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Accomplishments, Present Status and Future Opportunities for Agricultural Economists in the Planning Processes in Less Developed Economies

Planning involves evolving development strategies that reflect political and economic aspirations of the nation. At the same time, to be realistic the strategies have to be based on an understanding of the economic behaviour of the people. Besides, their implementation requires knowledge and understanding of administration. Evolving strategies that satisfy all these requirements is a major challenge. In underdeveloped economies where stagnation preceded the recent planning these challenges were real and formidable. Economists, administrators and policy-makers joined in facing the new challenges of economic planning. Agricultural economists interacted with all of them. Since agriculture constituted a major sector of the developing nations, the agricultural economists were called upon to have a major share in handling the problems of planning.

Our endeavour in this paper is to highlight one aspect of the contribution of agricultural economists to the evolvement of planning strategies. We shall discuss mainly the influence of economic theory and empirical findings pertaining to understanding the working of the agricultural sector, in shaping the planning strategies. Agricultural economists were almost at the centre of this process.[1]

1 ACCOMPLISHMENTS

Contributions of agricultural economists in the planning processes of centrally planned economies and market economies varied. The contributions to planning in market economies can be divided into three distinct phases. In the initial stages emphasis was on institutional reforms, followed by a search for new and better sources of growth. Employment and poverty have engaged the greater attention of agricultural economists in the recent past. While distribution has been an underlying objective, growth has remained a primary concern of the market economies. Attempts to integrate the two have recently been intensified.

Institutional reforms: first phase

Economic planning followed the political freedom attained in the post-war period by many of the developing nations. Though emphasis on growth in planning resulted from the gap between developed and undeveloped nations, the desire of the latter to collapse decades into years in attaining higher economic level (an element of idealism following political aspirations), led to an emphasis on a distribution aspect as well. Agriculture in these nations provided a major source of income to a large section of the community and land occupied a pivotal position in agriculture. "Agrarian Unrest in South-East Asia" reflects the political yearnings of developing nations in the early stages of planning. The early contributions from agricultural economists came therefore in terms of institutional reforms. The "land reforms vs. agrarian reforms" – a definition feud was settled in favour of the latter – and the term "agrarian reform" was defined broadly to include all institutional reforms pertaining to agriculture.

Linked with agrarian reforms was co-operation. In many countries property rights in land were relics of the past alien imperialist governments. Other institutions (e.g., credit and marketing) were built around the then prevailing land-related institutional arrangements. The first step was to remove old interests in land rights which evoked unanimous response. A second logical step was taken to pass on the rights to the tillers. The removal of conventional agents in credit and marketing institutions required replacement and co-operatives were suggested as healthy alternatives, since in principle they permitted wide and equal participation by members.

Theory and empiricism: second phase

Agricultural economics acquired vigour from both theory and empirical studies. Economic theory pertaining to both statics and dynamics – the latter relating to growth – had an impact on thought development in agricultural economics.

A. *Impact of Efficiency Consideration*. The neoclassical theory of markets in the context of economic statics influenced thinking regarding issues in agricultural planning. The major consideration pertained to efficiency in operation of markets. The functioning of the markets for produce, credit and land was brought under theoretical scrutiny. How efficiently or inefficiently the existing markets functioned within given institutions, was the major thrust of the scrutiny. It was believed that removal of inefficiency would make a direct contribution to growth, as it would save resources and would increase production with resources then available to the community. This search for efficiency came at a time when planning agencies were looking for a 'spark plug' effect to provide initial momentum to the engine of growth, so that the economy may move on the path of progress, in other words a take-off or threshold stage may be attained.

While land reforms continued to be a favoured component of planning

for political reasons, they have remained until this day an "unfinished task". When they came under scrutiny through application of efficiency criteria, they ceased to enjoy prime importance in the armoury of the planning agency. The agricultural economists provided lukewarm support to the programme. They were not sure about the trade-off the land reforms involved between gain in distribution and loss in efficiency. The history of the debate regarding tenancy (mainly share tenancy) and production efficiency is known. The debate on grounds of theory and empirical evidence is still inconclusive. A similar position obtained regarding the relationship between scale of operation and production efficiency (i.e. size of farm and productivity input).

Institutional reforms regarding credit and marketing had from the start an emphasis on the distributional aspect; "remove exploitation by intermediaries and let the benefit of 'labour' go to the producer" was the main argument supporting reforms. It was the slow progress of reforms that later invoked theoretical investigation. Thinking on this topic drifted in favour of the existing arrangement being efficient, under constraints of "high-risk high-cost" caused by lack of communication. Hence, changing the institutional form alone was regarded as a weak alternative for improving efficiency or for even substantial distributional gain. In practice, with co-operativisation of credit and marketing, only the power structure of local politics changed. This was a new situation and tackling it was outside the competence of agricultural economists.

While scrutiny of the efficiency of operation of marketing institutions led to less firm conclusions, the accumulating empirical evidence heavily discounted the initial assumption of non-rational economic behaviour of individual producers. Studies relating to allocation of land to alternative uses, response of crop production and sales to prices and incomes revealed a surprising consistency of the individual producer's response. Instances of this type of empirical finding can be multiplied by similar findings regarding savings, borrowing and investments. Such findings nearly baffled the policy-makers as they minimized the role of policy interventions. If the economy was in low gear, despite high economic efficiency, how was development to be planned? Obviously, the pace of growth had to be quickened, but intervention was likely to upset the old equilibrium and a temporary reversal of growth was regarded a major political risk.

B. Growth Theory Impact. Three major strands of growth theory that made an impact on thinking pertaining to agriculture found a way into planning. They pertain to the role of physical capital, food and human capital in aiding development.

Role of capital

Initially, the importance of investment in physical capital was emphasized by growth theories. The contributions of the Harrod-Domar model, Lewis's *Theory of Growth*, Joan Robinson's *Accumulation of Capital*, and Hicks's *Capital and Growth*, emphasized the role of capital in growth.

Under the influence of the prevailing growth theories, the role of capital came to be accepted as decisive for agriculture as well. Massive investments in agriculture in the form of gigantic irrigation dams and fertilizer factories – Damodar Valley Corporation (DVC) and Bhakhra Dam and Nangal Fertilizer Factory – were developed in India with "the biggest in Asia" label and belong to this period. The public sector investment came to be accepted readily in the field of agriculture as the contrast between the scale of investment in the public sector and that by individual farmers was obvious.

The agricultural economists in India played a critical role with regard to public investment in agriculture. Their conviction arose not from capital-output-ratio related theory alone; it was rooted in a social versus private benefits (and costs) perspective. If policy makers had been guided by direct-return criteria, few gigantic irrigation dams would have been constructed. Immense indirect social benefits made these investments economically feasible. What initially was an approach has now developed into a discipline and with several refinements has found national and international acceptance for non-market investment decisions. While the logic of massive investments was convincing, the programme faced rough weather owing to the long gestation period of large capital projects. Since in agriculture the decision regarding utilization of new irrigation facilities rested finally with the tiny producer, the total gestation period was much longer than the technological one.

The massive investment operation met opposition from the wage-goods theory which can be traced to Ricardo. The theory acquired new meaning when a wage-goods multiplier extension was developed. Lewis's dual economy model and its extension, particularly by Rani and Fei, came up with a strategy involving intersectoral transfer of labour. Transfer of labour involved transfer of food and if the two did not match, a wage goods gap would develop. In substance, these theoretical developments emphasized the primacy of agriculture. Since immediate expansion of agricultural production would require climbing up the Ricardian cliff of diminishing returns, international transfer of food as a catalyst was commended for the intervening period.

Micro-level planning

Agricultural economists perceived a stellar role of the individual producer as a decision-maker in regard to the use of inputs and levels and composition of outputs. Even if market prices provided general guidance for decision-making, increased access to an expanding resource base and to new knowledge about better methods of production would improve production efficiency. The agricultural extension services were introduced with this objective from the start of the planning process. However, their contribution during early years was limited.

A new slant on agriculture in growth theory, strengthened the search for sources that would yield immediate results for raising farm production and micro-level planning came to be emphasized in this context. Its logic

was simple: to help the producer it was necessary to identify the problems as close to him as possible. In agriculture the production problems are more location specific. To improve access of the individual producer to resources, the resource base had to expand at the local level. Further, the potential for growth could be better identified and more quickly exploited if local knowledge were brought in as an ingredient of planning. It would be easier to identify at micro-level the unemployed persons who were presumed to be in large number in agriculture and who could be brought into the production activity by a planning strategy.

In the context of micro-level planning in India, a district, and below it a block, was accepted as a unit of planning. While district level planning was adopted as a general strategy, intensive efforts were made in a few selected districts. This strategy was known as the Intensive Agricultural District Programme (IADP). The ideal of helping the individual producer to plan his production was central to IADP. Farm budgeting was accepted as a tool and was extensively used for the purpose of production planning. Agricultural economists, particularly in the agricultural universities, extension agencies and agricultural scientists played important roles in IADP. From farm budgeting to linear programming was one more step. But linear programming being a more complex tool, its use did not spread beyond the experimental stage.

Food

Food shortage was inherited as a war time legacy by most of the developing nations. Bad years aggravated it, good years provided relief. Management of food, however, was done with a sense of apology. Policy makers in the context of food would emphasize food production policy to be the planning plank and food management as a short term relief measure. With the emphasis on the role of wage-goods in the growth process, food acquired a "growth-good" label and food management the respectability of an "investment" activity. Internationally "Development Through Food" came to be accepted as a part of a planning strategy. Unutilized labour together with additional food would produce capital, which in turn would move the wheel of the economy ever faster. Agricultural economists once again came out of the side-wing. The history of food management in India bears witness to the significant contribution agricultural economists made in developing the "art" of food management in terms of procurement, distribution and price fixation. Food policy generated controversies also. In the context of the efficiency criterion any long term intervention in market operations was regarded by market economy-oriented agricultural economists as a violation of basic economic tenets resulting not only in loss of efficiency in the short run, but also in damage to long run growth prospects. The controversy regarding food market intervention has not died down but the market efficiency view has gained a measure of acceptance. The food management which should have received orientation to serve growth could not wholly shake off its wartime legacy of protecting consumers from the

crushing inflationary burden. Nevertheless, both micro-level planning and food management have survived as components of planning strategy. Their contents have even expanded. "Food for work" explicitly links employment and growth with food management.

Dual economy models generated new enthusiasm for empirical research mainly for the measurement of unemployment. Attempts to explain the nature, composition and extent of rural unemployment however, have met only partial success. Views have varied from an absence of unemployment to an existence of a vast pool of unemployed labour. The magnitude of the problem and the complexities of the task have been continuously examined and nation-wide data, collected over more than a decade, have given an increasing pile of quantitative information. While measurement of unemployment and under-employment has engaged the major attention of agricultural economists, the policy prescriptions they came up with to combat the problem were of a general character. Specific policies directed towards increasing employment range widely. They include redistribution of land, encouragement of traditional village crafts and a guaranteed employment scheme. Diversification of occupations was recommended at the individual producer's level by adding to cultivation, animal husbandry, poultry, fishery and (now) farm forests.[2] The varied nature of these prescriptions and their tenuous link with development theory reflect the present state of thinking.

The primordial role assigned to agriculture in the post World War II period differed from its physiocratic origins. Agriculture is not regarded as the source of "surplus", but is considered an instrument of growth which provides food as an input. Where wage-goods theories, Lewis's model and its extensions left off, Leontief's inter-industry input–output model took up. It emphasized that just as expansion of industries depended on supplies from agriculture, expansion of agriculture itself depended on supplies from industries. Thus, growth is a product of inter-sectoral resource flows. Both these theories made efforts to increase agricultural production, a "respectable" activity. The new respectability of agriculture changed its postwar label of "Achilles' heel" to that of "Engine of Growth". Label-changing, however, did not ease the task; the Ricardian wrinkle stayed with it nevertheless. The diminishing marginal product was more than a brake. It cranked down the "engine of growth" to a dead stop in a conceptual framework. Theory did not go beyond it. The appeal had to be made to history, past experiences and current developments in fields other than economics. At this stage came the contribution of *Transforming Traditional Agriculture*.

Human capital

The thought development reflected in *Transforming Traditional Agriculture* has a history. While endeavours to develop a framework of growth theory were underway, economists were reaching out to capture even scattered potentials for growth by exploiting "increasing returns" as a counter to diminishing returns. Firstly, Libenstenian construct led to the

"wage goods" multiplier. Later, a major contribution came in the form of a "Human Capital" concept. The amazing capacity of adaptation to face challenges continuously was demonstrated to be the characteristic of this newly "uncovered" form of capital. Empirically, its high pay-off was demonstrated earlier through staggering returns to technological research. It was decided that education, research and technological change provided a way to the modernization of agriculture. They would facilitate a higher rate of absorption of material investment. Indeed, a breakthrough in the theoretical conceptualization was achieved. The contribution came almost simultaneously and independently in agricultural economics and in general economics in development theory. Sraffa's contribution in value theory together with its reinterpretation and a survey of growth theory by Hahn and Matthews, bear witness to the contribution in growth theory itself. Acceptance of the importance of education, purchased inputs that embodied higher level technology (viaz., fertilizers and seeds), and increased investment in technological research in agriculture as a part of planning strategy, is recognition of the new theoretical breakthrough.

What became the fate of the past theories and the strategies based on them, perhaps would have been the fate of the new theoretical development also. A happy coincidence occurred, however. A technological breakthrough in high yielding varieties of rice and wheat ushered in what has now come to be known as the "green revolution". Was it a revolution? What happened to its potency which seemed to lay buried under the heap of empirical evidence, showing growth rate to be no greater than the two decades old trend in the sub-continent of India? The early empirical evidence could not reverse the thought of the contribution of theory nor did it dissuade the policy maker from adopting a planning strategy based on new technology in agriculture. Agricultural economists in national planning agencies responded quickly to the new developments. They examined, ahead of time, second and third generation problems. They evolved strategies for speedier distribution of inputs and credit. They discovered a kink also: what if the green revolution turned red?

2 GROWTH AND DISTRIBUTION

A patient journey back into the experience of growth through the analysis of consumption data uncovered "mass poverty" underneath economic growth. What could be the explanation? Those who uncovered the fact were agricultural economists and those who raised the question loudly were the development economists. Empirical agricultural economists responded to the problem differently. They identified "the poor" as being landless, or a tiller cultivating a small plot of land, or any one of the two not finding enough employment.

As an immediate response to the "newly" discovered situation of mass poverty, the agricultural economists particularly favoured the bi-modal

planning strategy. It meant that growth strategy was to be supplemented by special programmes for reaching the target groups. The Rural Works Programme provided employment to the unemployed in India around this time. The scope of the supplementary strategies was expanded by adding special agencies like "Small Farmers Development Agencies", and "Marginal Farmers and Agricultural Labourers Development Agency", "Guaranteed Employment Scheme", and special extension services for tribals. The Regional Rural Banks strengthened the financing of agriculture in less developed areas where poverty was believed to be widespread. Some of these programmes were initiated a little before the "target group" strategies became a part of "bi-modal" planning. Since target groups varied, so also were the strategies to reach them; bi-modal planning in practice assumed a multi-modal form.

The empiricism of agricultural economists became engaged in exploring the nature of association between growth and income distribution. The available empirical evidence came up with sharply contrasted indications. Calorie-based real income levels used for dividing the poor from the rest suggested an enlargement of the pool of the poor over time. An equally powerful indicator, viz., the expectation of life at birth, suggested a dramatic welfare improvement of all classes in the community. "P Quali" of the Overseas Development Council (ODC) and the calorie-gap indicator of the Food and Agricultural Organization of the United Nations (FAO) have taken the debate regarding the association of growth with income distribution to the international level. A theoretical integration of growth and income distribution has been attempted by John Mellor. Taking clues from consumption behaviour and working back to the production processes, he suggests that growth with its income effect will have a built-in element related to employment. The improved incomes will raise demand for products which have greater employment content, especially so in the matter of agricultural produce. Economists are currently re-examining demand theory. They have opened new "boxes". They ask how should the "quality" of consumer goods be measured? An even more basic question is raised: how can economic "good" be defined? If goods are to be defined – as they should be – in terms of their characteristics, we would be taking a journey back to "utility".

Agricultural economists are examining empirically issues relative to the characteristics of food. Is the demand for food by consumers nutrition-related or taste-related, and if both, what degree of emphasis is on nutrition and on taste at various income levels? This inquiry is in an embryonic stage. Its findings may add a wrinkle to the major inquiry regarding association between growth and equality. Tastes in a dynamic context are not unchanging, and what is more important, interpersonal effects on demand (i.e. on the consumption side), may be greater and faster than on the production side. In other words, the poor may emulate the food tastes of their rich neighbours in preference to nutrition or calorie-content much before the desired level of the latter is reached.

Such emulation of the technology of the rich farmer by the poor one is likely to be much slower.

Demography and dynamics of rural development

The tidal wave phenomenon of population expansion in the post World War II period has brought back demography into the fold of economics. While increased life expectancy is a clear sign of improved health, it adds mouths to be fed. Is the recent population expansion an exogenous phenomenon and is it transitory? Is it growth-related and likely to damage growth prospects themselves? Is population expansion linked with improved nutrition? Can policy intervention succeed in limiting population growth so that economic growth can continue unhindered? In this multiple question inquiry economists have participated more than demographers. Their major finding is that children are positive goods (in terms of numbers) at low incomes especially in rural areas. This finding brings the agricultural economists into the arena; they would want to examine in a more comprehensive context the rural dynamics that would take account of demographic behaviour. The inverse relationship between acceptance of fertility control and income levels with its attendant undesirable effects on economic growth and employment has once again spurred the search for an effective policy intervention instrument. The most malleable human capital, with its growth-aiding character, is found contributing positively to fertility control also.

All related issues that have been raised in the wake of demographic inquiries cannot be put back into Pandora's box. The vital question that challenges the intellect of practising economists and agricultural economists pertains to the time lag involved in beneficial effects that may put the economy back on the rails for its speedier journey to growth with equity. Agricultural economists not adequately equipped with knowledge of demographic techniques are waiting for findings to crystalize so as to include them in the calculus of rural dynamics. Witness, for instance, the finding of inverse relationship between property holding (mainly land) and family size: does it represent a "life-cycle" phenomenon? Is it related to a non-economic (mainly social) phenomenon of changing family structure? In both these cases, the phenomenon would vitiate the traditional income distribution measurement and hence, throw doubt on the observed inverse association between growth and income distribution. While economic theory is grappling with the new question of the relation of growth with equity, the agricultural economists in their role *vis-à-vis* the planning agency take a cautious route of multi-modal planning strategy.

Regional income distribution

Connected with the "Green Revolution" was the problem of regional income distribution. In fact, the problem of spatial distribution of income in the rural sector is also linked with the public sector investments in location-specific projects like irrigation dams. The steep differentiation

in adoption of promising technology embodied in the Green Revolution only brought the problem of regional income distribution to the fore demanding immediate attention. In the multi-modal planning strategy the backward area development programmes are included to aid the tribals and other weaker sections. These programmes are also location based. The problem not yet adequately attended to, even at the research level, pertains to mobility of labour over regions and its impact on inter-income-class and inter-regional income distribution. Regional science that embodies location theories takes account largely of the movement of labour from rural to urban areas and its attendant problems. Rural-rural and rural-urban migration would raise different sets of problems. The planning strategy has remained silent in attacking the problem of labour mobility in general. Since the mobility of labour from one rural area to another has become sizeable, we shall soon find attention turned to this problem. Until then, it remains a "dark continent" of agricultural economics.

3 PRESENT STATUS AND FUTURE CHALLENGE

Agriculture was the major sector of many developing nations that accepted planning as a major strategy for economic development, and it still continues to be so in many of them. The importance of agriculture in the economy led to pressing demands on the role agricultural economists were required to play. It went beyond filling the details in the framework evolved by others. In fact, at all stages, a major content to the planning was contributed by agricultural economists. Even at a stage where theorists faced a near impasse, the breakthrough came from leading agriculture economists and it made a lasting impact on the planning processes. The present status of agricultural economists is that of an equal partner in the process of planning.

The bi-modal or multi-modal planning strategies now adopted do not resolve, they only contain the biggest current challenge to planning as a strategy of development within the market economy. The understanding of inter-relationships between growth and distribution in (relatively) free economies is not yet within our grasp. Expedience of alternatives can buy time, but not for long. This then constitutes the biggest challenge. Agricultural economists being nearer the complexities of the new situation, as these are more sharply manifested in the rural areas, are expected to shed light to show the way. In their endeavour they need the co-operation of other colleagues in the economic profession trained in theory and techniques of planning.

NOTES

[1] While much of the discussion is general in character, experience of India provides the background. While what happened inside the planning commission, and how the decisions

were taken on most vital issues, are important to evaluate the effectiveness of agricultural economists, we can judge their effectiveness in terms of the final decisions that went into planning documents and follow the process in terms of the thinking that influenced the shape of the issues. I have preferred the latter of the two approaches. By the very nature of the issues raised, the discussion here relates to the contribution of planning in the context of the market economies.

[2] The latest Five Year Plan of India has an emphasis on the employment generation. A switch in the policy favours traditional crafts in the industrial sector and auxiliary activities in the agricultural sector.

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DISCUSSION OPENING – SUDHIN K. MUKHOPADHYAY

There are two points to note at the beginning: (1) The paper is concerned largely with the subject of *agricultural economics* as a discipline and the performance of economists dealing with the subject, rather than a given set of "agricultural economists" as such; (2) It is the response of agricultural economists as a whole to the emerging problems of planning for economic development which is dealt with in the paper, rather than exclusively that of those working in any national planning agency. The broad setting is India.

Accomplishments

The author distinguishes between three broad phases in the accomplishments of agricultural economists in the context of planning for national development: (1) institutional reforms, (2) growth, and (3) distribution. Spillover between phases is not ruled out, however.

(1) Institutional reforms: the contribution of the agricultural economist is traced to the post World War II period when many nations in their postcolonial attempts at economic development were faced with the institutional bottlenecks of land tenure and property rights in agriculture. The agricultural economist moved to highlight the need for reforms in the existing land, credit and marketing institutions. However, doubts were soon raised about the likely benefits from land reforms without loss of economic efficiency. The answer was indeterminate and so the planning machinery was left without any effective policy guidance. Agrarian reforms, therefore, in spite of the early initiative of the agricultural economist, remain largely an unfinished task.

(2) Growth: a related question that came up before planners concerned

with the problem of speeding up agricultural growth was: how far was the existing operation of factor and product markets in agriculture rational? Substantial attention was spent, often with the tools of neoclassical theory, on this problem of efficiency in farmer behaviour in production and sale. A surprising degree of consistency and rationality in this behaviour was revealed, implying that little could be recovered from anticipated inefficiency in operations and channelled into growth.

Faced with the pressing policy need for growth, agricultural economists interacted generously with growth theorists. On the theoretical scaffoldings of Harrod-Domar, Joan Robinson, Hicks, and others, agricultural economists put forth the case for massive public investments in agriculture. The dual economy models (Lewis, Ranis-Fei, etc,) brought to the fore the problem of intersectoral transfer of labour and wage goods. The role of farmers' knowledge and the extension worker was stressed, and agricultural economists, now hand in hand with growth theorists, came to highlight the prime need for micro-level planning in agriculture – an activity location-specific in character. Policy planners responded favourably (e.g., IADP), although not without controversies regarding the consequent uneven distribution of the results of such planning. The agricultural economists also concerned themselves with the problem of food management. "Food for Growth" and "Food for Work" came to link food management with growth and employment.

Investment in physical capital, extension, micro planning and food management could hardly alter the tendency of agriculture to display the "Ricardian diminishing marginal product" and assuage the discomfort of the agricultural economist, when a twin development occurred, one in theory and another on the farm: the theory of human capital demonstrated remarkable ability to explain growth or lack of it in terms of investment in education, research and purchased inputs representing higher technology in agriculture, while the new HYV seeds almost dramatised the reality of technological change in agriculture. Inevitably, serious questions were asked about the extent, nature and possible consequences of this "revolution", and agricultural economists got busy exploring them.

(3) Distribution: three major elements have been pointed out in the response of the agricultural economist to the observed disparity in the distribution of the fruits of development: (a) use of bi- or multi-modal planning and supplementing growth strategy with special programmes to reach poverty afflicted target groups or regions; (b) adoption of micro-level location-specific programmes to reduce spatial gaps in the levels of technology; (c) seeking more effective policy instruments with the help of the new economic-demographic theory of household behaviour.

Present status and future challenge

The response of the agricultural economist to the call for economic development through planning has so far been prompt and positive, and his contribution substantial in steering the course of many developing

economies. This has given him well earned status no less effective than the economic theorist.

The challenge now appears in the form of the crying need to harmonize considerations of growth with those of distribution. The agricultural economist's answer of multi-modal planning may still leave much to be desired. He has to join hands with the economic theorist and the planner in facing this challenge.

Suggested issues for discussion

1 The agricultural economist may be assumed to perform the dual role of an advisor to the policy planner in dealing with short term exigencies, as well as that of a social scientist providing long term guidelines for socio-economic development. Dr Shah's paper seems to be dealing mainly with the first role of short term policy advisor; what is the accomplishment of the agricultural economist in indicating the long-run course for development?

2 The somewhat non-committal role of the agricultural economist with respect to institutional reforms mentioned in the paper leads one to ask some further questions. Does this reflect the view of the agricultural economist that the current institutional pattern is optimal? Or does it suggest the relative difficulty in influencing institutional changes in the absence of technological progress?

3 The relationship between technological progress and institutional change as perceived by the agricultural economist has been ignored in the paper. How far can one be assumed to be inducing the other? What in the agricultural economist's view is the prime mover? Can the agricultural economist follow the dichotomy of concentrating on institutional changes at some time and place and technological progress at another?

4 In the light of the seed–fertilizer revolution, how far has the past record of the agricultural economist been characterized by his interaction with other agricultural and relevant scientists and the farmer in the field? Should increased and sustained collaboration of the agricultural economist, at the micro level, with the farmer, the policy-maker, the agronomist, the breeder, the agricultural meteorologist, the extension worker and others be considered useful for the future (especially as illustrated by the international agricultural research agencies). Can that be expected to facilitate the emergence of models to deal more effectively with the baffling challenges of the future course of agricultural development?

GENERAL DISCUSSION – RAPPORTEUR: PAUL WEBSTER

In the discussion it was suggested that the paper had perhaps underestimated the contribution of agricultural economists to planning at the state or regional level. In reply Dr Shah reminded the audience that he had been asked mainly to concentrate on contributions at the national level and that he fully appreciated what could be done at other levels. But it

was also suggested that a possible difficulty arose in the development of programmes for the alleviation of poverty since many of the relevant policy-makers came from groups (e.g. industrialists and large farmers) who had little interest in changing the *status quo*. It was recognised that agricultural economists had a continuing role in the analysis of structural change. The link between technological change and the necessity for institutional change was also recognised. Some planners were advocating, for instance, the formation of unions for small farmers.

Participants in the discussion included A.S. Kahlon and Ali Mohammad.