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By

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I am more than thankful to the fellow members of the Indian Society of Agricultural Economics for having chosen me President of the Twenty-fifth Annual Conference. Indeed, the words at my command are not adequate either in form or in spirit to convey the depth of my feeling of gratitude for the honour conferred on me to preside over the Silver Jubilee Session of the All-India Agricultural Economics Conference. If I do not succeed in rising to this occasion and fulfilling your expectations, I hope you will forgive but not forget me.

It is said that the best way to accept honour is with humility. To me and now, it is the only way, for I have not yet succeeded in my search for that elusive "sufficiency condition" to justify the choice of me for this exalted chair. This highest honour that our profession can bestow comes in recognition of a record of achievement and excellence that I do not claim to have, though I must admit to secretly wishing for it. Nor can I claim to be one of the "elder statesmen" of the profession and take this crown in my stride ! Uncertain as to whether I really deserve it, I have convinced myself that this elevation from the ranks has come to me as a result of a conspiracy of affection that was hatched last year by my well-wishers and friends in the Society. After all, I have been connected with our Society for the last twenty years. I am most sincerely grateful for being the victim of this conspiracy !

Since this is the Silver Jubilee Session, it will be in order to briefly refer to the genesis of this forum. The First Indian Agricultural Economics Conference was held in Delhi in February 1940, with Sir Malcolm Lyall Darling as President. This pioneer in the study of peasant life and economy in the Punjab chose "Peasant and Politics" as the theme of his address and with his characteristic insight sounded notes of caution on the potentially dangerous areas of impact of the emergent political forces on the economic and social behaviour of agriculturists. Some of his observations merit careful reading and attention even today. The keenness of interest he has taken in the activities of our Society all these years shows itself poignantly in the letter he recently wrote regretting his inability to read our journal any more because of his failing eye-sight. I am sure you will all join me in sending him our hearty greetings on this occasion and wishing him a long life.

The Indian Society of Agricultural Economics was getting slowly organized for the next couple of years; the annual conferences were held and the proceedings were published. In retrospect, it seems as if the Society had been waiting for the leader who was to give it vision and shape, and inject vitality into it. Shri Manilal B. Nanavati came forward to accept this responsibility. Soon after he became President, he gave new dimensions to the activities of this body, and literally transformed it in every way. The Indian Journal of Agricultural Economics was started; the Society became a well established body with an office and a library; a research and publications programme was taken up; and, of course, membership increased and the Conference became a focal point of agricultural economists in India.

The extent of Shri Nanavati's impact on the Society, almost as soon as he took charge of it, can be indirectly gauged, not only from the extension of activities along various lines, but also in the confidence and vision he brought to bear on the structure of the Society. He made it an all-India body; and even in those early years he had thought of organizing branches or chapters in a few regional centres depending on the availability of a sizable group of members with initiative and resources. This proposal or idea has still to be translated into a reality. Last but not the least he collected, almost single-handed, all the funds that have sustained the Society over the years. Thanks to him, the Indian Society of Agricultural Economics is now one of the few best organised among the associations of agricultural economists in different countries of the world. To this man who has, more than anyone else, made it possible for the agricultural economics profession in India to attain the status and recognition that it now enjoys here and abroad, we owe it to ourselves to offer our sincere thanks and regards, especially on the occasion of this Silver Jubilee. Even after his retirement, he has not ceased to take an active interest in the Society : may he have a long life and the rest that he deserves !

Over the last twenty-five years, the annual conference has had the privilege of being presided over by almost as many distinguished men who had been concerned with agricultural economics in academic or administrative fields. Many of them are happily still with us, but some are no more in this world. And over this quarter of a century, the Society has had the unqualified support of most, if not all, agricultural economists in India as well as some from abroad, besides others interested in agricultural economics. I may not be wrong in assuming that all of them are or have been members of the Society and, as such, contributed to its survival and growth. Then there are the office-bearers who have ungrudgingly given so much of their time and effort, and, with the help of the staff, borne the heavy burden of work, only the end results of which we come to see. It is not possible to name all these persons who have, in one capacity or another, guided or helped, nurtured or supported the Society all these years; the list will be too long. In celebrating the Silver Jubilee, we remember them all wherever they may be and send them greetings.

I shall, however, take the liberty of mentioning by name the person who is currently guiding the affairs of the Society as President. Professor D. G. Karve took over when Shri Manilal Nanavati stepped down, and there could not have been a better person. During the short period he has been at the helm, the Society

has initiated a training and orientation programme, besides intensifying the seminar activities, and these have been organized, for the first time, at the regional level. To this man who carries his wisdom and experience with unfailing courtesy, inimitable subtlety of humour and a pleasantness of behaviour unruffled by external events, I pay my compliments and regards. (Honestly, there has been no *tête-ā-tête* between the Society President and the present Conference President !) I am sure you will all join me in extending our greetings and thanks to Professor Karve.

The holding of this Silver Jubilee Session at the Allahabad University is also of some significance. The city of Allahabad is unique in India in the way it has combined at the highest level four important streams of our life—national politics, culture, academics and, of course, religion. What is probably of special interest to this gathering is that Allahabad, besides being the home town of Pandit Jawaharlal Nehru, whose undying concern for the scientific improvement of our agriculture and the rational development of the small men engaged in it is something we should remember on this occasion, is also the seat of the University which had, for a long time, been the nursery of the economics profession in India. I am indeed glad that we are able to celebrate our Silver Jubilee in such historically honoured, academic environment, and thank the Vice-Chancellor of the University for making this possible.

I have taken all this time to remember our past and pay homage to the pioneers, builders and helpers, because I feel this is the time to do it. It is true that twenty-five years do not add up to a long enough period in the life of a professional society; the Silver Jubilee signifies at best the completion of the adolescent phase. Even then, the Society has now come of age ! And I wish it would now think of instituting a formal system of honouring those who in every way deserve special recognition. Honouring persons who have made outstanding contributions to the development of our profession and/or our common discipline, brings honour to the Society also. May I suggest for consideration on this occasion, instituting an honour system under which a select number of such persons will be awarded the honorary rank of distinguished Fellow of the Society ?

I started off by doubting my qualifications for the honour of addressing you. That doubt became more nagging when I tried to decide on the substantive part of my address. Having been an evaluator for quite some time, I could not help taking an evaluative look at myself and, in the process, settled for a similar look at the present state of agricultural economics, specially with reference to its ability to explain the behaviour—economic behaviour if it pleases you—of our agriculturists. What I have to say will probably sound like loud thinking, besides being more negative than positive in its implications. If it is so, I seek your indulgence as I go through this exercise. In any case, in the year 1965, one can hardly say much that is absolutely original. However, my intention is an honest one, namely, to provide you with a change of fare, a relief from another analysis of the urgent problems of our agricultural economy.

In making this last comment, my intention is not to underrate the gravity of the food and agricultural situation in the country. It may be one of the worst we have had to face, and is likely to figure in the Conference discussions on one

of the topics. As a body, we should do everything possible to help the Government and the country tide over it. Fortunately, the problem has been anticipated in advance, and we hope that the different State Governments will take a national view of the emergent crisis. We also hope that friendly nations will take a sympathetic attitude and generously extend needed aid and assistance.

To get to the theme, my main problem is that the available economic theories do not explain sufficiently usefully the practice of agriculture in the so-called traditional societies and do not offer meaningful guidelines for its development. When I say this, I am referring not only to macro-economic but also micro-economic theories. My reference is essentially to theory, not to measurement. There have been important and significant advances in econometrics, which have immensely improved our ability to specify, measure and solve structural and even functional problems. But these have not changed, except in a few sidelines, the framework of economic theory. In fact, in some ways, they have diluted some of the principles. As an illustration, I may mention the convenient way in which principles like diminishing returns have been bypassed in all the models based on the linear system. So, I shall be concerned only with the theory and principles of economics and agricultural economics.

I would, first of all, refer to the general problem many of us have often faced in our attempts to apply the analytical principles of agricultural economics to the solution of the economic problems of development of agriculture and specially the agriculturists. As we all know, the proposition that is most often questioned is whether farmers in traditional societies such as India's do actually and invariably seek to maximize profit or net return of some sort. This question comes up awkwardly in nearly all attempts to apply the principles of farm planning and management and of production economics in general. What is doubted is the behaviourial motivation assumed in economic logic; and the ground for doubt is provided by observed discrepancies between the actual and the logically rational behaviour. However, what we do not usually try to differentiate in this argument is whether this assumption does not appear to be realistic only in dynamic situations, or both in static and dynamic circumstances. I shall come to this later on.

Once this doubt is raised, the questioning should not end there, for the whole of the economic logic gets implicated. The more important elements of this logic as far as micro-economic theory is concerned may be summarised in the following four propositions, if we leave out the one already questioned as well as the most general ones concerning wants, ends and means. One of these may be stated as: production is a techno-economic activity in which inputs combine and produce outputs according to certain predictable relationships. Secondly, the input factors as well as output products have markets in which these can be, and do get exchanged through the medium of money and in this process acquire a valuation or price through the operation of the forces of supply and demand or some variant of these. Thirdly, this market valuation process operates smoothly or perfectly enough in a competitive environment to provide guidelines for a rational allocation of economic resources. Finally, there are many variables such as technology, population, uncertainty, preferences, etc., which are recognized to be of crucial importance but have been traditionally treated as external ones, outside the system for most purposes. To understand the economizing behaviour of the farmers, it is necessary to evaluate these basic ingredients of economic theory. For the

purpose of this evaluation, I shall be having in mind the type of traditional agriculture which is found in a dual (or plural) economy such as India's. In other words, I shall not assume the extreme or the very early type in which money economy hardly exists, or if at all, on the fringe, and there is almost nothing but the subsistence sector.

How far is production a techno-economic activity under these circumstances? By and large, the question boils down to the nature of the crops or products grown, the so-called "state of the arts," the availability and elasticity of substitution of different inputs, and the nature and realm of decision-making. A broad general description of the type of agricultural economy I have in mind will be somewhat as follows. The crops or products grown are largely for the farm household sector; but a certain portion of the area is used for growing commercial crops. The "art of farming" is widely diffused among farmers at a level which has been stabilised over more than one generation of trial and adaptation. The level of technology is low; and technological change or advance is not a continuing process generated within the local community. Differences in skill do exist among the farmers, but these are within a given technological horizon which has evolved in relation to the natural hazards and environmental risks. Among the input factors, land is the most important for a variety of reasons. It also, in the context of India, suffers from a relative inelasticity of supply. There is no sizable segment of capital in the form of reproducible goods used as a means of production. Those generally used are the conventional tools and implements and draught animals. This does not mean that there has been no investment of capital at all at any time; on the contrary, there have been some improvements made in land and irrigation sources constructed in some cases; but these are all embodied in land. Most of the current inputs are home-grown (seeds, fodder, farmyard manure, etc.) and generally tend to be applied in quantities or doses that, subject to availability, are considered optimal by the local community. It is obvious that under the circumstances, these inputs tend to combine in given proportions, the only constraint being availability.

Labour is, however, in a separate category. The available supply is determined by the size and composition of the family as modified by the rather limited scope for alternative employment opportunities in the locality. Since the supply is almost pre-determined, there is an attempt to utilize it as fully as possible. The daily wage cost is not a deciding factor (except in respect of hired labour), since the annual subsistence bill has to be borne in any case. It is not surprising, therefore, that in families with small farms there is a tendency, if not a premium, on intensifying the family labour input on the limited land resources so that the available labour gets as much work as can be created. One can even say that it is to them immaterial as to whether all of this labour is technically needed for the volume of production handled by them. The imputed returns per unit of such labour thus becomes low, often lower than the conventional wage rate. But what is important for our analysis is that any measurement of this labour use shows not so much the magnitude of the labour input variable in the technical production function, as that of labour availability. There is always a difference between work for the sake of keeping busy and labour for production in the techno-economic sense. To a certain extent, the same holds also for family bullock labour.

For these and some other reasons production activity in agriculture cannot exactly be described as a techno-economic process. Not only are there far too many constraints, but also the technical relationships get damped because of the nature of inputs. Further, the nature and scope for independent decision-making is limited. It is not surprising, therefore, that production functions derived for such farming activity are not very reliable or meaningful for prescribing methods of improving allocative efficiency in the use of resources.

This point emerges more clearly when we look at the second and third of the hypotheses enumerated earlier. Basically, these relate to the existence of monetization, market mechanism and competition. That the household sector is dominant in such an economy both in production and consumption is an integral aspect of its specification. The nature and composition of the output is determined up to a certain limit by the domestic or subsistence needs. This forms a solid, hard core not easily amenable to change. On the outer perimeter of this core can be placed the so-called cash or market-oriented output. This follows from the dual or plural nature of the economy I have assumed. The volume of the latter is influenced by the market pricing mechanism. And to the extent the latter changes, the former also has to change by reason of substitutability. The influence of market prices on the subsistence part of the output may thus be said to be at best indirect, and any observed relationship should be interpreted with caution before any inference of a causal nature is drawn. In any case, if the bulk of the production of the majority of the farmers is for domestic consumption, the volume produced, as distinct from marketed, is more likely to be influenced by prices if purchased inputs amount to a significant portion of the costs.

That brings me to the market for input factors. Here we find an even more heterogeneous situation. Until the time that fertilizers and pesticides begin to be used, most of the current items of input such as seed, fodder and farmyard manure are home-grown or obtained from neighbours on barter. Payments for repair and servicing of tools and implements are even now made in kind after harvest, the basis often being a quantity of grain per implement per year. Land revenue and irrigation charges are in cash; but payment for the use of land by tenants is in kind, generally as a share of the produce. Wages of hired labour are paid partly in cash and partly in kind, the kind part being usually a quantity of grain conventionally considered adequate to meet the labourer's consumption needs. The extent of monetization in the factor markets is thus very low indeed. What is, however, more important is that valuation of sales, purchases and hire is often socially determined and the terms are not subject to negotiation, bargain or contract for each deal. The element of competition is functionally restricted by social codes; and in the case of land it is also structurally restricted.

When the factor markets suffer from such serious social constraints and structural rigidities, most of the neo-classical theoretic assumptions do not or cannot hold. Thus, the markets are not competitive; and the usual demand-supply-price interactions either operate imperfectly or are not strong. Capital in the form of means of production is not in any way meaningful sense differentiable from land; and if investments on land improvement (including irrigation) with their unknown age-composition are excluded, there is precious little left over to form a meaningful category of capital. In short, capital, in whatever way this factor

is defined, is not amenable to meaningful measurement. Finally, the scope for factor substitution is severely restricted; the elasticity is very low indeed. These conditions make a nonsense of the neo-classical theory of distribution with its underlying basis in the calculus of marginal productivity. Even Marshall would probably turn in his grave if somebody tries to tell him—in a seance session—that the impersonal theory of distribution based on assumptions regarding competitive market forces and possibility of continuous substitution along the production function, applies to such an economy or society.

In such dual societies, the "economics" of production in the non-monetized or imperfectly monetized sector cannot neatly fit into the framework of the conventional equilibrium analysis. The confusion becomes more confounded if an attempt is made to introduce into this theoretical analysis such dynamic elements as uncertainty and technological change. These are elements taken as given in the conventional micro-economic theory; but their importance, specially that of uncertainty, is basic to the economizing behaviour of individuals in the type of society we are considering. The incidence of natural hazards may or may not be any higher in these economies than in the developed ones. But the facilities and arrangements—technical or infra-structural, social or governmental—that help the people to bear them, and in the event of their incidence, get over them without economic ruin, are extremely underdeveloped in these countries as compared to the developed ones. Consequently, the feeling of insecurity and uncertainty in the minds of individuals in the former countries is much greater in relation to natural hazards, environmental risks, etc. Innovations, monetization and encroachment of the market economy add further elements of uncertainty except when these changes are designed to reduce hazards or risks that were obtaining earlier. In general, however, there are very few improvements in cultivation methods or practices and production techniques that satisfy the famous *ceteris paribus*—other things remaining the same. Consequently, the general attitude tends to be one of "playing safe." The decision rule is not necessarily to maximize, but something less than that—mini-max or some such criterion that is now being played around by the Game theorists.

Unfortunately, we still do not know how best to incorporate this uncertainty element into economic theory. A convenient way for purposes of operational use is to adopt a discounting approach to the net return or the variable (vector) assumed to be maximized by the individual. This procedure does not, however, explain how uncertainty affects the motivation of the individual, nor does it specify how the discount rate is to be arrived at. Another possible approach to measurement is to evaluate uncertainty on a scale of values and then add it to the cost of production. This is the procedure adopted for risks, but may not be easy or even feasible in respect of uncertainty which by definition is different from risks and, as such, not amenable to actuarial assessment. In any case, there is a long deductive exercise inviting us almost as a challenge, before we can hope to grapple with the uncertainty factor and understand its implications for the economizing behaviour of the individual. The game-theoretic approach seems to me a worthwhile one to pursue, provided psychologists are willing to help us in the process of conceptualization and abstraction of observed behaviour.

What I have said so far is mainly in the nature of an analytical description of the economic system in which the vast majority of the cultivators in a dual

society such as India's, have to behave and perform. Many of the aspects of the situation I have been mentioning as specifications without any explanation of the whys or hows behind them. Economists, however, have not been interested very much in these, but other social scientists have been; and I would like to make a brief reference to the relevance of a few of their findings for our purpose. I shall confine myself only to the main sociological findings. These are usually couched in the sociologists' terminology which has developed into quite a jargon, thanks to the limitations of the English language. I sometimes feel that communication between them and us would improve considerably if their works were re-written by persons like H. J. Fowler, the master of English usage. I hope my sociologist friends will not mind this jab.

Institutional structure has played only an incidental role in economic theory proper, and social structure has received even lesser attention. To the sociologists, however, these have been among the most important areas of study. According to them, the Indian society is rigidly structured on the basis of the system of caste and kinship; and its functioning has been influenced or guided by the *Yajmani system*. The former has defined the hierarchy in terms of status and roles of the family and the individuals, as well as their economic activity; while the latter has prescribed the socio-economic relations among the members of different caste groups in terms of service, activities and payments. This is, of course, a very broad and simple generalization of the very detailed study of the social structure and relationships that sociologists have been concerned with. It is against this background that they have tried to analyse and explain phenomena like exercise of power and authority, leadership and conformity, innovation and diffusion, achievement and ascription, tension and personality and attitude and behaviour. It is not possible to go into all these aspects in the course of this address. I shall merely refer, somewhat illustratively, to the implication for economics of some of their propositions.

The social system in India affects economic relations, among other things by restricting the mobility of individuals in respect of occupational pursuits in agriculture, limiting the play of competitive forces in intra-caste activities, inhibiting the growth of contractual institutions and impersonal rules of behaviour, putting a premium on allegiance to primary group members and interests and discouraging departures from traditional norms of socio-economic behaviour especially in respect of individual achievement. In retrospect, the system appears to have been designed more for survival and security than for growth and development. It had its good points, but in the changed political economic environment it is faced with a very difficult job of adjustment. All these features of the social system need not necessarily be obstacles that have to be removed for the sake of development. Some of them like dominance of kinship ties or faction allegiance may even be turned into forces favourable to development. There will, however, be a considerable degree of creative disruption in the transitional period.

So far as the core of economic theory is concerned, the findings of the sociologists more or less corroborate the weakness or invalidity of the assumptions that I have discussed earlier. The assumptions specially challenged relate to the competitive nature of the markets, particularly the factor markets, smoothness of the price-quantity curves describing the supply and demand functions, elasticity

of factor substitution and the sovereignty of the profit motive. Co-operative research between economists and sociologists have not advanced to the point where the needed modifications can be precisely quantified. There is no doubt that the theory of distribution will have to be taken away from its functional base and linked to the institutional set-up, and the production function approach, to be meaningful, will have to take into account a number of social constraints on the substitutability of inputs.

In a traditional dual economy, production and distribution are not mere economic activities. They are also socially influenced, if not determined. It is only a socio-economic view of production that seems meaningful for an analysis of the production behaviour of the agents engaged in it. Since distribution of income among the agents is often pre-determined by social norms such as in the case of payments to artisans or hired labourers, the scope for economizing decisions in respect of these is limited. In short, production and distribution will have to be viewed together as aspects of the same process.

When we take this point of view, we shall find that the "economic"—socio-economic in my scheme—behaviour of the traditional farmer in a dual economy stands the test of rationality. This rationality has the logic of the world he lives in. Professor T. W. Schultz in his book "*Transforming Traditional Agriculture*," has also characterized the behaviour of the traditional farmers as rational; but his argument and approach are different, based as they are on the assumption of a low level of marginal productivity of capital, lack of so-called surplus element in manpower, (low level of skill and training of the human elements in agriculture) and the unattractiveness of the available technological improvements. In my way of thinking, the concept of the marginal product of capital is not clearly distinguishable in traditional agriculture, nor is the marginal productivity of labour a determining consideration. Given the product distribution pattern in the society and the nature and extent of the uncertainty element that the farmer has to contend with, his allocation of land which is the most important asset entering into his calculations, among enterprises or production lines, is likely to be rational as long as technological or market opportunities do not change the static assumptions.

This brings me to a brief consideration of some macro-economic aspects having a bearing on the development of such a society. I would start off with a bold statement that in a typically traditional society, there is nothing like a national economy which as an entity can be distinguished from an arithmetic aggregation of the large number of local, sometimes even village economies. What I mean is that in its extreme form, the economy of a traditional society does not have a separate integrated structure other than a sum total of the structure of the local economies. This is, however, an extreme situation which I shall not try to develop or analyse. By the time such an economy acquires a dual character as a result of either colonial development or foreign enterprise or even urban-based native enterprise, an organized foreign trade and urban consumption sector has developed along with a limited industrial, commercial and transportation base. This organized sector manifests the characteristics of a national economy having control levers which can be operated through fiscal, monetary and market mechanisms. But the dispersed rural sector continues in its disaggregative state of

organization, not any longer as distinct area economies, but in respect of the subsistence sector. A state of functional dualism is thus introduced into the rural agricultural economy. The central problem of development of such a dual economy, as I see it, is one of "nationalising" the local economies based on subsistent self-dependence. As an *obiter dicta*, I may add that the main problem besetting the community development movement is also the same, namely, how to "nationalise" the village community which is cut across by partially overlapping social, political and economic systems.

Two sets of economists have tried to tackle this problem, one as practitioners and advisers, and the other as empiricists or theorists. The practitioners in the profession have been concerned with the problem of what is to be done to move such an economy, while the theorists have tried to find out how it does or can move. The pressing needs of planning and policy formulation have attracted to the former group of economists like Tinbergen, Frisch, Nurkse, Rosenstein-Rodan, Hirschman, Leibenstein, Chenery, Chakrabarty and others. They have made important contributions to the planning and development strategy with special reference to resource allocation, choice of techniques, etc. We would, however, have been in a much better state of enlightenment if they had started from a theory of development of a dual economy. Unfortunately, they have taken such a society as a datum and imposed growth conditions on these. Since my concern is primarily with the behaviouristic aspects of such an underdeveloped economy, I would have to bypass this group.

Surprisingly, there are very few economists who have been interested in a theoretical formulation of the behaviour of the agricultural economy in its passage from a dual to an integrated stage. Arthur Lewis,[1] who was the first economist in the post-war era to draw attention to the vast army of underemployed agricultural labour creating a situation of "unlimited supply of labour" at real wage rates fixed institutionally, emphasized, among the conditions of growth, the transference of this labour to the industrial sector. His assumptions were realistic; but he did not pay much attention to the agricultural sector. It is this line of explanation that has been further developed by the joint team of G. Ranis and J. C. H. Fei,[2] who have presented a more comprehensive analysis of the behaviour of the two sectors and their terms of trade. According to them, the rate of labour reallocation between the two sectors is the crucial variable to manipulate for converting a dual economy into a fully commercialised, market economy. The absorptive capacity of the non-agricultural sector should set the pace of labour release from the agricultural sector for achieving a balanced growth. As long as dualism exists, there are two different wage schedules, the one for the traditional sector determined by the subsistence level. All this sounds like a return to the lines of classical economics, though with a difference.

One of the weaknesses of the Ranis-Fei approach lies in the treatment of technological improvement and innovation. Another weakness lies in the assumption that the rate of growth of employment in the industrial sector will outpace the rate of growth of the labour force in agriculture. The recent experience in the

1. Arthur Lewis, "Development with Unlimited Supplies of Labour," *The Manchester School*, May, 1954.
2. G. Ranis and J. C. H. Fei : Development of Labour Surplus Economy, 1964.

developing countries shows that in reality, the rate of growth of net industrial employment is likely to be rather low in the initial stages of industrialization and development. If the real wages in the agricultural sector are to be maintained even at the current low levels, the productivity of labour in agriculture has to be raised faster than population growth, as a *sine qua non* of development. Otherwise, the system is likely to break down.

The other economist who tried to explain the behaviour of the traditional agricultural economy is T. W. Schultz, to whose contribution I have already referred. Schultz's main concern has been the explanation of the long run equilibrium of such economies at the subsistence level. His analysis brings out, as prime movers, the right type of technology which Ranis-Fei assume to be remaining stacked up on the shelf, and the functional education of the cultivators.

An economist who has attempted to tackle the challenging job of synthesizing economics, sociology and psychology is E. E. Hagen.[3] His is an admirable work that starts with the inadequacies of the economic theories of growth and then goes into social structure and personality formation conducive to entrepreneurial and innovational activity. This is the first inter-disciplinary work that I have seen and can commend to others. Economists, however, will probably wish that he had attempted in the end a reconstruction of economic theory proper, by introducing the personality factor and its capacity to live with tension and sustain change, among the relevant variables.

This brief survey of the recent lines of macro-economic theorizing on the development of the agricultural sector shows that all the loose ends have not yet been tied together. I should now conclude this part by presenting some of the lines of analysis that appeal to me. I stated earlier that at the macro-level, the problem of development of agriculture can be viewed as one of nationalising the local economy of the non-commercialised sector within it. This commercialisation has to proceed *pari passu* with a large enough growth of productivity, especially since a large scale transference of the so-called "surplus" labour can be ruled out in the short and intermediate run. As the traditional local economy has been stagnant, its structure and operation can be assumed to be not conducive to quick, regular and sustained absorption of technological improvement and innovation which alone can raise productivity. Among the factors which are relevant for consideration in this connection, the more important ones are capital *vis-a-vis* technology, uncertainty, growth of the labour force, quality and skill of the labour force, enterprise and innovational propensity of the decision-makers, the role of the Government in research, extension and organization, and the nature and tempo of development of the non-agricultural sector. These are the operational variables that need to be kept in view in formulating a theory of development of traditional agriculture.

The first pre-requisite for such a theory is an explanation of the relationships between technological improvement and capital-labour requirement, innovation and capital accumulation, technological change, its impact on uncertainty and the education and skill required for its adoption. This may not be an easy area for

3. E. E. Hagen : On the Theory of Social Change, Illinois, 1962.

theorizing, even for developed economies. As for the developing ones, there are very little experience and data to go by. There is no other way but to conceptualize hypothetical situations.

The second area of inquiry relates to what has been traditionally called distribution theory. There is here, a need for a thorough overhaul, not merely a nut-and-bolt job. The starting point should be the definition and identification of land and capital as items of factor inputs; and the inquiry should proceed from there to valuation and measurement of these factors against the background of the social valuation attached to these. Then there is the whole field of labour supply—wage labour as well as family labour—, wage determination for hired labour and returns for family labour. Both institutional and educational-cultural factors are bound to play a significant role in this area of study. Otherwise, it may not be possible to explain situations such as in Kerala (probably the best example of a "labour surplus" economy) where wage rates necessary to attract rural labourers are about the highest among the States in India, though the conventional wage rates in the traditional jobs are rather low. There is some evidence to show that once new jobs outside the traditional socio-economic pursuits are created, something like an entirely different social or group norm about the minimum level begins to operate, in spite of a statistically large enough supply. Finally the influence of the caste system operates to strengthen the non-competing groups.

Lastly, the production relationships should have social constraints built into them, in addition to technology and uncertainty. It is with these building boxes that a general theory of development of traditional agriculture can be attempted. It would take me too far out—and I do not have the time also—to attempt even a preliminary outline of such a theory. Obviously, there have to be at least two sectors, each with its behaviouristic relationships and areas of interaction with the other. All this may sound like a highly ambitious specification and a tall order; but I feel safe, for nobody can be elected President of this Conference for a second time.

What I have presented so far is an analysis of the theory on the basis of which agricultural economics is taught, practised or enquired into. Such an analysis does not immediately throw up findings of relevance to policy, though the address should, I understand, offer some suggestions on policy issues. In order not to go against this tradition, what I can at best do is to offer some views, purely as *obiter dicta.*

The analysis in the earlier part of the address indicates the need for a cautious and understanding approach to farm management research and extension. Workers in these areas would probably do better, if they expressly take into account the uncertainty situation facing farmers and the latter's assessment of these, in formulating resource allocation decisions. Secondly, input-output and other production relationships derived from non-experimental data should not be looked at as sacrosanct or invariant techno-economic measures. They are variable and depend on the socio-economic background of the farmers to whom these relate. It is, indeed, very necessary in any search for these relationships to decide initially on the groups from whom such data could be collected, for meaningful analysis and future application. Thirdly, I would be interested to see someone try out an

accounting method under which identifiable improvements on land are evaluated separately and included under capital, and then work out the relative returns to factors. Another accounting procedure for which there is considerable justification is to evaluate the total input of family labour in a year at the total subsistence bill for the family for the whole year. These are a few of the changes suggested by the earlier analysis.

On the macro-economic plane, there is a very strong case for evaluating all the technological improvements that are often stated to be waiting for use. Such an evaluation may, in the end, show that there are indeed not too many available to choose from, if the uncertainty and skill aspects are fully taken into account. After all, such improvements are expected generally to result in a reduction not only of input per unit of output, but also of the uncertainty element. It has been a common experience that the latter type of improvements gets accepted quickly and extended widely. Rust-resistant varieties of wheat provide a good example. I hope that in our search and research for improved technology, we will always keep one eye on the uncertainty element so that we do not blindly fall for things which promise very high output but only under the research station conditions of care and control.

My last point is on education, training and skill. By now, the value of education as an instrument of agricultural development is fairly well recognized; the question is one of what type of education. There has to be, of course, elementary education co-related as far as possible with agriculture. For immediate impact. however, this may not be sufficient. Is it not possible to supplement it with a quick training scheme that would have the effect of imparting new skills? What I have in mind are training arrangements for the masses of petty cultivators, tenants and agricultural labourers, in the use of improved tools, implements and eventually of machinery. It is they who have to use them if these are going to be extended on a large scale. Once they get trained and familiar with these, there will be a desire for using them. Even if they cannot buy them immediately, there will be a force or pressure injected into the society and the landowners will eventually think of investing in them. Is it not possible for the community development agency to undertake such a training programme in all blocks?

I have now come to the end of my address. I do not know if I have been able to present you with a fare rich enough for this occasion. But if what I have said enkindles in you a desire to take a new look at the economic theory underlying agricultural economics, I shall be very happy indeed; and if I have succeeded in evoking in you a challenge for a battle with hypothesis and theory, I shall consider my effort more than amply rewarded. Thank you.