CHAPTER SEVEN

TECHNICAL VARIABLES

There are a series of important technical decisions to be made in the course of any reforestation or soil conservation project. Even assuming the presence of a viable, profit-generating objective, improper choices on these decisions could hamper the success of the project. As will be seen below, however, the deciding factor--even on a technical choice--may be a non-technical consideration. For example, the choice of the spacing used between trees may hinge less on the particular growth needs of the trees than on the need to provide the cultivator sufficient space to continue grazing his animals. The present section of the report will deal with factors such as these.

7.1 Reforestation vs. the Use of Structures

If the prime consideration in a project is the most effective way of halting erosion, then most projects will undoubtedly opt for a combination of tree planting techniques and terrace or wall building techniques. Paradoxically, however, in the case of erosion-control projects among small-growing cultivators, the choice of emphasis or combination may be determined less by the erosion control efficiency of the particular measure than by the ability of the measure to contribute to the profit making objectives of the peasant.

That is, whatever their relative erosion control efficiency, certain types of measures may be inherently more contributive than others to the profit motive of the peasant. A project that depends on eliciting peasant cooperation will be forced, all other things being equal, to give as much weight to the profit characteristics of the measure as to their erosion control characteristics.

A general principle which appears to emerge from the research is that terracing and wall building can be profitable to the peasants only in certain special types of economic contexts, whereas tree planting holds more general promise for the mountain peasant of Haiti as an economic type.

The only context in which terracing and wall building have been found to be truly profitable has been the context of the hillside planting of cash crops using fertilizer. In this case the erosion control structures are necessary to protect the peasant's investment in fertilizer. Even where some households have moved away from commercial fertilizer to the use of homemade compost, as appears to have happened in the Fort-Jacques area, the terraces and walls are still sufficiently important to merit maintenance.

But it would appear that in those mountain regions where the peasants are not yet using fertilizer of compost, they will not on their own undertake the construction and maintenance of these structures.

The difference between fertilizer assisted yields and traditional yields is large enough to motivate erosion control investment. In contrast, the difference between the yield from a dry-walled, unfertilized mountain bean plot and an unprotected mountain bean plot is probably not dramatic enough to warrant investment on the peasant's part.

It would seem therefore that the most promising avenue to pursue is a program strategy which places emphasis on helping peasants make quick profits from the growth of different types of trees. That is, an emphasis on reforestation would appear more likely to succeed than the emphasis that many projects have tried to place on wall building or vegetative barrier.

It is true, one can point out to the peasant the marginal economic benefits to be had from vegetative barriers. But it should be recalled that, to be successful, erosion control measures cannot be associated only with marginal benefits. They have to somehow be meshed with visible, preferably dramatic, increases in annual profits. Except for those regions where cash cropping fertilizer use has come to prevail, trees seem to offer the most likely avenue toward this goal.

7.2 Combining Reforestation with Wall-Building

Why not simply combine the two? That is, it would be possible to design a project emphasizing the growing of quick yield trees, but to organize the project in such a way that the hillsides to receive the trees will first be treated with other erosion control structures. This is precisely what the FAO project in the Aux Cayes area did. All trees that were planted, were planted either in conjunction with dry-walls (where there were rocks) or mini-terraces (where there were no rocks).

The technician who directed this project justified this by claiming that the walls and terraces were beneficial to the trees themselves. But on the other hand, other important reforestation projects, such as that of the Turnbulls in Fermathe and that of Smith in Limbe, have simply planted trees without insisting that they be in conjunction with other erosion control structures. The matter warrants more technical research, but at this point it would appear over-restrictive, and might perhaps raise the cost of projects innecessarily, to insist on a marriage between the two general types of strategy. There may be regions where tree planting by itself would make more economic sense.

Where the decision is made to combine the two, the question then arises as to where to place the trees in relation to the structures. The most common erosion control structure in Haiti has been and will

probably continue to be, the dry wall. I have heard arguments as to whether the tree should be planted on top, near the edge of the wall, or down below, near the base of the wall. Experience in the Aux Cayes area would indicate that planting the trees on top of the walls not only leads to quick root-damage to the wall structure, but also deprives the young tree of some of the moisture it would receive if planted at the base of the wall.

7.3. Species - Selection Decisions

7.31 Consulting the Farmers

Most community development experts would assume that farmers should be consulted as to the trees that will be planted on their land. This is true, but the matter is not as simple as doctrinaire community development philosophy would have us believe.

Standard community development philosophy insists that the only type of valid project is one that springs from the spontaneous "felt needs" of the community. The reader should be aware by now, however, that the erosion control projects being discussed here have not sprung, and in the near future will probably not spring, from the spontaneous felt needs of the Haitian peasant community. They are projects that initiate from without. To state it somewhat differently, what is being proposed here are tree planting and wall building projects for which the peasants may feel absolutely

no need whatsoever. The strategy is one, not of learning what the felt needs of the community are, but of learning what is the most profitable way to introduce projects that the community may never have thought of, may in fact initially resist. To repeat, the project is initiated from outside the community.

Should the peasants then have the final say in what types of trees will be planted? Probably. But project organizers should enter with a de-romanticized vision of the wise old peasant and accept the possibility that popular community opinion may be misinformed. Recall: it is simply not part of Haitian peasant economy, tradition, or culture to plant wood trees. A wood tree is something that lévé pou ko-l, that grows by itself. If asked about what trees they would like to plant, nine out of ten peasants will start reciting a list of fruit trees, because in fact the only type of systematic tree planting that has been found throughout Haiti is the planting of a small number of intermixed fruit trees around the family home. But one of the most revolutionary and profitable innovations that a project could introduce is the large scale planting of fast growing wood trees, a concept that is unheard of in traditional Haiti.

Therefore, in answer to the question, yes, project organizers should consult with the peasants, who will have very practical insights into what trees have succeeded and have not succeeded in the region. But at the same time project organizers should be prepared to argue a new point of view as well. That is the whole point of the project.

There is no special sense in which peasants should absolutely be consulted; this concerns the specific trees that will be planted on their property. Most reforestation projects have made at least some superficial efforts to elicit peasant preferences. But this ordinarily takes the form of general questions about "what type of trees would people in this region prefer." It was surprising to learn, however, that at the moment of tree planting the peasant himself frequently had no choice in the matter. When the day came for his plot to be covered with trees, the work teams would plant whatever trees happened to be sent up from the nursery on that day. It turned out to be a game of chance, some peasants getting well known fruit trees and others being saddled with exotic wood trees whose names they could not even pronounce. Projects should eliminate this practice and, where possible, move toward the other extreme of permitting peasant to specify precisely the particular combination of trees they would prefer on their land.

7.32 Wood Trees vs. Fruit Trees

When asked as to whether they would prefer a hillside planted in fruit trees or a hillside filled with wood trees, most peasants would tell me that they would prefer a hillside planted with a combination of both types. Traditional Haitian peasant agriculture is built on the principle of risk-minimizing diversification. The peasant will not only strive for the acquisition of different types of land in his holding; he will in addition systematically intercrop different cultivates within the very same plot.

The principle of diversification should be taken into account by organizers of reforestation projects. It is easy for a technician to become enamoured of a particular species; the "miracle tree" Leucaena, for example, appears to evoke quasi-religious devotion among many of its adherents. But reforestation projects predicated on the allocation of land by peasants should be prepared to accept and facilitate intra-holding deversification. The peasant will no more allocate all of his tree land to leucaena than he would allocate all of his cropping ground to cabbage.

In most of the reforestation projects which I visited, the fruit trees were on the whole faring much more poorly than the wood trees. But long habituation to the concept of planting a fruit tree will lead the peasant to insist that at least half of the trees planted be fruit trees. This is problematic in regions of high altitude, where in fact the fruit will either not grow, or produce such poor specimens as to be unable to compete in the marketplace with the higher quality fruit produced at lower altitudes. Largely because of this problem, for example, the Fermathe nursery is specializing in the production of wood trees, especially eucalyptus.

But even in those regions where fruit will not grow well, some attempt should be made to supply at least moderately appropriate fruit trees, to permit the peasant to intercrop his trees in the same manner that he is used to intercropping his traditional crops.

7.33 Peasant Taxonomy of Wood Trees.

But the principle of intercropping can be applied even in regions where wood trees come to predominate. During the course of this research I have come upon a folk-taxonomy of wood trees that appears to prevail in different parts of the country. Peasants corrected me in my own attempts to distinguish simply between "wood trees" and "fruit trees". Within my own taxon of "wood trees" the peasants distinguish at least three sub-categories, constituted on the basis, not of botanical characteristics, but of practical uses.

1. Bwa pou siye. (Trees to saw). These are the true lumber trees, such as pine and mahogany, which,if left to maturity, can be used to fé planch, to make boards. (The creole term planch generally refers to the wide, thin board. The thicker and narrower two-by-four, though called a board in English, is called in Creole by the term travé, not planch.)

2. Bwa pou fe kay. ("Trees to build houses".) Except for the doors, the rural house in Haiti generally does not use boards. The walls will be constructed of blocks (kay block) or rock masonry (Kay miraye) in the case of better off houses, or of thin lattice and mudplaster in the case of poorer houses (kay klisé). But other types of wood are employed in constructing the roof rafters and the major uprights. There are some lumber trees, such as the popular bwa plé, whose fibrous characteristics render them unsuitable for the making of thin boards, but which can still be used in the construction

of these other parts of the house. These trees are placed by the peasants in a different category from the somewhat more valuable "sawing trees."

3. Bwa pou fe chabon. Last and to some degree least are those trees, such as gayak and bayaond, whose wood is unsuitable for any type of construction but which have been found suitable for charcoal making. The income derived from the individual charcoal tree is substantially less than that produced by either of the two types of lumber trees mentioned above. But the new availability and prominence of certain fast growing "miracle trees" such as leucaena and akasya endow these charcoal trees with an incalculably important potential for transforming the economy of the mountain peasant.

We can expect that, where tree growing becomes a common practice, farmers will attempt to intercrop different types of wood trees, using as their distinguishing criterion some variant of the above described taxonomy. But projects should give special emphasis to the third type of tree, charcoal trees. Their fast rotation could qualify them as the principal entry way to introducing the practice of planting trees as a cash crop. They have the further advantage that, being resistant to drought and unfavorable soil conditions, they can flourish or at least survive where other types of trees, especially fruit trees, would almost certainly perish.

7.4 Site-Selection Decisions

A number of important decisions concerning the location of the trees will have to be made.

Trees can grow, of course, both on mountain and lowland plots. But there are a number of reasons which should incline projects to choose highland regions for reforestation projects. There is first of all the fact that, in addition to the profit considerations mentioned earlier, a prime objective of reforestation is erosion control. It would make no sense, from the point of view of this goal, to concentrate planting in the lowlands.

But the same caveat enters even where profit considerations are taken into account. It would probably be unwise to induce lowland peasants to plant trees. The project will succeed to the degree that the profits from tree planting are substantially higher than profits to be made from other plots. But lowland own the whole tends to support more profitable agriculture than mountain soil, and the opportunity costs of planting trees would consequently be higher. Peasants may end up regretting take up valuable space with trees.

This is precisely what has happened to the project of the Oriental Mission Society in Limbé. An ingenuous cash remuneration scheme was devised, which succeeded in motivating widespread tree planting among the members of the mission's cooperative. But the trees planted were slow growing trees. and they were first planted on lowland plots outside of Cap Haitien. As the trees have grown larger, peasants find

that they are losing money because of the valuable space that the trees are taking up.

One tactic is to plant the trees on land that is less valuable--i.e. mountain land. The task is to choose the sites in such a way that the cost/benefit calculus will come out in favor of the treed plot rather than the treeless plot.

But caution must be taken not to go to the other extreme and dump all of the trees on the absolutely worst land unsuited for agriculture. This appears to be what is happening to many of the trees that are being planted in the Kenscoff/Fort Jacques region. The Community Councils seek out the worst plots of ground--i.e. those plots where the absence of cultivation means that landowners will be less likely to object.

But it is on this type of land that livestock are grazed, thus exposing the trees to destruction from that quarter. It would appear that the best solution is to plant the trees on plots where mountain agriculture is practiced. From an erosion control point of view, those are the plots at highest risk. And from a maintenance perspective, if the trees can be planted at the beginning of the cropping cycle, they will not only not interfere with traditional cultivation, but they will also be freed from the danger of animals, since peasants take strong precautions against the entry of animals

into such garden land. I have seen dramatic demonstrations of this principle in several regions of the country. The survival rate of trees planted on mountain garden land appeared to be four or five times greater than that of trees planted on marginal pasture land.

7.5 Private Woodlots vs. Communal Forests.

In this same vein we can ask whether reforestation projects should not aim for communal forests on State land rather than the private woodlots being envisioned in this report. This is a very complex issue.

In the first place it should be stated that there is clearly room in Haiti for "public reforestation projects," massive tree planting projects of a public works character which hire large numbers of people to reforest currently abandoned tract of State land or unclaimed land. But it is quite significant that virtually all reforestation projects have avoided this practice, have concentrated rather on reforesting private landholdings. The dynamics of a public works project--the challenges of planting and maintaining trees on land owned by nobody-- are of different character from the problems associated with attempts to get peasants to reforest their own holdings. Reforestation projects have, in my opinion, wisely opted for the strategy of approaching the peasant landowners, for all the difficulties that this entails.

USAID should, in my opinion, orient the bulk of its reforestation assistance to projects involving the property of the small private landowner.

In the first place, the trees stand a much greater chance of survival. Public reforestation projects have been successfully carried out in Algeria, for example. But they presuppose the existence of an institutional apparatus and a public sector committment which is simply non-existent in contemporary Haiti. The trees simply would not survive.

But secondly, and more importantly, the concept of growing trees as a cash crop is an increasingly feasible option which would not only help reforest treeless hillsides, but in so doing would open the doors to a profound, positive transformation of the economy of the mountain peasant. There is a market for charcoal and lumber. USAID's mandate to help the poorest of the poor would be directly fulfilled by any program which made the breakthrough of having peasants <u>plant</u> trees as a crop rather than <u>mine</u> them as a finite resource, as has been the case up till the present. If USAID is to become involved in reforestation activities, it should select that model which is most consistent with its mandate to assist the poorer sectors of Haitian society.

But the benefits to the peasants of having them plant trees on State land would be limited to the wages which they receive. What is being proposed here, however, is a much more important benefit: the breakthrough into a self-sustained microeconomy of tree cropping, analogous to the vegetable cropping of the Furcy farmers. This breakthrough will be made only on land over which the peasant has strong proprietary rights. In short, USAID should emphasize the route of the private woodlot, not that of the public forest.

7.6 Nursery Decisions

One decision to be taken early in projects concerns the source of the trees. Two of the most important nurseries in the country are run by individuals associated with mission groups: the nursery located in the Hopital Bon Samaritain in Limbe and nursery of the Baptist mission in Fermath. Both of these nurseries have been important supply sources for the tree planting that has occured in their respective regions.

But public sector planning for reforestation projects cannot allow itself to rely on these private voluntary supply sources. A responsible project must build in its own solution to the supply problem. Two competing arrangements have been observed. One arrangement entails the establishment of a regional nursery, such as that at Levy, near Aux Cayes, that supplies the trees for a large number of communities. Another arrangement attempts to set up

nurseries in the specific mountain communities where the planting occurs. Such community nurseries have been attempted in the community of Cassis, near Maniche, as part of the FAO project. Another such nursery was created in the community of Mare Rouge, beyond Jean Rabel, as part of an HACHO supported reforestation program.

In the case of the regional nursery, the seedlings are planted and cared for by nursery specialists. The peasants merely receive the shipments of plants when they are ready to treat a hillside. In the case of the community nursery, the peasants are responsible for the entire process, sowing, watering, and caring for their own nursery, and perhaps even searching out their own plants.

Each arrangement has advantages. The personal involvement of the peasants in their own community nursery, the independence which this gives them from outside supply sources, will make this option attractive to believers in "community development". Furthermore I have observed case where the establishment of their own nursery permitted the peasants of a community to begin planting certain popular trees which the project nursery had refused to send.

But in the long run I believe that the large regional nursery run by paid professionals will be the most efficient solution. Community nurseries are essentially voluntary in character, and the technical skills of the participants may be rudimentary.

Furthermore they retain dependence on the outside for the bags in which the seeds will be planted. The production of well-watered, disease free trees should be a task allocated to regional professionals. Just as peasants are not expected to synthesize their own fertilizer--they receive it ready made--perhaps we should also accept the existence of regional nurseries run by experts as a necessary feature of a modern reforestation project.

The danger is this approach resides in the tendencies of regional nurseries to dictate to the peasants what they will plant. The hills around Kenscoff and Fermathe are slowly filling up with eucalyptus trees as a result of decisions made, not by the peasants, but by the organizers of the nursery. The decision is probably an ecologically wise one, but advocated of peasant involvement in decision making will feel uncomfortable with any arrangement that leaves the community fundamentally powerless in terms of this important decision.

The solution, however, probably does not lie in the direction of community nurseries, but in the design of institutional arrangements by which local communities can in fact influence the content of the regional nursery that will supply them with trees.