PN-ABD-019

The scarcity of development funds, combined with the magnitude of development needs, makes diffusion of innovations a crucial process for less developed countries. We reviewed the diffusion of innovation literature in an attempt to identify a general strategy for identifying diffusion that occurs after the introduction of an innovation. The existing literature provides little guidance for the central problem of where to look for diffusion. this article suggests possible solutions. Prior research has relied heavily on a single data-collection strategy: sample surveys. The article reviews advantages and disadvantages of alternative data-collection strategies.

ON EVALUATING DEVELOPMENT ASSISTANCE PROJECTS

Some Innovations

CAROL H. WEISS
Harvard University

THEODORE D. FULLER
Virginia Polytechnic Institute and State University

When evaluators examine the effects of development projects in less developed countries, their attention is riveted on the target site. They study the extent of adoption of the practices being introduced (e.g., irrigation, school curriculum), and the consequences of adoption for the people and communities involved. But development projects have larger goals than improving the welfare (income, health, education) of residents in the few communities to which help is being directly given. Inevitably, assistance agencies hope that the practices they intro-

---

AUTHORS' NOTE: *This research was supported in part by the U.S. Agency for International Development. We are grateful to Molly Hugeborck for her comments on an earlier draft of this article, and to Claire Starkey for research assistance.*

EVALUATION REVIEW, Vol. 7 No. 2, April 1983 175-190
© 1983 Sage Publications, Inc.
0193-841X/83/020175-17$1.95

duce into the target sites will be picked up by other communities as well. The expectation is that people elsewhere will somehow hear about the new practices and in some way incorporate them into their daily lives. Only if diffusion takes place can the development project be truly said to have succeeded.

Evaluators have generally not been concerned with the spread of program ideas and products. On occasion, they have noted in passing that neighboring villages or collateral organizations were picking up the new program in whole or in part. They have been particularly apt to make such observations if the other sites had originally been designated as control groups, which subsequently became "contaminated" by the spread of the innovative technology. In such cases, diffusion was a nuisance and a threat to their design, rather than a phenomenon of positive and substantive importance. By and large, however, they have neglected the issue.

If they are to attend to the spread of project technologies, whether physical or social, they need a new repertoire of methods. The most likely place to look for appropriate methods would seem to be in that large, heterogeneous field called "diffusion of innovations." Accordingly, we undertook a review of the literature on diffusion of innovations in order to locate—and import into evaluation—relevant concepts and methodological techniques. If evaluation researchers have the methodological wherewithal, they may be more receptive to tracing the diffusion of innovative practices beyond the focal sites targeted by developent assistance agencies.

DIFFUSION OF INNOVATIONS LITERATURE

There is not one literature in this field, but many. A large number of disciplines have contributed to the study of diffusion of innovations, including sociology (rural sociology, sociology of education, of health, of science, of knowledge), economics, anthropology, and psychology. Also involved have been science historians, scholars of science and society, scientists concerned with particular applications, applied researchers in marketing and advertising, scholars in the management field, and of course, specialists in development. "Technology transfer" is one of the several noms de plume by which the field is known.

Given our interest in applying the methodological knowledge of the several diffusion traditions to the evaluation of development programs,

we concentrated our review on studies done in developing countries. In developed countries, the technological and social infrastructure makes possible a variety of data-collection strategies—telephone interviews, mailed questionnaires, retrieval from compendia of published data, review of records and documents—techniques that are often less applicable in developing countries. Nevertheless, we also looked at a large number of U.S. studies to see if we could identify ingenious methods that might be suitable.

The questions we had in mind as we examined the hundreds of studies on diffusion were these:

(1) How have researchers from the different traditions studied the adoption of innovative practices and products? What have been their general approaches?
(2) Once researchers moved beyond studying adoption at an initial target site, how did they identify other locations as candidates for study? What information did they rely on to select further sites that were likely to have been influenced by innovation?
(3) How did they collect their data? What procedure and instruments did they use? Whom did they go to for information? What kinds of questions did they ask? Did they find unobtrusive measures to collect the requisite information without having to engage in original data collection?

The review of literature produced disappointingly little by way of guidance. Indeed, a number of researchers have expressed discontent with the direction that diffusion research has taken and the fruit it has produced. Warner (1974), viewing diffusion research primarily within economics, complains of conceptual fuzziness (e.g., the definitions of "innovation" and "diffusion"), and argues that economists have accepted too narrow a definition of diffusion research. Feller, viewing a range of disciplines, argues that theoretical development has been stunted within diffusion research: "The emergence of a dominant conceptual framework . . . produced a situation in which research became first too simple and then too simplistic" (1979: 299-300). Rogers, the senior author of a major review of diffusion research, more recently has stated that the approach taken by much of this research was "oversimplified," and contained questionable assumptions, "such as that the innovation was largely an invariant as it diffused and was adopted" (1978: 3). Few observers have made a stronger case for the need for new ideas in diffusion research than Whyte:

> In many cases it is less important to gather new data than to develop a new way of organizing and interpreting data. For example, few problems in sociology have received more research attention than the *diffusion of innovation*, yet, as I have

pointed out, researchers on changes in agriculture in developing countries have generally followed a conceptual scheme based on a misdiagnosis of the problem and have therefore provided findings that are worse than useless [1982: 10, emphasis in original].

Part of the difficulty stems from the extreme emphasis on the correlates of innovativeness tradition. This approach limits attention almost totally to the question of identifying attributes that distinguish adopters from nonadopters of a given innovation. It ignores such questions as the nature of the process by which innovations become diffused through space, and the structural determinants that condition the process. It thereby bypasses a question that is central to any attempt to estimate the extent to which a particular innovation has diffused: Where should one look for diffusion of innovation?

Most of the literature we located has little relevance for our purposes. Although the diffusion literature is vast, and scholars from a variety of disciplines have contributed to it, it displays the following characteristics:

(1) Much of it is concerned with theories and concepts, and does not deal with methods for measuring the extent of diffusion.

(2) Empirical studies have concentrated on the adoption of innovations at an *original target site* (e.g., Alers-Montalvo, 1957; Choudhary and Maharaja, 1966; Junghare and Prodipto, 1963; Opare, 1977). Much less frequent have been studies of diffusion to other sites (Fliegel and Kivlin, 1966, Ramachandran, 1975).

(3) When replication of innovations at secondary sites is the subject of investigation, there has usually been a *directed diffusion campaign* to encourage people at the sites to adopt the innovation (e.g., Brown and Leinck, 1972; Fairweather et al., 1974; Panse and Singh, 1966). Therefore, selection of *which* sites to study in order to detect spread has not been problematic; the researchers studied the sites exposed to the to the persuasion campaign. The research effort was very similar to studies of original adoption.

(4) In several other studies in which replication of an innovation was studied, the investigator worked from a known list of later adoptions. This is particularly true for organizational innovations in the United States (e.g., Yin, 1978, Rogers et al., 1979). A government agency or private group had been promoting the innovation, and the promoters kept track of adopters through visits, information from regional staff, periodic phone calls, and so on, in order to maintain an up-to-date list of users. Again, the researcher did not have to confront the problem of selecting likely secondary sites.

(5) The predominant mode of data collection has been the systematic population survey. Structured interviews have been conducted with samples of the population of interest to find out who adopted the innovation, when, and under what conditions. Sampling techniques have varied in their attention to randomness and representativeness, but sampling of some kind is common.

(6) In studies where the adopting unit is an organization rather than an individual, the usual source of data is one or more informants in the organization (e.g., Becker, 1970; Evans and Black, 1967).

(7) Very few studies have been concerned with comprehensive inquiry into the *full scope* of diffusion. Almost all of the studies that we examined focused on correlates of adopting behavior. They were directed at identifying conditions that were associated with the adoption of innovations, and therefore they provided almost no information about the efficacy of data-collection techniques for capturing the total extent of diffusion within a population.

Another theme that emerges from the literature is that innovations often undergo modification during the diffusion process. Rogers (1978), for example, has argued that "re-invention" is often central to the diffusion process. Innovations are changed in various ways during the process of adoption and implementation. We would suggest that two types of modification can usefully be distinguished. One has to do with taking the *processes* used in an innovative project and adapting them to another arena. Instead of adopting the new technology intact, people select a component process and use it in settings and for purposes different from those intended. For example, villagers who participated in structured decision-making procedures in a water project may adopt similar decision-making procedures in taking action on schools. Or people who became familiar with assembly-line techniques to produce water pumps may introduce assembly-line techniques into other production activities. A second type of diffusion takes a new *product* and puts it to uses other than those for which it was introduced. For example, villagers use a new stove, designed for food preparation, for the making of pottery. Oil drums, suitably modified, have been used to mix swine feed and to make windmills (Hammond, 1978).

We found little in the published literature about adaption of innovative processes or products or their diffusion to new uses. It seems to us important to become more sensitive to the diffusion of innovations to places and uses that were unanticipated.

The work on the utilization of social science research and evaluation for policy making has some relevance. One of the significant findings by Weiss (1981), Caplan et al. (1975), Patton (1978), and others is that the generalizations and *ideas* from research influence policy much more often than do specific empirical findings from particular studies. This conclusion to some extent parallels Rogers's recent emphasis on the re-invention of innovations and the ideas of modification and adaptation.

SOME MODEST PROPOSALS

Because the literature we surveyed was dominated by studies of original adoption and, to a lesser extent, replication, and because the predominant modes of data collection were sample surveys and interviews with informants, we sought out any ideas that might extend the repertoire. We were particularly interested in (1) techniques for *identifying locations* to which innovative technologies or organizational arrangements might have spread, and (2) *ingenious means* for collecting data about diffusion. These are some of the ideas that we found provocative.

Physical tracers. The ideal mode of detecting spread would be akin to radioactive isotopes. The medical researcher introduces radioactive tracers into the human system that are then observable by radiation detectors. In nuclear weapons supervision, sophisticated equipment monitors radiation levels in order to detect authorized and unauthorized production and testing. During the invasion of Mediterranean fruit flies, their "diffusion" was monitored by medfly traps set at widely dispersed locations. Such procedures do not have obvious social analogues, but for some kinds of innovations under some conditions, ingenuity might develop parallel methods.

Communication trails. In order to hypothesize which additional sites are likely to learn/imitate/implement the local innovation, it is possible to chart the "communication trail" of persons involved with the innovation at the original site. Geographers have developed methods to measure the "mean information field" of people, that is, the distance or area within which inhabitants are in contact or receive information (Marble and Nystuen, 1963; Ramachandian, 1975). They chart the distance and direction that villagers take to market, for example, or the places at which fishermen put in to port. It seems possible that diffusion would follow inhabitants' communication trails.

Family contacts are another form of communication. Understanding kinship patterns and patterns of intrafamilial visiting would lead to hypotheses about diffusion paths. Of particular interest might be migration patterns to urban centers or construction sites, and urban-to-rural communication among members of extended families.

Some people in every society move from place to place, taking information with them. Itinerant craftsmen, for example, may be a channel for diffusion or, in some societies, Buddhist monks or other clergymen. In highly developed technological societies, innovations often travel when professionals leave one job (e.g., in aerospace firms or NASA) and move to other industries. Similarly, in developing societies, workers may change locations and take along their recent knowledge of innovative projects or procedures.

Sometimes, communication trails are highly structured. Brown and Letnek (1972) made use of communication trails when they studied the diffusion of commercial dairy farming along the routes of raw milk buyers. Similarly, extension agents from the government agricultural ministry or the departments of education or health make scheduled visits to bring modern practices to outlying sites. Their routes provide hypotheses about the paths of diffusion. The introduction of radios, newspapers, and other print media to villages may be channels for diffusion, and thus help to identify sites for study of program spread.

Attendance at demonstrations, "fairs." People can learn about innovative projects by visiting the original demonstration site. If records are kept of visitors who come to get information about the project, it may be possible to identify a cluster of visitors from a particular locality—which then becomes a logical site for investigation. Similarly, attendance at fairs or other events at which information is dispensed may suggested interest. Records of the persons who request further information may help pinpoint sites for study.

Informants and snowball samples. Key informants are always a good source of information about diffusion. Once an informed source is located, he or she can be asked to name other people who know about diffusion of the innovation. Snowballing from one informant to the next extends the network of information. In organizations, people in one organization can often name other organizations that have heard about, considered adoption of, or implemented the innovation.

Parallel organizations. If the innovative project is a structural/institutional arrangement or practice, the obvious sites for spread are similar organizations. Thus if the innovation is a reorganization in a port authority, spread can be investigated in other port authorities

Back-tracing from chance observations. Often the first indication of diffusion comes to notice by chance. Someone stumbles unintentionally across an application of the innovation. In such cases, it should be

possible to inquire how the new user happened to hear about the innovation: the source of information and the channels of communication. This is true not only in cases of direct replication, but also when modifications have been made in the original project.

Once such information is collected, it becomes possible to look systematically at *other* users of the same channels of communication and other persons in contact with the same source. By getting data from such people, it should be possible to identify further sites to which the innovation has carried.

Theory and speculation. Not least is the utility of theory. Scholars have developed credible theories about the pathways of diffusion for different types of innovations, and these can be exploited. Economists, for example, suggest that diffusion of industrial process innovations depends on such variables as the profitability of the innovation for a firm, its slack resources, size, market share, and the like. Sociological research has identified structural conditions under which diffusion is more or less likely to occur, including the costs and risks to adopters, the existence of appropriate social institutions, and the nature of the benefits that are realized. Social-psychological research has developed profiles of people in different cultures who are likely to be willing to adopt innovative technologies and ideas. Geographers have developed empirically based theories about the spatial spread of innovations.

Informed speculation can also be a source. People who are knowledgeable about a sector and a region may be able to identify the most likely sites to which innovation will travel.

Summary. These techniques for identifying locations to which innovations may have spread are no doubt of differential efficacy, and they require different investments of time, money, and expertise to employ. No firm evidence is available for ranking them in the order of their plausibility for evaluation purposes (i.e., the likelihood that they will yield comprehensive and valid information) or their cost-effectiveness. The diversity of conditions in developing countries—divergences in social, economic, cultural, political, ethnic, ecological, and historical environments and differences in types of innovative projects—makes any attempt to rank their merit an exercise in speciousness.

All we can offer on this score are a few general principles and some opinions. First, it seems obvious that concern about the diffusion of innovative projects should begin at the time of project development and not be postponed until postproject evaluation. During the initial planning stages, planners should take account of the potential for diffusion, including careful analysis of the suitability of the innovation to local and regional environmental conditions; costs in terms of capital investment, maintenance, labor, and risks; the distribution of costs (who pays) and of benefits (who profits); what kinds of benefits are likely to accrue (e.g., income, security, social standing, access to service or to consumer goods) and to whom they accrue (e.g., the lowest-income groups, rural areas, women); the infrastructure needed to adopt and maintain the innovation (e.g., credit, roads, social organization); political conditions and government policies that affect the attractiveness of adoption/maintenance of the innovation. When attention to such factors is built into project planning, it becomes simpler to map the diffusion of the innovation. More important, it increases the likelihood of there *being* diffusion to map. Planners have a better fix on which groups are *structurally* equipped, with resources and motivation, to adopt or adapt the innovation.

Second, as a pragmatic rule-of-thumb, it seems sensible to look first at adoption of the project at the original site. If the extent of adoption is limited there, despite the inflow of outside resources and expertise, then it may not be worth much effort to search for diffusion elsewhere. Diffusion might indeed occur, but the chances seem too slim to warrant extended search. Similarly, if evaluation of the project at the original site detects few benefits for adopters, search for adoption elsewhere will probably be unproductive. The time and money that search requires might be better spent in increasing the effectiveness of the innovation for its target population.

In terms of feasibility, the search techniques that we have listed can be roughly ordered in terms of the level of time and effort that they require. The use of informants is the easiest and least expensive search strategy. Although informants may not always be fully knowledgeable, and although they are often biased by their own interests in the situation and their own concepts and explanatory theories about social change, talking to a number of people from different groups and in different positions can provide important leads.

Reliance on theory and informed speculation can be a useful procedure, particularly if the theory and/or speculation is grounded in previous empirical inquiry. Again, possibilities for bias and distortion exist,

but this is also a relatively inexpensive way to start. When projects have been planned on clear theoretical premises, the initial evaluation provides an immediate check on many of the assumptions involved.

In those cases where parallel organizations are potential adopters, listing of such organizations seems feasible. In cases where records have been maintained on visitors to demonstration sites or requestors of information, use of the records is a relatively painless method for beginning a search. Communication trails and back-tracing require more time and effort. They may be a resort when other indications suggest that diffusion is probable and few other pointers to its location exist.

MEANS FOR COLLECTING DATA

Although the bulk of diffusion research relied on survey research, in all we found six methods of data collection in the literature: sample surveys, informant interviewing, ethnography, records/documents, observation/visual inspection, and aggregate statistics.

Sample surveys. Sample surveys are a versatile means for capturing a wide range of attitudinal and behavioral data. But surveys require considerable skill and time to develop, a trained field staff to administer, adequate knowledge and facilities for data analysis, and scrupulous attention to proper procedures to avoid bias in sampling, interviewing, and analysis. Unless surveys are informed by sophisticated understanding of the situation and appropriate theoretical assumptions, they can produce more paper than insight. Unless they are supervised by well-trained people, long periods of time may elapse before data become available.

Informant interviewing. Asking knowledgeable people in the local area can provide considerable information. Asking a variety of people — people of different class, caste, gender, cultural, economic, religious, and positional characteristics — can provide a cross-check on bias. Reviews of the pitfalls of informant interviewing and means of minimizing such biases are discussed by Chambers (1980) and Longhurst (1981).

Ethnography. Trained observers who live in an area for an extended period can learn a great deal not only about adoption of innovations but

about the particular circumstances that foster or inhibit adoption. By immersing themselves in the local culture, they learn about communication patterns, the flow of influence, the values of particular subgroups, the subtle influences of status and fear, responses to outsiders — the mutual adaptation of indigenous culture and imported innovation.

Although ethnography, like sample survey research, is a very time-consuming endeavor, libraries of universities or research centers may be able to identify anthropological studies that have been done in a region. With luck, some information of relevance to diffusion will surface. Even without directly relevant information, such studies may be helpful in interpreting information collected by other means.

Records/documents. Although records, documents, and previously collected data have been successfully used in a number of studies of diffusion (e.g., Ching-Ching et al., 1974; U.S. Agency for International Development, 1980), such sources probably represent the most under-exploited source of information. It is obviously impossible to specify which records will be fruitful sources for the many different kinds of innovative projects around the world, but it is worth calling attention to the vast caches of documents and administrative records that clutter local and national offices around the world. Of course, records are subject to the common maladies of incompleteness, careless entry, and the biases of recordkeepers in deciding what is deemed worthy of recording. Nevertheless, they often contain unsuspected gems of information. Lists of recipients of staff services, minutes of local meetings, expenditures for goods and services, intentions of sponsoring agencies — all may be retrieved from old file drawers to illuminate the dynamics of innovation.

Observation/visual inspection. Adoption of certain kinds of innovation is visible to an observer (e.g., Agnew and Hsu, 1960). For example, roads, deep wells, and new health clinics can be located. Aerial photography can map them; a vigilant visitor can examine not only their outward form, but the state of repair, the level of use, the nature of surrounding activity.

Particularly for organizational innovations, site visits can collect important information about implementation. Observation of classrooms may reveal whether a new curriculum is actually being implemented. Visits to government bureaus may show whether new equipment is in use or lying idle.

Aggregate data. For some types of innovations, aggregate statistics provide a measure both of the effectiveness of adoption (evaluation of the project) and of diffusion of the innovation. For family planning projects, for example, the birth rate of community (after an appropriate time interval) gives a rough indication of how successfully inhabitants are using the contraceptive methods. An examination of similar statistics in other communities to which the innovation is hypothesized to have diffused will *suggest* whether residents in those sites have begun using contraception. Over a sufficient time period, birth statistics can provide indications of the temporal and spatial distribution of the innovation.

For innovations involving hybrid seed, fertilizer, irrigation, and/or related practices that are expected to increase crop yields, statistics on aggregate yield can provide similar indicators. They suggest (without, of course, "proving") when and where the innovative practices have been implemented.

The "pinch point." In order to save the time, money, and effort that large-scale surveys and searches entail, it is useful to find a "pinch point" through which the relevant information must travel. For example, if all irrigation pumps have to be ordered from a single supplier, then the supplier's records will show the diffusion of the pumps.

One of the classic studies in diffusion used the pinch point technique. Coleman et al. (1966) wanted to learn which physicians in a community adopted a new drug, when they adopted it, and the characteristics that distinguished early from late adopters. Instead of undertaking a survey of physicians and relying on their (often faulty) memories about when they first prescribed the drug, they turned to pharmacists' records. From that source (through which all prescriptions must pass), they recorded the names of adopters, date of first adoption, and the frequency with which they prescribed the drug. The method was less time-consuming than a survey and provided more reliable information. They also collected background about the physicians from published medical directories.

Summary. No one data-collection method is ideal for all seasons. Each has advantages and (alas) disadvantages. Whether advantages outweigh disadvantages depends on the focal circumstances and the type of innovation being studied.

Relevant aggregate statistics, if available, can be a useful source of information. Results can easily be compared for different areas, and the time and skill required to utilize the information are relatively low.

Records and documents have many of the same advantages as aggregate statistics, but the time required to use them depends on their type and availability. If they are decentralized, travel to more than one site may be necessary, and if they are not summarized, it may be necessary to make extensive tabulations from the data.

Informant interviews take little time and money. While substantial skills are required to select informants from different structural positions in the society and to obtain good information from them, development agencies often have the requisite skills available. Informants can often provide important leads about *where* to look for diffusion, and they can suggest *why* an innovation has spread or failed to spread. Informant interviews do have several drawbacks. The validity of the data from informant interviews is highly variable, depending on the biases, knowledgeability, and objectivity of the informants; the data generally lack precision; and without additional supporting data, it may be difficult to compare results for different areas. Informants often use different standards (for example, in judging whether there has been significant diffusion) and have different referents for their observations.

Direct observation and visual inspection offer a number of obvious advantages. They reduce the subjectivity of reports, and they provide replicable and convincing evidence of the extent of project diffusion. If the area to be inspected is large, locating and visiting sites will require considerable effort, and some sites are likely to be missed. If site inspection can be combined with other activities, costs can be kept down and perhaps coverage can be improved.

The principal advantages of sample surveys are that they can produce quantitative, valid, precise measures of items of interest, such as the percentage of people adopting a particular innovation. They can also explore people's reasons for their actions and their perceptions of the social surroundings. If similar surveys have been conducted in different areas, comparison of results is relatively straightforward. If appropriate explanatory variables have been included, factors associated with differential diffusion can be identified.

However, surveys take skill, technical resources, money, and time. They require scrupulous attention to question wording, pretesting, interviewer training, and sampling, and some populations may be too suspicious or uncooperative to provide much significant data. Done poorly, surveys may be more misleading than illuminating. Done without the resources for proper analysis, they errate vast stacks of unexamined paper. One of the saddest phenomena in many development projects is the vast effort put into survey development and data collection, and the puny analysis that emerges.

Qualitative, process-oriented, ethnographic research requires a highly trained person and time. Because of the time involved, ethnographies pertaining to different areas will generally be conducted by different people. Whether or not they are comparable depends on exactly which factors each investigator chose to concentrate on. The strength of the ethnographic approach is the rich understanding it yields of the dynamics of behavior within the given social and cultural system. But development projects rarely have the opportunity to bring in an anthropologically trained person. If, fortuitously, a faculty member at a local university is doing such research and is willing to accommodate requests for information, or if students (under faculty supervision) are seeking opportunities to do research, that is a stroke of great good luck. Some attempts might be made to coax such opportunities into being.

In general, trade-off is likely to be the name of the game. Several data-collection techniques can be tried in the hope that their weaknesses offset each other. Most important, when any method is employed, the user should be fully aware of the potential biases and inadequacies that attend it—and take all practicable steps to overcome them.

CONCLUSION

Diffusion of innovation is essential to the success of development programs, because neither governments of less developed countries nor international development agencies have enough money to provide the necessary innovations to every region, community, and household. We examined the large diffusion of innovations literature in an attempt to identify strategies for studying the extent of diffusion that follows the introduction of a development project, and found the literature inadequate to address the question. Since the literature provides few strategies to identify locations to which innovations have diffused, we proposed several *search* strategies; these need to be field tested. Since prior research has relied heavily on one data-collection strategy sample surveys—and since that strategy is both costly and limited, we encouraged the use of alternative data-collection strategies. We discussed advantages and shortcomings of each.

Search strategies find the locations in which measurements will be made. But there is likely to be a cycling back and forth between search and measurement. Search leads researchers to sites where they gather data on the extent of diffusion, and there they can continue the search to identify additional sites, additional communication trails, or additional information about records available elsewhere. To identify adaptations

of innovations (use of project processes in new domains and use of innovative products for different purposes) requires flexible search and data-collection techniques.

Determining the full extent of diffusion is an important component of evaluating the impact of development projects. But over and above the methodological implications, this discussion highlights the importance of building a potential for diffusion into the planning of development projects from the outset. It is one thing to try retrospectively to capture the full range of project spread, but it is a chancy business both methodologically and substantively. Much more satisfactory is to take account of the cultural, economic, social, and political factors that enhance the pull of innovative technologies at the planning stage, and design projects in ways that make them attractive to local people in and beyond the target area. When this is well and sensitively done, the routes that innovations travel, and the benefits that attend their travel, will leave clear markings on the landscape.

REFERENCES

AGNEW, P. C. and F.L.K. HSU (1960) "Introducing change in two mental hospitals." Human Organization 19: 195-198.

ALERS-MONTALVO, M. (1957) "Cultural change in a Costa Rican village." Human Organization 15, 4: 2-7.

BECKER, M. (1970) "Socioeconomic location and innovations: reformulation and extension of the diffusion model." Amer. Soc. Rev. 35: 267-282.

BROWN, L. A. and B. LEINEK (1972) "Innovation diffusion in a developing economy: a mesoscale view." Economic Development and Cultural Change 21: 274-292.

CAPLAN, N., A. MORRISON, and R. J. STAMBAUGH (1975) The Use of Social Science Knowledge in Policy Decisions at the National Level: A Report to Respondents. Institute for Social Research, University of Michigan, Ann Arbor.

CHAMBERS, R. (1980) "Rapid rural appraisal: rationale and repertoire." Discussion paper 155, Institute of Development Studies, Mysore, India.

CHING-CHING, E., J. J. LIU, and M. Y. LIN (1974) "Family planning telephone services in two Asian cities." Studies in Family Planning 5, 4: 111-114.

CHOUDHARY, K. M. and M. MAHARAJA (1966) "Acceptance of improved practices and their diffusion among wheat-growers in the Pali District of Rajasthan." Indian J. of Agricultural Economics 2,1: 161-165.

COLEMAN, J., E. KATZ, and H. MENZEL (1966) Medical Innovation: A Diffusion Study. New York: Bobbs-Merrill.

DUBEY, D. C. and H. M. CHOUDIN (1967), "Communication and diffusion of the IUCD: a case study in urban India." Demography 4, 2: 601-614.

EVANS, W. M. and G. BLACK (1967) "Innovations in business organizations." J. of Business 40: 519-530.

FAIRWEATHER, G. W., D. H. SANDERS, and L. G. TORNATZKY (1974) Creating Change in Mental Health Organizations. New York: Pergamon.

FELLER, I. (1979) "Three coigns of diffusion research." Knowledge. 1, 2:293-312.

FLIEGEL, F. C. and J. E. KIVLIN (1966) "Attributes of innovations as factors in diffusion. Amer. J. of Sociology 72: 235-248.

HAMMOND, R. W. (1978). "The oil drum: humble appropriate technology building block." Pictorial Monograph 3, Engineering Experiment Station, Georgia Institute of Technology.

JUNGHARE, Y. N. and R. PRODIPTO (1963) "The relation of health practice innovations to social background characteristics and attitudes." Rural Sociology 28, 4: 394-400.

LONGHURST, R. (1981) Rapid Rural Appraisal: Social Structure and Rural Economy. Institute of Development Studies Bull. 12, 4 (special issue): 1-54.

MARBLE, D. F. and J. D. NYSTUEN (1963) "An approach to the direct measurement of community mean information field." Papers and Proceedings of the Regional Sci. Assn. 2: 99-109.

OPARE, K. D. (1977) "The role of agricultural extension in the adoption of innovation by cocoa growers in Ghana." Rural Sociology 42 (Spring): 72-87.

PANSE, V. G. and D. SINGH (1966) "Promotion and assessment of technological change in Indian agriculture." Indian J. of Agricultural Economics 21, 1: 121-131.

PATTON, M. Q. (1978) Utilization-Focused Evaluation. Beverly Hills, CA: Sage.

RAMACHANDIAN, R. (1975), Spatial Diffusion of Innovation in Rural India. Mysore, India: Institute of Development Studies, University of Mysore.

ROGERS, E. (1978) "Re-invention during the innovation process," pp. 1-18 in M. Radnor, I. Feller, and E. Rogers (eds.) The Diffusion of Innovations: An Assessment. Evansville, IL: Northwestern Univ. Press.

K. P. MAGILL, and R. E. RICE (1979) The Innovation Process for Dial-A-Ride. Stanford, CA: Institute for Communication Research, Stanford University.

U.S. Agency for International Development (1980) Kitale Maize: The Limits of Success. Washington, DC: U.S. Agency for International Development.

WARNER, K. E. (1974), "The need for some innovative concepts of innovation: an examination of research on the diffusion of innovations." Policy Sciences 5: 584-451.

WEISS, C. (1981) "Measuring the use of evaluation," in J. A. Ciarlo (ed.) Utilizing Evaluation: Concepts and Measurement Techniques. Beverly Hills, CA: Sage.

WHYTE, W. F. (1982) "Social inventions for solving human problems." Amer. Soc. Rev. 47: 1-13.

YIN, R. (1978) Changing Urban Bureaucracies: How New Practices Become Routinized. Santa Monica, CA: Rand Corporation.

Carol H. Weiss is Senior Lecturer at the Harvard Graduate School of Education and the winner of the Evaluation Research Society's 1980 Myrdal Award for Science. She is a Fellow of the American Association for the Advancement of Science and President-Elect of the Policy Studies Organization.

Theodore D. Fuller is Assistant Professor of Sociology at Virginia Polytechnic Institute and State University. He is spending the current year at the Social Science Research Center at Khon Kaen University in Thailand.