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THE SOCIOLOGIST'S APPROACH TO TECHNICAL
ASSISTANCE METHODOLOGY

by

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As I understand the task before me I am to prepare a paper that defines technical assistance from the viewpoint of sociology, based on this definition describe the theoretical frameworks most appropriate for approaching the problem and then specify what activities follow from the definition and approaches. This has proved to be a formidable task and after many false starts I have had to delimit the field. Some sociologists have seen technical assistance to mean institution building, others as training Third World sociologists, and others as a form of maintaining U.S. hegemony over developing countries by controlling markets and technological dominance. but far and away, the bulk of sociologists have seen technical assistance as improving the diffusion of technological innovations from either foreign or national sources to potential adopters. And the bulk of innovations they have considered are agricultural or health practices. Thus, for the purposes of this paper, technical assistance refers to the introduction of innovations (i.e., any new way of doing something in any field whether it be agriculture, teaching or medicine) in Third World countries.

Moreover, I have been asked to develop this theme as a sociologist qua sociologist. I must confess that I have found this confining but have attempted to achieve this goal until the last section of the present study. At that point, I will argue that traditional disciplinary approaches are too narrow and must give way to an integrated social science approach.

Now that I have defined the area of study, we may focus on theoretical approaches. But to do so requires a bit of review of the history of sociology and social thought. The importance of such a review is that sociologists, being also human beings, are subject to their own concepts. This being the case, sociologists are socialized into the mold of their discipline. There is an elaborate network of rewards and punishments employed by departments of sociology to assure that new Ph.D.'s, whether they come from Africa, South America or Iowa, understand and accept particular assumptions woven into the foundations of sociology. The foundations of contemporary sociology were laid by European sociologists from 1830-1920 by such men as Marx, Weber, Durkheim and Simmel.

I. THE CONFLICTING FOUNDATIONS OF SOCIOLOGY

In order to understand these foundations, I have found Nisbet's (1966) notion of unit-ideas very helpful. This notion was borrowed from Lovejoy (1942:3) who argued that, "By this history of ideas I mean some thing at once more specific and less constricted than the history of philosophy. It is differentiated primarily by the character of the units with which it concerns itself.... In dealing with the history of philosophical doctrines, for example, it cuts into the hard-and-fast individual systems, and, for its own purposes, break them up into their component elements, into what may be called their unit ideas".

The unit ideas providing the foundations of contemporary sociology grew out of how the individuals forging them related to the three great ideologies of the nineteenth and twentieth centuries: radicalism, liberalism, and conservatism. Thus, the main unit ideas that still predominate in sociology may be viewed as "linked antitheses" that form the warp of the sociological tradition into which students are socialized: community-society, authority-power, status-class, sacred-secular, alienation-progress (Nisbet, 1966:7). Depending on how each sociologist relates to these ideological perspectives, his definition, and therefore, his approach to problems under study will vary. The plain truth is that, until very recently, the majority of sociological approaches lay much closer to the conservative end of the spectrum because sociology's essential concepts and its implicit perspectives placed it much closer to philosophical conservatism (Nisbet, 1966:17). Thus, sociologists could view new technological inputs as contributing to development without asking what their consequences were for income distribution, or concern themselves with who could have access to these new inputs.

What I have been suggesting is that the history of science is analogous to the ideological struggles noted in politics. This is essentially what underlies Kuhn's (1962) distinction between "everyday" and "revolutionary" science: a paradigm is accepted by almost all the practising scientists in a given field. Investigations, which begin with definitions, are directed by and interpreted in terms of the paradigm. At times, however, the paradigm is overthrown. This

happens not merely because some facts fail to corroborate certain theories. Theories can be modified and even discarded within a given paradigm. The throwing out of the paradigm (a scientific revolution) destroys the relevance of a whole class of problems (Rapoport, 1969:225). Sociology has not yet had its revolution so the principal source of its definitions remains basically conservative with regard to change and development.

The manner in which one defines development influences the entire research process. "In every field of study there are three basic questions which must be answered. First, what is the nature of the phenomenon in question? Second, what are the sources of its uniformities and variations? Third, what are the consequences of its existence or action?" (Lenski, 1966:21). It is important to note that these three questions must be answered in the order given, since how one describes the nature of the phenomenon influences the types of uniformities and variations which are sought, and these in turn, influence the consequences observed. For example, if one defines development as growth, then you look for certain uniformities such as savings, investments, foreign loans, prices, effective demand, new technological inputs and political stability. On the other hand, if the nature of development is described as justice and equality one looks at distribution, access to resources, life chances, patterns of concentration, and political change. Obviously, the phenomenon of development should be defined so as to include both growth and distribution under periods of both stability and change in institutional arrangements with the goal being that of improving the quality of life of the broad masses of the population.

The major approaches to the sociological study of societies and their patterns of change may be divided into two broad camps that roughly conform to the unit-ideas that form the foundations of sociology. These unit-ideas range from conservative to radical philosophical assumptions. In everyday terms these two broad camps are usually referred to as equilibrium models or conflict models. Not every major work will fit nicely into one or another of these camps because: 1) sociologists tend to be eclectic and draw upon both approaches either in the same or in different studies, and 2) some sociologists have worked toward a synthesis of the two approaches (Van den Berghe, 1963 and Lenski, 1966).

It should be noted that classifying an individual's work as falling into one or another of these camps does not imply that they are all cut from the same mold. As Lenski (1966:22) noted, "Conservatives have not always agreed among themselves, nor have radicals. The only belief common to all conservatives has been their belief that the existing system of distribution was basically just; the only belief common to all radicals has been their belief that it was basically unjust. On other matters there has been no single conservative or radical position to which each and every adherent subscribed".

Nevertheless, there are some basic issues which delineate the two broad approaches. These issues are: 1) the nature of man, 2) the nature of society, 3) the degree to which systems of inequality are maintained by coercion, 4) the degree to which inequality generates conflict, 5) the means by which rights and privileges are acquired, 6) the necessity of inequality, 7) nature of the state and

of law, and 8) the use of the concept of class (Lenski, 1966:23).

Table 1 summarizes how the equilibrium and conflict approaches have divided on these issues.

Table 1. Differences in Assumptions Between the Equilibrium and Conflict Approaches to Development*

| Issue | Equilibrium | Approach | Conflict |
|---------------------|-----------------------------------|----------|--|
| 1. Interests | Uniting | | Dividing |
| 2. Social Relations | Advantageous | | Exploitative |
| 3. Society Unity | Consensus | | Coercion |
| 4. Society | System with needs | | Stage for class struggle |
| 5. Nature of Man | Requires Restraining Institutions | | Institutions Distort Basic Nature |
| 6. Inequality | Social Necessity | | Promotes Conflict and is Unnecessary |
| 7. State | Promotes Common Good | | Instrument of Oppression |
| 8. Class | Heuristic Device | | Social Groups with Different Interests |

* Derived from Lenski (1966), Dahrendorf (1958), Van den Berghe (1963), Horton (1967), and Adams (1967).

The importance of Table 1 for this discussion is that most U.S. sociologists, or sociologists trained in the U.S., are socialized into the equilibrium approach as part of their training in the field. If

one accepts the philosophical tenets of the equilibrium approach, development issues become reduced to technical solutions to the problem of increasing rates of growth. Assuming that relations are essentially harmonious and that inequities are part of life and the State exists to minimize (but never eliminate) inequities, there is no need to study the big questions. Therefore, there is a tendency to develop models of how to introduce new technology as an issue that each individual can decide for himself. Some individuals will adopt sooner (because they have more control over resources?) and will, consequently, receive a greater share of short-run profits but these new income streams are accessible to all in the long run. The State, being benevolent, will assure that this occurs in the long run. Peter Sober is a benevolent dictator but Peter Drunk is a despot. A big question such as who keeps Peter Sober is never asked if you assume the problem away. But let us turn our attention to how these foundations affect approaches to technological change.

11. SOCIOLOGICAL APPROACHES TO THE DIFFUSION OF TECHNOLOGY

It is somewhat surprising that the vast majority of sociologists who have been concerned with technology have investigated the diffusion of technology within a given society, or the transfer and then diffusion of technology from one society to another. 1/ Most sociologists harken back to Marx, Weber and Durkheim as the real grandfathers of sociology. All three of these were concerned with the consequences of technology for social relations, but Marx gave this concern priority in his theory of history. Not only did he concern

himself with the consequences of technology for the capitalist mode of production, he also saw technology as a major means of liberating man, if it was properly incorporated in the socialist mode of production. Since I wish to return to these issues in a later section, it may be well to review briefly how Marx treated technology since it will bring into stark relief the differences between his approach and the approaches currently in vogue in sociology.

Structural change is the resultant of the interaction between nature and man, in the latter's struggle to obtain a surplus for himself by continually developing new processes for the control of natural phenomena. The sum total of the knowledge gained by man in this struggle -- tools, productive organization, scientific knowledge, and labor relations -- can be called 'technology'. 2/ Technology is, in this sense, the process of creation of itself; a process by means of which man tries to control nature for his own ends and, meanwhile, to create not "utensils" but rather man himself. This man-nature interaction is not only an economic process but a social one which creates common knowledge, customs, language, ideas, and ideology.

Thus, technology has structural effects not only in the economic sphere but in the political and ideological spheres as well. Each organizational form has its own characteristic and complementary set of institutions and ideologies. In addition, each presents the opportunity for new groups to gain control of the new technological organizations. Historically, a group arises which gains control of the dynamic aspect of the infra-structure and appropriates part of the surplus for its own benefit.

As a result of this control of the means of production, society becomes divided into different social classes according to the relationship of each to the control. The same opportunity for the assumption of control of the means of production by new groups presents itself when a new form of technological organization arises. The struggle for control is not always successful, but it always occurs. Thus, the history of man, up to the present, is a constant struggle for control over resources and the most critical of these resources is technology.

This view of the paramount importance of technology with regard to its consequences for establishing and maintaining class structure and, thus, in the absence of appropriate institutional controls, allowing for further concentration of resources and exploitation of many by a few is rarely considered in current sociological approaches to the diffusion of technology. This is accounted for, on the one hand, by purely ideological and ethnocentric reasons on the part of U.S. scholars and, on the other hand, by differences in theoretical assumptions.

Most sociologists studying diffusion subscribe to the equilibrium approach outlined in Table 1. Thus, they view interests of all members of a given society as essentially uniting and current institutional arrangements controlled by a government that is attempting to promote the common cause. Consequently, the introduction of new technology, either foreign or indigenous, may cause temporary imbalances that will soon be restored to a new equilibrium that embodies a more egalitarian distribution of benefits. What I propose to do

in this section is to show how these underlying assumptions are translated into empirical studies of the transfer of technology that are deficient on two grounds: 1) a misunderstanding of the phenomenological reality of most Third World peasants, and 2) a failure to take into account the existing structural arrangements of these countries.

Starting from the broad assumptions of the equilibrium approach, most students of diffusion adopt a behaviorist position. The major tendency of the behaviorist approach is to draw upon one or more learning theories for their concepts and measures (Bandura, 1969). The following central assumptions have been developed and presented by Kunkel (1970:23).

1. Individuals are subject to conditions of physiological deprivation and satiation.
2. Some types of deprivation and satiation are learned and have a cultural origin.
3. The effectiveness of action varies directly with the level of deprivation and inversely with the level of satiation of the individual.
4. If in the past, in a certain context, a behavior pattern has been rewarded, the possibility that the same behavior pattern will be emitted in the future, under similar circumstances, is increased.
5. The converse is also true, past behavior that was punished is less likely to recur under similar circumstances.

6. The specific components of rewarding and punishing consequences of actions are function. of the social context and may be expected to vary among individuals and over time.

7. The major implication for development analysis, and especially for the formulation of action programs, is that behavior can be changed at any time.

8. By judiciously altering those aspects of the social environment which constitute rewards and punishments, it is possible to alter behavior patterns and to initiate or accelerate social change.

The strong individualistic bias of this approach is apparent in the behaviorist approach. There is a recognition that institutional arrangements may present themselves as constraints on the individual, but the individual can, by his own action, break out of these constraints since the underlying equilibrium assumptions are that social relations are harmonious and the State which controls these institutional arrangements is constantly attempting to promote the welfare of all individuals. Thus, the individual operating alone can change his perceptions and attitudes and become "modern" which, by definition, involves the use of innovations. Thus, behaviorists talk about the following questions as critical in changing human behavior.

1. What are the principal reference groups employed by a given individual?

2. To whom, or to what group, does the individual look for cues for behavior?

3. To what extent does the individual feel relatively deprived in relation to his significant others?

4. What action does the individual take to reduce his feelings of relative deprivation?

5. How is deviance viewed by the significant others?

6. What are the legally defined limits of deviation?

7. What are the socially acceptable norms of evasion that the individual may employ?

8. What are the relationships between social values and innovative behavior?

9. How is innovative behavior rewarded or punished?

10. What role do the major political institutions play in changing legally defined rewards and punishments?

Once again we notice that very slight attention is given to the fact that institutions may be structured and controlled for the benefit of a few. The assumption is that all have equal access to information and credit to finance the acquisition of new technological inputs. The individual's milieu may reinforce traditional patterns but, if he so desires, he can change this milieu. This becomes even more obvious as we move to a review of some selected empirical investigations of diffusion. 3/ Given the assumptions built into these studies, it is not surprising that in almost all cases the independent variables emphasize individual attributes. At best, variables such as gross farm income and farm size are the only indications that there might be some structural constraints on the use of new technology. Even then, these "constraints", as such are only rarely incorporated into the models. Usually, they are considered as personal attributes. Table 2 presents a summary of 14

studies; 10 conducted in the U.S. and four in Colombia.

Table 2. Summary of Past Attempts to Predict the Adoption of Agricultural Innovations*

| Researcher | Independent Variables | Success of Prediction (Variance Explained) |
|----------------------------|---|--|
| A. U.S. Studies | | |
| 1. Copp (1956) | Gross farm income Professionalism Mental flexibility | 50.00 |
| 2. Fliegel (1956) | Familism Information contact Level of living Attitude towards innovations | 32.00 |
| 3. Rogers (1958) | Attitude toward change Social Status Communication competence | 17.00 |
| 4. Copp (1958) | Gross farm income Membership in farm organizations Discerning ability Level of living | 52.00 |
| 5. Hobbs (1960) | Attitude toward change agents Cosmopolitaness Brand awareness Knowledge about innovations Management vs. traditional work orientation Gross farm income Farm size | 29.70 |
| 6. Sizer and Porter (1960) | Knowledge about innovations Social Status Education Social participation | 25.88 |

Table 2 (continued)

| | | |
|--|--|-------|
| 7. Straus (1960) | Net Worth Education Wife's supportiveness | 33.64 |
| 8. Rogers and Havens (1961) | Gross farm income Age Belief in agricultural magic Venturesomeness Social status | 56.27 |
| 9. Cohen (1962) | Mobility Individual values Family income | 54.76 |
| 10. Rogers and Havens (1962) | Community norms on in- novativeness Farm size Opinion leadership Communication behavior Social status | 64.10 |
| B. Colombian Studies | | |
| 11. Deutschmann and Fals Borda (1962) | Mass media exposure Farm size Education Cosmopolitaness Knowledge of innovations | 56.30 |
| 12. Havens (1963) | Mass media exposure Level of living Age | 47.30 |
| 13. Rogers (1964) | Social status Mass media exposure Trips to urban centers Farm size Empathy Education | 39.03 |
| 14. Rogers (1966) | Trips to urban centers Social status Empathy Farm size | 70.30 |

* Adapted from Rogers and Havens (1962) and Rogers (1966).

Table 2 presents some startling similarities. From 1956 to 1962, very small changes in the selection of independent variables can be noted. More importantly, we find the Colombian studies employing the same independent variables as U.S. studies. Surely, there must be different constraints on farmers' decisions in Colombia than in the U.S. However, these constraints are not reflected in the predictive models. Moreover, both Havens (1963) and Rogers (1966) were able to explain more variance with fewer variables in their Colombian studies (a fact which made them both ecstatic). This should have been a clue, but in their earlier work it was ignored. What their variables were reflecting was not personal attributes, but their respondents' location in the political economy of the country.

However, most researchers do not seem to realize that variables from one setting, diffused or transferred to another setting, may be reflecting different phenomenological worlds and structural conditions. Consequently, given that individuals who were literate actively sought knowledge about new information, were empathetic and achievement-oriented, and adopted new technology in a variety of cultural settings. it was assumed that a generic approach to technological transfer was at hand. The generic methodology was to make information about technological advances available to all farmers, emphasize program content that would increase empathy and achievement orientations, provide some new capital inputs in the form of credit, and the important commercial sector of the economy would adopt innovations. Those who didn't adopt were peasants and they were backward. But the increased production brought about by the commercial sector could be

channeled into new programs for the peasant and thus a new equilibrium would be reached that would improve the quality of life for the broad masses. The remainder of this paper will be devoted to supporting the following contentions: 1) that such a formulation as described above is phenomenologically mistaken, 2) that structural arrangements in most Third World countries prohibit the peasant from participating in the political economy of their country, 3) that each developing country (and regions within countries) are in different phenomenological and structural circumstances in their historical development process that militates against a generic approach to technological transfer, and 4) that approaches appropriate to a country or region can not be developed by a strictly disciplinary approach but, rather, only by an integrated social science approach.

III. THE PHENOMENOLOGICAL WORLD OF THE PEASANT 4/

There are a number of analysts and planners of development who have argued that many of the obstacles to development would be resolved by the diffusion of new technology from more advanced societies to less developed areas and from advanced sectors of developing countries to lagging sectors in the same countries (Barnett: 1953; Hirschman: 1958; Moselitz: 1960; Levy: 1966; Rogers: 1969 and Rostow: 1971). For these scholars, much of development centers around the issue of increasing productivity so as to satisfy internally, the major, if not the entire, demand for foodstuffs and raw materials for

transforming industries. Development, then, occurs largely through the transfer of certain cultural patterns and material benefits from the developed to underdeveloped areas. Within each underdeveloped nation, a similar diffusion occurs from the modern to the traditional sectors.

Either explicitly or implicitly there is the assumption that the traditional (sometimes referred to as the backward) sector serves as a brake on the modern sector and, thus, limits development. Szentes (1971:60-82) refers to this assumption as simplistic dualism which assumes that the major cleavage between the "modern" and "backward" sectors is based on the degree of use of modern technology.

The full-blown version of this simplistic dualism suggests that underdeveloped countries consist of two separate societies. It is argued that there is a "modern" society which consists of social relations determined by exchanges motivated by the desire to attain rational goals. In this society, it is held that the norms and values tend to be oriented toward change, progress, innovation, and maximum benefits at minimum costs (Lipset: 1967:5). In short, it is alleged that this dynamic and capitalistic segment of the underdeveloped society is most likely to expand and generate development for the whole society.

On the other hand, it is argued that the archaic or feudal society in the rural sectors is incapable of contributing to development. This "other" society is characterized by traditional norms and values that ascribe to each individual a place in that society. Within this traditional sector there is purportedly little impetus for change since the norms and values of the archaic society exalt,

or at least accept, the status quo. The socialization pattern of these people is one which teaches acceptance of the present structure, man's inability to control nature and the inability to understand rational economic processes (For a full discussion of these notions see Lewis 1954:189-191 and Havens and Flinn 1970:1-28).

These, and similar notions, lead to the conclusion that the provision and acceptance of new technological inputs will trigger development. This underlies Hirschman's (1958) notion of linkages between leading and lagging sectors, and Rostow's (1971) "take-off" is initiated by the transmission of "expansionary forces" from the primary growth sectors to other economic sectors.

Some sociologists have adopted this simplistic notion of dualism and suggested that the major factors accounting for the existence of the traditional and modern sectors of a country are the differences in attitudes and values of those who make up the two sectors (Banfield: 1958; Lopreato: 1962; Hickey: 1964 and Rogers: 1969). This lead Rogers (1969: 19-42) to develop a "subculture of peasantry" where the peasant is seen as typified by: 1) mutual distrust in interpersonal relations, 2) having perceived limited good, 3) dependence on and hostility toward government authority, 4) high familism, 5) lack of innovativeness, 6) fatalism, 7) limited aspirations, 8) inability to defer gratifications, 9) a limited view of the world, and 10) low empathy.

I find such a classification tells more about the researcher that it does the peasant. Therefore, I propose to present six

hypotheses about the traditional mind that emerges from sociological research and, in each case, offer a counter argument. Five of these hypotheses are adapted from Kleymeyer (1970) and I acknowledge his courtesy for allowing me to use them herein.

A. Peasants distrust all persons who are not members of their extended families. There is little empirical evidence to suggest that peasants have interpersonal distrust of strangers. They indeed may mistrust their ideas since many paternalistic change agents attempt to force the acceptance of new techniques that are not appropriate for the peasants' situation. Indeed a colleague and I once successfully introduced a new synthetic seed corn into a highland community only to find that it was not frost resistant (even though we had been assured that it was by the National Experiment Station). It must be remembered that the peasant operates so much on the margin that what we may see as a small failure is a tremendous loss to him.

Moreover, I cannot understand how anyone who has just spent three hours of a peasant's time, eating his only chicken, drinking his scarce home brew, and asking him questions all the way from how much money he makes to with whom and when he had his first sexual experience (OHLADE Rural Fecundity questionnaire), and receiving honest answers to these absurdities can maintain that the peasant is interpersonally distrustful.

B. Peasants are ignorant -- they suffer from a gross lack of knowledge about this complex world of ours (Kleymeyer). It is unrealistic to think that peasants have empty heads. Peasants are not ignorant -- they are merely uninformed in the ways and means of western

technology (as we are in their ways) and unconvinced that such technology is not only reliable but feasible when applied to the peasant condition. On the other hand, peasants have a great wealth of knowledge about their social, cultural, and physical environments. Because of their position in the social structure they are often the last to be touched by western knowledge --- and the first to suspect it.

C. Peasant society is an undeveloped, technological void, where technology, in fact, is an anathema (A. Leymeyer). The concept of "undeveloped" conjures up the image of an empty vessel. However, just as in the biblical passage it was not possible to pour wine into a full vessel, neither has it been possible, for example, to pour medical technology into societies which already possess complex and often successful systems of "folk" medicine. In such cases, what has actually been added to the existing system is a set of alternative practices from which to make pragmatic selections (often empirical ones). In the peasant's mind, then, the structure of health services has been diversified, not replaced. He benefits from reduced dependency on old methods, but suffers from the developers inability to harmonize "folk" with "modern" medicine (as some folk practitioners have done, to a necessarily limited degree). In any case, peasant society is not a technological void, but competitive arena in which western technology often stumbles blindly about like a giant shadow boxer.

It should probably be made clear at this point, that there is nothing sacrosanct about any brand of technology, be it "folk" or

"modern". A technology is merely a set of predictions concerning environmental manipulation or control. Technologies vary as to strictness of method, accuracy of prediction, and efficiency. Realistically, however, any technology is especially apt to be in error when applied to environments foreign to the one in which it was developed or foreign to that developer who attempts to apply it. No one knows this fact better than the peasant, who often has seen countless unexplained failures by a veritable parade of developers. Nevertheless, those developers generally work on the assumption that their technology is above error. If something happens to go wrong, it is usually blamed on the peasants or rationalized away and forgotten. Assumptions are the scourge of any technology or science, for they are the basis for perceptions which may be grossly in error.

D. Peasants are tradition-bound, stubborn, and unwilling to make changes (Kleymeyer). Much more reasonable is the assertion that peasants are conservative and cautious when dealing with issues concerning their survival. To look again at structure -- given their **tenuous situations** as poorly nourished, disease-ridden, and grossly exploited subsistence farmers, peasants are understandably averse to taking risks. Risk-taking is a luxury of the secure or the insured. To misread caution or anxiety as **refusal** is short sighted though admittedly easy to do. Moreover, when viewed over time, peasant societies are by no means static. Peasant societies have evolved and disappeared through progressive changes -- by borrowing from other cultures or societies (accepting innovation) and by

developing their own new techniques. Whether these changes took place immediately or over time is just one variable dimension -- by no means the only one -- of the whole process. The result is that peasants have adapted to their hostile environments, and even to their western occupiers -- while managing to keep their autonomy and identity -- by skillfully mixing change with resistance to change.

E. Peasants are lethargic, unmotivated, lazy, satisfied with where they are -- if not they would do something about their condition (Kleymeyer). Sol Tax (1963) illustrated quite well that Guatemalan peasants will energetically pursue, by any means which are available and which they are convinced will work, the end of economic benefit for themselves and their families. And this phenomenon is not limited to small entrepreneurs in Guatemala. The fact of the matter is that resources are so limited and the peasant's social position is so stultifying that he is as mobile as an oyster on the floor of the ocean. The peasant's level of dependency upon the environment and upon various sectors of the social system leaves him with extremely limited alternative sources of that which he must have in order to survive. When alternatives are limited -- or when they are not perceived as plausible alternatives -- then attempts to exploit alternatives will necessarily be limited also.

F. Peasants are simply incompetent -- unable to advance themselves (Kleymeyer). Anyone who lives with peasants soon learns that they are, in fact, ingenious improvisers, pragmatic and highly skilled survivors against great odds in a hostile environment -- both the physical environment and social environment.

Developers, then, often view the peasant as dull, superstitious, traditional, etc., as illustrated above. To these characteristics, they attribute his resistance to technological change. However, it is possible, as suggested above, to show that these "characteristics" are little more than the biased perceptions of developers brought about by his failure to take into account the peasants place in the social structure. The reason for the failure of technology to bring about widespread changes in peasant societies is that the most important obstacle to rural social change is the social structure -- the structure of land tenure, of political participation, of economic segregation (both class differentiation and lack of integration into the national economies); the inequitable distribution of wealth, of services, of legal privileges and rights; and on and on. But these factors have been all too frequently overlooked. Thus, we turn our attention to structure.

IV. STRUCTURAL CONSIDERATIONS FOR TECHNICAL ASSISTANCE METHODOLOGY

In the first section of this paper I attempted to show that within the field of sociology there are two broad sets of assumptions that influence theory and research. Most sociologists who have concerned themselves with technological change have accepted the assumptions of the equilibrium approach to change and society. I have attempted to show how these assumptions have released them from being overly concerned with structural arrangements of the countries receiving technical assistance and, thus, have reduced their studies

to the individual level.

It must be obvious by now that I do not share these assumptions. For me, classes do exist and their existence is dependent on their members' ownership or control of productive resources. All too frequently, those who control the means of production also control the State which established, changes, and maintains institutional arrangements. The decisions taken regarding institutional arrangements usually are for the benefit of the dominant class without much regard for the consequences these decisions have on the quality of life of the broad masses of the population. While the interests of the members of the dominant class are not always congruent, each class, at the level of social formation, is composed of sub-sectors that have different and contradictory interests. For example, most dominant classes are comprised of large land owners, industrialists, large commercial interests, bankers and financiers. These interests are not identical but usually they are aware of the necessity of compromise for the sake of their over-all class interests.

The exploited classes usually divide along the lines of owners of small farms, sharecroppers, renters, shop keepers, artesans, agricultural laborers and industrial workers. At the level of social formation each of these groups may act as a separate class. Consequently, they rarely unite to form a single block to place demands on the State. In some countries, these classes form along racial lines but race is not their major characteristic. Their uniting characteristic is that they are divorced from or marginal to the control of productive resources.

When these conditions exist, the introduction of new technology, a productive force, usually falls under the predominant control of the current owners of the means of production. Consequently, new technology may increase productivity and, thus, incomes, but these benefits will not automatically trickle down to the broad masses. Even technology such as green revolution inputs that are by nature divisible for use on small plots may not reach the owners of these small plots without changes in institutional arrangements.

To demonstrate this, let us look at the introduction of a new coffee variety in a rural Colombian community. The area studied is located in the Department of Antioquia which, under normal conditions, produces about 20 percent of the total coffee production. In 1963, there were 1,575 rural families in the area studied of which 1,008 resided in the coffee producing area. The remaining families resided in altitudes either too high or low for successful coffee production. Of these, 1,008 families, 100 were interviewed in 1963. A complete description of the area is presented in Havens (1966). All indications are that the area is typical of coffee producing areas in Antioquia (Ochoa: 1968).

The initial 100 families were selected by simple random sampling techniques. Of the 100 families, 56 were individual decision-makers on coffee units. The other families were either sharecroppers, thus not making decisions with regard to the use of new agricultural inputs, or were agricultural laborers employed on surrounding farm units.

In 1970, the original 100 families were relocated and re-interviewed. The 56 family units that were decision-makers in 1963, form the basis for the analysis presented herein. The major changes noted during the past seven years were the availability of two new coffee varieties, Caturra and Borbon, and new fertilizer and weed killers. Public investments during the seven-year period remained relatively constant in real terms.

Of the 56 coffee-producers that were in a position to take decisions regarding the factor mix on their farms, 24 had adopted the new coffee varieties and used commercial fertilizer and weed killers (17 had adopted Caturra and 7 Borbon). The remaining 32 had not adopted the new varieties.

What we want to determine is what was the adopters income, farm size, use of credit, and use of labor in 1963 and how has it changed by 1970? And, how do these factors compare with owners but non-adopters of the new variety?

Income

The basic issue with regard to income is that even though seeds and fertilizers are supposedly divisible so that they may be used on small farms as well as large, the existing institutional arrangements tend to cut the small farmer off from sources of information and credit that are required if one has little capital accumulated (Crosson: 1970). Some evidence indicates that information agencies, like extension services, are essentially designed to serve large farmers (Brown: 1970). Thus, the small farm owner

is likely to first learn of the new inputs by seeing them adopted by large farmers. Moreover, if the small farmer has low capital accumulation, he cannot make the change-over without credit resources. However, credit resources are generally more available to large acreage farmers (See below for justification of this assertion). Therefore, we hypothesize that adopters of new varieties of coffee will: 1) have had higher incomes than non-adopters in 1963, and 2) have experienced greater increases in real income from 1963-1970. Table 3 presents the findings regarding these hypotheses.

Table 3. Changes in Real Family Income for Adopters and Non-Adopters of New Coffee Varieties, T amesis, Colombia, 1963-1970

| Income in Pesos | Adopters | | Non-Adopters | |
|----------------------------|----------------|----------------|----------------|----------------|
| | 1963 (N=24) | 1970 (N=24) | 1963 (N=32) | 1970 (N=32) |
| 0 to 1,000 | 8% | 0% | 0% | 13% |
| 1,001 to 5,000 | 55 | 38 | 87 | 78 |
| 5,001 to 10,000 | 29 | 42 | 13 | 9 |
| 10,001 to 15,000 | 8 | 8 | 0 | 0 |
| 15,001 to 20,000 | 0 | 8 | 0 | 0 |
| 20,000 plus | 0 | 4 | 0 | 0 |
| Total | 100% | 100% | 100% | 100% |
| Average Real Family Income | \$4,420 | \$8,097 | \$3,136 | \$3,106 |

Table 3 indicates that adopters of green revolution inputs in T amesis had average annual incomes of 4,420 pesos in 1963 or more

than 1,000 pesos higher, on the average, than non-adopters. Moreover, adopters average annual incomes increased in real terms to 8,097 pesos while the non-adopters average real income declined between 1963 and 1970. Of the 24 adopters, 20 families (83 percent) experienced an increase in real income with the average increase being 4,576 pesos; four families experienced a decline in real income with the average decline being 806 pesos. For the non-adopters, 13 (40 percent) experienced an increase in real incomes with the average increase being 1,800 pesos while 19 experienced a decline in real income with the average decline being 1,600 pesos.

Thus, the evidence from the present study indicates that adopters of new seed varieties had higher initial incomes and experienced much greater increases in real income. In fact, for the adopters, real income doubled on the average while it remained constant for the non-adopters.

Credit

Changing to a new coffee variety requires the ability to withstand lower returns while the new coffee trees come into production (usually a minimum of two years). Thus, one must have accumulated capital or access to credit while the changeover is made. Obviously, lending agencies demand collateral. Long term credit is almost unattainable without adequate land, and short term credit requires a demonstration of resource base judged to be credit-worthy. Except for supervised credit programs where technicians assist small farmers with the loan application, one must have a certain amount of education

and time to cope with the cumbersome applications and delays (Thiesenhuis: 1971). Moreover, high-yield varieties usually require from three to four times the amount of fertilizer required by the traditional varieties. This implies an even greater need for credit resources for the owners of small plots.

Given these considerations, it is hypothesized that adopters of new coffee varieties used more credit in 1963 and in 1970 than did non-adopters. Table 4 presents the data concerning use of credit.

Table 4. Changes in Amount of Credit Usage for Adopters and Non-Adopters of New Coffee Varieties, Tamesis, Colombia, 1963-1970

| Pesos ^a | Adopters | | Non-Adopters | |
|--|----------------|----------------|----------------|----------------|
| | 1963 (N=24) | 1970 (N=24) | 1963 (N=32) | 1970 (N=32) |
| None | 55% | 42% | 78% | 66% |
| 1, to 1,000 | 33 | 8 | 13 | 18 |
| 1,001 to 5,000 | 8 | 29 | 3 | 13 |
| 5,001 to 10,000 | 0 | 17 | 3 | 3 |
| 10,001 to 20,000 | 0 | 0 | 3 | 0 |
| 20,001 to 50,000 | 0 | 4 | 0 | 0 |
| 50,001 plus | 4 | 0 | 0 | 0 |
| Total | 100% | 100% | 100% | 100% |
| Average Size of Loan for Credit Users | \$7,610 | \$5,357 | \$5,143 | \$2,722 |
| Average Amount of Loan per Acre of Coffee | 724 | 352 | 166 | 166 |

^a One dollar was equal to approximately 10 pesos in 1963 while in 1970 one dollar was equal to approximately 20 pesos.

Table 4 indicates that more adopters used credit in both 1963 and 1970 than non-adopters. Also, those who used credit among the adopters had access to more credit than non-adopters both in terms of average size of loan for credit users (7,610 pesos for adopters versus 4,143 pesos for non-adopters) as well as credit per acre of coffee production (724 pesos versus 166). It should be noted that the decrease in credit per acre for the adopters between 1963 and 1970 is accounted for by the fact that they significantly increased their land holdings between 1963 and 1970.

Change in Size of Farm

The greater profits that are captured by the early users of green revolution inputs become available for re-investment. In some instances, particularly on very large farm units, these increased profits are taken out of agriculture and invested in non agricultural pursuits (Beltrán: 1971). The more frequent trend among owners of medium size farms is to reinvest these profits in more land. Thus, the introduction of green revolution inputs can lead to further concentrating land resources if the small-farm owner is effectively blocked from their adoption. It is hypothesized that average coffee acreage for adopters was greater in 1963 than non-adopters and will increase from 1963 to 1970 while it decreases for non-adopters.

Table 5 presents the results.

The hypothesized trend is clearly observed in Table 5. Adopters increased their coffee acreage from an average of about nine acres to 13 acres while non-adopters coffee acreages decreased from about five

and one-half to four and one-half. Also, adopters had, on the average, three more acres in coffee production in 1963 than did non-adopters.

Table 5. Changes in Acres in Coffee for Adopters and Non-Adopters of New Coffee Varieties, Tamesis, Colombia, 1963-1970

| Acres of Coffee | Adopters | | Non-Adopters | |
|-------------------------|----------------|----------------|----------------|----------------|
| | 1963 (N=24) | 1970 (N=24) | 1963 (N=32) | 1970 (N=32) |
| Less than 2 | 29% | 17% | 41% | 50% |
| 2 to 10 | 38 | 42 | 41 | 41 |
| 11 to 25 | 33 | 21 | 12 | 6 |
| 26 to 50 | 0 | 12 | 6 | 3 |
| 51 to 100 | 0 | 4 | 0 | 0 |
| 100 or more | 0 | 4 | 0 | 0 |
| Total | 100% | 100% | 100% | 100% |
| Average Number of Acres | 8.76 | 18.04 | 5.48 | 4.60 |

Labor Requirements

There has been much discussion about green revolution inputs and their consequences for labor requirements (Thiesenhusen: 1971; Wharton: 1969; Falcon: 1970). Such a discussion is urgent due to the high rates of unemployment in most rural areas of Latin America. In the area studied herein, for example, only 42 percent of the available agricultural laborers were able to find employment during

the entire year and most of these were tied-laborers. What most frequently occurs is that rather than diversifying cropping patterns, which tend to spread labor requirements throughout the year, an intensive cropping pattern emerges in which there are peak times of great labor needs and more troughs in which workers are idle. The Caturra coffee variety has precisely this effect since it requires no shade and weed killers may be more effectively employed. The older varieties must be weeded by hand in most circumstances because the shaded varieties involve an undergrowth which limits the effectiveness of weed killers. Thus, we hypothesize that adopters will employ less labor per acre in 1970 than non-adopters. Table 6 presents the data concerning this hypothesis.

Table 6. Changes in Hired Labor for Adopters and Non-Adopters of New Coffee Varieties, T amesis, Colombia, 1963-1970

| Days of Hired Labor | Adopters | | Non-Adopters | |
|---|----------------|----------------|----------------|----------------|
| | 1963 (N=24) | 1970 (N=24) | 1963 (N=32) | 1970 (N=32) |
| None | 50% | 29% | 50% | 63% |
| 1 to 50 | 17 | 25 | 25 | 25 |
| 51 to 100 | 8 | 8 | 16 | 3 |
| 101 to 500 | 13 | 17 | 9 | 9 |
| 501 to 1,000 | 4 | 13 | 0 | 0 |
| 1,001 to 2,000 | 8 | 8 | 0 | 0 |
| Total | 100% | 100% | 100% | 100% |
| Average Number of Days per Year of Hired Labor per Acre | 97.04 | 62.30 | 32.48 | 36.76 |

In order to understand Table 6, it is necessary to recall that Table 5 indicated that adopters have increased their coffee acreage so that labor employed per farmer has increased in an absolute sense but declined per acre of coffee. Thus, the long run trend will be for lower demand for labor.

Did the introduction of new seed varieties increase coffee production and incomes? Yes, it did for 20 percent of the population, but what about the other 80 percent? If development is defined as improving the quality of life of the broad masses of the population, then is this the most effective way of obtaining development?

My answer is that the structural arrangements of Colombia, in general, and this community, in particular, do not allow the broad masses to participate in either new technological changes or in the benefits of those changes. Under these conditions, development will not occur until there is a change in these structural arrangements. In those areas where the broad masses may participate in the economy and polity, capital and technological inputs may be sufficient for development. Where these conditions do not exist, capital and technological inputs may actually worsen the gap between the haves and have-nots. Thus, technical assistance methodology must begin with determining the structural arrangements of the country under study.

V. TECHNICAL ASSISTANCE METHODOLOGY: AN INTEGRATED
SOCIAL SCIENCE APPROACH

Up to this section I have tried to stay within the disciplinary boundaries of sociology. However, I do not feel that the broad area of development and the role technical assistance plays can adequately be understood from a narrow disciplinary perspective. Many times the processes under study by sociologists are rooted in economic structures and, in turn, are institutionalized and defended by a State which represents these underlying economic interests. Thus, technical assistance methodology must draw upon the combined inputs of all the social sciences.

I do not pretend to develop an integrated social science approach to technical assistance methodology. However, I will indicate the sorts of questions that must be confronted prior to deciding what sorts of technical assistance should be provided. Before presenting these questions, let me return to Table 1 and the underlying assumptions of not just sociology but economics and political science as well. I maintain that the assumptions embodied in the equilibrium approach are not appropriate for most Third World countries; interests are incongruent; some social relations are exploitative; conflict is, albeit latent, omnipresent; the State is at times oppressive; and, classes do exist in the bodies of real groups with different social, economic and political interests. Let me add that under these conditions the mass media usually is controlled by the dominant class and, thus, is employed to assist in socializing

citizens into a relatively passive acceptance of the status quo as one's lot in life. Taking this viewpoint, the following questions need to be answered before any decisions are taken regarding the nature and type of technical assistance.

1. What is the nature of the economic order and, within it, the sphere of production of the society in question? For example, how does new technology affect the level of production? Is unemployment rising or declining? To what extent are the main changes generalized or localized?

2. What are the major classes and how are they located in the economy? What are the objective interests of the main classes and strata? For example, do the direct producers own or control the tools and other means of production? Does there exist an economic surplus of material goods over and above the subsistence requirements of the producers? Who has control of the surplus? How is it used and which classes benefit most directly from it?

3. Are class members aware of their objective position in the economic structure and the extent to which it determines their life chances?

4. What form does conflict take among the main classes? Within the classes?

5. Which parties are in power? What is their relationship to the respective classes? Who controls the military, the police, etc.?

6. What is the tendency toward concentration of resources? Who controls these resources? What proportion of these resources are controlled by international interests?

7. How do the external relations of a society affect its development?

After answering these questions, it is possible to decide on whether or not technical assistance, in the form of capital inputs and technology, would really assist the broad masses of the population. If resources are highly concentrated and the broad masses are blocked from participation in the political economy of the country, capital and technology will likely increase the concentration. If most of the commanding heights of the economy are foreign-controlled, these inputs may even increase capital flight unless the national laws prohibit it and these laws are enforced. If this is not the predominant set of structural arrangements, then capital and technology may be very appropriate.

The key point is that without prior study we cannot take for granted that equality and justice are the basic social goals of the society. I believe that most Third World societies do not present structural arrangements that will allow new income streams created by capital and technology to be accessible to the broad masses. If this is true, then technical assistance is probably best performed by establishing national centers of research relating to a clear understanding of what the current structural arrangements are and what groups they exploit. Only on the basis of such an understanding can **adequate** plans for change be developed.

In developing these understandings, techniques from all the social sciences may be utilized. However, the emphasis should be on qualitative as well as quantitative factors. In all instances such

research should be problem oriented and committed to the general notion of improving the life chances of the majority. We should accept Praxis insofar as it is understood that Praxis implies the examination of the moral and political implications of existing forms of social organization and not propagandizing.

What is being called for is a recasting of the various pieces of knowledge that we have concerning development into an applied, integrated approach. This process must begin with a definition of development that looks at societal goals and how we achieve them. Based on this definition, it is necessary to decide what key concepts must be incorporated into the model and how they are inter-related. In drawing upon previous studies we must determine what is significant which is, in part, determined by the definition of development and the initial conceptualization. However, as analysis proceeds this conceptualization may require modification. And finally, we must integrate these pieces of knowledge not only into a total picture of the development process but, at the same time, indicate at what level change may proceed. These, I believe, are the key problems we are facing and those which technical assistance must address.

Footnotes

1. There have been some notable exceptions in the field, A few have given primary attention to the consequences of technological change for social relations and structure. Some examples are Mumford (1934), Ogburn (1947) and Baron (1957).
2. I am perfectly aware that this use of technology is the same as Marx's concept of mode of production. I have used it in this fashion in order to emphasize the primacy of technology in shaping the main features of the mode of production.
3. There are over 2,000 studies concerning the diffusion of innovations so, at best, these 14 can only be considered illustrative and not necessarily representative. Fortunately Everett M. Rogers has provided a needed service by the Diffusion Document Center at Michigan State University.
4. My own interest in phenomenology was indicated by my dissertation research where I employed a phenomenological determinism model. However, it was rekindled by Charles Kley Meyer, a Ph.D in Development major at the University of Wisconsin. He is currently conducting his dissertation research in Peru concerning the phenomenological gap between change agent and highland peasants.

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