TECHNOLOGY WITHOUT LITERACY:

AGRARIAN INNOVATION IN RURAL HAITI

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Introduction

This paper, dealing with the diffusion of technologically innovative tree planting strategies among the nonliterate population of rural Haiti, may seem to differ in its focus from the other papers in this volume, concerned as they are with the role of technological literacy.   But the disparity is only apparent; there is a unifying underlying issue: technological diffusion. Many of those writing about technological literacy are concerned with overcoming local barriers to the diffusion of innovative, appropriate technologies. To that agenda the lessons learned in rural Haiti -- lessons about trees learned by Haitian peasants, and lessons about technological diffusion learned by program planners -- are fully germane.

For my point will be that it is not the literacy or illiteracy of a population that need be the principal determinant of the rapidity of technological diffusion, but rather the manner in which outreach agents are able to reconceptualize, modify, and present the targeted technology to make it mesh with the preexisting economic, social, and personal agendas of the human beings in that population. Where this mesh is achieved programmatically, diffusion will occur despite illiteracy. In contrast, where this pragmatic mesh between technology and local life is not achieved, even a literate population presented with well written materials will probably reject the technology.

I will argue even more explicitly that this mesh can be achieved through the application to program design of insights gleaned from anthropological fieldwork. In many cases indifference toward or rejection of the technology by a population is due less to technological issues per se than to accessibility, benefit-flow, institutional, or motivational factors whose identification is facilitated by anthropological rather than purely technological research. These abstract propositions about the potential untility of anthropology will be illustrated by a specific case study in which anthropological input in fact led to acceleraied diffusion of tree planting among Haitian farmers.

The removal of Haiti's tree cover is now virtually complete. Both agrarian needs for land and the income-generating potential of charcoal have motivated peasants to cut trees. Peasants are aware of the deleterious long range ecological impacts of this behavior. But the ecological value of forest cover for soil conservation and moisture retention purposes is less urgent in the calcuations of impoverished cultivators than the current economic value of the tree in the local charcoal and lumber markets.

Caribbean governments have long recognized the problem and a standard response has been to stress the need for education, to urge the instilling of a "conservation ethic" among villagers. When educated ɼ to the ecological utility of trees, villagers will presumably leave nature's trees alone, and will even plant new forests, with external f---ling and with local government support and supervision. In the context of such a

model, silvicultural and educational experts will be brought in, slide shows and radio messages will be prepared, nurseries will be planted, and campaigns will be enthusiastically launched.

Rather than a burst of tree planting by ecologically awakened villagers, a more common result of such undertakings has been the death of tens of thousands of unwanted seedlings in nurseries that have been foolishly launched in the complete absence of any real local demand for the trees. Faced with such villager recalcitrance, agents begin reminding villagers of the government's right to command obedience in such matters of high national interest, and the secret war begins. Cultivators need land for food and cash crops. In addition governmental agents frequently insist that the trees, once planted, continue to belong to the government. Reluctant to cover their land with government-owned vegetation, villagers do everything possible either to avoid planting the seedlings or to have their livestock "accidentally" remove them once planted. It is clear that the barriers to tree diffusion had little to do with the illiteracy of the intended "beneficiaries."

Redefining the Problem in Anthropological Terms.

The Agroforestry Outreach Project (AOP) was designed as an anthropological alternative to this governmental approach. It began in 1982 and has continued to function effectively despite the political turmoil in contemporary Haiti. My own input came at several phases. Before being invited by USAID to deal with the tree issue, I had already done several years of village fieldwork into Haitian peasant land tenure and agrarian technology (Murray 1977; 1978a; 1978b). Though this basic research had been done without a specific intent to apply findings to program design, USAID planners found the findings of potential relevance for their own programs.

This led to an invitation by USAID to do an evaluation of some 20 conservation projects. Two other anthropologists were also invited to conduct program-relevant research into tree planting (Conway, 1979; Smucker, 1981). The results indicated that most tree planting efforts targeted to rural Haiti had been rejected by the rural population. On the basis of my research, I hypothesized that the rejection had been due neither to technical nor "cultural" factors at the local level but to faulty problem definition and program planning at the institutional level.

Problem definition issues entailed a basic paradigm shift at the theoretical level. I proposed to planners that the theme of "conservation", though popular in developmental circles, was an unrealistic approach to the tree issue in the Caribbean. Even beginning anthropology students were aware that in ancient times *Homo sapiens* still depended on hunted protein and wild vegetation. We ran into a resource depletion crisis some 10,000 years ago: we engaged in overkill of the animals and overharvesting of the wild vegetation. One can imagine that even back then there were voices crying for conservation. But our solution as a species was not that of conserving. What we did rather was to move into a domesticated mode of food production. The wild animals were converted into domesticated herds; and people began planting crops rather than foraging wild vegetation.

Applying this "domestication model" to the Caribbean tree situation, I hypothesized that a redefinition of the "tree problem" was absolutely necessary. The task is not to coax an "irrational" population into protecting their environment by the cessation of tree cutting, but rather to create the conditions whereby rural cultivators will begin harvesting as a crop the wood which up until now they have been foraging from nature. The emphasis of the conservation paradigm is toward the stoppage of tree cutting behavior. The emphasis of a domestication paradigm, in contrast, is to promote tree planting with a specific view to increasing the cutting of trees and the returns derived therefrom. Stated somewhat differently, the tree should be presented to peasants not as an ecological "patrimony" to be perennially protected, but rather as a new income generating cash crop that farmers

could plant and harvest (Murray 1979). That is, a basic paradigm shift seemed to be called for in the manner in which planners were conceptualizing the "tree problem."

Tripartite Planning Model: From Theory to Program Design.

When these abstract suggestions were accepted in principal, I was then invited to propose a concrete model of project design and outreach. Much USAID program planning focused on technical variables, the assumption being that an ecologically sound tree planting model would diffuse by itself. I argued instead for a tripartite planning model which gave simultaneous attention to three essential project subsystems: a technical subsystem, a benefit-flow subsystem, and an institutional outreach subsystem. Planning had to concern itself with all three. Defects in one would sabotage an entire project.

Designing the technological sybsystem.

Anthropological insights into local life can be used not only to adapt technological messages directed outward toward the client population. Of even greater preliminary importance are the insights that lead to modifications of the technological packages themselves. The tree planting technology required under a domestication model is quite different from that which would be appropriate under a traditional conservation model.

Some program planners try to emphasize fruit trees when dealing with smallholding cultivators with limited landholdings. Because, however, the income generating potential of fruit is much less than that of wood, AOP emphasized the latter. Furthermore the policy of emphasizing the slow growing precious hardwoods so popular with many tree lovers makes less sense in the rural Caribbean than a policy focused on fast-growing trees. Smallholding cultivators necessarily demand quicker returns and cannot afford to wait 40 or even 15 years for slow-growing trees. AOP therefore emphasized fast growing tropical hardwood trees which could produce harvestable trees in four or five years and whose wood could be sold locally for charcoal or lumber. The species emphasized in the earlier phases of the project were Leucaena leucocephala, Cassia siamea, Azadirachta indica, Casuarina equisetifolia, and Eucalyptus camaldulensis. For higher altitude regions, Pinus occidentalis was used.

And finally, as a critical dimension of the technological subsystem was the use of intercropping of trees with food crops to permit land scarce farmers to plant trees in a manner which minimized interference with their food growing activities. Intercropping and border planting strategies were proposed therefore for physically combining tres and crops. Such a strategy differs radically from a traditional reforestation model and falls into the category of what is referred to as agroforestry. Summing up the preceding, the main contribution of anthropology was in the identification of the modifications necessary in the technology itself to make it mesh with the preexisting economic system of the population that was presumably to use the technology.

Designing the benefit-flow subsystem.

Well designed technological packages will sit unused in laboratories or nurseries unless simultaneous planning energy is allocated to the designing of benefit-flow systems. By this I am referring to the embedding of the technological package in ownership and usufruct structures that leave no ambiguity as to the identity of the eventual beneficiaries. The traditional rejection by rural Caribbean populations of tree planting projects is due neither to their hostility to the tree nor to their ignorance of the "value of trees." They know perfectly well that trees protect and restore the soil and that wood is an extremely valuable commodity. Their rejection stems rather from their well founded fears that the real benefits -- i.e. not the far off ecological improvements, but the money to be made from the harvesting of the wood -- will accrue to other social groups. Most reforestation projects make the government the owner of the trees or leave ownership of the planted trees

ambiguous. Many projects which make participating farmers the owners of the trees will follow up with the chilling warning, however, that they are not allowed to cut "their" trees, a most strange form of ownership indeed. In short, no matter how ecologically and technically sound the selection of tree species, no rational farmer will cover any of his land with vegetation for whose harvest he could end up in jail.

In view of these considerations I recommended the following measures to activate a benefit-flow system by which there would be an unambiguous flow of benefits directly to the participating farmers. I first urged that the project allocate several hundred seedlings free of charge to each farmer who wished to participate. In contrast to most other Haitian tree planting projects, however, there would be absolutely no wages paid for the planting of trees. Furthermore the farmers would be the sole owners of the trees which they planted on their land. And above all they would be able to harvest and sell the wood from their trees without asking project permission.

Stating this somewhat differently, the project addressed the benefit-flow issue by embedding the tree in the same type of private ownership and usufruct structure that governs the planting and marketing of other crops in the farmers' agrarian inventory. We vigorously rejected the misguided attempts of many other projects to make the trees government property or community property. Farmers will not use a new technology unless they are convinced, first, that the new technology will yield higher returns and, secondly, that they, not somebody else, will be the beneficiary of these increased returns. This is, of course, merely common sense which requires no Ph.D. in developmental planning. That these common sense principles were viewed by some as revolutionary breakthroughs in developmental planning merely symbolizes the irrational character of much of what goes on behind closed office doors.

Designing an institutional outreach strategy

Even when the first two design problems -- technology and benefit-flow -- have been adequately addressed, a technology transfer project has one more dangerous chasm to cross. A well designed technology embedded in positive benefit-flow channels will still be to no avail if the funds and implementing authority of the project are entrusted to incompetent or predatory institutions. The traditional practice of turning over tree planting funds to Duvalier's government for implementation would have guaranteed beforehand the failure of the project. Though the predatory skills and mismanagement achievements of the Duvalierist regime had achieved world renown, managerial mediocrity seems to be characteristic of governmentally mediated projects around the world.

To deal with this issue I recommended a non-governmental implementation mode. Though space restrictions prevent details here, interested readers may consult Murray 1986. A two tiered non-governmental resource-channeling structure was created, consisting of a centrally funded office in the capital city which entered into contractual relationships with Private Voluntary Organizations (PVO) throughout Haiti. These local grassroots organizations were the direct link with potential village tree planters. The conditions of participation in the project were explained and the PVOs drew up lists of interested farmers. The seedlings were produced and delivered regionally by the Project. Individual participants were responsible for the final transportation to the hillsides.

Project Results

The initial project goal had been to plant three million trees on the land of some six thousand Haitian villagers over the four year life of the project. Given the traditional antipathy of the Haitian peasants, if not toward trees, at least toward tree planting projects, this goal seemed quite high. But it was forced on the project by an economist examining projected internal rates of return to project funds. However the anthropological design principles that had been incorporated into the project touched an economic nerve in rural Haiti. When learning that they, not the government, would have ownership rights over the

trees, tens of thousands of peasant cultivators all over Haiti lined up for the trees. By the end of the fourth year, the project had reached more than 80,000 rural families who had planted more than twenty million trees on their land.

As of this date numerous formal evaluations have been ca. ¬ied out (Balzano 1986; Buffum and Buffum 1985; Conway 1986; Grosenick 1985; McGowan 1986). As with all projects there have been snags and shortcomings. But the success enjoyed by the project in reaching -- not only physically but also motivationally -- an unprecedented number of Haitian farmers has led many observers to consider it a breakthrough.

Conclusions

What has been presented in this paper is an explicit attempt to facilitate the emergence of a modified land use technology. If one had to select three characteristics of a successful technology diffusion project on the basis of the experiences learned here, the following might be the most important.

Evolutionary. It would be based on evolutionary principles. That is, it would assume a preexisting technological system already in use among the intended user population. The parameters of the preexisting system create evolutionary "windows of opportunity" and evolutionary constraints. The new technology should be examined item by item in the light of the preexisting technical system in use among the future users.

Sensitive to user agendas. Tree project designers are often fervently dedicated to ecological agendas. Caribbean users are more concerned with short-term micro-economic agendas. The designers of the new technologies have to have the anthropological capacity to envision themselves in the life-circumstances of the intended users. This may entail certain technical sacrifices -- e.g. bench terraces might have been a better soil conservation device than wood trees -- but the results will be a much more rap-d spread of the technology. The resulting project will be a compromise between the agendas of the users and the agendas of those introducing the technology. In that light it is useful to note that the key information on whose transmission the success of the project depended was not the (fairly simple) technical information about how to plant and care for the trees. What excited the farmers and motivated them to participate in numbers far exceeding our earlier expectations was the critical legal information that they, not the government or the project, were the owners of the trees, and the economic information about how much income a farmer could expect from planting several hundred of these trees.

Depoliticized. The institutional delivery channels should be chosen on the basis of their ability to carry out project objectives. This common-sense observation is often ignored in those technology-transfer projects that occur as part of "foreign aid". Prevailing institutional custom assigns the bulk of "development funds" to host-country governmental agencies, a custom that has arisen more out of political expediency than out of any positive track record which these institutions have developed in terms of effectively serving their client populations. In this paper I have explored the op `on of non-governmental resource channeling mechanisms that produced results astronomically superior to those that would have been achieved by any governmental institution in the Haiti of the old regime.

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