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Employment and Output—as Objectives of Development Policy

IF there is only one sector of production and only one technique in this sector, there emerges a fixed relationship between output and employment. Since a certain amount of employment is associated with a given level of output, an increase in employment requires an increase in output. In aggregative growth models which do not distinguish between economic sectors and which postulate fixed factor proportions, the maximization of current income is consistent with the persistence of unemployed labour. This outcome is the result of a divergence between the proportions in which labour and capital are available in the economy and the proportions in which the prevailing technology combines them. Under these circumstances, an increase in employment would require an augmentation of the stock of capital in the economy. There are two ways of doing so; one is the importation of capital from abroad and the other is through domestic accumulation of surplus for capital investment out of the current income. In this context there is no conflict between output growth and employment growth; in fact the former is a precondition for an acceleration in the latter. The higher the rate of growth of income and the higher the rate of saving out of current income, the higher is the rate of investment and the higher is the rate of growth of employment.

Once, however, the variability of factor proportions is introduced and differences between the sectors in terms of their factor requirements are recognized, the simple relationship between output and employment no longer holds. If the proportions in which factors can be combined are continuously variable, either within each sector or by shifting resources between sectors, output is maximized by employing capital with the techniques and in the sectors which use maximum labour per unit of capital. The distinctions between sectors are important in terms of their implications for employment because even when in a particular sector there is no choice between alternative techniques of production, by changing the product-mix or sectoral composition of output, one could vary the amount of employment generated in the economy as a whole. Moreover, even when alternative techniques in each sector are found feasible, the range of choice between the labour- and capital-

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intensive techniques will be different between the sectors. In some sectors like agriculture the choice is usually wider than in the modern industries dependent on imported technology. In fact, with a continuous variability in factor proportions and/or output composition, current output would be increased so long as an application of additional labour to a stock of capital yields any positive income. Alternatively, with a given investment fund, its allocation between sectors and techniques could be varied until application of additional labour to capital yields a positive income. However, such a policy implies a conflict between labour productivity and employment. The greater the ratio of employment of labour to capital, the lower will be the marginal and average productivity of labour. Output per unit of labour will rise if employment of labour declines. This is consistent with the fact that total output and hence *per capita* income for the entire population will be higher in the situation where productivity of labour is pushed to the lowest through maximum employment. The output per head of the entire labour force (employed and unemployed) will be higher; in the contrary situation of a smaller amount of total employment, output per head of those who are employed will be higher but income per head of the entire labour force will be lower. Thus there is a conflict between high labour productivity of those who are employed and low output or income per head for the entire labour force. Under these circumstances, there will be considerable inequality of earned income because the unemployed earn no income; it is not necessary, however, to tolerate the resultant inequality of consumption since the unemployed may receive transfer of income from those who are employed and thus a given total of aggregate consumption can be more equitably distributed.

Thus, once flexibility in factor proportions is granted, there is no conflict between the maximization of income and employment in the current period. Given the scarcity of capital and abundance of labour, a situation typical of the developing countries, current output is maximized through heavy emphasis on labour-intensive techniques and sectors which maximize current volume of employment at the same time.

While the limit to the degree of labour intensity of techniques is set by the available range of technological choice, there is a limit to the extent to which the pattern and compositon of output can be varied with a vew to maximizing employment via an increase in the output of the labour-intensive sectors of the economy. The limits are set by the composition of demand for the output of different sectors. However, this constraint can be relaxed in the context of an open economy so that limits to the expansion of the output of a sector set by the extent of domestic demand can be overcome by exports. The excess of domestic demand over the output of the shrinking sector can be met by imports, whereas the excess of domestic output over the domestic demand of the expanding sector can be exported abroad. The limits, if any, to the expansion of markets through exports bring us into the realm of international economic policy of the importing countries as well as the structure of the export market and the nature of demand for the particular labour-intensive products. If the

expansion of exports faces an inelastic demand, the fall in the export price and the consequent loss in real income may bring us to a position of conflict between the expansion of current employment and income. The phenomenon of inelastic export demand depressing export price is more likely in the case of agricultural products than with industrial products. For example, if the export crop of a particular country constitutes the bulk of the world supply of the commodity, it influences the export price through variations in the export sales. This may also happen if all the developing countries push the export sales of the labour-intensive agricultural products facing inelastic world demand.

To the extent that the tariff and non-tariff barriers to world trade restrict the growth of the labour-intensive manufactured exports from the developing countries—which incidentally appears to be confirmed by the existing pattern of commercial policy in the developed countries—the promotion of employment in the poor countries will conflict with the objective of increasing output. In so far as the pattern of domestic demand puts a limit on the expansion of the output of the labour-intensive sectors or industries, it is conceivable that the pattern of demand is regulated by either direct or indirect controls with a view to diverting demand in the direction of the more labour-intensive products. This can be done by means of a fiscal policy which taxes labour-intensive products lightly compared to the capital-intensive products. Moreover, it is widely held that a more equal distribution of income often directs the pattern of aggregate consumption towards the labour-intensive commodities, because a large part of the consumption expenditure of the lower-income groups is spent on relatively simple consumer goods which are produced by the labour-intensive techniques. It therefore follows that a development strategy which concentrates on increases in output in these sectors, in which large masses of poor people are employed, such as agriculture, trade, transport and cottage and small-scale industries, stimulates the demand for the labour-intensive consumers goods, including food.

The absence of conflict between the objectives of maximization of current income and that of employment is based on the assumption that with a more labour-intensive technique output per labour unit is lower and output per unit of capital is higher than in the case of a less labour-intensive technique. Since capital is the scarce factor of production, the choice of appropriate technique should ensure that output per unit of capital should be higher than under any other alternative technique. This will maximize output with a given investment fund while at the same time employing the maximum amount of labour. If more capital-intensive techniques produce more output per unit of investment, while employing a smaller labour force, then there is a conflict between larger output and higher employment. In other words, the above situation implies that more labour-intensive techniques require more labour as well as more capital per unit of output. This is obviously an inefficient technique from the technological point of view since more of both factors is necessary to produce the same output, and should, therefore, automatically be ruled out

from the range of choice.

This is an appropriate line of reasoning where different technologies are simultaneously developed or available and are chosen from on the basis of the given factor prices. While such obviously inefficient techniques will be ruled out if new techniques are either chosen or developed today, the developing countries typically are confronted with technological set or production surfaces which represent technologies often belonging to different time periods. They are in fact faced with technologies or capital equipment embodying technologies of different vintage. They are more often than not in a stage of transition from the traditional to the modern technology. Moreover, the capital-intensive techniques may also be associated with economies of scale, and therefore, yield higher output per unit of both labour and capital. In cases such as these there is a conflict between maximization of current income and employment. Such cases may, however, be limited in number. Moreover, in cases of conflict, the choice may require the policy-makers to attach relative weights to output and employment, assuming that cases of conflict are large enough and frequent enough to make an appreciable difference to the level of employment in the economy as a whole. It may happen that capital-intensive activities that are either supplied by or through their products feed industries that are intensive users of unskilled labour so that over the economy as a whole their direct and indirect effects are both employment and output generating and in these cases it does not militate against employment. They may also generate scarce foreign exchange resources with high opportunity cost or economize the services of factors even scarcer than capital such as certain classes of highly skilled labour; in both cases, capital-intensive techniques justify themselves.

In evaluating the employment implications of choice of techniques and projects in a particular field, it is necessary to take into account their total impact. A partial view can be misleading. The total impact consists of: (i) employment generated during the construction phase of a project; (ii) employment involved in the operation of the project after it is completed; and (iii) employment made possible in other linked sectors. Construction being generally labour intensive, the employment impact varies with the proportion of construction in total fixed capital formation. The higher this proportion, the greater will be the employment impact. In the operation stage, the employment effect varies with the capital intensity of technology on which the project is based. The more capital intensive the technology, the less will be the employment generated in operating the facility. Finally, the employment impact on other sectors depends upon the intensity of the backward and forward linkages that this project has with these sectors and whether these linkages are positive or negative.

For the reason given above, the three components of the total employment impact vary in intensity and sometimes even in direction as between different fields of development. A hydro-electric project for instance, generates a lot of employment during the construction phase, both directly and through backward linkages with industries providing

the required materials and equipment. The number engaged in operating the project may be much smaller. The power made available to run irrigation pumps and manufacturing industry, etc., may expand employment opportunities in these sectors. The total employment impact of a fertilizer plant is broadly similar—considerable employment generation during construction relatively limited employment opportunities in operation,* and a powerful impact on the employment potential of agriculture through intensification. On the other hand, a housing project, while it generates considerable employment during construction, has little employment during construction and has little employment potential thereafter. A project embodying a superior labour-saving technology, while generating employment during the construction phase, may actually bring about a decline in total employment when it goes into operation by causing the units based on inferior technology to cut back production.

A truly employment-oriented policy, therefore, must seek a reasonable balance between the employment-intensive sectors such as agriculture, small industry, construction, road transport, and services, and the others linked to them. Construction cannot go far without an adequate supply of steel and cement. Nor can modern small industry flourish without supply of ferrous and non-ferrous metals, intermediates of chemical and petro-chemical origin, mechanical, electrical and electronic components, and power, transport and communication facilities. Road transport will remain stunted in the absence of adequate supply of vehicles. Intensification of agriculture will be frustrated if the fertilizers and pesticides are not available. Only power or diesel oil can be the basis of rapid growth of minor irrigation. A disproportionate development of the economy as between employment-intensive sector and the other sectors will lead to extensive under-utilization of capacity, thus frustrating rather than promoting the employment objectives.

While the objective of maximizing current income does not conflict with employment objectives except in the cases mentioned above, conflict may arise when the rate of growth of income, rather current income is sought to be maximized. The rate of growth of income is a function of the rates of saving and investment. If current income originates in the labour-intensive sectors, employing the labour-intensive techniques, it is suggested that the rate of saving is lower than it would be if income is generated in the capital-intensive sectors or by the use of capital-intensive techniques. This is so because in the latter case the share of profits in income and hence the rate of saving is higher. This is on the assumption that profit-earners have a much higher propensity to save than the wage-earners, so that a pattern of distribution of income which heavily favours the savers is conducive to a higher rate of growth. A high share of profits in national income, since profit-earners are few and wage-earners are many, implies first that an unequal distribution of income is a

* In respect of employment opportunities for the highly skilled personnel, the operation phase of a fertilizer plant is important.

prerequisite to a high rate of saving. Secondly, an unequal distribution of income is related to an investment in the low-employment-generating techniques or capital-intensive sectors.

Let us examine this line of reasoning closely. Even if it is true that the profit-earners save more than the wage-earners, investment in labour-intensive techniques or sectors does not necessarily lower the rate of saving. The amount of savings generated by an initial act of investment is a function of both the magnitude of increase in income as well as of the rate of saving out of the increase in income. The initial investment in a labour-intensive technique or sector may yield an increase in income large enough to offset the low rate of saving out of the increase in income. In other words, incremental capital/income ratio may be lower than the incremental saving/income ratio so that the ratio of incremental saving to the initial act of investment is higher in the case of the labour-intensive techniques or sectors than in the case of the capital-intensive techniques or sectors. This is because in the case of the labour-intensive sectors or techniques, increase in income per unit of investment is higher as compared to that in the capital-intensive techniques or sectors. Thus the effect on incremental income may swamp the effect of a lower rate of saving so as to generate a higher total amount of saving; it is the latter which is relevant to the rate of growth of income. The effect on 'reinvestment' coefficient of a given volume of initial investment in the labour-intensive techniques or sectors is an empirical question which needs proper quantification.

Secondly, it is necessary to analyse how far the inequality of income or a high ratio of profits in income is a precondition of a high rate of saving. In the first instance, this line of reasoning applies to private saving and not to total saving, including public saving. A more equally distributed income may generate a higher rate of saving if fiscal policy is efficient enough to squeeze saving out of a given income. To suggest that bulk of savings may be generated in the public sector or through fiscal policy does not imply that investment needs to be nationalized. A preponderant share of public saving in national saving is quite consistent with a large volume of private investment if public savings are channelized to the private entrepreneurs or investors. In fact, in many developing countries private investment is financed to a considerable extent by loans and credits from the publicly sponsored financial institutions, dispensing funds derived from the public saving. That it is politically difficult to raise the rate of saving through fiscal policy is not denied. But to suggest that it is politically easy to raise the rate of saving by means of an unequal distribution of income associated with large unemployment, specially in view of a greater political consciousness relating to the problem of both unemployment and poverty in recent times, is unrealistic. The unemployed labour would and is increasingly demanding social welfare measures for the alleviation of their poverty; any attempt to alleviate their condition would necessitate expenditure of public funds and would reduce the volume of public saving and hence total domestic saving, even if private

savings of those who receive high incomes remain high.

Thirdly, recent experience and analysis has demonstrated that availability of new and profitable investment opportunities generate high rates of saving from relatively low- or middle-income earners, in small-scale industry and agriculture, where savings and investment decisions are combined in the same hands. This may suggest that if a high rate of saving is to be generated out of a more equally distributed income, it may be necessary to have a wider access to investment opportunities among a larger population than is the case with a highly unequal pattern of income distribution.

Data on the sources of private savings by income groups and source in the developing countries are not adequate to allow any clear-cut verification of the relation of saving to either personal or factorial income distribution. Most data on corporate saving show high rates of reinvestment of corporate profits, even though it is difficult to assess the degree of underestimation of profits, which tends to yield an exaggerated picture of the saving rate. Moreover, savings and investment in the non-corporate sector as well as in the self-employment sector, which includes agriculture and small-scale industry in developing countries constitutes the largest component of domestic saving, corporate saving is a small proportion of the total domestic saving. Empirical knowledge on the relationship between the distribution of personal income and household or personal saving is far from satisfactory. It has been suggested that an unequal distribution of income may in fact reduce savings by pushing upward the consumption function of the lower-income groups who tend to imitate the consumption habits of the rich. Moreover, a more equal distribution of income may provide greater incentive for hard work on the part of the labour force and in cases where standards of nutrition are very low, increase the productive capacity of workers and hence total output.

The moral of the above analysis appears to be that the potential rates of saving and investment have been linked up with the criteria of allocation of investment resources between alternative techniques and sectors to an exaggerated extent without adequate empirical foundation for the underlying behavioural relationships which are assumed in such an analysis.

With a given income and given distribution of such income, the amount of saving which can be realized is often a matter of political decision as to the instruments of policy which are to be used, and is a function of political will and determination to use the instruments effectively once a decision is made. Saving out of an increase in income implies that somewhere in the economy some group or groups have to undergo a sacrifice of consumption; but the decision as to which group or groups have to undergo a sacrifice of an increase in consumption is a political one. To have the unemployed bear the burden, as is the case with investment in capital-intensive sectors or techniques, is no less a political decision than to have the poor but employed bear the burden via an increased taxation. Similarly, to rely on private saving as the main source of investment is not necessarily more efficient than reliance on public

saving, combined with widely dispersed, private investment activities throughout the economy.

Unfortunately the experience to date of developing countries does not provide enough empirical evidence to resolve the issues raised above. To suggest that there are a number of countries such as Korea and Taiwan which have in recent years attained a high rate of growth of income as well as of employment, with an increased emphasis on labour-intensive mix of technology and of output does not indicate necessarily a resolution of conflict between employment and output as objectives of development strategy. The fact that they have attained a high rate of both employment and output does not eliminate the possibility that they could have grown faster if they allowed employment to lag behind. The possibility of trade-off may have been there even though no conscious decision was taken to choose between the two. This could be due primarily to the fact that since the growth of output was comfortably high, there was no desire to sacrifice employment considerations to accelerate further the rate of growth of output.

It is important to note in this context that a strategy of development which advocates concentration on the growth of output via investment in the capital-intensive sectors or techniques does not neglect employment as an objective for all time to come. The relative neglect of employment objective, according to this strategy, is only a short-run phenomenon. To the extent that a higher rate of growth leads to higher rates of saving and investment in the future, there will be increase in output as well as employment in the future. The attainment of the employment objective is only shifted to a future time horizon. This line of reasoning argues that with a sufficient long-term time horizon for planning, the conflict between the output and employment growth disappears in the long run. Since current employment is sacrificed in order to increase the rate of growth of income and hence the rate of growth of employment in the future, the choice boils down to a high employment growth in the future at the expense of current employment. Whether such a choice is socially desirable depends on the social rate of discount between future and present employment.

IMPORTANCE OF EMPLOYMENT AS A DEVELOPMENT OBJECTIVE

As one scans the history of thinking on the problem of unemployment in the recent past, one detects several stages in its evolution. There was a time when there was a single-minded concentration on economic growth, i.e. a higher growth rate with enough 'trickle down' to expand employment maybe even to achieve full employment. Recent calculations regarding the rate of growth of output, which are consistent with high rates of growth of employment yield very high figures which appear, at first sight, totally beyond the realm of achievement in the foreseeable future in any of the developing countries. For example, a model designed by Dr S. K. Singh to estimate the rate of increase in gross domestic product required to absorb

the increase in labour force in non-agricultural jobs yields the following results:*

	Per capita income	*Rate of growth of population*	*Required rate of growth of GNP*
1. Typical Asian country	$ 100	Per cent 2·5	Per cent 10·2
2. Typical Latin American country	300	3·1	9·3
3. Typical African country	100	2·7	11·0

The above rates of growth, it should be emphasized, would only employ the increase in labour force, but would not decrease the absolute number of people working on the land nor would it effect the existing backlog of unemployment and underemployment.

The second stage in the evolution of thinking on the problem of unemployment also assumes no major parameter shift in the behaviourial relations of the system. It suggests, however, that after the traditional planning exercise has been consummated, a 'supplementary strategy' must be employed to mop up the remaining unemployed. This customarily means instituting labour-intensive public works programme, either in the rural or urban areas. This approach, though its employment-generating potential is not negligible, specially if such programme is buttressed by adequate technical assistance and necessary institutional and administrative infrastructure in the rural areas fails to make employment a primary component of development strategy and relegates it to an afterthought. At the last stage which has been reached in the 1970s especially after the inauguration of the Second Development Decade with its concern for employment and income-distributional problems in the poor countries one is more concerned with exploring ways of combining employment with output as integral parts of the overall development strategy.

The increasing concern with the problem of unemployment in recent years is traceable to a number of factors. Basically, there is the increasing realization on the basis of experience in the recent past that there is a substantial and increasing number of people available for work who are unable to maintain an adequate living standard on the basis of employment opportunities available to them. First, and most important, are the implications for the growth of labour force of the population explosion in the developing countries. Secondly, is the realization that modern sector employment, specially manufacturing employment, neither has absorbed in the past nor on present trends can be expected to absorb more than a small part of the labour force. Thus, as more empirical studies of income distribution, family expenditure and dietary surveys become available, it is apparent that large groups of people have experienced no improvement in the standard of living in the past decade

* S. K. Singh. *Aggregate Employment Function: Evaluation of Employment Prospects in LDC's.* Mimeo for Basic Research Center, World Bank (December 1969).

and may even have become worse off, despite the rate of growth of G.N.P. at 5 per cent or more per annum. Lastly, there is a growing body of evidence of open urban unemployment. Despite unemployment, these cities are growing rapidly, partly because of considerable immigration, and already account for a significant fraction of the total population in many countries. While the above factors explain the changing attitude and increasing concern with unemployment, there are important logical reasons why employment objectives should constitute an important component of development strategy. The reasons so ably stated in a recent monograph are as follows:*

1. A considerable volume of unused labour constitutes an important, potential productive resource for a poor country and should be brought into use.
2. Employment in productive jobs provides opportunities to learn work skills and attitudes that are an integral part of the modernization process.
3. Location of good jobs and incomes determines to a great extent the population movements in developing countries.
4. Unemployment, specially urban open unemployment, among the young and active causes frustration and tends to break out into violence.
5. In the absence of social security systems in developing countries, productive employment is the central mechanism for alleviating poverty.
6. Although the distribution of income in developing countries is often very unequal, the scope for a redistribution of income is severely limited by fiscal inefficiencies and the lack of political power sufficient to redistribute the ownership of income-generating capital. Since this is so, it follows that the only chance of improving the income of poorer groups is that of raising the standard of their employment.

OUTPUT AND EMPLOYMENT OBJECTIVES AND AGRICULTURAL DEVELOPMENT

The implications of the pursuit of the twin objectives of income growth and employment expansion can usefully be examined in the context of agricultural development in developing countries, specially those with large unemployment and rapidly growing population. Many countries in this category are characterized, on the one hand, by low rate of growth in agricultural production and, on the other, by open unemployment among landless labourers, disguised or underemployment among small farmers, especially during slack seasons and low productivity among the whole range of medium and large farmers. Until recently prior to the advent of the seed-fertilizer technology, the principal means for accelerating the rate of agricultural growth was an increase in the ratio of capital to labour by means of investment in capital-intensive equipment and machineries. This

* R. Shaw. *Jobs and Agricultural Development.* Overseas Development Council Monograph No. 3, Washington, D.C., 1970, p. 2.

was to be combined with capital-intensive investment in the development of water resources for the purposes of irrigation. The history of agricultural development in the advanced countries seemed to confirm this approach.

The employment implications of this strategy of investment were far from encouraging; indeed, the whole approach was oriented towards raising per head output in agriculture through augmenting *per capita* capital stock in agriculture. This was intended to reduce the proportion of population engaged in agricultural production. It was expected that the growth in the non-agricultural sectors would absorb not only the net increase in labour force but also a significant and growing proportion of the labour force, previously employed in agriculture. This history of the large-scale industrialization in the past two decades of development in the poor countries belied this expectation. The limited employment creating capacity of the large-scale manufacturing sector, given its capital intensity, was increasingly realized. A rapid expansion of employment in the non-agricultural sector requires a rate of growth of the manufacturing sector which is far beyond the ability of a typical developing country in terms either of mobilization of resources or of implementation.

In terms of the traditional strategy of agricultural development, increased productivity in agriculture involves a massive shift of population from agriculture and their subsequent absorption in employment in the non-agricultural occupations on a scale which is not feasible. Thus there is a dilemma and a conflict between the objectives of raising agricultural output and expanding employment.

The foregoing analysis emphasizes the importance of appropriate technology for resolving the conflict between the objectives of accelerating rate of growth of output and the expansion of employment opportunities in the short run. The new technology, i.e. seed-fertilizer technology, which consists of a package of inputs which increase production while at the same time increasing demands for labour inputs has opened up considerable possibilities of reconciling such a conflict in the short run. The new cereal varieties require much more careful cultivation, better water control, more fertilizer, and more weeding if they are to fulfil their promise. The combination of higher yields and improved cultivation means that more labour may be required for the new seeds, and that the returns to that labour can be higher. The examination of the implications for employment of the new agricultural technology raises a number of questions:

(a) Can the new agricultural technologies be used to provide more rural employment opportunities?

(b) How can developing countries design agrarian systems incorporating the new technologies to combine the goals of maximizing food output and productivity employing the rural population?

(c) How can the developing countries best use the increases in cereal production to accelerate the growth in output and employment in the rest of the economy?

The higher yields and the greater intensity of farming made possible by the new varieties should have a considerable effect in raising the amount of labour required per acre for their cultivation. At the same time, however, the efficiency of the complementary inputs, and particularly of fertilizer and water, is improved by use of the new varieties. As a result, the required labour for each unit of output is likely to decline. Thus, while yields may double, the increase in labour requirements per acre is not likely to increase, by and large, in proportion. This divergence is extremely important in any discussion of the overall employment effects of the Green Revolution.

Studies show that each of the phases of the cultivation cycle, with the exception of harvesting, requires more labour per acre in many parts of Asia. Of special importance is the extra time spent in seedbed preparation, transplanting and water control. A greater care in cultivation is also a major contributor to yields.*

Switching to the new varieties from traditional ones requires more labour. But an even more significant increase in the demand for labour occurs if a farmer can shift from growing one crop a year to growing two or more (multiple cropping). Each crop requires that the land be prepared, the seed sown, the plants weeded, and the grain harvested and threshed. The potential for multiple cropping is enhanced by the shorter maturation period of the new rice varieties. At the same time, the additional yields and profits from the new varieties make it worth while for farmers to invest in water-control facilities, which are essential for cultivation in the dry season.

In those areas where multiple cropping is made possible, the increase in employment seems to be roughly equivalent to the rise in the intensity of cropping. A study of some large farms in the Punjab showed that because of the longer working hours per man per day, and also because of the increased numbers of workers (both family labour and more especially hired hands), the input of *labour per acre on farms irrigated* by tubewells averaged 57 per cent higher than that of the farms without irrigation. This corresponded quite closely with the expansion of cropping intensity due to the tubewells.

In many respects the new varieties appear equally effective on any size of farm; that is to say they are neutral to scale. For the seed themselves, for the fertilizer that is an essential component of their higher yields, and for other agricultural chemicals, all of which are divisible into very small units, this seems to be true. But some other features of the new technologies offer returns to scale unless their effects can be neutralized. Principal among these features that offer advantages to large farms are mechanization, irrigation, credit, and management. Each tractor size is associated with an operating area below which it becomes uneconomical. Thus large farms are in a position to make the best use of the advantages of mechanization. For irrigation through the most efficient units, i.e. the

* R. D. Shaw. *Jobs and Agricultural Developments.* Overseas Development Council. Mimeograph, Washington, D.C., 1970, pp. 19–20.

private tubewells, there is a minimum command area below which the costs of water rise sharply. The size of the minimum command area varies from 25–50 acres. Large farmers can sink a well of their own and use the water effectively; farmers who own less than the minimum command area have to depend on co-operation with others if they want to take full advantage of cheap water. The costs of credit are usually higher for small farmers than for large, both because the risks are greater and because the same amount of administration must support a smaller loan. This is aggravated in some areas by the reluctance of co-operatives and banks to loan to small farmers at all.

This approach can bring a number of employment problems in its train. As the large farmers adopt the new varieties, they can reduce costs and increase output, generating additional profits for themselves. There have been tendencies in many parts of Asia for the larger farmers to use these profits both to buy machinery that can displace labour, and to purchase more land. Where small farmers do adopt the new varieties, it is reasonable to expect that there will be significantly greater employment of family labour, and an increase in the demand for hired labour at peak periods of the year. Most small farmers are unlikely to mechanize their farming operations, so that the full possibilities of the high-yielding cereals for creating employment should be realized in these cases.

For these small farmers who are unable to make the transition to the new technologies, the prospects are bleak. They have to compete with a growing volume of cheap grain from the new varieties. Many of them will be unable to market economically what surplus they produce. These farmers are faced with two alternatives; they may take advantage of rising land values to sell out in order to clear their debts and to attempt a new start in life, most likely adding to the trek to the cities; or they can attempt to diversify into other agricultural production (which may be difficult since they lack either the environment or the institutional setting for adoption of the new cereal varieties). The situation is particularly acute for those farmers whose farms are so small that they cannot provide even a subsistence livelihood for the cultivator and his family.

The Green Revolution has been accompanied by a steep rise in the demand for the mechanization of farm operations. The basic arguments advanced in favour of mechanization are:

(a) Power and equipment facilitate and increase in yields through more timely and effective farm operations. Optimum yields of the new high-yielding varieties depend on correct seedbed preparation, proper seeding dates, precise fertilizer placement, and the uniform and timely distribution of water and chemicals. All of these can be better provided through mechanization.

(b) The possibilities for multiple cropping put a premium on speedy harvesting and land preparation so that the next crop may be planted. This gives rise to peak season labour shortages when the demand for human labour exceeds the supply. Mechanization helps output by

supplementing labour during the peak periods and so getting the next crop planted more quickly.

(c) Mechanization reduces the dependence on draft animals, which have low productivity and high costs. These animals also consume food sources of energy, and so utilize land that would otherwise be available for growing food for human consumption.

(d) Mechanization lowers the costs of production. This is important in terms of the overall growth of the economy because it permits the generation of savings for investment. It is also important for those countries hoping to lower costs in order to export cereals into the world markets.

The following arguments are generally put forward against mechanization:

(a) The evidence of the effects of mechanization on yields is inconclusive.

(b) In countries where labour is plentiful, but both capital and land are in short supply, the most efficient mode of operation is to utilize the abundant resource while conserving capital and land.

(c) In countries where capital is in short supply, it should not be diverted into agriculture where labour-intensive alternatives are available.

(d) Mechanization displaces labour. Since no other sector of the economy can readily absorb this labour, substantial social and economic dislocations will occur.

(e) Mechanization can accentuate the disparity in incomes between the large landowners and other farmers by enabling the former to lower their costs. This encourages the concentration of land and other resources.

The relationship between mechanization and yields is complex. It is evident that the productivity of the small farms of Asia can be raised without tractor mechanization, at least to a point considerably above their present levels. But some intermediate forms of mechanical advances are probably required in conjunction with the new cereal varieties. What these forms are in any particular situation is an important question and deserves a great deal of attention at the farm level.

There are two areas where selective mechanization is called for. One is the need for multiple cropping, i.e. increase the number of crops grown by speeding a few critical operations through the use of machines; second is the seasonal labour shortage for selected operations at peak seasons. The rise in wages observed in many countries at harvest times is also taken as an indication of labour shortage. It is, however, important to study the dynamics of the labour supply at these times in the fields. It is likely then that higher wages attract more people, especially women and children, into the labour force. And in response to the higher wages, considerable migration of farm labourers has been noted in many parts of the world. More analysis needs to be done to discover the true extent of labour shortages, and the extent to which multiple cropping is slowed down or prevented by lack of labour. It is also essential to find out whether the

families of labourers can earn enough income to survive throughout the year if they are denied the opportunities for higher wages during the peak seasons. In situations of real labour shortage, i.e. where production is held down because even a rise in wages does not call forth sufficient labour to handle the work, it will be necessary to devise the most appropriate mechanical methods to increase output without decreasing the number of jobs. Agriculture consists of a whole series of farm operations. The time and energy required for some of these operations place distinct limits on the expansion of the entire agricultural cycle. If some forms of mechanization can be selected for these specific operations, the blockages can be overcome, increasing agricultural output and the overall demand for labour as well. The essential elements of the solution to this problem are to raise the interest rate and to value foreign exchange at a more appropriate, higher level. But, where there is reluctance to do this, special policies should be devised for agricultural mechanization because of the immediate, critical danger of rural labour displacement. At the very least, taxation and pricing policies should place the full burden of all costs on those farmers who purchase the machinery. Subsidies on agricultural machinery in the forms of undervalued foreign exchange, cheap subsidized credit, and similar devices should cease. Another approach would be to place heavy taxes on agricultural machinery, preferably graduated by horsepower.

There is an important policy issue in the field of agricultural development, which provides an illustration of a possible conflict between output and employment objectives. This concerns the scope and nature of land reforms including distribution of land ownership and tenural arrangements.

In the context of a large number of small farmers, with inadequate land to employ fully members of the farm households, and landless labour, a redistribution of land from the large landowners to these two categories is an immediate and short-run method of expanding employment opportunities in the agricultural field. Below a certain size, say 1·5 acres in Bangladesh, for example, it has been found that output per acre declines as farm size goes down with the result that the very small farms not only do not provide adequate employment but also yield smaller output and income per acre. They are not viable either from the point of view of employment or income. They do not provide scope for the application of modern inputs nor do they allow an efficient use of either fixed or variable inputs, such as implements and cattle. A redistribution of land from the large to the very small farms makes the latter more economically efficient.

Above this minimum level, which obviously varies from country to country, depending on technical and economic considerations, the current state of research under widely varying conditions in different countries, demonstrates that output per acre is higher in small farms than in big farms, i.e. output per acre declines as size of farms increases. It has also been found that the big farmers not only make a less intensive use of land, the scarcest factor in a land-scarce economy, but also leave a larger

percentage of land fallow and use a large amount of labour replacing mechanical equipment. Under these circumstances a redistribution of land increases employment as well as output. It increases output per acre and, therefore, maximizes output, on the basis of a given quantity of land, capital and given technique.

But a redistribution of land may be necessary but not a sufficient consideration for an increase in output; it is conceivable that under certain circumstances it may even lead to a fall in output. First, redistribution of land to landless labourers, many of whom for years may not have been engaged in farming operations and have lost interest and skill in cultivation, may bring a decline in output. Because land transferred to them will be cultivated less efficiently or less carefully than is the case with the traditional cultivators. Secondly, a transfer of land to small farmers may also have adverse effects on output and production, if small farmers do not have necessary access to the agricultural inputs or financial resources and credit necessary to have command over such inputs. This is specially relevant in the context of seed-fertilizer revolution, popularly known as 'Green Revolution'. The impact of Green Revolution is usually on the prosperous farmers more than on the small farmers because they have greater financial resources or easier access to credit. The more prosperous farmers have greater control over the marketing and distribution channels, i.e. co-operative and government agencies, for the distribution of such inputs as fertilizer, seeds, and pesticides. This adversely affects the small farmers, especially when these inputs are in scarce supply. A more equitable distribution of inputs, marketing and credit facilities is conditional upon a more equitable distribution of economic power in the villages. This is achievable through a more equitable or egalitarian distribution of land, which is the principal base of economic power in the rural areas.

In order that land reforms do not have adverse impact on production, it is necessary that two conditions are fulfilled. First, it is necessary to redistribute land to the small farming families, who make a careful and more intensive use of land. If land is distributed among the landless labourers, care must be taken to see that only those among the landless labourers secure land who, while owning no land, have worked on land in the past either as hired labourers or share-croppers. Mostly, however, the share-croppers happen to have some land of their own. Secondly, redistribution of land must be accompanied by an increased supply and widespread distribution of inputs, including seed, fertilizer and irrigation water, and above all, credit and extension services so as to physically reach the small farmers. Unless this can be accomplished, land transferred to the small farmers would fail to receive the benefits of agricultural inputs and agricultural production may consequently suffer.

The wide distribution of inputs and provision of credit and extension services among a large number of widely dispersed small farmers is a very much more difficult undertaking than the task of concentrating them on a limited number of large farmers. The latter involves large organizational

input and development of viable institutions, in the form of co-operatives and/or farmers' groups and associations which cater to the needs of small farmers. In a developing country the administrative input is in scarce supply. Even without land reforms, a considerable share of the total available administrative input has to be employed in the organization and distribution of modern inputs, as well as in the provision of credit and extension services so as to reach both the large and small farmers, in order to make an impact on the rate of growth of agricultural output. It has often been argued that the implementation of land reforms itself would absorb a very large share of the administrative and organizational inputs available for rural development. The establishment of land records and entitlements, verification of the family size and consequent redistribution of land in a manner which will eliminate loopholes require considerable administrative effort. Therefore, in a situation in which efficient delivery of modern inputs and wide provision of credit and extension services among the farmers is a *sine qua non* for a major impact on agricultural growth rate, the diversion of the limited administrative talent to the implementation of land reforms, may restrain the pace of progress in the modernization of agriculture.

There is a choice involved in the two alternative uses of administrative inputs in the short run. A clear answer is not readily available. The particular circumstances in each country, relating to the availability of administrative inputs, on the one hand, and requirements for and demand on this input for *(a)* implementation of land reforms and *(b)* organization of agricultural supplies and development for rural services and institutions, must determine the pace of progress in both directions. It is clearly understood, however, that land reforms, which cannot be implemented efficiently, and which can be avoided by fictitious land records and spurious transfer of land do not achieve the objectives of land reforms. Land reforms can only be successfully implemented by the co-operation and active participation of all the villagers, large and small, and by a well-developed political will as well as organization at the village level. If the big farmers dominate the political organization at the village level, and can influence the administrative and law-enforcing agencies in their favour, by fair means or foul, land reforms tend to remain as pious hopes on the statute book and will not get down to the ground at the village level. Attempts to eliminate by law sub-letting in many countries have ended up in insecure tenancies and widespread use of share-cropping which is less efficient than fixed-rent tenancy. Once land reforms are undertaken, it should not be implemented in a half-hearted manner but with vigour and with the support of adequate administrative resources and political will and organization at the 'grass-roots' level. That is why it is often suggested that 'power to the tiller' should precede 'land to the tiller'. The political power of the small farmers and the landless labourers needs to be strengthened at the village level, in the rural political and development agencies, in order that a scheme for land reforms can be successfully implemented.

The second important consideration for the determination of the pace and timing of land reforms, in a situation where immediate increase in agricultural output is a pressing consideration, is whether once agricultural development gets under way, with its concentration on large and medium farmers the political strength of the latter group would not *pari passu* increase and hence thwart any serious attempt at land reforms in the subsequent stage. A short-run increase in output, which is unequally distributed, impedes progress towards land reforms, which increase both output and employment in the long run. This consideration suggests that concerted efforts at increasing agricultural productivity should be combined with land reforms at an early stage.

It is sometimes argued that land reforms, while undoubtedly increasing the employment opportunities for small and landless farmers, tend to reduce marketable surplus, impede capital accumulation and restrain the spread of modern technology, which is dependent on economies of scale and, therefore, on large-scale farming operations. The marketable surplus in the agricultural sector, let us say in food production, is predominantly supplied by the large farmers. As land is redistributed to the small farmers, household or on-the-farm consumption is likely to increase leading to a reduction in marketable surplus. This reduces the supply of wage goods necessary for implementation of development projects in the rest of the rural economy and in the urban sector. However, if land reforms take place in the context of an intensive effort to modernize and increase the productivity of the agricultural sector, the risk is not of an absolute fall in the marketable surplus but of less than a proportionate increase in marketable surplus in response to an increase in agricultural production. Moreover, the availability of marketable surplus as a resource for development outside the agricultural sector is partly a function of the price policy and partly of institutional arrangements for the provision of marketing facilities to the small farmers.

If the small farmers save and invest less as a proportion of their income, a redistribution of land may tend to reduce the total quantum of savings in the agricultural sector. Even if small farmers save a smaller proportion of income, its impact on aggregate savings is not necessarily adverse, since small amount of individual savings from a very large number of small savers (farmers) can more than offset the decline in absolute savings from large farmers. What is necessary is the organization and development of institutions for the mobilization of rural savings. Recent experience in countries like Bangladesh indicates that small farmers have, in general, a more satisfactory repayment record than the big farmers, excepting in the years of natural calamity and failure of crops. This is partly because the big farmers feel, because of their greater influence on credit institutions, that they can with immunity postpone repayment or default. Furthermore, once the prospects of substantial gains from investment in new inputs have been demonstrated, savings of the small farmers and hence self-financing of investment in modern inputs, are stimulated. A more appropriate interest-rate policy, oriented towards the encouragements of rural savings

and investment, past experience indicates, has more than a negligible role to play.

While in the use of seed-fertilizer technology small farmers do not suffer from any disadvantages, the use of mechanical implements may require large-scale operations. The use of tractors and threshers does not necessarily require large units of ownership or of operations. The small farmers can group together and jointly use such mechanical equipments. This has been the case with pumps and tubewell for irrigation purposes, which are used by co-operatives or farmers' groups. Economies of scale are more substantial in the marketing and processing of agricultural products and other ancillary operations rather than in the actual cultivation of crops; these operations are unrelated to size of agricultural holdings.

In fact, small size of ownership of operational holdings forestalls premature mechanization; large farmers tend to mechanize or substitute machines for labour, partly because of diseconomies of management and supervision of a large number of hired labourers. This tendency is aggravated, by underpricing or subsidization of agricultural machinery, on the one hand, and on the other, by the desire to avoid the problems of management of large masses of employed labour, specially in view of the spread of unionization among agricultural labour. The farming practices need close, personal and intensive attention of individual workers, by the very nature of their operations, from sowing to weeding and harvesting. With the increase in the size of an agricultural farm the need for supervision to ensure efficiency increases to a degree which is far greater than in the case of more routinized, machine-paced, automatic operations in a manufacturing firm. Small farms ensure close personal attention to farming operations; therefore, they do not create an incentive for substitution of labour by machines and are conducive towards a more optimum use of factor endowment in an agricultural economy in which both capital and managerial ability are in scarce supply.

The foregoing analysis of the general problem of possible conflict between output and employment objectives demonstrates that often the conflict is more artificial than real; sometimes it is also a question of appropriate rate of discount with which flows of output and employment over time are discounted.

Ramón Fernández y Fernández, *Mexico*

I should like to make a few comments on the very interesting paper given by Dr Islam. These comments do not essentially disagree with the theses put forward by Dr Islam, but rather underline them.

The conflict between labour productivity and employment has very frequently been shown to be false in practice. Intensification through capital means a new technology. This in turn implies an inseparable set of inputs which, in the majority of cases and in keeping with the trend of

changes in the structure of agricultural production, mean an increase in the amount of labour used per unit of land, although not perhaps in the proportion of labour used per unit of production value, which is unimportant since the production value has increased.

Capital is a more timid factor than labour; by that I mean that capital is more affected by fear of risk. This is true for both small and large capitalists, although more so for the small, as farmers usually are. Labour puts itself at risk; capital plays it safe. Capital is surrounded by securities partly on the basis of the varied forms of the use of capital, which imply varied forms of the use of labour. The result is that the amount of work applied to the land increases.

In this sense the distinction between labour-saving and non-labour-saving inputs of capital is minimal, when such a distinction is considered in the context of development. This occurs even within the same sector, and the distinction becomes positively misleading if its repercussions in other sectors of the economy are taken into account. Instead of this meaningless distinction, it must be established that increase in agricultural production requires new technologies, and these new technologies involve, directly and indirectly, greater inputs of capital and greater inputs of labour, although to a degree less than proportional to the way in which production must increase if the productivity of both factors is to grow, as is desirable.

This is how I think the lack of conflict between the maximization of income and of employment should be considered, rather than as an alternative between labour-intensive and capital-intensive techniques. To put this alternative is to adopt a theoretical position unrelated to the practical problems of production, and although a preference for labour-intensive techniques which sacrifice labour productivity might succeed, this would be slowing down development, encouraging stagnation, and the best way to combat unemployment is development. Stagnation achieves at most the substitution of unemployment by underemployment.

I agree with the author that the above position does not deal with the immediate problem but the final outcome. This outcome is, of course, most important. Only emergency situations make it advisable to prefer immediate solutions. Besides, immediate solutions can be dealt with laterally, by the promotion of works of public infrastructure and training programmes for poor peasants, without sacrificing work productivity.

Odd Gulbrandsen, *UNCTAD*

ILO in the context of its World Employment Programme, undertakes comprehensive missions in developing countries to define an optimal employment strategy. Participating in the discussions in these missions, a question has come to me, with special reference to Iran, whose earnings from petroleum give a certain freedom of choice. Although in the long run no conflict between income and employment goals may exist, the scarcity of capital creates a problem in the short run, which is preferable:

(i) to maximize employment by using the capital in labour-intensive industries adapted to present skills, as handicraft and other small-scale rural industries, which might be poorly competitive in the long run; or (ii) to establish a hard core of large-scale capital-intensive industries, competitive in the world market and with great future expansion power, including backward and forward linkages, but using little manpower in the short run, and reducing underemployment by putting as large a proportion of the population into school and vocational training, making the labour force suitable for work in modern industries in the long run?

V. Herer, *Poland*

I believe that the experience of Poland, which used to be an agricultural country, might be of interest in research work on the problems presented in the paper. Unemployment, including also disguised unemployment, was one of Poland's most serious economic problems between the wars. The percentage of the unemployed *sensu stricto* ranged from 74 to 20 per cent of non-agricultural employment, while the disguised unemployment, depending on the evaluation method, covered from 25 to 50 per cent of the population active in agriculture.

The major and most rapid effect of social changes, achieved in Poland after World War II was a very fast elimination of undisguised and disguised unemployment, within 3–4 years after the war was over. It should be noted that this elimination took place under conditions of simultaneous rapid growth of population (about 2 per cent in the years 1945–55), with no emigration to foreign countries and with a high share of agricultural population in the total population of the country, about 47 per cent by the end of the 1940s. This result was achieved with a rate of growth of the national income of 10 per cent. The measures applied to do away with unemployment were the following:

1. Agrarian reform, without compensation, combined with debt cancellation, increased the intensity of land utilization and the labour expense per hectare of land allotted to smallholders. Simultaneously, the so-called 'natural' or non-capital investments increased consisting in the use of labour of farmers' families, with the simplest equipment and very few materials of industrial origin, for the development of farm construction, for husbandry purposes and for drainage. The industrialization of the country provided a practically unlimited market for agricultural products which prompted smallholders to maximize production per hectare, and even to a production requiring high marginal labour expense. At the time of eliminating unemployment evident preference was given in agriculture to labour-consuming forms of technical progress on land cultivated by farmers.

2. The part of national income which was spent out of the profit for luxurious consumption was eliminated. This provided an unlimited market

for what is correctly called by Dr Nurul Islam 'simple consumer goods which are produced by labour-intensive techniques'. Under these circumstances the choice of techniques was easy. With the shortage of capital which was very acute in our country at the time of elimination of unemployment, the central planner could always find adequate employment for the unemployed, using their work even with the application of extremely labour-intensive techniques for the production of simple consumption articles, a market for which could be found. While satisfying the demand for consumption goods, the role of imports was limited to a minimum, and the scanty foreign currency resources were designated primarily for imports of raw materials and machinery.

3. Directing the total profit for the needs of development facilitated a very rapid growth of employment in sectors such as education, health service and science.

The application of the above measures soon solved the problem of unemployment and make it possible to reconcile the policy of maximization of the rate of growth of national income with full employment. It should be remembered, however, that this policy does not maximize the rate of growth of wages in the non-agricultural sector and payment for working hours in the agricultural sector, which, of course, brings about essential difficulties in our economy.

Hossein Mohtashem-Nouri, *Iran*

I would like to congratulate Dr Nurul Islam for his constructive presentation on 'Employment and Output'. He mentioned that institutional arrangement is needed in order to increase the level of output and employment.

I fully agree with this statement, and believe more emphasis should be given to this point. Because it is obvious that among the developing countries, institutional changes are considered as fundamental and one of the most important elements of economic development. Particularly, if it is borne in mind that the majority of people in developing countries, in one way or another, are engaged in agricultural activities and that the greatest share of gross national income may come from agriculture, then the importance of institutional improvement in the agricultural sector is obvious.

Accepting this, then, the first attempt of the developing countries should be towards solving the following three main institutional problems of rural people which are considered as the key strategical factors in the dissemination of technical know-how. They are:

(a) *Land reform*, which provides a more equitable distribution of wealth and social justice, and will pave the road for the introduction of knowlege and new techniques to the rural areas.

(*b*) *Establishment of co-operative systems* and/or other systems such as establishment of Farm Corporations and Production Co-operatives which

has been successfully experienced in Iran. It provides more easy credit and financial assistance to the farmers, allows mechanization and helps the development of better marketing channels for farm products.

(c) *Extension services* which introduce new technical know-how and modern techniques of production to the farmers, would increase efficiency in the use of land and labour and, therefore, increase productivity and level of income.

Iran's experiences in the way of land reform and introduction of institutional improvement could provide an ideal example of how to achieve a high rate of economic growth within rather a short span of time.

Gershon Kadar, *IBRD/Israel*

I'd like to congratulate Dr Nurul Islam on his broad and well-balanced paper dealing with one of humanity's most gigantic pressing problems.

How to get the subsistence peasant to participate in the growth and welfare of his country?

This cannot be done without agrarian reform. Dr Nural Islam—and others—pointed out that the success of agrarian reform depends on many factors, the foremost being the political will of the government. He also mentioned the importance of adequate administration in the success of agrarian reform.

I would like to back up his point by pointing to (*a*) the dimensions of the administrative apparatus (*b*) the availability of know-how, pertinent, practical, proven, detailed, on how to administer a major agrarian reform.

In Israel, within a few years, 120,000 people were settled on the land. Besides a large share of capital resources we had to recruit a huge number of instructors and administrators. At the peak of the settlement effort its administration numbered 4 officials for every village of about 100 families; and even then one-third of the original settlers dropped out.

Recently I worked in a Latin American country that has all the attributes favourable to agrarian reform.

—This very issue lifted the present government into power, and the government believes that it will not be able to stay in power without decisive action on agrarian reform.
—The campesinos—70 per cent of the population—have a political organization of sorts.
—It is lucky to have extensive land reserves, largely in the hands of the government.

Of course they have an agrarian reform institute, but they know that it is absolutely inadequate to cope with this major task in their history. So the government looks frantically—desperately—for help to show how to tackle the mechanics of agrarian reform, commensurable with its resources.

In my opinion the international community—of which our conference

is a part—should be able to do at least two things: (*a*) build up a body of knowledge on the design of administrative policies and organizational set-up for execution of agrarian reform, (*b*) create a task force able to extend a major helping hand under appropriate circumstances.

J. P. Bhattacharjee, *FAO/India*

Dr Nurul Islam's paper illuminatingly covers a field in which available data and analysis are frustratingly inadequate. He has tried admirably to reconcile the income and employment objectives in development policy by combining analytical insight with consideration of practical possibilities in respect of technological choice and institutional support. Without disputing his arguments I would, however, submit that the problem of employment in the developing countries is far more complex than one of mere factor proportions. Indeed, a major finding of the recent ILO Missions is that the employment problem is not one but many faceted and requires to be tackled on many fronts. It has implications for plans and policies in such diverse fields as regional balance, education and training, income differentials as related to job categories, urban growth, rural development and support of the sector of 'informal' activities. I wish Dr Islam had discussed these, especially in their inter-relationships with the growth of income, consumption, saving, and investment.

This broader sweep of the employment problem also highlights the limitations of an aggregative analysis in terms of labour as an input in the production function sense. Its elegance is not matched by its ability to throw light on the disaggregated picture of distribution of jobs or work, and in the end the latter has to be related to the labour force seeking jobs and/or available for work of different types. In agriculture, especially, this is important, for the adoption of a capital-saving technology, while resulting in a relatively larger input of labour, may not increase the employed labour force. The so-called employment gain may be in the form of a larger input of family labour in which case the farm household gets the benefit of returns and underemployment is reduced in the household sector without any visible effect on job creation or the labour market. In cases where increased use of hired labour takes place, there is a visible impact, though the horizontal spread of employment may be less than the labour input. In yet other cases where new types of labour are required (such as operator–mechanic for irrigation pumps), the two sides can be more nearly equated. The effect of employment and income creation on consumption and investment is unlikely to be the same in the three situations. Unfortunately, data on these are conspicuously lacking, even in the most 'statistically' advanced of the LDCs.

The magnitude of the employment problem facing LDCs and its accelerating gravity needs to be specially emphasized in a conference like this. By now it is generally accepted that during the next decade or more,

these countries will have probably no other alternative but to find employment opportunities in agriculture for a much larger number of persons. To what extent this will be feasible and how this can be done without lowering productivity per man are questions to which answers do not come easy. For example, Dr Islam, has given in his paper the findings of a study which indicates that labour input per acre rises considerably in irrigated areas as a result of intensive multiple cropping and more or less in proportion to the increase in cropping intensity. If this relationship can be generalized, its implications are both reassuring and disturbing. On the pessimistic side, it indicates limits imposed by the hydrological resources and the costs of irrigation development. For the near future, however, there is reason for optimism. Perhaps, Dr Islam would like to comment on this.

A. Simantov, *OECD/Greece*

I think the presentations by Dr Islam and Professor Fernandez throw much light on how agriculture can develop in any country, not only in those where there are fast demographic developments. And I would like to put a question to Dr Islam which is related to a statement he made about the development of mechanization which, in many cases, can prevent a long-term development in employment, although it can be justified in the short term for raising food production and also for a contribution to the balance of payment problem of some developing countries. Here I see a contradiction between the immediate problem of raising production and alleviating the balance of payment situation and the longer-term objective of improving the employment possibilities.

Now, we have noticed, by analysing developments in the developed countries for the last hundred years, that technology in agriculture spreads at the same rate as economies grow. That is, agriculture cannot use more technology or more sophisticated technology than the environment of the economy as a whole can sustain. And, it is interesting to note, irrespective of the location of a country or the period in history, at least over the last hundred years, that the amount of purchased inputs that agriculture uses can be a sign of the technological applications.

And the question I would like to put to Dr Islam is whether in the analysis that he has been performing in Bangladesh or in other countries in Asia these constant proportions have been observed. And if this is so, what would be the possibility of accelerating the rate of growth of agricultural production? Would there be, at least for a period of time, a justification for increasing the inputs used in agriculture just to speed up the development of agriculture, or will that create an unbearable burden on the rest of the economy?

My point is that agriculture cannot grow faster than the economy allows it to grow.

D. Mubyarto, *Indonesia*

I agree that there may be no conflict between output and employment objectives in the long run. How many years is long run? Should we not worry about the *real* problem in the short run?

At the village and farm level, the farmers also do not distinguish between additional income and additional employment. I am convinced that due to the smallness of land-holding the only way to solve the poverty of these farmers is to increase their income via increase of employment. But creating additional employment and additional income is not so easy. We still have a lot of problems in the rural public works programme and in promoting small-scale industries. The success stories on these are still lacking.

Dr Nural Islam (in reply)

I am very grateful for all the comments made around this table, with most of them I have no disagreement. In fact, many of them are elucidations of some of the points which I could deal with extensively in the paper.

Regarding conflicts between objectives, I did not say that there is a conflict, necessarily, in the short run, between an employment and output objective. I merely enumerated some of the conditions under which this conflict may arise and the possibilities of resolving this conflict.

The point made about the difficulties of a developing country which is investing in labour-intensive industries but is unable to be competitive in these industries, is a very good one and well taken, but I am not sure if its implications are very clearly understood. I would not think that a poor developing country would be more competitive in capital-intensive industries than in labour-intensive industries. We have been told that the reverse is the case and experience supports this.

Capital-intensive industries often require a very high component of skill. Skill intensity and capital intensity in many cases tend to go together and developing countries are short of both. Part of the reason why labour-intensive industries in many countries find it difficult to compete in export markets, I would say, lies in the policies pursued by the developed countries which UNCTAD, amongst other organizations, has been engaged in expounding. We all know how the barriers to market entry in the developed country to labour-intensive manufactured exports from developing countries continue to inhibit the exports of these countries. This has been the subject of discussion over the last decades. We all know how, even today almost all of the countries in the developed world apply a large number of both non-tariff restrictions and tariffs which severely restrict the export of labour-intensive manufactures from developing countries.

All the various trade negotiations take great pains to ensure that trade liberalizations amongst these countries are so designed as to keep out labour-intensive manufactures from poor countries. So, I am not quite

sure why, given (*a*) a policy in the developed countries to open up the markets to labour-intensive manufactures from developing countries, and (*b*) appropriate exchange rates and pricing policy in the developing countries, and investment in labour-intensive manufactures in the developing countries should not provide a reasonable basis for growth in the manufacturing sector.

Coming to the second group of comments, on land reforms in Poland, I entirely agree with all the arguments and examples Dr Herer put forward. I would only like to add and agree with him, in fact, that the range of choice even though limited in the manufacturing sector is quite large in construction activities, in trade, transport and services. Secondly, one has to consider the range of techniques, not in specific fields, but also in its indirect implications.

For example—to illustrate—a fertilizer factory, in terms of operating it is highly capital-intensive, but in the phase of construction it uses a lot of labour and its direct implications is employment generating.

So, if you consider each project in terms of labour requirements, *vis-à-vis* capital requirements, at the construction phase, operation phase, and its indirect implications when its inputs are used in other sectors, then only can we get a comprehensive picture of the choice of the total range of techniques in all the sectors for employment in the economy as a whole.

A very important point made by Dr Herer was that they have no problem in terms of marketing the output of manufacturing industries. He points out, which I also slightly touched on in the paper, if you have an income redistribution policy, which is necessarily involved in land distribution policy, with the more equitable distribution of income, the expenditure pattern is usually biased in favour of output of labour-intensive manufactures and also against import-intensive commodities. So, an egalitarian distribution of income, which is involved in an employment-oriented strategy, helps in expanding the domestic market base for labour-intensive manufactures.

The emphasis of institutional changes which are very critical for development of any kind of strategy in agriculture are well taken. We have been discussing them for years, the role of extension services, credit, co-operatives, and land reforms, are well recognized and I have no particular comments to make on them.

Dr Battacharjee has made a very pertinent point. I am familiar with the various reports of the ILO Employment Missions and I have also seen the summary of meetings held in Bangkok on the utility of these employment missions, which was held very recently. And two facts stand out prominently in these reports—especially the report on Kenya, which was, I thought, one of the best reports of these employment missions; but the emphasis is also in the report on Sri Lanka—that the employment is multi-faced and not merely a macro-choice of techniques on the economy as a whole.

To disaggregate the economy and sectors and the various aspects of unemployment, is not necessarily inconsistent with discussing the problem

in terms of proportions. Admittedly, a macro-economic discussion of factor proportions is not, in that context, very illuminating. But then, as these reports point out when they were discussing the employment problem, that basically in many of these countries the problem is one of low productivity employment rather than open unemployment and that, of course, there are problems of employment which are peculiar to educated people, related to the types of education they get, the wage and salary structure which creates a certain imbalance between supply of skills and demand for skills, the nature of urban employment and the role of what the report on Kenya calls the informal sector, which we traditionally call the trade, services and smaller-scale industry sector.

These are all very relevant points and I am grateful to our friend from FAO in pointing out this particular problem.

But more relevant is the issue he raised that, is the additional employment created in agriculture as a result of new technology, mainly in terms of increase of cropping intensity? No, I only gave an example of two sets of contributions which are made by new technology. One, labour requirements per acre increase as a result of use of seeds and fertilizers, because a more intensive use of labour is necessary, using pesticide, fertilizer, preparation of seed bed and all the rest, and also, it enables you to produce more than one crop a year, one, two, three crops and that both of these factors increase the extent of employment.

But the more operational question, is this additional employment going to those who are already employed in agriculture? Does it benefit the non-farm population in the rural area and landless labourers? The answer to this, I would suppose, would lie in the indirect impact effects of increased income and employment within the narrowly defined agricultural sectors in the rural areas and an extension of (*a*) such programmes as the rural public works programme, (*b*) the cottage and small-scale industries in the rural areas to provide employment for the non-farm sector of the rural population.

Again, various other speakers have made references to the critical role of land reforms which tend to combine both objectives and facilitate the employment objectives as well as the output objective. I entirely agree with the comments that the nature of administrative machinery necessary for implementing land reforms has often not been adequately understood.

More important than political will and administrative machinery to implement land reforms, appears to me to be the need for an adequate political organization at the village level for implementing land reforms.

Experience to date shows, whatever superstructure one builds at the national level, whatever laws one passes onto the statute books, can easily get frustrated if at the village level the political power is not distributed in such a manner as to implement land reform. Examples of frustrated land reform laws put on the statute books abound all over Asia. I am not familiar with Latin American countries but I am sure it is true all over. In fact, the distribution of political power in the village and implementation of redistributive land reforms in the village are so closely connected and

so critical to success that whatever superstructure we build about administrative machinery can be easily frustrated so long as power in the rural area is concentrated in the hands of those who own large quantities of land.

Dr Simantov's comment that the agricultural sector cannot progress in terms of its technical development out of line with the rest of the economy is a good point, well taken. In fact, what you have found in many countries, premature mechanization of agricultural operations has been facilitated and encouraged by inappropriate pricing of various scarce inputs, which I have discussed in my paper. If you have an overvalued exchange rate or artificially low rate of interest, which provides capital equipment, imported or otherwise, at less than scarcity price to the farmers, necessarily we are distorting producers' choice of techniques in favour of capital-intensive techniques by positive policy. And it has also been found that when you have prematurely accelerated mechanization in agriculture the use of tractors or other agricultural machines is often extremely inefficient. That highlights the point that agriculture cannot be technically more advanced than the rest of the economy. The frequent breakdowns of agricultural implements, lack of repair and maintenance facilities, and even a lack of well-trained mechanics to operate the machines, has often resulted in tremendous waste of agricultural mechanical implements used in agriculture in many Asian countries.

Further discussion of papers by Dr Simantov and Dr Nural Islam

J. S. Sarma, *India*

Dr Nural Islam, in his excellent and thought provoking paper on 'Employment and Output as objectives of Development Policy', has very ably dealt with most of the issues pertaining to the topic. I therefore propose to supplement what he has said by going into the operational aspects of a policy which seeks to reconcile the goals of increasing employment and output. I will use Indian experience in illustration.

In India, as well as in most of the developing countries, the bulk of the population lives in rural areas and depends on agriculture for its livelihood. The absolute magnitude of the additions to the work-force each year are so large that it is difficult to provide employment outside agriculture for all these new entrants. For example, there is a view that, in India, even up to the end of the present century, there will be no substantial change in the percentage of population dependent on agriculture and there is no question of the agricultural population going down. Nor is there scope for large-scale transfer of income from the non-agricultural sector to the agricultural sector through the manipulation, for example, of inter-sectoral terms of trade. Under the circumstances, the more the agricultural growth lags behind that in the non-agricultural sector, the more the disparities in the levels of per capita incomes in the two sectors will grow.

Further, studies on the income distribution have shown that roughly 40 per cent of the households have an income which is below the minimum level needed for a living or below the poverty level. It is these people who need immediate attention by way of providing employment to the unemployed and underemployed and by way of augmenting incomes at least up to the minimum or just above the poverty level.

A large number of these rural poor belong to the category of small farmers, marginal farmers and landless agricultural labourers. By small farmers, I mean those having between 1 and 2 hectares of land and by marginal farmers those having less than 1 hectare. These limits would vary from country to country or even geographically within the same country. The small farmers are those who are potentially viable, and who could produce surplus, if they had irrigation facilities and were enabled to grow the high yielding varieties of cereals. Thanks to the seed-fertilizer technology, there is scope for augmenting the output of small farmers through provision of integrated agricultural credit, input supply, extension and marketing services. With the help so given these small farmers become viable and will be in a position to repay the credit which they obtain from institutional agencies.

On the other hand, in the case of marginal farmers, i.e. farmers having less than 1 hectare of land, even after the adoption of high yielding varieties, the increased output is required by them for their own consumption. Hence they are not in a position to have a surplus out of which the repayment of loan instalments can be made. For increasing the incomes of these farmers, which are not adequate to give them the minimum level of living, they need to be provided with subsidiary occupations which give them not only additional employment but also increased incomes.

It is in this context that animal husbandry programmes assume special significance. Even at present, milk production is largely in the hands of small and marginal farmers and landless people. Recent studies have shown that in India roughly one-third of the total milk production comes from large and medium farmers, another one-third from small farmers and the remaining one-third from the marginal farmers and landless people. Similarly pig and sheep meat and wool production are also largely in the hands of economically weak and backward sections of the population. Any attempts to improve the output of animal husbandry products such as milk, poultry, meats, etc., through technological advance in their production systems will help to increase their incomes, and provide additional employment. To the extent that these producers consume part of their own production, it will also help to improve their nutrition. Thus these programmes will have triple benefits by way of additional employment, higher incomes and better nutrition.

Emphasis on animal production has other advantages. One of the several reasons why the overall rate of growth in agriculture is slow is that, in crop production which accounts for the bulk of income from the agricultural sector, the rate of growth has been between 2·5 and 3 per cent per annum. It is true that with the adoption of seed and fertilizer-

based technology, the rate of growth can be faster, but very soon the constraint of demand will begin to operate. At the most, the internal demand for foodgrains can be expected to grow at 4 per cent per annum. And unless there is export demand which could be met at competitive prices, the country cannot absorb larger surpluses. I am not suggesting for a moment that a growth rate of 4 per cent per annum in foodgrains has already been achieved or is round the corner; but the nearer we approach this rate, the more the emphasis would need to shift from crop husbandry to animal husbandry.

Demand will not be a constraint, for quite a long time to come in the case of animal husbandry products, including fish; as the income elasticities of demand are high for these products relative to cereals.

There is also scope for attaining faster rates of growth in the animal husbandry sector with the adoption of scientific methods of breeding, feeding and disease control, etc. Surpluses in coarse cereals which are expected to develop in crop production could be profitably absorbed as livestock feed.

Further, most of the increase in the animal husbandry sector will be in the rural areas and will contribute to the reduction in income disparities. This will also help in achieving rate of growth in agriculture which is faster than that in crop production.

I would like to deal with another aspect of this problem. If growth in the livestock sector is the only aim without consideration of enlarging the employment opportunities, this could be done through the encouragement of bigger and medium-sized dairy farms, poultry farms, etc. But this policy will not help the rural poor. A production policy designed to increase the output through the small and marginal farmers and the landless labourers will serve the need for growth of employment as well as output. The implementation of this policy will no doubt involve finding solutions to some very difficult problems of evolving suitable institutional agencies for providing credit, supplies of inputs, extension and marketing, to which I have drawn attention earlier.

A more difficult question to be handled is that of subsidy, whereas the medium and the bigger farmers can obtain institutional credit and will be in a position to repay, the small and marginal farmers would need some financial assistance by way of initial subsidy on investment for a limited period. This the government should be in a position to provide. In actual practice, the subsidy element in these programmes may act as a constraint on taking them up on a very large scale. But these subsidies are inevitable if the policy of raising the income levels of the weaker sections of the population is to be implemented. In the case of the so-called Green Revolution, this slant towards the weaker sections of the population has not been given in the initial stages. This is understandable because of the preoccupation of the government with the measures for securing immediate increases in foodgrain production. But this policy has resulted in widening the gap between the rural rich and the rural poor.

Before I conclude, I would like to add a further comment on this

question of employment. Organizing public works programmes is one of the methods of creating employment opportunities. Experience has shown that the programmes have a role to play in periods of famine and scarcity to get over the immediate problems of unemployment and distress caused by natural and climatic factors. But as a regular employment measure it would be far better to lay emphasis on self-employment, rather than on hired labour employment. There is no escape from the need to lay the major emphasis on increasing employment opportunities within the framework of self-employment.

Stane Krašovec, *Yugoslavia*

My observation pertains in some respects to several main papers and this may be the appropriate time to bring it forth.

When talking about the human factor in either the present or the future technology, one should not forget the increasing share of women as an active labour force, sometimes the only labour force, in agriculture. This is true not only of some tropical regions as, for example, the forest zones of Africa where women alone do everything from sowing to harvesting and marketing. It is true also of a large part of more developed or high income countries, and indeed in increasing proportions. At the Twelfth Conference in Lyon I had the privilege of presenting an assessment of part-time farms. It should be recognized not only that women are very active but in many instances and in many regions they are the only agricultural labour force on those farms. It is true that I argued then that the part-time farmer as an individual is disappearing from agriculture in either the second or the third generation but, as I have elaborated later in detail, part-time farming as an institution is of longer duration. Recent developments with rapid rise in the size of marginal farms causes a wider spread of mixed occupations. I see it confirmed also in Lamartine Yates' report for the 1972 FAO Regional Conference for Europe in Munich and in Philippe Lacombe's thesis at the University of Montpellier in France. Finally, there are many thousands of migrant workers from small holdings on which only women remain for cultivation and management.

While merely the frequency of employment of women in agriculture has been slightly touched on at the Twelfth Conference, it is my point this time that the educational system does not take sufficiently into account the share played by women as active labour force in agriculture. In so many instances the son has graduated in some kind of agricultural schools or courses but later on he takes an occupation in the town and leaves the holding while the girl who had been educated primarily in various types of home economics remains in charge of the holding. Moreover, the legislation in matters of inheritance, of fragmentation or non-fragmentation, of old age insurance, etc., does not take such a situation into account. In my country very frequently countrywomen express in letters to editors of newspapers their feeling that administrative and

educational institutions lag behind the factual development of the women's situation. Recently some research on this subject in Europe was published, by Ester Boserup in Denmark and by Corrado Barberis in Italy. I wonder whether some special group will take up this topic. But at any rate I do think that the matter should be put on the agenda at the next Conference.

Maxwell Myers, *U.S.A.*

My comment derives from the excellent paper by Dr Simantov and, more specifically, from two separate points make in it, namely:

(*a*) that we should concern ourselves more with public policies which affect agriculture in addition to specifically agricultural policies, and
(*b*) that when we concern ourselves with 'farmers' we should define 'who' we mean.

In this context of public policy, the question of who—of whose interests should have highest priority—deserves broader application than to segments of rural populations alone.

It deserves, also, more intensive study than we agricultural economists have given it. Generally, we have ignored this question or have assumed a 'who group' without thorough study of alternatives or priorities. Also, we have assumed, or accepted objectives to be studied with inadequate attention either to priority 'who groups' or to alternatives, of priorities or objectives. At worst, this has meant that we have by assuming answers to these critical questions left for our detailed study only minor questions.

At best, as in Dr Simantov's paper, we have tended to study possible effects of various policies on various groups or the possible reactions of various groups to various policies, but with major emphasis on the effects. Thus for me, and I would hope for you, three of the more important implications of the Simantov presentation are:

(*a*) It is imperative that more attention be given in policy studies to more thorough analyses of priorities of 'Who Groups'. This approach can lead to more effective analysis of priorities of objectives as related to higher priority 'who groups'.
(*b*) We cannot and should not expect other professions to accomplish these important evaluations for us.
(*c*) Our professional capabilities now include the attitudes and some of the tools suitable to this purpose. We can develop necessary additional techniques.

I do not claim that this process will be easy, precise or comfortable but I do suggest that the rewards for devoting early and intensive study to these major determinations of who and what, could include increased relevance, applicability and reliability, for our policy recommendations.

Douglas Ensminger, *U.S.A.*

I would like first to make two comments with respect to Dr Islam's paper. It is my feeling that Dr Islam should make one addition to his shorthand version of the new technology, when you say seed and fertilizer. I think that it is well documented that the high yielding varieties of seed will produce the yields when they have the full dosage of fertilizer and they can have the full dosage of fertilizer only when there is assured water. And this means assured water when it is needed and in the quantities required.

Secondly, when we are talking about labour-intensity it seems to me that we also have to recognize this new technology again applies in terms of multiple-cropping potential only in the areas where there is assured water. So, when we look at this on the world-wide basis, and think of the new technology, being applicable only in the irrigated areas, and irrigated areas of assured water, we are still leaving out about 85 per cent of the agricultural area.

The third point I would like to make is that a great deal has been said about technology, about developing people's institutions and about the importance of local political institutions. But in the final analysis people develop institutions and more attention is going to have to be given to the development of people as human beings. And I think this calls for a real revolution in education, particularly primary and secondary education, where the emphasis should be 'people development-oriented', rather than 'achievement-oriented'.

Finally, with respect to this question of poverty and unemployment, I think we have got to face the fact that there is not much we can do for the people already born and locked in poverty. We have got to do what we can to relieve their conditions, but we have got to start now to correct what causes it. So far as agriculture is concerned, we have got to put the whole of agriculture in the setting of integrated role development if we are going to give relief to this problem in the future.

A. T. Birowo, *Indonesia*

I am personally very grateful to the paper by Dr Nural Islam and his conclusion that there is indeed no real conflict between output and employment objectives in the long run. I would like to ask Dr Islam to explain more specifically what 'long run' means.

We see in the developing countries a real problem facing us. Output, which has been planned in the five-year plan, or the planning of agriculture, in all these countries, usually grows faster than employment, so the employment objective is far behind the output objective.

But, in general, I agree. I also agree completely that in the long run the output may be synonymous with the employment objective, not only at the macro level but also at the micro level—at the village and at the farm level. If you talk with the farmers in my own country they would not

distinguish between additional income and additional production, or additional output.

In studying the problem in Indonesia, I feel that due to the smallness of land holdings, on the average only 0·2 or 0·3 hectares per family at the present time, in Java especially the only way to solve the poverty of these farmers is to increase their income via the increase of employment.

This has been mentioned by Dr Islam this morning, but there are very few success stories on this to try to imitate.

Public work projects and small-scale industries have been mentioned and have been proposed in many different discussions. But again we still have a lot of problems to explain which cannot be taught and cannot be imitated. In the experiences of small industries and public work programmes in Indonesia, there is still the problem of whether we could create the public project at the right time, and still it is a problem which in practice we cannot solve. We cannot create employment by asking the co-operation of the farmers because co-operation is a basic element in the nature of all these people. But yet they are not very easy to mobilize to create productive projects. To mobilize them for consumption purposes is much easier.

We can also see a lot of problems of the small-scale industries because of the marketing, and the quality of the products produced by these farmers or the people in the rural areas, especially in competition with the better quality products which are imported from foreign countries.

Gunther Schmitt, *West Germany*

I would like to make a short comment on Dr Simantov's statement that agricultural policy favours the richer and bigger farmers. This indeed is a most common criticism of farm policy in advanced economies put forward very often by general as well as agricultural economists. But I think that this statement is only valid as far as *price policy* is concerned and it is not any more true as far as the total of farm policy measures, including price policy as well as social, structural, regional, labour market and infrastructural policy measures. In U.S.A. and Canada it might be different because of the comparative advantage of food production but it is true for the advanced economies in Western Europe. The reason is that within the process of economic growth farm production in those countries is increasing faster than domestic demand for domestically produced food. As a consequence of this, farm policy in those countries is forced to complement or, perhaps, to substitute traditional price policy measures as a means to transfer income from consumers, (or tax-payers), to farm producers by policy measures of those types mentioned above. This, of course, is a consequence of the fact that society is not any more willing to spend increasing amounts of money on supporting the farm sector and to the consequences for international trade.

The income transfer to farmers by such policy measures in most

countries in Western Europe is approaching or, in some cases exceeds increases to the farm sector generated by price policy measures. The quantitative change, within the structure of the income generating policy, towards an absolute and relative growth of government expenditures for structural and social policy measures, is a consequence of the changing position of agriculture within the context of economic growth and can be observed and statistically proved by comparing government and consumer expenditures in various countries differing in their level of economic development as well as in time series analysis of real expenditure in rich countries. Of course, other factors such as the existing farm structure, the relative supply of farm goods in relation to total domestic demand, comparative advantage in production of food, etc., are also relevant. However, in general, I think it is not any more true or relevant simply to say that farm policy favours only the more efficient and larger farmers because the other policy measures mentioned above are in most cases extremely favourable for the small farmers. I do not say that the present farm policy is optimal, whatever this means, but I think that farm policy is not so bad with respect to its distributive effects on income as many people think it is.

Adolf Weber, *West Germany*

I would like to draw the attention of agricultural economists to the role of research and development in the food industry which has strong repercussions on the agricultural sector. We have to look more closely at the innovative capacity of the different branches of the food industry which are able to shape strongly the environment of the total food and agricultural sector. Agricultural and food policy should be combined to take into consideration the effects of these innovations. Could Dr Simantov comment on this?

Ahmad Kamali-Nafar, *Iran*

Following what I said yesterday about institutions I would like to carry on from Dr Nural Islam's remarks on this subject to refer to an approach we have used in Iran which may interest others. We have attacked the problem by using separate education, extension and health corps. All young boys and girls graduating from high school, and the universities, instead of going to military service, have been sent to very remote areas—where ordinarily, voluntarily, no one would go, to serve as doctors, nurses, extension people, agriculturists, economists, and educators.

With this project, we have achieved that the level of education has been raised greatly, and farmers have been getting real help from the extension workers, doctors, etc. It works all right in my country, maybe it will work in other countries. This is why, perhaps, the income from ten years

ago to now, according to our statistics, increased from 200 U.S. dollars to more than 500 dollars a year. The Fifth Plan, now starting, leads to a projection that is much more optimistic.

These developments have created enough enthusiasm for farmers to set about helping themselves. Now they are building roads for themselves, as a part of the plan, and also other facilities. Some of the processing plants that one of my colleagues mentioned have been built and now is open to the farmers, and they have started selling to the big cities.

To do that they had to increase output, and also employment. This system is working very well and its effects have spread elsewhere into the economy.

Michel Petit, *France*

My remarks deal with the role of economists, a subject touched on by Dr Simantov in his conclusion. Faced with problems of economic policy, economists alternatively adopt two positions: on the one hand, that of the social moralists which is, no doubt, useful but which can be dangerous in so far as it often leads to outrageous simplifications of analysis, and, on the other hand, as a reaction, that of the analyst who, refusing to pronounce on the objectives which society should pursue, takes these as exogenous data. This latter attitude corresponds to a philosophical position referred to in the United States as 'conditional normativism'.

If one adopts this attitude, one rapidly perceives, as indeed Dr Simantov has done, that the objectives pursued are contradictory. His explanation that these contradictions are due to the fact that society is changing, and that therefore the objectives it pursues evolve, is no doubt a valid one, but appears to me to be incomplete. Another possible interpretation is that the contradictions between objectives reflect conflicts between various social groups constituting society.

Should not our task as economists, in this case, be to identify these conflicts rather than to seek to identify an eventual common good as does the moralist who in some way believes himself to incarnate this general good?

The identification of these conflicts requires that one should identify the social groups which have interests in common, that one should understand the economic bases of these conflicts, and allows one in return to determine the economic consequences. One then returns to the old tradition of political economy, where a particular stress is laid on the relationships between the economic and the political. I believe that we are ready for this change of perspective. But we shall have to preserve the richness of analysis of the neo-classicists. It is therefore an analytical political economy which we must build. Much remains to be done in this respect—consideration of the very bases of power themselves having scarcely yet been begun by economists.

S. Kulthongkham, *Thailand*

In my opinion the goal of future agriculture should be to produce plenty of food for us all at low prices.

I have heard from previous speakers that agriculture can be developed by technical, institutional and administrative improvements, but as agricultural economists, we have paid more attention to these headings than to improving the weather. Weather is one of the most important factors affecting food production. In my country water is more important than anything else. If there is an optimum amount of rain, well distributed, we get a good crop. If the rains fail, as they did last year, rice and corn fall well below our production target, and short crops in exporting countries affect all who import.

I would like to appeal to all of us to put heart and soul into research and development on making the optimum amount of rainfall at the time when the rice and corn farmers need it. Construction of dams and digging deep wells are useless if there is no rain. These are the facts not only in my country but in about 150 others.

My King has been conducting research and development in this field with quite satisfactory results. We can make rain and can provide rain to the farmers on a small scale due to limited resources. There are two problems that are not solved yet—one is achieving the optimum amount of rainfall; we cannot control it yet, sometimes there is too much, sometimes too little. Secondly, although the rain falls we cannot control the location of it yet. If anyone knows how to solve these two problems, please let me know. Should any person wish to have more details of Thailand's rainmaking technique, I will gladly provide them.

Dr Simantov (in reply)

I think I could agree with all the points that were made this morning concerning the views that I expressed yesterday.

I fully agree with Dr Weber's observation, about the need for more knowledge on the advances made by the food industries. For many years, the agricultural economist thought that the food industry was not part of his preoccupation. The industrial economists were not looking at the food industries either. They were looking at the other industries, so that I would agree that more work is needed, not only to know how innovation is spreading in the food industry, but also to determine the various institutional changes that are occurring in it and to determine what are their effects on agriculture. Agriculture's behaviour in all societies, and specially in the industrial societies, will change drastically, because of those changes in the food industry and in distribution, especially because of the concentration of business in these two branches.

I agree, also, with the points made by Dr Myers and I think, Dr Schmitt; what I would like to emphasize is that we have been looking for many years at agriculture as a uniform sector. Even in statistical

publications, you see that the average size of a farm, in country 'X', is 5 hectares, for instance, but when you go there you do not find a farm with 5 hectares. The statistical average is not representative of anything at all but, in spite of that, all the calculation about farm income, productivity gains, and capital use, are all based on this average notion. We have to look at the various sectors in agriculture, and I have to admit that our knowledge, and even our empirical knowledge of how the various groups react to policy is very limited. How many times, for instance, when politicians have to set the price of milk, is there argument whether a reduction in the price will increase production or whether it will reduce production?

This is because the agricultural sector is not uniform, and we know very little about the behaviour of the individual farmer, in his particular circumstance.

More research is certainly needed to find out how each group reacts; and, when we find out, then the policies will have to become more selective, and less uniform than they are at present.

I agree with Dr Schmitt, that policies in Western Europe, are not exclusively price-support policies, that there are other elements in policy, which are increasingly important: but I have to say, that in spite of that, the bulk of the public expenditure, both by Government and consumers, is for price support.

I do not think that much of what goes to agriculture as social expenditure can be accounted as help to agriculture, because other groups in society also have social pensions, and social security. These payments are not, I think, on account of a better agricultural policy, but in recognition that farmers have to be treated like other people in society. But even if we look at structural improvement, are we sure of what we are doing? I speak in a personal capacity, because as an organization OECD is promoting structural improvement, but personally, I'm starting to have some doubts. What do we do, in fact, by putting money into structural improvements?

We raise the price of land, this is one of the consequences, and in this way we reinforce the need for higher price support, because of the high price of land. It is a spiral effect, and I think this is one of the consequences, when Governments enter economic life—by intervening in one place, they create a need to intervene somewhere else, and I don't know where that will lead us.

And a last point in response to Dr Petit; I agree with what he said, and if I have given the impression that I'm more of an analyst and less of a moralist, maybe this was my fault. I think the starting point of all my thinking, is the ethical point. The more we try to analyse what really happens in society, and the conflicts that exist, the more service we provide to these people who are in need of some help.

I would agree with his point, that the conflicts we have in our society, are not only the consequence of conflicts in goals of the governments, and the inability to change in policies, it certainly includes conflicts of interests

among various groups, not only between agriculture and the rest of the society, but within agriculture itself. What the policy-makers do, is in line with the balance of power in the various groups that compose agriculture. The more we analyse these elements, the closer we come to more just policies.

Dr Nural Islam (in reply)

I have very little to add to all the comments made this morning. I will concentrate on two points only. I entirely agree with all of Dr Sarma's comments on the paper excepting that while we agree that one of the means of providing employment to the rural population is an increasing emphasis on livestock and animal husbandry in rural areas, including poultry farming, in practice it is often found that the technological problems are immense. Two particular aspects seem to be of particular importance, in the area of livestock production:

(*a*) How to provide technical assistance to the small farmers, who are supposed to engage in association with the agricultural operations in livestock and poultry farming?
(*b*) Related to the first is how to provide sufficient technical assistance for the prevention of disease?

In advanced countries, livestock production is clearly done on a very large scale, using very carefully planned capital-intensive methods. How can we organize the techniques for combining livestock and production and poultry farming with the small farm without creating new problems of disease, or supply of feedstuff, etc. To my knowledge, it has not been satisfactorily solved.

About rural road programmes, I think that, so far, the rural roads programme has been treated as an adjunct to the policy of integrated rural development. It is only very recently that we started thinking in terms of a rural public road programme as an integral part of the new rural development strategy. Here again, I think we have not emphasized enough the role of local government institutions at a local level, for organizing both agricultural programmes as an integral part of rural development and for organizing cottage and small industries in the rural area.

I entirely agree that water is a critical input, in fact, as far as the new technology in the rain-fed areas, as against irrigated areas is concerned, there are still unresolved problems of both technological and/or organizational nature. Here, in order to induce farmers to adopt the new methods, it will be necessary to ensure that the gains with the new methods are considerably more than in the irrigated area, because the risks are considerably better.

About the short-run and the long-run conflict between the employment and output, I think I have been slightly misunderstood this morning. What I said was that the traditional view states that there is no conflict in the long-run and my answer was that, even in the short-run, the conflict is

more imaginary than real, and the conflict is more due to socio-political reasons than to technical and economic reasons. If in the context of countries that suffer from severe unemployment and underemployment, and acute poverty at the present moment, an appropriate rate of discount is used to discount income or employment flow in the future, one will find that the conflict disappears, that the employment and income distribution strategy will get precedence, even in the short-run.

I conclude by agreeing about the role of the economist in policy-making. People like us, who have moved from the area of research and teaching to the area of practical policy-making, would find it difficult to distinguish the role of a political economist from that of a field analyst. All policies involve conflicts, in the sense that they affect one social group differently from another social group. Sometimes they benefit one group and harm another group. It is very difficult to conceive economic policies that will not do that, and therefore once involved in advising policy-makers and politicians, one cannot get away from making value judgments. Therefore the terminology coined by our friend from France of Analytical Political Economy seems quite appropriate.