Transforming Traditional Agriculture
A Critique of Professor Schultz
V M Dandekar

This paper critically examines the economic logic underlying Professor Schultz’s concept of Traditional Agriculture and his policy recommendations for transforming the same into a modern efficient agriculture (Theodore W Schultz, “Transforming Traditional Agriculture”, Yale University Press, 1964) and points out a certain element of the situation which it seems have escaped his attention.

The paper is thus divided into two parts. In the first, I shall raise certain questions of economic analysis. In the second, I shall indicate certain relevant issues which I think Professor Schultz has missed.

I

Questions of Economic Analysis

The economic-analytical apparatus set up by Professor Schultz seeks, in the first instance, to explain the production behaviour of farmers who are bound by traditional agriculture. His point of departure from conventional explanations is to reject cultural and institutional differences as necessary explanations. Consequently, he bases his economic concept of traditional agriculture on the fact that an economy characterized by traditional agriculture does not grow or is stagnant. This means that in such an economy, the stock of reproducible means of production does not grow or remains unchanged. Because this is a condition to which traditional agriculture arrives gradually over a long period and presumably stays there indefinitely, Professor Schultz refers to it as a condition of long-term equilibrium. Analytically speaking, such a condition is reached and maintained provided the conditions of supply and demand for reproducible means of production in an economy remain constant over a sufficiently long period. That the conditions of supply remain constant is expressed by means of his first ‘critical condition’ namely that “the state of arts remains constant” wherein by the state of arts is meant “the state of arts underlying the supply of reproducible factors of production” (p 30). The requirement that the conditions of demand remain constant is expressed by means of his second ‘critical condition’, namely that “the state of preference and motives for holding and securing sources of income remains constant.” His third condition expresses the requirement that the first two conditions prevail over a long enough period for the economy to arrive at an equilibrium. The derivation of the equilibrium follows the text-book treatment by Milton Friedman in his “Price Theory” (A Provisional Text, Chicago, Aldine, 1962. Chapter 13).

The equilibrium is stationary and is characterized by zero net savings and investment and consequently by a stationary stock of reproducible means of production. Professor Schultz emphasizes that throughout this discussion the reproducible means of production include not only the material factors but also the skills and capabilities of man that are augmented by investment in him and that are useful to him in his economic endeavour.

In an economy characterized for a long enough period by a stationary stock of the reproducible means of production it seems reasonable to assume that “a state of equilibrium exists in the sense that productive services are being combined in the right proportions to produce the right amount of goods” (Friedman: op cit, p 246). Professor Schultz expresses this by means of the first of his two ‘critical hypotheses’ derived from his concept of traditional agriculture, namely, that “there are comparatively few significant ineficiencies in the allocation of the factors of production in traditional agriculture.” However, “since the productive agents include the human agent, the knowledge (or know-how, or instruction) of how to employ each of the productive agents including himself is also an integral part of the factors of production” (p 134). Hence this particular hypothesis cannot in fact mean very much for it means no more than that the allocation of factors of production in traditional agriculture is as efficient as the managerial ability in it is capable of. It seems however that Professor Schultz means a little more than that. One of the implications of this hypothesis, as he spells it out, is that “an outside expert however skilled he may be in farm management, will not discover major inefficiencies in the allocation of factors” (p 39). I find myself in complete agreement with Professor Schultz on this point though I must make it clear that if managerial ability is itself regarded a part of the reproducible factors of production, this is not a necessary implication of the hypothesis derived as it is from the initial concept of the stationary equilibrium. It means that in the matter of farm management, the farmers in traditional agriculture, through a long process of trial and error, have learnt all that can be learnt and that therefore the new mathematical techniques of farm planning and farm budgeting have not much to offer to them. Personally, I believe this to be so and I agree that it is worth stating particularly in view of the rather wild promises that a school of agricultural economists appears to be holding for obtaining substantial and often surprisingly large increases in agricultural production through a mere reallocation of the existing factors of production.

None Below Subsistence

Professor Schultz spells out yet another implication of this hypothesis, namely, that the productive factors below subsistence level are employed and with particular reference to labour, he interprets this to mean that "each labourer who wishes and who is capable of doing some useful work is employed." He proceeds to observe as follows: "The efficient but poor hypothesis does not imply that the real earnings (production) of labour are not means of living less than subsistence, are not inconsistent with this hypothesis provided there are other sources of income, whether from other factors belonging to workers or from transfers within the family or
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among families in the community\(^5\) (p 40). Does this last proviso mean that in poor communities characterized by traditional agriculture, no one in fact lives below subsistence? How is it that living below subsistence is inconsistent with the "efficient but poor" hypothesis? Why is it inconceivable that in relation to the existing stock of reproducible means of production, which in terms of the equilibrium concept has long ceased to grow, the burden of population may be so large that even the most efficient allocation and use of these factors does not permit any useful employment of the whole labour force or at any rate does not produce enough for the subsistence of the whole population? Professor Schultz does not ask himself these questions. Instead he proceeds to dispute and refute what he calls the "Doctrine of Labour of Zero Value".

**Doctrine Disputed**

While disputing this "doctrine", Professor Schultz opines that what is "typical of many agricultural communities because they are in a stable state of long-run equilibrium" is that "the marginal product of labour in agriculture is very low" but that nevertheless "labour in agriculture produces as much as does comparable labour in other sectors" of the economy. He concedes a situation where "the marginal product of labour in agriculture is less than that of comparable labour in other sectors of the economy" but he interprets it as follows: "The second is related predominantly to growth and to lags in adjustment, and it represents one of the disequilibria that is rooted in economic growth. It can persist for decades, and is presently most evident in some of the countries in which agriculture is technically in the vanguard." (p 57). This may be so. However, it seems to me that the second situation is more general than the first and that the underlying reason is that conditions of employment and the pressure of population in agriculture and in other sectors of the economy in relation to their productive resources are very different. In traditional agriculture, along with traditional industry, employment is primarily self-employment wherein no clear distinction between employment and unemployment is possible. In the other sector, namely, of organized modern industrial and trade, employment is for a regular wage which in general cannot be less than subsistence. Moreover, this latter sector is so organized that it will not employ labour force beyond the point where its marginal productivity equals the wage. In contrast, traditional agriculture and traditional industry must accept the entire residual labour force on the basis of self-employment and survival and quite irrespective of its marginal productivity. Here the marginal productivity is often below the subsistence and even if it were zero, there is no way by which this sector may throw out or disown any part of the labour force which seeks self-employment in it. Whether in fact the marginal productivity is close to zero will naturally depend upon the size of the labour force in relation to the stock of the reproducible capital in this sector. In a particular case, it is in fact zero, it is not inconsistent either with the long-term stationary equilibrium that traditional agriculture is postulated to be or with the derived hypothesis regarding the efficient allocation of the existing factors of production. I venture to suggest that in disputing at such length what he calls the 'Doctrine of Labour of Zero Value', Professor Schultz was carried away by the energy of his own argument. It seems to me that he undertook this task because as he states: "To build where there are obsolete structures one must first demolish and remove them, which can be costly." (p 8). I suggest that a little reflection on his part would have convinced him that this little structure was not indeed in his way. However, if he must demolish it anyhow in the belief that it was obsolete, I am afraid, the cost might be very heavy.

**Price High — Relative to What?**

So much for the first of the two "critical hypotheses" derived by Professor Schultz from his economic concept of traditional agriculture. Let us now turn to the second namely that the price of the sources of income streams from agricultural production is relatively high in traditional agriculture. It seems to me that in terms of his analysis, this hypothesis cannot mean much. The price is relatively high: relatively to what? In point of fact the price is the stationary equilibrium price at which the existing stock of reproducible means of production remains constant with zero net savings and investment. Having postulated this, the hypothesis that the price is relatively high makes little meaning. Nevertheless, Professor Schultz puts forward this hypothesis because he thinks that still "the analytical task is to explain a low rate of net investment in traditional agriculture or even no net investment whatsoever" and believes that "a low rate of return would provide a logical basis for a low ratio of savings to income" and hence proceeds to "represent a theoretical basis for a low rate of return to investment in factors of production in traditional agriculture" (pp 72-73). In point of fact, a full theoretical basis for zero net savings and investment is provided as soon as the condition of long-term stationary equilibrium is postulated. Therefore if there is any further analytical task left, it is to explain as to why the traditional agriculture gradually arrives at the long-term stationary equilibrium or if we know that this is because in traditional agriculture, the conditions of supply of and demand for the reproducible means of production remain constant over a long period, to explain why these conditions of supply and demand remain constant for such a long period.

Professor Schultz's formulation of the conditions of demand for the factors of production is that the state of preference and motives for holding and acquiring sources of income remain constant. All the explanation that he has to offer as to the reasons why it remains constant is as follows: "That the basic preferences and motives under consideration may remain constant over long periods is highly plausible, if for no other reason than that it is difficult to conceive of developments that could change them." (p 31). As to the conditions of supply of the factors of production, Professor Schultz's formulation is that "the total output of arts remains constant" and he does not raise the question why. Does he imply that this is something which simply happens? If he does, then by including it as a critical condition underlying traditional agriculture or in other words as an explanation of what he calls the condition of long-term equilibrium which is another name for stagnation, I am afraid Professor Schultz is playing the same game, namely "The Game of Concealing Factors".
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which he accuses others of playing when they use the concept of technological change as an explanatory variable of economic growth. He warns: "The advance in knowledge and useful new factors based on such knowledge are all too frequently put aside as if they were not produced means of production but instead simply happened to occur over time. This view is as a rule implicit in the notion of technological change" (p 136). It is for this reason that he rejects the concept of technological change as an explanatory variable of economic growth. As he puts it: "To use it for this purpose is a confession of ignorance, because it is only a name for a set of unexplained residuals" (p 137) and hence: "Analytically it conceals most of the essence of economic growth" (p 138).

Well then, let us be clear on this point. If technological change is not something which simply happens outside the production process, then its absence cannot merely be the negation of something which otherwise simply happens. It is something more and worse than that. In order to emphasize this active aspect, we should refer to this condition as the condition of 'Technological Stagnation' rather than referring to it by such neutral terms as 'the constancy of the state of arts' or 'the absence of technological change'. If we do this, then a full economic explanation of the phenomenon of traditional agriculture will require us to raise the question as to why and how technological stagnation occurs and to try to answer it within the framework of economic analysis. If this does not seem possible, then we must agree that an appeal to certain cultural and institutional attributes of the communities concerned is necessary.

Game of Concealing Factors

In the economic logic developed by Professor Schultz, there is discernible apparently another variation of this "Game of Concealing Factors" and which for want of better name, we may call the "Game of 'Missing Factors". After having outlined the critical conditions underlying the type of economic equilibrium that he postulates traditional agriculture is, Professor Schultz points out that "in the process of reaching this type of equilibrium, the stock of material factors of production and the labour force are the principal variables" (p 30). His subsequent analysis is based on a concept of capital which is all-inclusive, "including human as well as non-human capital" (p 78) and closely following Friedman (op cit, pp 247-48) he derives a horizontal demand curve for permanent income streams. However, it seems to me that he is not very consistent about this matter for when he comes to the supply curve, he assumes it to be "positively sloping" (p 77). If he had been consistent with his concept of capital to be all-inclusive and followed Friedman, he would have obtained an equally horizontal supply curve and would have found it hard to arrive at the long-term stationary equilibrium he postulates (Friedman, op cit, pp 252 and 257).

Concept of Capital

My impression is that Professor Schultz does not and does not even mean to use the all-inclusive concept of capital "including human as well as non-human capital". What he requires is that the concept of capital should include all reproducible means of production but, as far as I can see, he has no intention to include in that concept those factors which cannot be augmented: for what is under consideration is a supply of these factors and this is meaningful only in the context of reproducible factors. He observes: "There are particular qualities in the natural environment and in human beings which are not augmented". They are therefore qualities that represent factors, the supply of which is essentially fixed." Here is a footnote: "In the case of a man, the qualities that are not acquired but are inherited biologically are for all practical purposes "fixed" per man in any large population over any time span that matters in economic analysis. Then he proceeds: "Capital goods are always treated as produced means of production. But in general the concept of capital goods is restricted to material factors, thus excluding the skills and other capabilities of men, that are augmented by investment in human capital. The acquired abilities of a people that are useful in their economic endeavour are obviously produced means of production and in this respect forms of capital, the supply of which can be augmented" (pp 135-36).

If Professor Schultz had firmly held to this concept of capital as comprising all reproducible factors of production, he would have found it necessary and useful to distinguish the following factors of production:

1. Land, meaning thereby the particular qualities in the natural environment which are not augmentable;
2. Labour, meaning thereby the particular qualities in human beings which are not acquired but are inherited biologically and which for all practical purposes are fixed per man;
3. Capital, that is to say, all reproducible means of production including: (a) all improvements in land as a factor of production which can be augmented by investment; (b) all improvements in man as a factor of production namely his acquired skills and capabilities which can be augmented by investment and finally (c) all other reproducible material means of production. In this classification it should be noted, labour is not non-reproducible in the same absolute sense in which land is non-reproducible. What is not reproducible in labour are the particular qualities per man. However, men can be reproduced and their number increased. Nevertheless, the reason to distinguish labour from other reproducible means of production is that within the existing social and institutional framework in which human reproduction takes place, we do not expect it to respond to economic pressures and incentives in the same manner as the supply of other reproducible means of production.

The Theoretical Scaffold

If we thus distinguish the factors of production into three broad categories called land, labour and capital, and follow Friedman in his treatment of the Theory of Capital, we obtain the following results. Friedman (op cit, pp 247-248) after a preliminary exercise in which an all-inclusive concept of capital including human as well as non-human capital leads to a horizontal demand curve, considers the slightly more real case wherein factors of production are distinguished into two categories, namely human and non-human wealth. He then confines the term capital to non-human wealth and derives a zero-net-saving demand curve for the same. "With a given income from human wealth", this demand curve is negatively sloping. He follows the same procedure in respect of the supply curve, and "with income from human wealth fixed", derives a posi-
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tively sloping zero-net-investment supply curve. The intersection of the two curves gives the required long-run stationary equilibrium. With the distinction between factors of production as land, labour and capital as suggested above, we could somewhat improve upon this but would obtain basically the same result. Now capital would include all forms of reproducible means of production, embedded in land, man and other materials and we would get a negatively sloping zero-net-saving demand curve and a positively sloping zero-net-investment supply curve for capital with income from land and labour given and fixed. The intersection giving the required equilibrium. This is as far as we could go following Friedman in this matter. This is not much. Nevertheless, it does help clarify an important issue. It is the following one: the whole analysis, or the "Theoretical Scaffold" as Professor Schultz calls it, which admittedly follows closely Friedman's treatment of the subject, is based on the condition that income from land and labour is given and fixed. I shall not raise here the question of how and in what sense one allocates incomes to different factors and I shall also not raise questions regarding the income from land. I shall however ask this question: Whatever the meaning we may attach to the term income from labour in what sense do we expect it to remain fixed? In particular, under a growing labour force do we expect the per capita labour income to remain constant? In fact, once the stage is reached when the reproducible factors of production, called capital, cease to grow, do we expect even the per capita total income from all sources to remain fixed? If not, does agriculture, under these conditions, at all reach the long-term stationary equilibrium which Professor Schultz postulates it to be?

Thus partly through an early and unnecessary decision that the problem of surplus labour is nothing but an obsolete doctrine which he must demolish and partly through his total dependence on a class-room treatment of the subject of the Theory of Capital which again apparently he did not pursue beyond an elementary proposition, Professor Schultz seems to have missed a crucial element of the situation. Consequently, throughout this book, one perishes in economic logic purported to clarify the economic character and nature of traditional agriculture, he makes no reference to the consequences of population growth.

II

Certain Missing Issues

Thus it seems to me, it is because he missed the consequences of population growth, that Professor Schultz has arrived at an over simplified understanding of the causes underlying traditional agriculture and the measures necessary to transform it into a highly productive sector. He derives a state of long-run equilibrium as arising out of constant conditions of demand for and supply of capital, that is reproducible means of production.

Consequently, the only way to break through this state of stagnation is to alter the conditions of demand for and supply of capital, as for instance, by shifting the demand curve up and the supply curve down. Apparently, Professor Schultz does not think that much can be done to the demand curve. The only thing to do is therefore to shift the supply curve downward which in other words means to reduce the supply price of reproducible means of production. This requires development of new means of production with higher rates of return which is another name for technological progress. Thus, having got into a situation of stagnation arising out of technological stagnation, the only way to break through it is to achieve technological progress.

The only substantial point gained through this rather long-winded argument is that technological progress is not something which simply occurs over 'time but something which can be attempted and achieved by well conceived investment, and, further that, this is not something which can be done only once for then we reach another state of stagnation, though with a larger stock of capital than before. Continued progress along this direction requires continued technological progress and this needs basic long-term investment which will promote knowledge, science and skills. Thus education, beginning with primary education, must receive a high priority.

This is well taken though this might appear to be a rather roundabout way to reach the primary school. That apart, as an analysis of the problems of traditional agriculture, it suffers from oversimplification and hence from incomplete understanding. The reason, as I have stated, is the missing factor, population. As soon as this is introduced into the analysis, the complexity of the situation becomes evident. In terms of the analysis pursued by Professor Schultz, its first effect is on the demand for produced means of production for now it becomes clear that, like the demand for any other goods and services, the demand for the produced means of production depend not upon their price but also on the income of the demander. In other words it becomes clear that, on what factors are the produced means of production not only because the price is high but also because the income is wanting. In the following I propose to pursue this one single point and trace the consequences of population growth.

Dissaving and Disinvestment

Let us therefore suppose, as Professor Schultz postulates, that traditional agriculture is a stationary state of economic equilibrium characterized by zero net saving and investment and consequent stationary stock of capital. Let us suppose that under these conditions, the population does not itself reach a state of stationary equilibrium but that it continues to grow more or less independently of the stock of capital. In any case, this is what seems to be happening with number of poor countries characterized by traditional agriculture. Because the stock of capital is supposed to have become stationary, the flow of income will in general not expand in proportion to population. Hence with increase in population, per capita income will fall and hence savings will fall. In other words, the equilibrium price of the stock of capital at which the stock was maintained stationary with zero net savings and investment, will no longer be an equilibrium price, because at that price net dissaving will occur and the stock of capital will be reduced. The process will continue inexorably as the pressure of population grows further. There will thus be no state of stationary equilibrium but a state of continuous deterioration with negative net savings and investment and a steady reduction in the stock of capital, Thus the characteristic condition of traditional agri-
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culture turns out to be that it fails to produce a surplus over subsistence and hence soon begins to live on capital consumption.

That dissipating and disinvestment occurs progressively is discernible to anyone who is familiar with field conditions at first hand; and innumerable instances may be cited. One merely has to notice the state of repairs in which in a majority of cases land, equipment, living houses, livestock and finally the health of people lies. Repairs are not attended to not because investment in repairs does not pay or because that knowledge and skills are lacking but because no surplus over subsistence is available for investment. So fences, bunds, sources and channels of irrigation are not mended; implements, cattlesheds and living houses are not repaired; cattle is famished and is let into one another's fields for grazing; and men are undernourished to the point that often good seed is eaten. All this happens with full knowledge of what is happening.

The Reason for the Surplus

We do not have to assume that in traditional agriculture every inch of soil is under pressure of population so that it does not produce any surplus over subsistence of the population it is burdened with. This is not true either. Thanks to the very unequal distribution of land among the people dependent upon it, there exists a sector within traditional agriculture which is not overburdened with population and which therefore produces a surplus of varying degree over subsistence. Consequently, in the residual sector, the burden of population is all the more excessive and dissipating and disinvestment of varying degree prevail. Let us for convenience distinguish these two sectors within traditional agriculture, say one which produces a surplus over subsistence of the population it takes care of and the other which does not produce a surplus over subsistence of the population it is burdened with.

The reason why one sector produces a surplus and the other does not is that one has a small population in relation to its land resources than does the other. The reason for the surplus in one is not by any means any superior productivity of its agriculture. In fact, in regard to the character of their reproducible factors of production, the nature of their agricultural inputs and the returns to them, the two sectors are basically similar. In short, agriculture in the sector which produces a surplus over subsistence is as traditional as agriculture in the other sector which does not produce a surplus.

Let us first consider the nature of traditional agriculture in the sector which produces surplus over subsistence. This sector is evidently not under pressure of population and I think the nature of traditional agriculture here comes close to its concept as put forward by Professor Schultz. For instance, in this sector, in spite of its savings potential, little net investment takes place because any further additions to the stock of capital of the traditional kind are not worth making and supplies of improved inputs are not readily available. Existing stock of capital is kept in repairs and is maintained and there is no net disinvestment in as in the other sector but there is no net investment either. Hence the sector may be supposed to be in a state of long-term equilibrium of the kind postulated by Professor Schultz. Secondly, all available labour is fully utilized and its marginal productivity is not zero and in fact can be well above subsistence. In short, there is no surplus labour. On the contrary there is a shortage of labour. Finally, management is reasonably efficient in the sense that all available factors of production are properly allocated and utilized. Thus the sector clearly satisfies all the major requirements of traditional agriculture as developed by Professor Schultz.

Now let us look at it once again. As I said above, little net investment occurs in this sector because addition to the existing stock of capital of the traditional kind is not worth making. Does it then mean that in this sector, the stock of capital is optimum in relation to the size of land? Not quite. One might find that this sector is in fact understocked in comparison with the other sector which does not produce any surplus and in spite of persistent disinvestment occurring in that sector. I shall later on refer to this comparative stock position of the two sectors. For the present let me consider the basic point that the stock of capital in this sector is not optimum in relation to the land and nevertheless no additions are made.

Why not? Because the limiting factor in this sector is neither land nor capital. The limiting factor here is labour. The stock of capital in this sector is adequate only in relation to its own labour resources.

This would sound paradoxical and might even be regarded an amazing feat of reasoning that starting from a population situation, one should have landed in a sector of traditional agriculture where the limiting factor was labour. Nevertheless, this sector is a fact. How is it then that this sector which exists in the midst of another section which is burdened with an excess population, should itself suffer from shortage of labour? Why is it not able to draw on the idle labour resources of the other sector? The reason is as follows: When extra labour is employed, it has to be employed for a wage and the wage has to be at least a minimum subsistence wage. The experience of the employer then generally is that whatever the wage, the productivity of the hired labour does not justify it. In other words, it does not pay to employ hired labour. Earlier it was said that the marginal productivity of labour in this sector is generally above subsistence and can be well above subsistence. Hence, it does not pay to employ labour even for a subsistence wage! It is because of several factors. One is the basic difference between the family labour of the farmer and the hired labour. In agriculture, particularly of the traditional kind, the difference in the productivity of the two can be very large. Secondly, often the physical and mental qualities of the labour that can be hired are such that its productivity is necessarily below its subsistence. This is not because of any inherent inferiority of its natural endowment. But because of a long process of disinvestment to which it is subject, mainly due to malnutrition and hunger, its productive efficiency has fallen so low that it does not pay to employ this labour for a wage. Hence it is not employed unless it becomes absolutely necessary. Therefore, generally speaking agriculture in this sector is so organized as to minimize the use of hired labour. Labour thus becomes the limiting factor in this sector.

Other Hindrances

There are other circumstances which inhibit the practice of improved agr-
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culture in this sector. These too are consequences of population pressure, though not inside the sector but outside of it. In the midst of poverty and hunger, it is always difficult to protect visible prosperity. A good standing crop is frequently in danger of being trespassed by hungry men and hungry cattle, and a good prosperous farmer often finds himself surrounded by latent hostility. Therefore, in his farm operations, even a farmer with means and ability is unwilling to enter into commitments which he with his own labour and the labour of the members of his family cannot meet. In fact, for a farmer owning land beyond the physical capacity of the members of his family, the simplest method of managing his farm is to keep up in self-cultivation what he can with the help of his family members and rent out the rest, to a share-copper; and here I am referring to not a landlord in the sense of an idle, non-working landowner but to a farmer proper, the tiller of the soil.

Saving Potential

Shortage of family labour of the farmer in relation to the size of his holding, thus explains the condition of zero net investment in this sector in spite of its savings potential. What then, happens to the savings potential? Of course, in the first instance the full potential is not realized and considerable part of it is flattered away in ostensible and wasteful consumption. A part of the savings also flows out of agriculture as for instance in the training and education of sons for eventual moving out of agriculture. But there are three main channels of investment in which a large part of the savings flows: buying or acquiring of additional land for renting out; moneylending for consumption purposes at exorbitant interest rates; and trading and shopkeeping. Poverty and hunger around provide ideal conditions to pursue these activities and for a competent operator, the returns on investment in any of these lines far exceed any conceivable returns on even improved inputs in agriculture. Therefore, even as investment decisions of a good manager of his affairs, they are completely justifiable. It is unfortunate, that his activities in all the three fields add little to the total wealth of the community; for basically their function is exploitative and their result further deprivation of the poor and the hungry.

In the traditional societies, this is well recognized and understood by both parties to the process and they will be surprised if they are told that a school of modern economists does not think it to be so. I need hardly describe the nature of traditional agriculture in the other sector, namely, the one which burdened with excessive population does not produce any surplus over its subsistence. As I have already explained, the traditional agriculture is characterized not by a state of equilibrium but a state of continuous deterioration with negative net-saving and investment. Because it does not produce enough for its subsistence, it lives and survives by capital consumption, that is by cheating the land, cheating the cattle and finally cheating the man. As a result, though, in relation to its land resources, the sector has a surplus of labour, its productivity is very low and under its own pressure would continually decline further. The same is true of capital. Superficially there is a surplus of capital in the limited sense of material equipment and implements. This is mainly because of certain indivisibilities and because every farmer, however small his holding, would strive to possess his own implements and cattle. Consequently, in relation to the size of land, the number of cattle is large but it is famished and so also the number of implements is large but they are often not in good repair. Thus here, man works on land with a continually declining stock of reproducible means of production including those qualities of land and man which can be augmented and maintained by investment; and in the absence of such investment, both land and man move inexorably towards the ultimate equilibrium where both are reduced to their irreducible minima.

Thus the two sectors exist side by side not in mutually complementary relationship but a relationship based on exploitation, callous disregard for res- tment and latent hostility. Even the barest analysis of the nature of traditional agriculture in the modern world must take cognizance of these facts.

Professor Schultz has missed these issues either because of unfamiliarity with field conditions or through an analytical error of omitting population as a factor of any consequence. Equally likely, he took cognizance of these issues and after due examination, dismissed them as unreal. In any case, these issues do not appear in his discussion of the policy and programme in this field. Therefore, let me briefly indicate the policy implications of the additional issues which I regard as real.

The starting point is to recognize the existence of the two sectors and to adopt appropriate policies. I shall presume that unless there are very strong reasons to indicate to the contrary, the transformation of agriculture will be sought within the framework of a family farm. I shall therefore keep my discussion confined to this institutional framework. I do this without entering into the merits of this particular institutional choice.

Two Sectors

Let us begin with the first sector which because it takes care of a proportionately smaller population, produces a surplus over subsistence. If for a while, we may forget the excessive population burden thrown on the other sector, we can make a good case for keeping the agriculture in this sector in family farms. There are then two principal problems connected with this sector: one is how to direct their savings potential into productive investment which will help transform traditional agriculture into a highly productive economy. The second is how to supply it with enough labour. The two are of course related but for convenience we shall treat them separately.

As I stated earlier, at present a substantial part of the savings of this sector flows into three activities, namely, land acquisition for renting, moneylending and trading. Because of the existence of poverty and hunger around, these activities earn very very lucrative returns. In large part these returns are not returns to economic service performed; they are plain exploitation which is anti-social and harmful to the productive efficiency of the community. The possibilities of earning such lucrative returns to investment in these activities is a principal reason why savings in this sector do not flow into more productive investment. It is therefore necessary to regulate these activities to eliminate exploitation and to ensure that the returns are in consonance with the economic service performed.
On the question of supply of labour to this sector, I do not think that any sector organized into family farms will be able to hire and employ usefully on any scale unskilled labour which is very poor and which through chronic hunger has been reduced to very low productive efficiency. In short, this sector will not be able to make much use of the surplus labour in the other sector. Therefore, in order to transform traditional agriculture in this sector into a highly productive agriculture, one must turn to mechanization. Mechanization of agriculture in this sector will provide in the first instance a channel for productive investment for the savings in this sector. Secondly, it will reduce the dependence of this sector on unskilled labour; it will need a small supply of skilled labour which will become available in due course from within the sector as well as from the other sector.

Let us now turn attention to the second sector, which because of the burden of population it bears, does not produce any surplus and which in fact is in a state of continued net dissavings and disinvestment and not in a state of equilibrium at all. As I have indicated, Professor Schultz has not touched upon the complexities of the phenomenon that traditional agriculture is and of the all out effort that will be needed for transforming it into a highly productive sector. One must first be given the adequate feeding of these people. It will not do to postpone this basic responsibility by suggesting that they must first be given gainful employment. Of course, they must be given work to do. But that can come later.

The second problem is how to make productive use of the labour in this sector. Once it is properly fed, it will soon turn itself into good productive labour. It must therefore be put to good use. The land resources in this sector are not adequate for this labour to be engaged in cultivation but a part of it will have to be withdrawn from current cultivation and employed on works which will directly create capital mostly embedded in land. Depending upon the size of the labour force to be thus handled, this will require an effort of organization in order to withdraw the surplus labour from current production, to hold it in appropriate organizations for employing on capital works of one kind or another and to train for eventual withdrawal from agriculture for being employed in the industrial sector as it grows. I am not sure that all this can be done without disturbing the family farm organization in this sector.

I have raised these issues only to indicate the complexity of the phenomenon that traditional agriculture is and of the all out effort that will be needed for transforming it into a highly productive sector. One may differ on the details of this description or even more so on the remedial measures to be adopted. However, neglect of these complexities will result in a statement not adequate even for a class-room understanding of the subject let alone for deliberating on questions of policy and program in this field.

JAMSHEDPUR STEELMEN WIN
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