developing countries because in this context emigration meant unrestricted access to the two greatest labour markets of the world, the U. K. and U. S. A.

GERMANY

Dr. H. Wilbrandt, in his paper stated that Germany developed in one century, from an agrarian society with per capita income of $160 at current prices to a modern industrial economy with per capita income nearly $1,000. At the stage of 'Take off', *i.e.*, about the middle of 19th century Germany's population density was 30 per cent of what it is today. Two-thirds of the population lived on agriculture with subsistence farming in the south-west, feudal farming in the north and east; and a number of commercial farmers interested in agricultural exports. By the first decade of the present century, the total population had doubled but only one-quarter occupied in agriculture. Owing to large scale industrialization per capita income rose to $400. The growing demand for agricultural products from the non-agricultural sector benefited agriculture, particularly larger farms. This as also the spread of new agricultural techniques resulted in increased agricultural productivity, the production of foodgrains rising from 1881-85 to 1914 by about 70 per cent. Despite this

the demand of the growing non-agricultural population had to be met by imports of agricultural commodities. In the face of competition from overseas food, the agriculturist demanded duties to compensate rising wage costs with the result, internal prices rose above the world market level. Apart from increased supply and demand, agriculture's important contribution to economic growth was the supply of man-power to growing industry; the cost of whose professional education was borne by the rural sector. Payments made by farmers in substantial amounts to feudal lords and payments by way of taxes which amounted to one-third of all taxes in some German States helped substantially capital formation outside agriculture. Agriculture's contribution in the initial stages to industrialization was of prime importance though, with progressing industrialization, it became less important.

Role of Agriculture in Today's Economic Growth

After the Second World War, the population of West Germany has increased because of continuous flow of refugees from East Germany, with the result that three-fourths of the Germany's pre-war population now lives on half the area. With very little land available for new settlement most of the refugee farmers had to change to non-agricultural work. Initially, providing working places was a heavy burden on the Federal Republic but skilled and active minded refugees proved an asset to further industrialization making industry a dominant factor in the economy. This resulted in a larger market for agricultural products. The agricultural production increased very sharply though the level of agricultural prices, lying 30 to 50 per cent above the world market levels was an important contributing factor. In West German agriculture, medium and small family farms predominate. They were taught the use of modern techniques by intensified and expanded training facilities and enlarged extension services. As a result of increased intensity of cultivation, the average annual production has risen by 40 to 50 per cent above the pre-war level and has been twice as high as during the first post-war years. Industrial expansion not only absorbed the refugees but also a large number of agricultural workers. The full factors are even now operative. This led to a wave of farm mechanization, an increase in the average size of farms to 8 hectares and increase in productivity per man. As structural changes are not brought about overnight, there are still peasant family farms of pre-capitalistic times alongside the commercially run farms of different sizes. The value added by agriculture during last decade rose by 76 per cent from 8.1 to 14.3 billion DM. In spite of these developments on average, the incomes of the farming population are not high enough compared with incomes received in other branches of the economy. Agriculture accounts for roughly 10 per cent of total employed but the value added by it amounts to 6.7 per cent. The measures taken to meet this problem are embodied in the 'Green Plan' consisting of global subsidies to agriculture and measures to improve productivity. Agricultural prices are already above world level due to import policies. Beyond this the Green Plan provides subventions for higher prices for some agricultural commodities and lower prices for some means of production. Global subsidies within this plan amount to 1.45 billion DM yearly. On the basis of world prices agriculture is helped by import policies and by Green Plan to the tune of 6 to 7 billion DM. In regard to increased productivity, specific long-term programmes for consolidation, amelioration and adaptation of old fashioned villages to modern needs, enlargement of farm holdings, provision of labour-saving implements have been started. The aim is the commercial family farm in the industrial society.

Thus the problem is no longer one of how can agriculture be a basis of

economic growth but how can it keep pace with industrial development. Agricultural income can be increased by increase in production. But the small family farms cannot be changed within a few years into large family farms. Agricultural production already provides 73 per cent of food consumption, despite the addition of 12.5 million more people; hence this situation is not far different from self-sufficiency achieved before the war for the whole Germany. In view of decreasing income elasticities for food and small natural increase in population, the expected increase in production due to higher prices may become a burden specially because of the same trend in the E.E.C. countries. In this connection, while referring to the agricultural price policy, he stated that, the higher level of agricultural prices will lead to greater agricultural production but it will stimulate a sector with low productivity in the use of capital and labour. On the other hand, in Germany's present stage of development, a rise in agricultural prices may not affect industrial development. Removal of price supports may be politically unrealistic. But in his view farming in Germany requires a combination of Governmental assistance and private initiative for improvement of its structure and this process will take a long time for majority of farms. Economic growth would be served best if prices were fixed at such a level that a certain disparity remained which would stimulate efforts for higher productivity. Under the prevailing conditions further increase in production is expected to lead to surpluses and restrictions. The suggestion of W. H. Cocharane, in this context, that combination of agricultural price regulations and negotiable sales certificates such that production would be promoted by the cheapest and not the most expensive producer, deserves a great deal of study and attention. In Germany, the industrial sector is ready to absorb a large number of agricultural labour and is providing capital for structural improvements. The small farmer is gradually transforming himself into a 'entrepreneur'. Thus if specific efforts at increasing agricultural productivity, which will take decades for attainment, remain in the background compared with global aids which preserve an out-dated agricultural structure, a respective restraint of total economic growth will result.

III. DEVELOPMENTS IN PATTERNS OF FARM UNITS

NEW LANDS AND NEW SETTLEMENTS

In his paper on 'Developments in Patterns of Farm Units—New Lands and New Settlements,' Mr. Andal, at the very outset, has expressed the hope that the pressure of population on land and the inability of farms in vast areas to take advantage of technological advances as also the desire to bring improvements in income and in working and living conditions of millions would encourage new land development and the reorganization of existing farm land on a more productive basis. It is suggested that it is technologically possible to double the land under cultivation.

Recounting the recent settlement activities, the writer says that a large number of countries of the world have resorted to settlement of new land largely due to availability of increased irrigational facilities. This activity would continue as could be seen from the project proposals in several countries. The motivating forces, which have also been responsible to a large extent in deciding the patterns of settlement, inducing the Governments to initiate settlement activities include, among others, (i) a desire for land reform, (ii) establishment of efficient farm units, (iii) large-scale migration of people, and (iv) land use adjustment. The most common feature of land reform has been providing ownership of land to cultivators who lived in extreme poverty and in

low social status, had small holdings and insecure, non-incentive forms of tenure. In these countries, there was extreme concentration of land ownership. The land reforms involved the breaking up of large estates either by expropriation, more commonly with compensation, or by purchase. These lands were then distributed among the small cultivators. Alongside limitations were placed on size of holdings. Japan, India, Pakistan, several European, Middle Eastern and Latin American countries had carried out land reforms broadly on these lines.

New patterns of settlement in several countries appear to be primarily directed towards establishing efficient farm units. Although resettlement programmes in U.S.S.R. and China have received their main impetus from desires for political and land reform, huge collective and state farms have been established to obtain maximum efficiency from mechanization. The United States and Canada are countries of family farms and thus most of the agricultural development of these countries has taken place under the strongly prevailing concepts "family farms" and freedom. Thus in spite of large farms in these countries, there has been little agitation for limitation on sizes of holdings. In Canada the policy is directed towards permitting larger holdings. In these countries there are also programmes for rehabilitation of small farmers. Since 1945, Australia is following a policy of keeping the holdings to be of sufficient size as to produce a reasonable income. In the Netherlands, an important feature of the Rural Development Programme has been the enlargement of farms. It was brought about by co-ordinating the programme of resettlement in old areas with the settlement programme on new lands. Farmers on uneconomic units in old areas have opportunities to settle in reclaimed areas and the land they leave is thereby made available to enlarge the farms of those who remain. In some European countries, considerable efforts have been made in resettlement of fragmental holdings or more efficient consolidated units. Settlement problems of some countries have been associated with large-scale migration of people, *e.g.*, Finland and Israel. While in Finland land for settlement was obtained by expropriation, irrigation and also reclamation provided new land for settlers in Israel. Sometimes original settlement took place without knowledge as to the best use for land. For instance, in the prairie provinces of Canada, large areas were subsequently proved unsuitable for cereal crop production and a programme was developed for turning these relatively unproductive lands to community pasture use.

In conclusion, Mr. Andal has described certain elements necessary for a successful settlement. He has, however, cautioned that the importance of each would depend on objectives of settlement, concepts of values, and the physical, economic, social and demographic characteristics of the country involved. The main elements of successful settlement are (1) Allocation of sufficient resources, including competent management for the development of plans and for the follow-up of physical works and settlement. (2) Supply of scientific information on soils, crop and livestock for provision of basis for farming practices. (3) Although increased responsibility is placed on government there should be proper co-operation among individuals, governments and organizations. (4) Efficient application of technology and attainment of a satisfactory level of income requires a moderate scale of operation. In view of the pressure of demand for land economically optimum size of farm may have to be reached by stages. Settlement patterns and institutions should be flexible enough to adopt the technological advances. (5) Availability of credit, largely by government and encouragement of capital formation from increased production, by restraining consumption, (6) The choice of settlers: settlers with agricultural experience, industriousness and ability are desirable. (7) Finally,

prevalence of institutions and conditions providing incentives for all to produce.

While concluding the author draws attention to certain broader questions. To what extent are reclamation and settlement activities economically oriented? Would inter-regional competition and comparative economic advantage lead to the current steps being taken to increase food production? What would the relative costs of obtaining food by permitting and encouraging an increased flow of trade? Nutritional requirements call for substantial increases in world food supplies. What would be the costs and what kind and scope of reclamation and resettlement activity would best meet those needs?

THE CONSOLIDATION OF AGRICULTURAL HOLDING AND THE IMPROVEMENT OF THEIR INTERNAL STRUCTURE

Prof. Henrique de Barros discusses the various aspects of the problem of consolidation of holdings in the light of experience of European countries. He stated that among the various causes leading to fragmentation of holdings, the system of equal inheritance of real estate is doubtless the most important. Apart from the right of succession, the most important cause is that of population pressure which is always increasing. The desire which every tiller of the soil has always had to own at least one piece of land in the more fertile part of his locality, is a cause of greater significance than is readily apparent. Besides, the ambition to increase the surface area of an estate and the high price of land ratio to the purchasing power of the farmer has resulted in the acquirement of pieces of land here and there which are sometimes minute. Finally, the larger works of construction in the countryside (roads, railways, canals, dams, large buildings) have led to breaking up of plots into fragments which are often impossible to cultivate.

The disadvantages of an agrarian structure characterized by scattered plots are well known. They start with difficulties of access, illogical arranging of paths, the obligation to allow rights-of-way giving rise to queries and legal proceedings, and leading on to the enforced rotation of crops and old-fashioned cultivation, to the impossibility of mechanization and the difficulties of practising plant hygiene on an adequate scale. Further, the separation of the plots, some in relation to others, and some in relation to the farm buildings, causes considerable loss in time in going to and fro. The losses of arable land owing to the dense network of paths and numerous fences are also considerable. All these defects, nearly always combined, tend to diminish the value of the land and consequently to create difficulties for the farmer who wants credit facilities. Finally, owing to the continual impact of these defects on the cost of production, the yield of a rural estate is far below that which would normally result from the work and sacrifices of the farmer and his family.

To put this situation right, the solution generally suggested is 'remembrement' or consolidation. One must say, however, that it is only a partial solution and that, in general, one must go further than the straightforward rearrangement of the scattered plots of each property. Consolidation can have more or less far-reaching effects and assume various forms according to different criteria: (1) General or Special; (2) Relative to the property or to the exploitation; and (3) Optional or Obligatory.

Consolidation is considered 'general' when it aims at a systematic redistribution of the plots enclosed within a given perimeter, nevertheless tending to correct all the recognised defects in the division of the property, yet without affecting the allocation of the latter. It is considered 'Special' when it aims at curing only some of the disadvantages of scatter such as suppression of enclaved plots and trees, or of plots of less than a certain minimum area, or of those with

shapes unsuitable for cultivation; modification of the net-work of paths to facilitate cultivation, etc. Consolidation proper is that which has a bearing on ownership although it is always based on the idea of helping cultivation, *i.e.*, it sets out to recognise not the legal, but the economic units. Until recently, consolidation was optional being carried out only according to the decisions of and at the request of the owners. In the twentieth century some States intervened by first offering the opportunity to the owners and then making the actual processes obligatory once they had been accepted by the majority, and finally regarding itself judge in the matter. This evolution means that modern consolidation is based on the social utility of the arrangement in accordance with modern conception of the rights of ownership.

Thus, consolidation cannot correct situations resulting from an excess of population pressure giving rise to an excessive breaking up of the land, but it does present some economic advantages: (1) Increase of the productivity of the land owing to an increased area of cultivable land relative to the size of a region, (by eliminating paths and fences), and to the possibility of employing more effective methods of cultivation. (2) Increase in the productivity of labour, owing to economizing in man-power, in transport and journeying, and to the greater likelihood of being able to mechanize, and to better facilities for supervising the work of cultivation and stock-raising. (3) Reductions, always considerable, in certain expenses such as for seed, manure, transport, repairs to fences, etc. (4) Improvement of the technical efficiency of fixed capital (especially buildings and machines). (5) Prospects of realizing basic improvements, initiated either by individuals, or collectively, or by public authorities. (6) Greater opportunities for encouraging agricultural co-operation. (7) The removal of obstacles, such as the small-size of the plots, their awkward shape, and difficulty of access, which hitherto discouraged the initiative of competent and progressive farmers.

As for the advantages in another sphere, the gains make themselves felt if one considers to what extent they can contribute towards reducing friction between neighbouring owners, discouraging absenteeism of landlords, improving irrigation, extending, simplifying and speeding up credit facilities, defining the rights of ownership with greater precision, and above all assuring greater prospects of success to the family enterprise in the development of their land, thus contributing to an improved standard of living among country people and reducing their rate of emigration.

Had the problem been of merely joining together what was separated earlier, consolidation alone could constitute the solution to be recommended and applied, but the real problem is that of creating units of economically workable size. Recognition of this fact leads to the concept of complete consolidation or 'rememberment integral', in which the aim is to increase simultaneously the productivity of the land and the labour, improving structural conditions for cultivation, replacing the unsatisfactory scatter of plots by a new arrangement where each owner's plots constitute a continuous area, sufficiently large and of such shape as to facilitate cultivation, with independent access and good contacts with a generally improved environment such as provision of irrigation and sanitation, protection against erosion, re-afforestation, opening up of roads, provision of drinking water, electric power, postal and telephone services, etc. Besides, the promulgation of legislative measures destined to avoid the break-up of the new units and to discourage the absenteeism of the owners as also the creation of conditions which stimulate the co-operation of farmers towards improving the possibilities of buying and selling, use of machines and pedigree

breeding animals, access to credit and insurance, etc., are the other characteristics of complete consolidation. Seen in this perspective, when a consolidation project is launched, one has to face various types of difficulties. Broadly, they can be put into four categories, *viz.*, (i) psychological, (ii) economic, (iii) simultaneously technical and economic, and (iv) judicial and administrative.

The main psychological obstacle arises from the almost physical love of the small farmer for his property, especially when it has a long family tradition. Another obstacle is the tendency of farmers to over-estimate the value of their property and to under-estimate that of other people's at the time of an exchange. Among the numerous economic obstacles, the most powerful is the difficulty of finding plots of equivalent value to be exchanged. This becomes more serious when there have been fundamental improvements or because of the good situation of a plot of land in relation to towns and villages of means of communication. Under the simultaneously technical and economic difficulty comes the question of knowing whether and to what extent consolidation would not destroy the usefulness of certain basic improvements. Another question concerns the need to preserve the balance of a holding which, in many cases calls for changes in the use of the arable and forest land which justifies, and even demands, a certain amount of breaking up. Then is the problem of mountainous region where fragmentation has made most progress and at the same time where it is seldom possible to obtain plots much larger than the original ones. Finally, the great problem, when there is a question of agricultural modernization, is to decide to what extent it is an advantage to continue to keep such land under cultivation instead of simply giving it over to forestry. The judicial and administrative difficulties crop up when there is no cadastral map of rural property. This, in turn, creates confusion and doubts about the identity of the landowners, the boundaries of the plots, the legal position of many of them, the number of people dependent on them, their legal rights, etc.

Some important measures which may be taken to protect the basic cultivation of a workable agricultural enterprise, to keep it economically stable and able to face future responsibilities are: legal maximum limits to the splitting up of plots, revision of the traditional juridical system of inheritance of real estate; special guarantees granted to property cultivated by the farmer himself and his family (exemption from the general principles of rights of succession); technical and financial aid to those who wish to unite small holdings or to join very small ones to larger ones; facilities given to those who wish to exchange plots among themselves; support for the development of an agricultural estate; and control of tenancy to prevent the splitting up of an enterprise.

LARGE-SCALE COLLECTIVE AND STATE FARMS OF THE U.S.S.R.

The experience of large-scale collective and state farms in U. S. S. R. was the subject matter of Dr. I. S. Kouvshinov's paper. He started by saying that the gradual but steady transition from small-scale private farms to collective land tilling and the abolition of exploitation, have created possibilities for the toiling peasantry to display enterprise, daring and genuine initiative in achieving higher labour productivity. Far-reaching developments have taken place in the number and proportions of the collective and state farms since the establishment of the collective farm system. By the beginning of 1961 Soviet agriculture included 7,400 state farms and 45,100 collective farms. The average area of farm land per state farm in 1960 was 24,000 hectares and that of sown land 8,300 hectares; the corresponding figures per collective farm were 5,500 hectares and 2,300 hectares, respectively. The number of people engaged in

collective farms in 1951 was 21.5 million; at the Technical and Repair Stations —0.2 million, and at the state farms —4.5 million. By the end of 1959, the Soviet agriculture had 1,921,000 tractors (in terms of 15 h.p. units) or 1,090,000 physical units, 526,000 grain harvesters and 776,000 lorries. While in 1913-17 the rate of available power per person engaged in agriculture was 0.5 h.p. and in the terms of sown area the rate was 20 h.p. per 100 hectares, the figures in 1959 were 4.7 h.p. and 70 h.p., respectively. At present 96 per cent of state farms and 61 per cent of collective farms have electricity. During the current seven-year plan (1959-1965) the volume of electric power made available to collective and state farms will practically double that available in 1958.

In the past seven years the area sown to all crops in the Soviet Union has grown from 157 million hectares to 216 million hectares. The total crop production and the number of cattle on the collective and state farms have increased by 50 per cent and 54 per cent respectively over the same period. The gross harvests and the sale of grain crops to the state increased from 80.9 and 32.8 million tons in 1949-53 to 133.2 and 46.7 million tons, respectively, in 1960. The average yield per hectare also increased from 7.7 centner to 10.9 centner during the period. Compared with 1953, grain production in 1960 increased by 161 per cent and the *per caput* production by 52 per cent.

There has also been a steady growth of animal husbandry products in the agriculture of collective and state farms. For instance, production of milk and meat (dressed weight) increased from 36.5 and 5.8 million tons in 1953 to 61.5 and 8.7 million tons or by 69 per cent and 50 per cent, respectively in 1960. Likewise, butter production grew from 497,000 tons to 848,000 or by 71 per cent during the period.

The best results in grain production were registered in the virgin and long-fallow land development areas in Kazakhastan, the Altai Territory, the Volga regions and in North Caucasus. The idea of developing the virgin and long-fallow lands was advanced by N. S. Khrushchev in 1954. The government envisaged a planned and large-scale utilization of the opportunities provided by the development of virgin and long-fallow lands, the creation of big, mechanised state farms in the unpopulated areas and the utmost development of the economy of the Eastern areas of the country. The programme of developing virgin and long-fallow lands and the creation of big, mechanized state farms in the unpopulated areas was initiated in 1954. The total virgin land area developed in the country is 41 million hectares including 25 million hectares in Kazakhastan. Thanks to the development of virgin lands, grain production in Kazakhastan increased from an annual average of 3.9 million tons in 1949-53 to 13.8 million tons in 1954-58. The state purchase of grain grew over the same period from an average of 1.8 million tons to 8.3 million tons annually. Virgin land development also opened up new opportunities for the rapid development of animal husbandry, both meat production (dressed weight) and milk production for all categories of enterprise growing more than 1.5 fold.

Similarly, striking instances of experience in the work of large-scale Soviet farms in the virgin land development areas could be found in Siberia. The "Altaisky" state farm of the Altai Territory has been founded on virgin lands. It has developed field husbandry comprehensively and alongside wheat, grows fine crops of podbearing plants, raw crop and perennial grasses.

It has been shown by estimates that state investment in the development of virgin and long-fallow lands in the U.S.S.R. has been rewarded with much profit. In 1954-60 the state invested in the development zone 4.4 billion roubles

in addition to the ordinary investment rate. Over the same period the state drew from the marketable grain increment only over 7.6 billion roubles of additional turnover and profit tax. It follows, that the virgin lands have returned all the expenses involved and are yielding a big accumulation of capital.

The large-scale state and collective farms are equipped with highly efficient modern machinery. The 1959 figures illustrate the degree of mechanization of the basic field operations; ploughing 98 per cent; grain crop harvesting by combines –93 per cent; sowing of spring crops –97 per cent. The sown area per tractor in grain producing districts is 100 hectares and this load is deemed the most economic for the given conditions.

A scientific analysis of the experience of large-scale enterprises over a long period under the conditions of socialist methods of production helps to lead to the conclusion that the basic requisites of their successful advancement are:

(1) The voluntary transition of small-scale peasants to the system of large-scale farming. Under the new conditions of large-scale farm management, all its branches get the opportunity of developing production through higher capital investment. This major factor results in radical changes in the pattern of farming operations: intensification, transition to better methods of field cultivation, the use of mineral fertilizer, perfection of implements and machines, greater use of machines and greater employment of qualified workers.

(2) Large-scale use of state credits extended on privileged terms, with the objective of increasing the volume of production and the proportion of marketable produce.

(3) Rational utilization of land, modern machinery, methods of progressive farming technology, implementation of irrigation, and hydro-development, use of electricity—all this can be carried out on a large-scale, with consideration for zonal features of farming and with economic advantage only in large-scale farming enterprises. In those enterprises the increase in farming produce and in labour productivity proceeds at a rapid pace. The payment to and the incomes of collective farmers and of the state farm workers are growing. The production cost per unit of produce is reduced.

And finally, the material technical assistance provided by the Soviet State. The entire system of scientific and practical assistance to agriculture in the U.S.S.R. is founded on the planned work of Land Departments and an efficient network of agronomical bodies subordinate to them which in their turn draw support from the experimental and pilot enterprises, which are supplied with all the necessary resources. This system makes possible the generalization, elaboration and determination of the optimal sizes of the enterprises (within the confines of separate zones), the specialization of the farms and the ensuring of their profitability, and productivity, with higher standards of farm management.

IV. ENVIRONMENTAL CONDITIONS FOR DEVELOPMENT OF AGRICULTURE

EDUCATIONAL CONDITIONS

Prof. G. Medici devoted his paper to discuss the educational conditions for development of agriculture. He stated that in past, education of the peasants was in the family and the experience of the elders sufficed to instruct the

younger generation in methods of cultivation and breeding of animals. When farmers started producing for the market, use of modern techniques acquired decisive importance. However, when the discoveries of science were multiplying and fostering new technologies, the rural workers of the world live on, remote from schooling or cultural development. Schools are attended only by a minority of rural population, from which the multitudes of peasants are excluded. All over the world, children have remained without that heritage of learning, which lessens inevitable inequalities in socio-economic conditions.

Education represents one of the various kinds of capital, *i.e.*, "human capital", complementary to other kinds of capital, of which it facilitates better use. It also helps to mould the social environment in which Man projects his personality, so as to create the civil and political systems of the country in which he dwells. Hence, the statesmen affirm that money spent on education represents the investment that offers highest return.

Democracies demand a high level of education of all citizens. Further, one cannot nowadays conceive agriculture dissociated from democratic organization of the State. Therefore, scholastic institutions must be considered an integrative part of a policy of agricultural development. Complexities of the process of production have given to the educational problem an aspect that was unknown in the past: that of *vocational instruction.* Schooling should help young people to discover their aptitudes, so that those who remain in agriculture can enjoy an activity which not only produces income but offers scope for self-expression. Vocational training in agriculture is a fruit of recent times. It must enter the scholastic sphere since schooling now represents the main instrument of economic transformation. It is not only a question of creating institutions able to give to pupils a teaching in step with the changing realities of the rural world but is also that of preparing sufficient recruits for agriculture which, being modern, asks of the farmer precise notions regarding machinery, agronomy and animal husbandry. That is why development of agriculture is closely linked to education. The limiting factor has been "human capital", almost everywhere but especially in under-developed areas.

The chief risk that agricultural schools run is to become schools where agriculture is taught by abstract method. Modern farming requires scientific knowledge and gains from acquaintance with chemistry, physics, botany and zoology but demands *always* demonstration of how a determined technique suggested by a determined scientific discovery can be put into effect. Therefore, the agricultural school should always have a farm and should be situated in the country, so that students have immediate contact with plants and animals. They should also have residential facilities so that they can follow crop-cultivation and breeding in the various seasons and periods of activity.

In economic development, drift of labour from land is marked and continuous. Young people, who very often have attended agricultural schools and acquired specific knowledge of farming seek other activities due to favourable labour market conditions. The result is that those left in agriculture are the older ones and those young ones who have less knowledge and initiative. Hence the need for two forms of intervention, *viz.*, (a) vocational instruction for adult rural workers and (b) technical assistance for farmers. Vocational instruction of adult workers cannot be achieved by purely scholastic method. For them, a practical content should be given to lessons which need not deal with theory at all. The time should be devoted to demonstration, in the shape of practical lessons that teach how to carry out something which experience has

revealed as having good economic results. Technical assistance helps farmers to increase productivity on their holdings and broadens their outlook on innovations. It consists in putting at the disposal of farmers, technicians who can help them to improve the set-up of their enterprises, having regard to soils, climatic conditions and market situations of products and raw materials. When such assistance becomes systematic, farmers soon acquire a good stock of ideas and the level of their farming knowledge rises.

SOCIOLOGICAL CONDITIONS

Prof. E. W. Hofstee confined his paper to a discussion of sociological conditions for development in agriculture. At present one of the least developed sectors of sociology, he said, is economic sociology. It has not yet achieved the status in the science of sociology, as a whole, as its other branches. Rural sociology for greater part has developed within institutes for higher education and research, devoted to the furtherance and development of agriculture as an economic activity. However, it has also not yet been able to compensate for shortcomings in the field of economic sociology or sociology in general. In other words, there is not yet a well-developed, generally accepted, body of theories with regard to the sociological conditions of economic growth.

Sociologists can look at economic growth from many points of view such as relation to leadership, to social stratification, to type of family life, to urbanisation and so on. Yet the author thinks that the most essential sociological problem related to the phenomenon of economic growth is that of social change. In fact, economic development is always a social change in the sense of change in the social relations between the human beings involved, change in their culture and in their behaviour as it is conditioned by social structure and culture. Not all economic developments imply equally important social changes. It is also possible that economic growth may be so slow as to be almost imperceptible so that change in social life as such may not be experienced by the people.

Economic growth is part of, and cannot exist without, a rapid and complex process of social change, which the farmers may not be willing to accept. Even in some of the highly developed countries, due to resistence by farmers for social change, there are still regions where hardly any development of agriculture is perceivable, though all necessary information about modern agriculture is readily available and the government and private organizations do their utmost to bring agriculture on a higher level. This is so because mankind has lived for ages in a world which hardly showed any consciously experienced change. In modern society, however, there may be differences as to the kind of change desirable and its degree and speed but the conviction that change is not only unavoidable but that it is a means for the improvement of living conditions has become ever general. The present day society has become really "dynamic" in the sense that change has become normal and part of the routine of people's daily life. However, the modern pattern of culture reached the countryside rather late. It was often called the modernization or the urbanization of the rural areas. Again, there are in a country some regions which are relatively traditionalistic and others which are relatively modern; further, within a region farmers on different levels in a continuum running from traditionalistic to truely dynamic are to be found.

The conclusion, according to the author, is that economic development in agriculture depends to a higher degree on the willingness of the farmer to accept change. The willingness to accept change in a concrete case is dependent on

the farmer's attitude towards change in general. This attitude is for the greater part determined by the degree to which the farmer has accepted the modern pattern of culture and that a favourable attitude towards change is even the most essential characteristic of this modern culture, as opposed to traditional culture.

Attitude towards change cannot be sustained by exact evidence. The author has cited the main findings of investigations, carried out in the United States and the Netherlands. These studies further show that there is a correlation between social behaviour, including economic behaviour, with different cultural patterns. The findings do not suggest that inborn qualities of outlook among farmers are of great importance. The degree, to which the modern pattern of culture has penetrated certain regions and communities is dependent on the degree to which they are open to cultural influences from the outside.

Among the conditions, which influence the penetration of cultural influences from outside, the degree of geographical isolation is of importance. The next factor is the degree of education taken in the widest sense. The importance of the means of transport and communication can hardly be exaggerated.

Among the causes of the continuation of traditionalism, distrust of outsiders in peasant communities is very important. The degree of distrust and the chance to break it down are highly dependent on the government. The type of social structure is also important. Strong caste and class differences and lack of communication between the higher classes (who are normally first to accept the modern pattern of culture) and the lower ones may lead to retardation of the acceptance of modern culture by the lower classes in the countryside. Self-created socio-cultural isolation of small groups may also lead to the same result. The smaller the group, the more they keep to traditional cultural patterns and vice versa.

The author does not claim that there are no sociological factors of importance other than those described above. He, however, points out that in the present situation the most valuable contribution rural sociology can make to economic development in agriculture is to identify the social conditions in the countryside which are hampering the development of the modern dynamic pattern of culture and the means necessary to change these conditions.

INSTITUTIONAL ENVIRONMENTAL CONDITIONS

Shri K. Skovgaard's main theme was that the institutions are pre-eminent tools for the promotion of agricultural development and the implementation of policies. In fact, there is a correlation between the level of development of agriculture and that of the agricultural institutional environment. Further, there exists an important interdependence between farm size and the institutional environment. Small farm size promotes the advancement of agricultural institutions which simultaneously preserve or even foster the small farm. It is essential to the development of a favourable institutional environment, however, that the farm population should have a positive attitude of tolerance, responsiveness, willingness to co-operate and confidence in undertakings. Through education and information, uniformity of interests of the small farmers is easily appreciated and the road to progress and participation is smoothened. They should not have competitive feelings among themselves, but should develop a feeling of collaboration with their neighbours.

The author has elaborated these remarks with special reference to Scandinavian countries. In these countries, institutional environment of agriculture is

fairly well developed, production pattern is almost uniform and small and medium sized family farms are largely prevalent. In spite of an extremely individualistic outlook and a considerable social divergence between the various social groups, there exists within the main groups of farmers a widespread sense of cultural and economic solidarity which is an essential pre-requisite of a developing institutional environment. In this respect the group of middle-sized family farmers, who are in relatively large proportion, have played a dominant role. They have also been initiators and leaders of agricultural institutions for many years.

Agricultural institutions are of two types, namely, formal (under public or private controls) and informal. Informal agricultural institutions are older ones originating through tradition, convention and experience. Though they have no legal status, they exert great influence among farmers and last longer. It is particularly so when they establish rights or usages, as they regularly do, in the tenure, use and inheritance of land and farms. Those may be for the better but are more often for the worse. In the latter case, the informal institutions are obstacles to development and their discontinuation or rationalization are primary objects of agricultural policy. Formal agricultural institutions are established in two ways; either they grow up themselves, developing from small local undertakings into nationwide institutions; or they are established by law or general decision. Formal institutions are set up according to law or public order and provide for a very composite and extensive number of functions. As they are instrumental in creating economic and social climate, it is important that they are fully compatible with the mentality and expectations of the farm population. Thus, in northern Europe, close co-operation exists between the governments and the farmers who are traditionally represented by these institutions.

Public agricultural institutions may be distinguished by their functions: (a) general or compulsory conditions to which farmers have to adjust or (b) utilities to be used at the discretion of farmers. The first group of institutions comprises land tenure in all its aspects, compulsory social institutions, a number of measures to eliminate waste, increase efficiency, establish controls and support agricultural prices and incomes. Owner occupancy has established itself as an informal institution of great impact. The security of tenure and property of the owner occupier is a valuable social function; it promotes the careful utilization and development of resources as all values accruing from resources are assured to owner occupier. Owner occupancy has established itself as an informal institution of great impact in these North European countries, where owner occupiers form more than 80 per cent of total farmers. A shortcoming of the system, however, is the organization of agricultural credit institutions capable of replacing functions of landlord.

In agriculture, many problems of technique and business, such as the control and combating of pests and disease of plants and animals, control of qualities, declarations and standardizations of means of production and agricultural products, can be solved efficiently only within a public institutional framework.

Conceiving the institutions set up to support agricultural prices and incomes, the author observes that the Danish farmer has to adjust production according to open market prices. Hence, he has had to lay more emphasis on the development of the institutional environment which is within his own influence and imagination. During recent years, however, with the worsening of farmers' terms of trade, they are taking increasing interest in the establishment of institutions which would stabilize their economic environments as in other countries.

The second group of agricultural institutions is those establishing utilities to be used at the farmers' discretion. These institutions provide services in many fields of management and production. They comprise service organization in agricultural education, information, advisory work, research and experimentation, agricultural credit, techniques in plant and animal breeding, land reclamation and improvement, land consolidation and construction, etc. To secure farmers' support, their administration in Denmark is decentralized by delegating the administrative functions to experienced and highly esteemed farmers. This has resulted in overlapping and interdependence between the public utility institutions and the farmers' own associations.

Financing of investments, the author points out, must be on terms which are reasonably in accordance with the slow disinvestment rate peculiar to agriculture. Hence the proper organization of agricultural credit is one of the corner-stones of a developing agricultural environment. The provision of agricultural credit is predominantly a service of co-operative credit associations and savings banks.

Finally come the institutions under private control and set up by the farmers themselves. They fall into two closely interrelated categories, *viz.*, (a) the co-operatives and (b) the farmers' associations. Co-operatives are highly specialized according to function and enterprise, especially in Denmark. Consequently, a farmer is a member of a number of co-operatives ranging from 8 to 15 or even more. Participation is highest among small and medium-sized family farms. Co-operatives have also had indirect educational effect by disseminating "know-how" in technique and management.

Farmers' associations have long traditions. Usually they represent group interests. In Denmark they also perform services of public utility institutions.

Of all the institutional environmental conditions, the author concludes, the most important is the establishing of institutions in such a way that the full participation of the farmers is ensured. The proper way to do this is to persuade the farmers themselves to engage in the establishment, in providing the leadership and in effective functioning of the institutions.

V. MARKETING OF AGRICULTURAL PRODUCTS AND AGRICULTURAL DEVELOPMENT

MARKET STRUCTURE FOR AGRICULTURAL DEVELOPMENT

Dr. O. V. Wells, while discussing the relationship between improvements in agricultural marketing structure and agricultural development stated that "Agricultural Marketing" is a broad field encompassing all events which take place in moving products from the initial producer to the final consumer, embracing the activities of all the forms and institutions, which make the necessary decisions and carry out the actual economic and physical operations involved. However the discussions centre on some portions of this total process or structure rather than looking at the whole. It is a belief in certain quarters that only slight or secondary connections exist between agriculture and economic development; yet in case of under-developed countries which are almost wholly agricultural, there is no alternate point from which to start. There are obvious economic conflicts in the interests involved in this process. The relative bargaining power of these various interests, including political and institutional strengths, is always a real, often the controlling factor in retarding or speeding up marketing improvement. It is easier to change market structure or increase efficiency

of marketing processes as the volume of product handled is increased. In under-developed countries, market structure is always mixed, with varying degrees of marketing efficiencies, from primitive to excellent, existing within different regions, or within different commodities. The more efficient marketing system is associated with the specialised, plantation sector type of agriculture, which is not the pattern towards which most of under-developed countries want to work. Many of the conditions pre-requisite to market improvement lie outside the market field itself. In short, it is an 'ascending spiral' process which involves not only the producing and marketing structure for agriculture but also the entire process of economic development.

The main essentials for the development of an adequate or satisfactory agriculture market structure are that the farmers of an area must produce substantially more than they can consume; the means of transportation are developed; adequate storage facilities are built up; efficient handling practices are implemented; development of adequate weights, grading and standardisation, supply of market information, availability of low cost credit.

Although the broad lines of solution of the problem in under-developed countries are known, the author emphasizes the need for "clear forthright policy decisions followed by vigorous administration and programme action which will unite the village people and the servants of the Government in a common cause". In this connection, the author sites the Intensive Agricultural District Programme being operated in India which simultaneously provides, through co-operatives, for adequate and timely supply of production requisites, credit and marketing arrangements; it also involves intensive education for farmers, strengthening of transport arrangements and increasing number of godowns. Some support or guaranteed commodity price arrangements have also been envisaged. The author concludes by saying that the essentials of a good market structure are easy to understand. We want to improve transportation, storage, communication, and information while at the same time supplying credit and standardising quality so that what was under simpler conditions, a series of loosely connected local markets, becomes a true national market. In this process the farmer, the private trade, co-operatives and the Government must co-operate and take necessary action in their respective fields.

There are some difficulties. Producers and producer co-operatives, the processing and handling trade, and the Government must find specific places to take hold, specific ways to motivate change. Above all, there has to be something to market. Simply organising a co-operative, for example, in the area where there is not enough surplus commodity or commodities above local subsistence needs to justify the necessary marketing facilities and some specialisation on the part of the marketing personnel will not do the job. Announcing Government grades and standards which are not used or regulations which are not enforced will not do the job. And, finally, market improvement is only a part of the process by which agriculture contributes to the end process in which we are all so much interested, economic development.

REGIONAL AGREEMENT FOR AGRICULTURAL MARKETS

Dr. S. L. Mansholt, Vice President, Commission of the European Economic Community discussed the problem of regional agreements for agricultural markets. The desire to exploit the advantages, which the technical and economic advances of today offer in a larger market, has resulted in closer association of large areas. Such mergers are intended to produce a union in which economic policy is co-ordinated in many spheres so that a wider single market

is created which shows all the characteristics of a domestic market. Ultimately, such regional mergers move beyond greater economic unity towards political fusion.

In this connection, important attempts made since 1945 to merge large areas that extended across national frontiers, such as the Overseas European Economic Co-operation are mentioned. At present the Arab States in West Asia and young African countries are also contemplating establishment of common markets. The author then dwells upon the problem of including agriculture in such mergers. The structure of agriculture in these countries has evolved within the national frontiers in "a glasshouse climate". For agriculture to fit into wider areas, changes in structure are inevitable. Different outlooks developed by agricultural population as also ideas and institutions familiar at national level will have to be abandoned. These are frequently painful and entail personal hardship.

The author believes that it is not right or even possible to exclude agriculture from economic mergers involving large areas because it is not possible to draw a clear line of distinction between agricultural and industrial products as far as food industry is concerned. Besides, food prices in a national economy, which are decisively influenced by agricultural market and price policy, constitute an essential cost factor in non-agricultural sectors; hence equal conditions for competition in trade and industry exist in a large scale merger only when there is a common level of prices for agricultural products. Agricultural policy is an important part of economic policy even for highly developed industrial countries because the changeover of the active population from the primary sectors, of which agriculture is one of the most important, to the secondary and tertiary is one of the characteristic phenomena of economic growth. Hence inclusion of agriculture in regional mergers becomes the more compelling the more people are engaged in agriculture, the greater the share of agriculture in foreign trade and the higher the aims of the merger.

The focal point of such a co-ordination of agricultural policies in a large scale merger must be the level of agricultural prices and the question to what extent agriculture is to be exposed to competition, both within the area to be merged and in its relation with non-member countries. This is more so especially because agriculture has frequently enjoyed special protection under the national agricultural and economic policies of the industrialized countries. Wider the area encompassed in a common market, keener will be competition felt by farmers. A far-sighted agricultural policy would help farmers to hold their own in this new and keener competition. It would include measures to improve conditions of production especially agricultural structure, to improve the marketing system for agricultural produce and to establish equal competitive conditions in the fiscal, social and transport fields. Coupled with this are the structural changes and processes of adaptation.

Turning to the European Economic Community and its common agricultural policy, the author distinguishes between agricultural imports from developing countries and those from other countries which are highly developed either industrial or agricultural countries.

The developing countries mostly export items such as coffee, tea, cocoa, tropical spices and bananas, or industrial raw materials of agricultural origin (cotton, rubber, jute). The prices paid for these products and the flow of trade in them are of vital importance to the economy of many of these countries, because they represent one of their few export products. The common

agricultural policy, the author contends, does not affect the E. E. C's imports of these goods because these are not items which are produced in Community countries or which compete indirectly with products of the Community. In this context the Commission has but recently made known its intention of increasing consumption in the Community countries by a gradual elimination of excise duties and by lowering the duties laid down in the common external tariff. Payments are to be made into a stabilization fund in order to take into account the special position of the developing countries associated with the E. E. C.

Special measures for the other agricultural commodities are envisaged in the common agricultural policy under the Treaty of Rome. Among these oilseeds, vegetable oils, rice and cane sugar are of importance to some developing countries. However, two-thirds of the Community's import requirements of temperate zone agricultural products are supplied by highly developed industrial or agricultural countries of the temperate zone. For some of the agricultural products, the E. E. C. Commission has proposed market organizations which will be backed up by certain measures taken at the common external frontier. The future common commercial policy in the agricultural sphere would dispense with a series of restrictive measures still in force under the commercial policies of Member States. There would be no more import monopolies, state trading practices, import quotas or compulsory mixing regulations. Quantitative import restrictions, prohibited in principle, would be considered only in emergency cases and in accordance with the GATT rules. Imports from non-members are controlled by custom duties and flexible import levies. These instruments, it is contended, are necessary with a view to maintaining stable prices mainly because of the conditions still obtaining in some world markets where forces of free competition do not prevail in agricultural markets. While concluding, the author emphasized that common rules of competition for trade in agricultural commodities—a kind of code of good behaviour—be worked out on a large scale, if possible on world-wide scale and observed. He also cautioned that if it is desired to prevent the nascent regional mergers from evolving differing concepts of agricultural policy, which in the long run would lead to a dangerous isolation of agricultural markets one from another, then the time has come for working together a code of good behaviour for world agricultural policy.

UNIFIED AGRICULTURAL DEVELOPMENT PROGRAMMES

Prof. D. G. Karve focussed attention on a very important experiment in India, *viz.*, 'the Package Programme' from the point of view of accelerating agricultural development in developing countries and thereby promoting economic growth. He said that as a rule, in an under-developed state a country relies mainly on subsistence agriculture. The non-agricultural complement of the economy is relatively small and not much progressive. Due to smallness of holdings, the process of modernizing agricultural techniques of operation and of maximising their yields confronts special difficulties. The most approved democratic method of meeting the challenge of this situation is the community development and national extension programme commonly found in several countries of South Asia. As economic progress is desired through democratic methods the greatest emphasis is placed on social education and on institutions of voluntary self-help. Normal school education is supplemented by broad civic and elementary scientific and industrial education keeping in view the needs and prospects of the betterment of village life. These prospects concern the occupational reformation of the agricultural population and the alteration of their habits so as to be helpful for achieving modernization and progress.

In view of the major objective of developing a free and democratic pattern of society, the programme of occupational and social reformation must needs be formulated and implemented by democratic methods. Much of the planning and mobilization of resources take place at the national level. However, with a view to ensuring speedy progress and fullest people's participation, formulation, adoption and execution of local development plans have to be left to the people's own organizations such as civic councils, co-operative societies and other cultural and occupational bodies. Opportunities are given to the small farmers, artisans, etc., to participate in this process of modernization and democratization. Attempts are made at improving overall services to agriculturists with increasing measure of international help through schemes of irrigation, transport, power and fertilizer supply. To enable the cultivators to participate in programmes of the more profitable utilization of these and other resources of agriculture, schemes of research, extension, supply, credit and marketing are being put into force.

Citing the example of India, the author contends that the programme of Community Development and National Extension Services has resulted in an achievement which as compared to the need and expectations appears rather limited. The moral of the situation, according to him, is that extension and democratic institutionalization do not by themselves succeed in ensuring the required supplies of essential agricultural products. If these supplies are to be obtained in required quantities and if their rate of increase is to be commensurate with the anticipated increase in demand a concentrated and an intensive programme on a somewhat selective basis must be followed as a necessary supplement to the programme of general extension and community development. Another reason for adoption of the 'package programme' as an integral part of developmental planning in a democracy is that if a developing economy is to reach a stage of revolutionary change and sustained growth, the impact of the change must be massive enough to affect the character of the economy and to create a surplus and a momentum which will carry forward the change to a continuous progress. For attaining this qualitative and concentrated effect unless in some areas either of region or of class, all the needed services which would influence the whole nature and productivity of economy are simultaneously utilized, the rate of change will not easily attain the intensity and comprehensiveness of a revolutionary movement. Thus the need in a democratic economy of an intensive programme of agricultural development. The areas to be picked out for the purpose should have high potentiality and low risks, the principles of choice being good soil, assured water supply, progressive farmers, access to markets and habits of successful co-operative association.

Thus, in Ludhiana, a district chosen for the Intensive Agricultural Development Programme in Punjab in India, 6.13 lakh acres of the total of 7.89 lakh acres are under crops such as wheat, gram, maize, sugarcane, cotton and groundnut. Of this area, nearly 63 per cent is irrigated.

Extension agent, called the Village Level Worker is made available for every 400 families. In addition to the normal staffing of a block, a suitable number of agricultural technicians and co-operative officials has been appointed. All the staff has undergone requisite training, both technical and programmatical. Essential supplies such as seed, fertilizers, pesticides, agricultural implements, iron and steel, cement and bricks have been made available in requisite quantities. These supplies, stored in conveniently situated godowns in each block, are in possession of farmers' co-operative organizations; issues from the stocks would be in kind on credit and to selected farmers as and when needed.

Village worker, acting under the advice of agricultural technicians, pre-

pares a plan for improved farm management and crop cultivation for a two-to-three year period in the first instance. On the basis of the physical and financial implications of such a plan, members' legitimate needs of supplies of credit and producers' goods are assessed. Resources of co-operative institutions are strengthened at different levels adequately.

To achieve large scale and quick augmentation of net productive capacity, the intensive programme is directed towards the economic-sized holders of farms. Farmers of this class help in reaching standards of mechanization and of efficient cultivation. They blaze a new trail in agricultural pursuits making agriculture a promising industry or business. Such a policy of concentrating productive resources on the most promising situation is a natural one with an obvious economical appeal. It is also socially justifiable since the intensive plan is supplementary to the general programme of extension and community development. The relevance of an economic, and preferably an optimum unit in a scheme of concentrated all-sided investment of productive resources is crucial. Farms of about 15 to 20 acres of irrigated land have been seen to offer every attractive opportunities for skilful, mechanized and modern farming. Where submarginal holders continue to exist in large numbers, the possibility and the benefit of promoting joint cultivation so as to ensure optimum or economic size of cultivated unit cannot be ruled out.

General economic progress, of which agricultural progress is a part, implies that more and more people will turn to non-agricultural pursuits thus diminishing the man-power available for land. It will create a new situation in regard to economy of mechanical cultivation and the relative advantage of the prevailing size of land holding. To facilitate these changes when they become natural and beneficient, sufficient elasticity in organization and tillage will have to be provided for, while chalking out a programme of intensive agricultural development. Secondly, imminent technological changes may have profound effect on scales of economic unit, capital investment and running costs. The author, therefore, suggests that relative merits of an intensive and unified approach should be judged at all stages of change. In this process of assessment, international comparison as indeed prospects of international co-operation would loom large.

USING SURPLUSES FOR ECONOMIC DEVELOPMENT

Mr. J. C. Crawford discusses a problem which has become controversial recently, *viz.*, use of farm surpluses for economic development. The Agricultural Trade Development and Assistance Act of 1954 (commonly known as Public Law 480 of U.S.A.) defines "a surplus agricultural commodity" as the excess supply over that amount, whether publicly or privately owned, which may be "expected to be in excess of domestic requirements, adequate carryover, and anticipated export for dollars." The surpluses in U.S. are still very large, especially in wheat and some other grains, cotton and tobacco. The objectives of P. L. 480 programme include the promotion of economic stability for American agriculture, expansion of international trade in agricultural commodities, "to encourage economic development" and promotion of the collective strength of the free world. Certain uses of the surpluses do contribute to economic development in ways over which there will be few serious doubts, *viz.*, famine relief, continuing charity to the starving, building up national reserves as buffers against the ordinary vagaries of supply in under-developed areas and a supplementary way of raising the calories intake of a growing but seriously underfed populations. Straightout gifts of food can be made under Title II of P. L. 480 for these purposes and national reserves built up in under-developed countries

to stabilize food supplies. This will also serve to sustain a minimum level of nutrition and thereby help economic development. Thus, Mr. R. K. Hefford has estimated that P. L. 480 (Title I) disposals to India (all foodstuffs) from July 1, 1954 to June 30, 1961 represented a gross average per capita calorie intake per day of 77 calories. This compares with an estimate of 2,050 calories per capita, total intake for 1958-59. Thus, P.L. 480 disposals could be, and may have been, an important indirect factor in Indian productivity.

There is a direct relationship of food supply to development. If development is associated with an expanding investment programme, utilizing otherwise unused factors of production, which leads to rising money incomes, there must, in the absence of inflation or control, be made available consumer goods like food and clothing in rising volume. Unless belts are to be tightened by inflation or more direct means, additional investment calls for additional consumption goods to meet inevitable extra demand. A necessary condition for the use of agricultural surpluses for economic development is that additional consumption made possible through receipt of surpluses be matched concurrently with additional investment. Additional investment with an insufficient supply of consumption goods would cause inflationary pressure, while added consumption goods without corresponding investment would contribute relatively little, except in an indirect way, to capital formation.

It is necessary in any intelligent planning for development to have some concept of *minimum* food standard to be achieved. A given supply (*e.g.*, 16 ozs. of grains a day) may maintain physical capacity to work, but it may need some thing more (say 18 ozs. of grains per day) to provide useful incentives and to minimise the dangers of inflation. This, at least is how the author judges the objectives of the Indian Third Plan. India cannot be accused of fixing an extravagant *minimum* food standard, he points out, when a comparison is made with Japan. When adequate food supplies cannot be provided quickly enough by increase in domestic production, foodgrains have to be imported. Thus the availability of foreign exchange becomes a critical issue. The author states that the Indian Third Plan aims at self-sufficiency in foodgrains by 1965-66. In the meantime at least, needed food supplies must come from imports. P. L. 480 supplies now become relevant either as replacement of commercial imports or as additions to some concept of 'normal' commercial imports.

The author then generalizes that "if aid in the form of food is additional to a planned level of export earnings, capital inflow and aid, it will serve, in effect, as an addition to receipts. There is a limit: the disposals must not exceed the *necessary* amount of food required under the Plan to supplement home production. If it does, it may be usable but it will almost certainly call for more non-food aid, or capital inflow or export earnings in order to expand the investment programme commensurately with it."

Recent Indian experience and the projected Third Plan illustrate the general thesis stated above. Thus, commercial cereal imports, which were 20 and 25 per cent of total imports by value in 1951 and 1952, fell to 3 per cent in 1958. Textile yarn and raw material imports fell from 20 per cent in 1952 to 9 per cent in 1958. On the other hand, imports of metals, machinery, vehicles, etc., rose from 19 per cent in 1951 and 22 per cent in 1952 to 53 per cent in 1958. These three movements reflect the influence of P. L. 480 disposals of wheat and cotton. In a very real sense, commercial wheat exporters, specially Australia, have contributed to Indian development through loss of market.

During the Third Plan, 17 million tons of imports of foodgrains valued at Rs. 600 crores are anticipated under P. L. 480 agreements. If these imports

when added to home production and commercial imports prove excessive in relation to the projected minimum *needs*, a waste of resources will occur. This, the author points out, is highly unlikely in view of the high ratio of incomes spent on food.

Although food disposals may function as a form of aid the question is whether it is the best form of aid. It is argued that it is an inefficient way of transferring income from rich to poor countries. Even if the disposals appear to meet all the tests of fitting into the planned allocation of real resources as an integral part of a development plan there are serious qualifications to their effectiveness. Referring to the practice of setting P. L. 480 produce through local currency identified as "counterpart funds", he stated that under the agreements signed with India from July 1, 1954 through December 31, 1960, the total market value (including ocean transport) of disposals is estimated at $1345 million equivalent of rupee sales split up as under.

Million dollar	*per cent*	
370	27.5	Grants for economic development.
113	8.4	Loans to private enterprise.
667	49.6	Loans to foreign governments.
195	14.5	For U.S. uses.
1345	100.0	

The first item of grants enables matching investment resources to be used. Loans to private enterprises can make sense if the enterprises fit in with the Indian plan, otherwise they will compete for resources which the Indian Government may have preferred to use for greater priority needs. Loans to Government may be subject to the same comment. If the Government must find projects to fit the loans it will certainly put forward those projects it would have gone ahead anyway. It can then reduce the amount of deficit finance or internal borrowing it would have done. The same result is better achieved by granting the counterpart funds. On the other hand, if U.S. Government looks for projects outside the Plan, then it is unfairly forcing the Indian Government to drop preferred projects or to risk inflation by adding unsafely to the total money investment flow. The last item, *viz.*, the 15 per cent for U.S., according to the author, denies the Indian Government of that source of unfettered foreign exchange, or if wheat imports are needed by India, Australia and other competing countries are denied the opportunity to compete.

Another question is whether the method of selling P. L. 480 supplies in the recipient countries really gets the food to those consumers both in greatest need and likely to respond in terms of productive effort. Administrative steps need to be taken to ensure the geographical distribution to match development areas. Further, the readily available surpluses may retard agricultural development if it results in fall in prices (which is not a significant danger in India). Secondly, planners may fail to provide corresponding investment needed for ancillary aids to agriculture—chemical fertilizers, equipment, irrigation, etc. For donors of surpluses to acquiesce in this attitude would be irresponsible in respect of countries where improved agriculture is possible. Greater productivity in agriculture is needed not merely to meet the needs of a growing population both rural and urban but also through higher farm incomes, to provide for the growing output of the industrialized sector.

While concluding the author has stated that the surplus disposals should not be regarded by U.S.A. as a substitute for other aid which is needed in ever

larger measures by the under-developed countries. He has also advocated a greater move towards the multilateral agreements and understanding on three grounds, *viz.*, (i) the interest of friendly exporters, (ii) the fact that food aid by itself cannot replace the need for substantial aid in other forms and (iii) the growing awareness by America's Allies, especially but not only in Europe, that aid policies call for more support and for greater co-ordination. Thus, though P. L. disposals are a less efficient form of aid, nevertheless they can contribute to economic development more effectively if international action to reduce frictions generated by the programme is taken.

THE AGRICULTURAL ECONOMIST AND HIS TOOLS: RESEARCH METHODS

Prof. Earl O. Heady in his paper discussed the use of different research methods in analysis of agricultural economic problems. He said, economics is the most mature of social sciences. It is blessed accordingly with systematic concepts and theory and with empirical tools which have a "greater ring of exactness and sophistication" than other social sciences. As an applied field within economics, agricultural economics has become the most profound or advanced of all applied fields in economics, or of all applied fields in the social sciences, in the use and application of conventional and newly-developed quantitative techniques. Of all new empirical tools developed over the last two decades, agricultural economists have been the most avid and energetic appliers. However, it is not unlikely that the profession has, in recent times, sometimes found itself partly caught up in the pressure of "fads" or "stylishness."

Mr. A. A. Rogow in his classification of terminology in the broad fields of social science, especially political science, has classified terms which are "sophisticated, modern, knowledgeable;" as compared to those which are "crude, obsolete and uninformed," using the distinctions of U (upper class) and non-U. The U orientation explains some of the agricultural economists' intense interest in new methodological tools, concepts and empirical methods which will allow the better conquest of relevant and complex relationships which exist in economic and related phenomena. However, the efficacy of empirical tools, given their varying degree of sophistication and predictive power, is most likely to be tested in this realm of real world solutions and recommendations. If the solutions and directions are provided by agricultural economics, apart from results and predictions of the more refined empirical tools, agricultural economics will still prosper as a mature science serving to further the aspirations of men and societies. If, in contrast, the basis for solution and directions are provided by the empirical tools and steps, and if these lie dormant or are ineffectively used and agricultural economics in general is not able to provide an effective and workable framework for agricultural policy and transition, both phases of science will become discredited and withered in financial support. Hence, if it is desired that refined empirical technique *per se* and agricultural economics as a broader professional activity do not live apart but increasingly join in producing the greater scientific and social product, then the two should work as complementary inputs. Here, it is also necessary that empirical technique serves as a means, rather than as an end *per se* in professional concentration.

As regards the allocation of tools for solving a problem, according to Dr. Heady, the tools for the agricultural economists are something more than the set of statistical and mathematical techniques available for generating predictions since they also include the broader set of concepts, theories and principles drawn from the field of economics. This set of theories provides the meaningful framework within which the application of quantitative techniques must take place if the latter are to have high scientific and social value in an applied field.

For instance, as in less developed economies, the principle and its application with data lacking extreme refinement, but of sufficient reliability and coverage over the nation, can be more useful than pure concentration on high refinement of a meagre set of data. Refinement in prediction and elegance of technique may be demonstrated for an isolated set of data, but it may represent a stratum which is too small a proportion, both in time and space, of the universe to be useful in devising an efficient plan. Thus, the problem is of weighing the relative value of a less refined but a broader set of data applied in a relevant theoretical framework to a broader universe versus a more highly refined but narrower set of data with restricted application to the universe. But pay-off or value of data can be measured neither alone by its expanse nor by its depth and refinement. Both characteristics of data have marginal values which decline with their magnitude or extension. Hence, the real problem in research is to obtain the proper balance between the allocation of research resources and the problem being analysed, the existence of previous data and the urgency for individual or social action.

The proper approach while applying research methods should be that of first formulating the problem carefully and then selecting the most appropriate and efficient methods for the particular problem, rather than one of selecting problems which fit into routine moulds based on particular methodologies or concepts. Considered in this perspective, empirical techniques have two powerful advantages over the simple technique of data collecting and processing. First, they generally require a systematic formulation of the problem and its structural foundation. They cannot be used effectively unless the model on which they are based is set down in explicit form with an orderly specification of the relationships and variables concerned. Secondly, modern day computational facilities can be more usefully used in empirical techniques than in techniques resting on less formality and adapted mainly to hand calculations.

As far as the question of allocating specific tools to national needs is concerned, no rigid line of restriction can be drawn as to the area of operation of a particular tool. Most of the empirical tools available to agricultural economists have considerable generality in their application to micro and macro units. For example, linear programming is adapted to a single firm in specifying optimal allocation of scarce resources among competing investment alternatives, but it does have similar promise in national planning and economic development models where data are available or can be made available. In classification among the general methods of empirical analysis, perhaps a more important distinction for national purposes and needs is that between positive and normative tools, although the two are not discretely different. But there can be no denying the fact that national interests and urgencies may converge somewhat to emphasize one or the other of these two approaches. In nations where the social system is highly stable, where present is linked with the past and where very little change is desired, these positive techniques may have greatest utility in the sense that they are methods of predicting quantities and relationships as they have existed, or do exist, in an ongoing or real world context. In other nations which have little interest in the past and where the urgency is in creating a structure which is far distant from it, or even from the present, there the positive or descriptive tools such as regression and input-output analysis may have small utility and little value for planning and policy activities. Instead, what might be needed more will be normative techniques, such as process analysis and associated techniques to provide estimates of conditions which should or can hold true in resource allocation, production and investment patterns and in market quantities if particular goals or ends are to be attained. Hence, research and the development and use of tools needs to be ordered according to the needs of the nations.

In conclusion, since U designation is more or less synonymous with "current styles" in a particular science, it perhaps is necessary for the agricultural economists to be U classified to show 'they are uptodate" in displaying knowledge of and facility in applying, new techniques. These manifestations rather than the social significance of the problems tackled and results forthcoming may provide the orientation of some efforts. But, U classification and the social value of research results are not synonymous. The extent to which these two products of research are complementary or competitive will depend on the setting of the particular country and its needs.

USING RESEARCH FINDINGS IN POLICY ISSUES

Dr. Mordecai Ezekiel devoted his paper to an examination of use of research findings in policy issues. He has given a historical recapitulation of research work done since World War I in the field of agricultural economics and its application in framing national policies in the U. S. Besides, F.A.O.'s contribution in this field has also been highlighted in the portions dealing with post-war period.

During the decade of World War I, the major applied use of agricultural economics research in the United States was in production economics, with the classic arguments with Warren and Spillman on the respective places of research and extension, and with later debates as to whether cost of production computations or farm enterprise and farm income analyses provided the proper guide to war-time farm price fixing policies. Relatively little practical use, however, was made of research conclusions as a basis for farm policies in this period.

The decade of the 1920s saw the establishment of the Bureau of Agricultural Economics (B.A.E.) and the rapid development of quantative studies in a number of different fields as also the beginning of efforts to apply these results in actual policy formation. On the production economics side, extensive experiments were made on the analysis of relative profitability of different systems of farm organization. These were conducted first by advanced statistical methods including multiple correlation and later by the more satisfactory farm budget and synthetic budget methods. A start was also made on the determination of agricultural production functions and their use to compute most efficient or profitable levels of input with varying prices. These production economics studies formed the basis for advice to farmers through county agents and extension economic specialists, but did not directly affect governmental agricultural policies in this period.

Simultaneously work on agricultural prices, supply demand relations and agricultural index numbers developed. Price-analysis reports on different commodities also were started. In 1923 the first "The Agricultural Outlook" report came out. Thus the 1920 decade was a period of rapid flowering of quantitative research in the economics of agriculture in U.S.A., of the application of such research to the problems of decision making by individual farmers and of initial experiments in the application of such research in national agricultural policies.

However, one of the first efforts to apply research directly to agricultural policy itself was made in 1929 under the Federal Farm Board established by the Hoover Administration (1929-32) for helping the steadily worsening economic position of farmers. The Farm Board made relatively little use of research in planning its price support and crop storage programmes, but did carefully appraise the results (or lack of them) in its annual reports. It also made use of commodity price analysis in guiding its marketing and price-support loans to cooperatives handling fruits, vegetables and other specific commodities. The interventions of the Roosevelt Administration to raise prices and incomes to farmers

were much broader in scope. Economic research and quantitative analysis were relied upon in these activities to an extent previously unprecedented in public affairs. Policy making was further aided by detailed economic and statistical studies of world economic conditions which had contributed to the development of the emergency conditions. This heavy use of, and dependence on, research results has continued ever since in the U. S. in both public legislative and administrative activities; in planning, conducting and reporting on governmental activities in agricultural and other fields; and in appraisals by private agencies of the results of such efforts.

In the field of agricultural policy, the research, extension and policy advice of the State Universities was particularly important in the fields of farm management and production economics; in the detailed local application and development of the national agricultural policies under the varied conditions of each state and its different type of farming areas; and in the contributions of the local and state points of view to these national policies.

Outside the United States, similar though less extensive activities were under way in the inter-War years in the conduct and application of research to public policy. The publication of John Boyd Orr's study of food, health and income (1936) and later the investigation and report on human nutrition by a committee of the League of Nations (1937) were the two developments of key importance to agriculture. A third notable development was the publication of John Meynard Keynes' famous treatise on Employment, Interest and Money (1935) which has since become the backbone of financial policy in every country of the world.

During the World War II, public economic research, qualitative and quantitative, was developed extensively in almost all countries for operating their wartime economies, for planning military needs and production, agricultural and industrial, and for regulating prices or price-controls. As the war drew to an end, they were applied to developing ideas for the post-war world and plans for the new institutions, national and international, needed to cope with them. One further application of economic and econometric study and analyses was to the general economic problems of the business cycle and full employment. Problems of reconversion from war to peace, and of dealing with the expanding economies thereafter, were studied intensively and dealt with in myriads of reports, hearings and legislative and policy actions.

The decade of the 1950s witnessed the development of three new techniques; the first was the making of projections of future economic magnitudes as a guide to policy, in addition to the analysis of the past and the examination of the probable results of specific proposed action. The second related to the projection, over a given number of years ahead, of the probable consequences of given changes in public policy, as contrasted with the otherwise expected trend of development. The third development is the greatly increased emphasis on economic development in the less developed countries. Much attention is given in many countries to the preparation of national plans for a stated period ahead, involving quantitative projection of all parts of the economy, with specific administrative, financial and legislative arrangements, to make those plans come true as far as possible.

The creation of the Food and Agriculture Organization in 1945, and its subsequent development, along with that of other newly created or existing international organisations with economic functions, has led to a great expansion of data collection, economic analysis and research, and policy discussion and formulation at the international level. F.A.O. took over and expanded the statistical col-

lection and publication functions of the previously-existing International Institute of Agriculture, the first permanent international organization, and added new international activities in the collection and publication of data on food and agricultural conditions and commodities, on national development, and on agricultural policies generally. Among the different valuable publications of F.A.O. a mention needs to be made of the annual review "The State of Food & Agriculture," commodity outlook reports, the report on disposal of farm surpluses. The emergence of the U.S. programme of surplus disposal under P.L. 480 and the evolution of an F.A.O. international code of behaviour for surplus disposal and formally agreed to by 44 countries are cases of use of research in policy formation at the international level.

Another subject in which research by an international organisation had direct effects upon policies and operations is in financing international investment in less developed countries. The material shifts in policies towards more emphasis on financial assistance and on International Bank loans to under-developed countries were the direct result of a F.A.O. study completed in 1949. F.A.O. developed special regional training institutes to teach officials of under-developed countries how to prepare and appraise suitable projects. These helped to train a large number of officials of under-developed countries in preparing and appraising development projects suitable for investment. Many of these projects have since been included in their development plans and carried into effect. In this case, research on a vital problem helped to stimulate needed policy decisions, and new training and applied research stimulated by the policy discussions led to further concrete action.

More recently, the F.A.O. studies on surplus disposal, and especially on possibilities and principles in their use for the financing of economic development, have contributed to the American Food for Peace proposals backed both by the Eisenhower and Kennedy Administrations, and to the recent U.N. Assembly Resolution requesting *multilateral* action to speed the effective utilisation of food surpluses by part of surplus disposals being handled by an international organisation, preferably F.A.O. itself. In line with this resolution, the Director-General of F.A.O. prepared a definite proposal whose implementation depends upon approval by the governments concerned. This proposal is based also upon research and post-war experience with related issues. Projection for production and consumption of different commodities have been done, with particular reference to the European countries by F.A.O.

One different kind of activity based upon research is the Freedom from Hunger Campaign, now being conducted by F.A.O. in co-operation with many other organisations, inter-governmental and non-governmental, and international and national. This campaign will operate over the period 1960-65. It is aimed at focussing world concern on the unsolved problem of continued hunger and malnourishment in the midst of abundance, and the even greater future problem with the population explosion; and at creating an improved world understanding among all thinking people of these problems and of steps needed for their solution.

Despite the hopeful results secured in a number of cases already mentioned, research and inter-governmental discussions under F.A.O. auspices have not yet solved one of its great original basic tasks—to attain agricultural policies and programmes in member countries which produce consistent and balanced results on a world scale. In addition to the pursuit of this objective by commodity and other activities, some of which I have already referred to, another approach is under way. This is the attempt to evolve an agreed statement on desirable agricultural price stabilization and support policies in a form which can be agreed to

by member countries as a standard for their behaviour, just as the F.A.O. Principles of Surplus Disposals have been accepted in their field. While this broader step has not yet been completed, substantial progress has been made.

In the end, the author has dealt with some of the philosophical issues that arrive in research aimed at providing a basis for the choice of policies. This relates particularly to the rationale in appraising how far the adoption of a given new policy will change future events from those most likely to occur if no changes were made in the existing policies. The process of estimating the probable results of new policies, whether projected forward or backward, then becomes a matter of contrasting what was with what might have been; or what seems likely to be if nothing is changed with what might be if certain changes were made. Either process is at best a very "iffy" one; the first depending on the comparison of a reality with an estimate, and the second of one estimate with another. The process of making such estimates therefore involves a considerable margin of error, which must be given due consideration in drawing conclusion from the results.

MANAGEMENT AS A TOOL IN EXTENSION WORK

Prof. Arthur Jones in his paper discussed the role of farm management technique in extension work. He stated that the role which Farm Management plays in Extension Service, (or what is known as Advisory Service to farmers and horticulturists in England) has assumed greater importance in the context of changed farming techniques and the unparalleled progress made in the field of mechanization, in problems of animal diseases, weed control methods, insecticides, etc., during the last 20 years. Much more capital has been injected into agriculture and individual farmers have modernized their fixed equipment including buildings, to meet changed conditions brought about by the factors mentioned above. Further, there is a new awareness by the State of the importance of the agricultural industry. Lastly, the departure from traditional system of husbandry and cropping has involved the farmer in more and more capital expenditure.

In view of the developments in agricultural sector, particularly in highly developed countries, there is no rhyme or reason for adopting new methods, new systems and new techniques unless they are based on a sound economic and financial foundation. It is in this connection that the Extension or Advisory Services can contribute. They should appreciate the need for giving 'overall' advice, advice that embraces both technical improvements and economic soundness. Generally speaking, the aim is to produce food at progressively less cost, materially, and in terms of human toil. How can Farm Management and the techniques associated with this approach can contribute to this necessary and desirable end? Farm Management is concerned with farming as a business, *i.e.*, its organization and equipment, or in other words, the fitting together of the many and differing enterprises which make the farm an economic unit. From the farmer's point of view, Farm Management is merely a pleasant academic exercise unless it is purveyed to the farmer in a form he can understand. This can only be done through the Extension Service in case wide coverage is to be achieved because if the farm management work is undertaken by extension economists and not through the general extension practitioner, this will have to face the two obvious drawbacks, firstly, that of the limited supply of economists and secondly, the county agents, (or County and District Advisory Officers as they are known in England) who are always in touch with the farmers, will remain out of the picture. Furthermore, if Farm Management is to be effective, it must integrate the technical as well as the economic aspects of farm planning. This work can be

more effectively undertaken by the "general practitioner" with a sound technical background and trained in the techniques and tools of Farm Management developed by research economists. In this connection the author has recommended the use of introductory or refresher courses for training the advisers.

Referring to the common belief that the Farm Management approach is not as rewarding or as effective in the case of the small farmer as compared with the large he pointed out the special needs of the small farmer in relation to management advice. In countries where small farms or family farms predominate, the size of the farms cannot be enlarged by buying or renting more land. Their freedom of action is also restricted by what the limited capital under their control is capable of financing. In view of these considerations the level of profits on small farms will be influenced much more by the level of output than by the level of input, but high output should not be achieved by the extravagant use of resources —increased output must stand up to the economic test of continuing satisfactory profits at reasonable cost. This calls for high qualities of managerial competence and it is here that a competent management service can play its role by providing guidance to the farmer at all levels of decision making.

In view of the limitations, financial, educational, psychological of the small farmer, the author stresses the need to make the advice simpler and understandable to him. Given confidence in the adviser (it is essential that there exists complete confidence between farmer and adviser), he will accept a plan of action if simply drawn up, which he himself can understand and believes will lead to improved husbandry and higher profits. He must, however, be led step by step and above all the adviser must not draw up a plan which is manifestly beyond his managerial capacity to carry out.

As regards methodology to be adopted in the Farm Management, Mr. Arthur Jones has advocated adoption of simultaneously both Programme Planning and account analysis and budgeting, both partial and complete; since, in his view, the essential pre-requisites to any method are an adequate sample of accurate financial and physical data. Regardless of the methods used in drawing up the plan, it will only be as good as the data on which it is based. He has, however, cautioned against the tendency to adopt advanced methods followed in more developed countries with much greater experience in the underdeveloped countries. In his opinion, it is useless and misguided to apply these advanced techniques when what is really needed is to enlist the co-operation of the farmers, gain their confidence and introduce them to keeping accounts and records. Above all, the adviser must concentrate on the technical aspects of husbandry, encourage better breeds of animals, higher yielding crops, balanced rationing and so on. Once this work is under way and simple records are being kept, the climate in which farm management work can be fruitful and rewarding is there. But even at that stage I would suggest that simple accounting and comparative analysis will turn out to be the most effective weapons. Certainly not Linear Programming and advanced Capital Budgeting.

Referring to the tendency observed in some countries to consider Work Study, as the answer to all the problems of the farmer and farming, the author said that it does contribute a great deal in the field of labour organisation and management. Work Study deals only with one factor of production, *i.e*. labour, while Farm Management is concerned with all the four factors of production and the allocation of scarce resources between competing needs. In other words, Farm Management is concerned with the best organization and combination of all the resources on the farm for the achievement of a given objective. Work Study, on the other hand, is what one might term micro-science concerned with the handling

of resources in carrying out a particular operation or activity. While conceding that Work Study can help in increasing productivity, he at the same time, cautions from looking on it as the panacea for all the ills of farming since he fears that in wrong hands Work Study can prove only a palliative. He feels that there would be considerably less wastage of the time of Work Study advisers if a farm management analysis had preceded detailed Work Study and that the time and efforts of the Work Study specialists could be devoted to the streamlining of key operations.

In conclusion, Farm Management as a tool in Extension Work is not a subject for academic study but is a means to an end. It is an approach which recognizes that the main purpose of agriculture in a competitive economy as distinct from one of subsistence, is to provide food for the consumers at a price they can afford to pay, and, at the same time, securing for the farmer and his family sufficient profit to support a reasonable and adequate standard of living. The extension efforts should, therefore, be directed to improving not only the farmer's technical management but his economic aspect of his business as well. Farm Management is the one method of approach that can tackle adequately the obligations and demands an industrialized system of farming make on the farmer and the adviser.

The Farm Management approach has the technical and economic disciplines necessary to weld into one pattern what is demonstrably sound farming practice with those sanctions of economic efficiency. In the measure that we, as advisers, bring technical knowledge, economic thinking and sound judgment to bear on problems of farm planning, we may look forward to a period of increased prosperity not only for the individual farmer, but for the farming community generally.