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**Watershed
Management
in Haiti:
The STAB
Experience**

DESFIL

Development Strategies for Fragile Lands
624 9th Street, N.W., 6th Floor, Washington, D.C. 20001

Development Alternatives, Inc.
Tropical Research and Development, Inc.

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Watershed Management in Haiti: the STAB Experience

by

Thomas H. Pierce

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INTRODUCTION

Few countries in the world face a more serious environmental situation than Haiti. The country's natural resource base, particularly its steeply sloping hillsides, is deteriorating rapidly as evidenced by almost complete deforestation and accelerated erosion of valuable topsoil. Although Haiti is already one of the more densely populated countries in the world, its population is increasing at a rate of almost 2 percent per year. As a result of natural resource degradation and other factors, Haitian agricultural production has declined steadily over the past decade.

Projects in watershed management, reforestation, and soil conservation were developed in an effort to reverse these trends. Although some projects have achieved success, the overall result is a patchwork of uncoordinated and often conflicting efforts. In 1987, there were 116 separate interventions by both the private and the public sectors in the broad area of natural resources and watershed management. This large number of projects presented both advantages and disadvantages. On the one hand, through trial and error, successful ideas, techniques, and approaches emerged that can be applied in other projects in other parts of the country. The effort also produced a cadre of experienced Haitian technicians and effective community organizations. On the other hand, so many projects, often in close proximity to one another, created sharp differences because there were no clear national policies for addressing natural resource and watershed management issues. Many mistakes were repeated due to a lack of coordination and communication. Little attention was given to project evaluations or building on past successes.

This case study summarizes two years of experience in setting up and operating the Technical Secretariat for Watershed Management (Secretariat Technique à l'Aménagement des Bassins Versants, or STAB). STAB, established within the Ministry of Agriculture, Natural Resource, and Development (MARNDR), was designed to develop and implement a coordinated national watershed and natural resource program that would reverse the degradation of Haiti's hillsides.

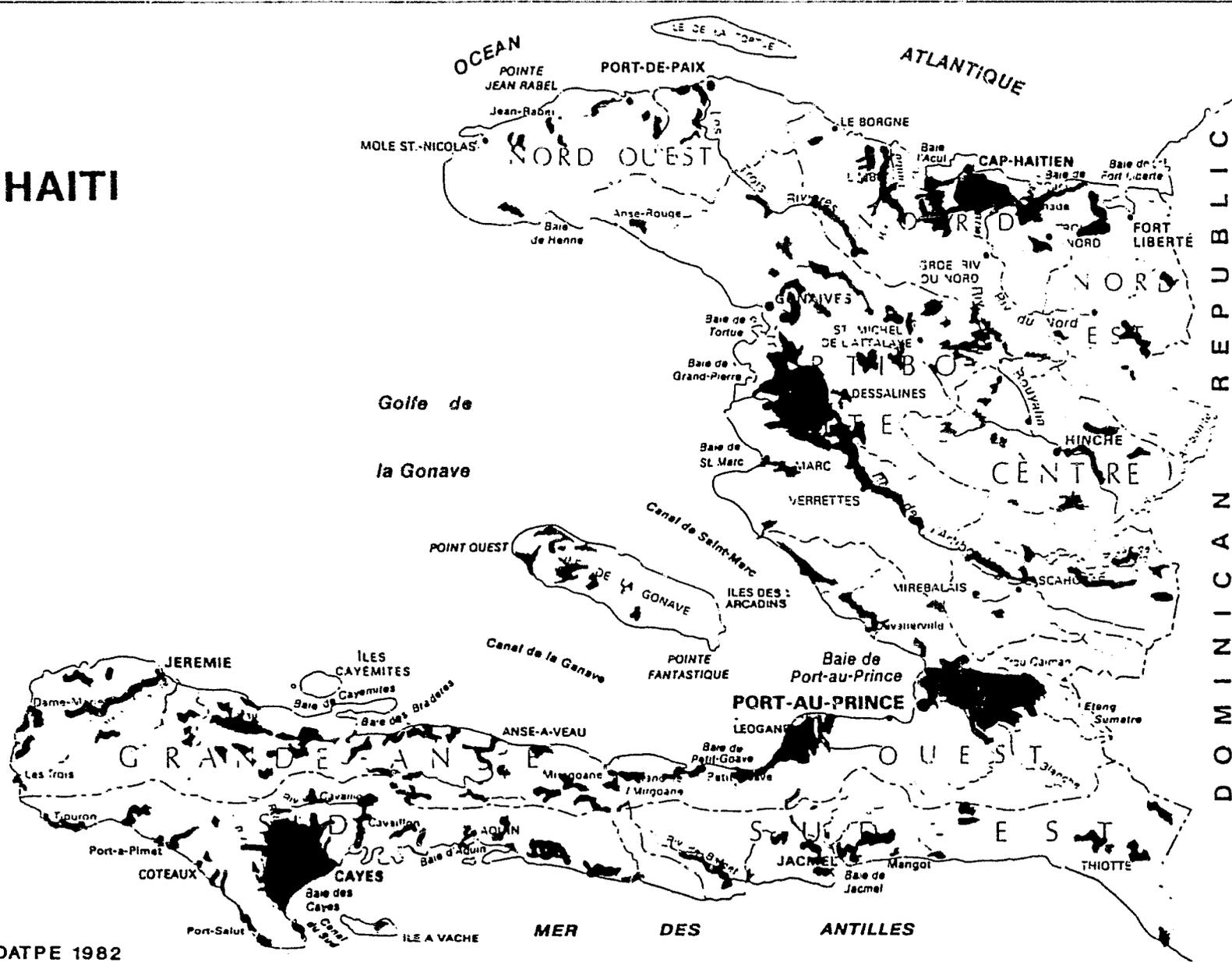
STAB was charged with strategy development; policy analysis; information collection and dissemination; training; research; and the planning, design, and evaluation of individual projects. The unit was to address both technical and institutional issues. Of primary technical concern were soil conservation; mountain agriculture; reforestation; and the integration of agriculture, forestry, and livestock management. Other related issues included spring and cistern development, provision of agricultural credit, resolution of land tenure questions, and development of rural infrastructure -- such as market-access roads. On the institutional side, STAB was to forge a cooperative working relationship between the government, nongovernmental organizations (NGOs), and the donor community. A Committee of Reflection (CR) was created under the direction of STAB and included all the major organizations and individuals involved in watershed management in Haiti. The committee served as a forum for conflict resolution and information exchange.

STAB focused on the long-term issues associated with watershed management and, by design, had no day-to-day project management responsibilities. Because of its clearly defined scope, STAB was able to initiate new policy and direction without being distracted by the daily crises associated with project management. STAB was funded by the U.S. Agency for International Development mission in Haiti, partially through a buy-in to Development Alternatives, Inc.'s (DAI) centrally funded Development Strategies for Fragile Lands (DESFIL) Project and partially through PL 480, Title III.

NATURAL RESOURCE DEGRADATION IN HAITI

Haiti occupies the western third of the island of Hispaniola, which it shares with the Dominican Republic. The Haitian side of the island is predominantly mountainous and covers a total area of 27,700 square kilometers. Sixty-three percent of all lands have slopes greater than 20 percent. Because of its steep topography, only 11.3 percent of the land is suitable for irrigation and mechanized agriculture (Ehrlich et al., 1987). The shaded areas on Map 2 indicate those lands with good to excellent soils, good drainage, and slopes of 8 percent and less.

HAITI



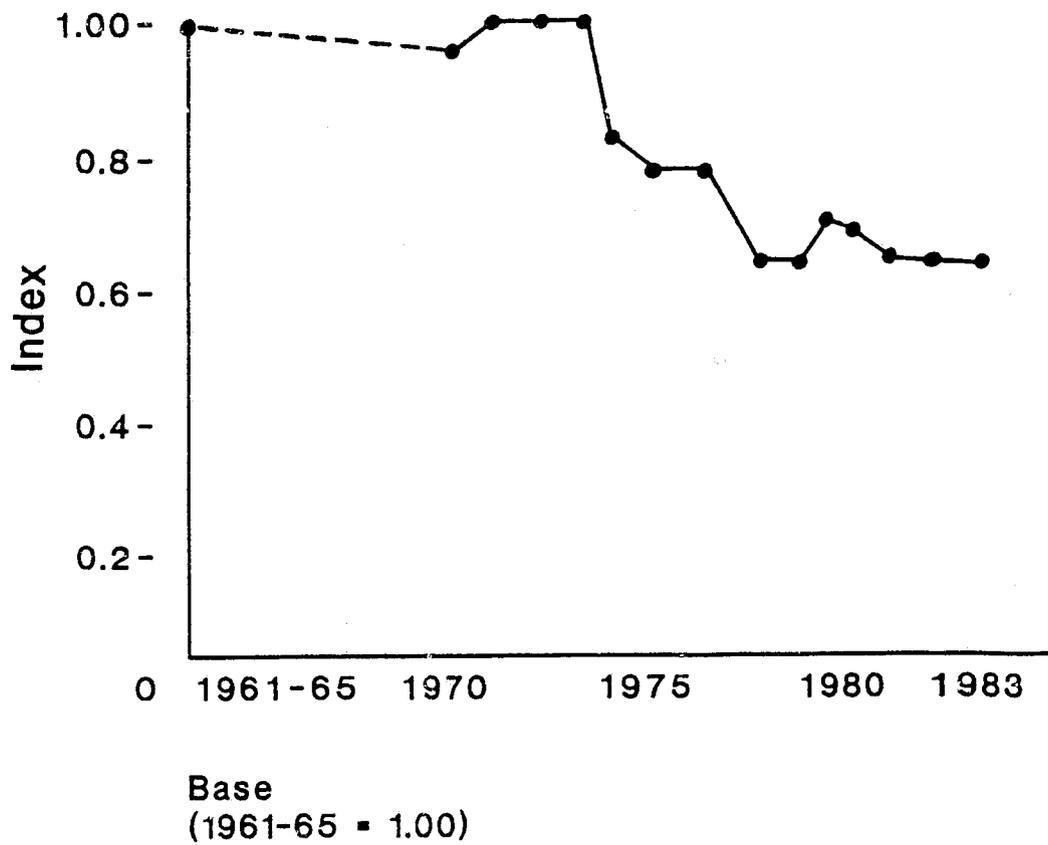
from DATPE 1982
Source: Ehrlich et al., 1987, p.38.

Map 2
Areas Suitable for Intensive Agriculture

Deforestation and erosion have taken their toll. Each year cultivation moves farther up the hillsides, accelerating erosion on increasingly steeper terrain and extending into the remaining forested areas. Erosive agricultural practices have led to severe land degradation, with one-third of all lands classified as either extremely eroded or abandoned. Each year about 6,000 hectares of valuable arable land are abandoned because of erosion and reduced soil fertility (Ehrlich et al., 1987). Over the last 40 years, estimates of "good" arable land show a constant decline of as much as 3 percent per year. Per capita food production is declining at an estimated 2 percent annually (Paskett and Pierce, 1986). Figure 1 shows a decrease of 30 percent in per capita production of cereals during the period 1965 to 1983. Land holdings are small and fragmented. Seventy-one percent of all production units occupy an average of less than 1.3 hectares. These are generally multiple plot family farms with from three to six plots per family (McLean and Steinburger, 1987).

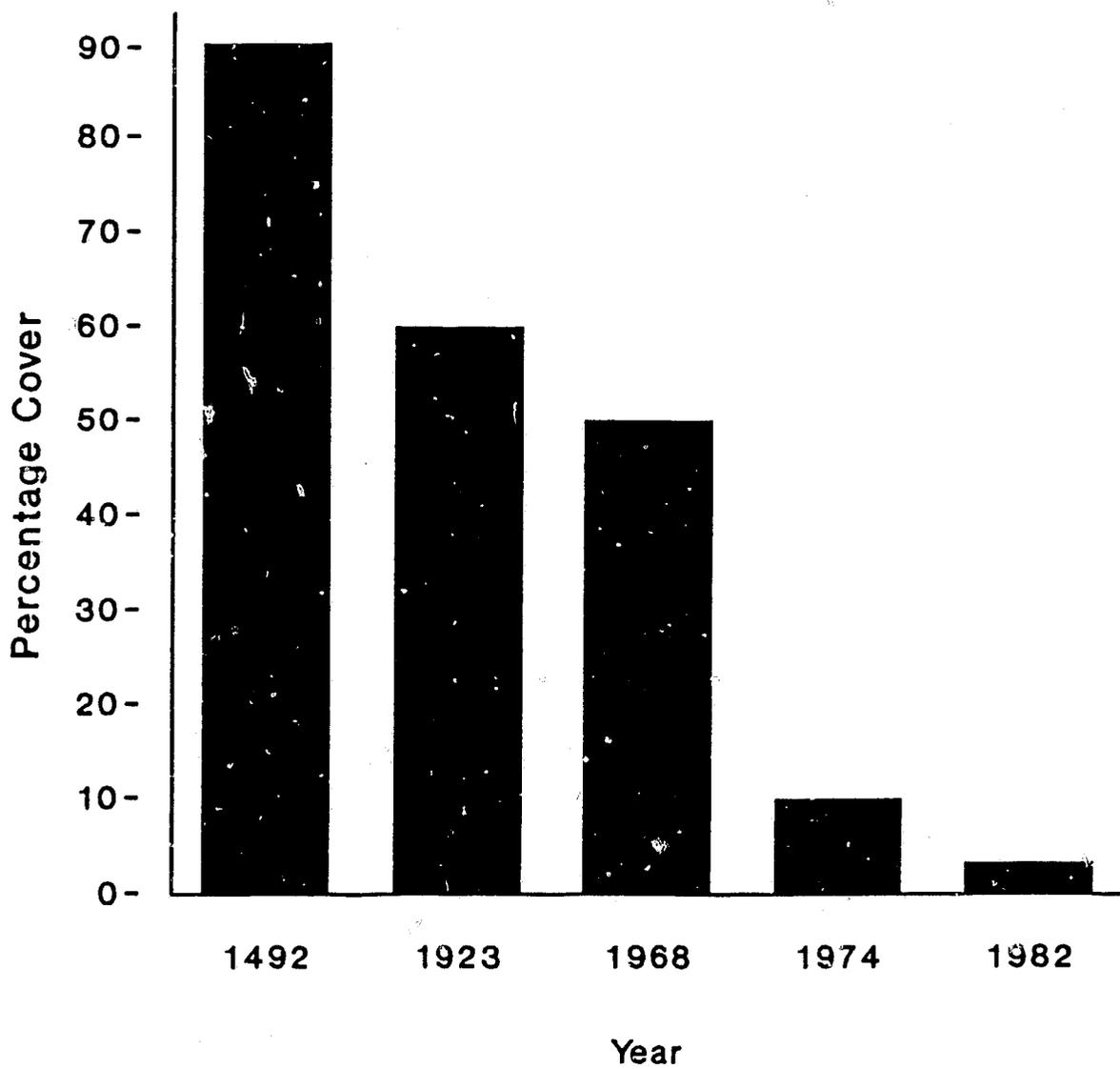
Originally, most of the country was covered with lush tropical forests. Until the early part of this century, Haiti was an important exporter of teak and mahogany. The country is now almost entirely deforested. Nondegraded dense forest cover constitutes less than 1.5 percent of the country's land area. Estimates on the percentage of total land area in forest cover show a decline from 60 percent in 1923 to 3.6 percent in 1984.

Historically, the primary reason for the elimination of forest cover has been the extension of agriculture into wooded areas as farmers have moved steadily up the mountainsides in search of rich topsoil held under the protective forest canopy. As original forest cover decreases, there is increasing demand for uncultivated forest land, of any quality, because of population increases (the latest estimate of live births per Haitian woman is seven) and decreased mortality rates due to improved health care. A secondary reason for the degradation of Haiti's forest resources is the increasing demand for wood fuel as more than 70 percent of the country's energy comes from either firewood or wood-derived charcoal (Smucker, 1981; Pierre-Louis, 1983). The decline in forest cover is graphically depicted in Figure 2.



Source: Paskett and Pierce, 1986.

Figure 1
Index of Per Capita Cereal Production, 1965-1983



Source: Paskett and Pierce, 1986.

Figure 2
Decrease in Forest Cover, 1492-1982

CONSEQUENCES OF DEGRADATION

The continued erosion and hillside degradation have triggered two side effects of critical importance to Haiti's future well-being. The first side effect is the growing rural to urban migration. As people can no longer earn a living on the land, either because the soil's productive capacity has been exhausted or because no more arable land is to be found, increasing numbers migrate to the country's fast-growing urban areas. Here they encounter the squalid, overcrowded conditions of the slums of Port-au-Prince and other large urban centers. Their presence further strains the already overtaxed -- in some cases nonexistent -- public services for potable water, sanitation, and health care.

Second, hillside degradation threatens the public infrastructure in the plains. For example, the hydroelectric generating capacity for Port-au-Prince and some of the smaller cities such as Cayes and Jacmel is threatened by reduced storage capacity in impoundment lakes, due to flooding and deposition of sediment from denuded watersheds upstream. Unless sediment loadings from the Upper Artibonite watershed are significantly reduced, the operating life of the Pelegre hydroelectric dam, an important source of power for Port-au-Prince, is expected to end by the year 2010, years sooner than expected. The impoundment lake had an initial storage capacity of 603 million cubic meters of water in 1956 with an expected life span of 180 years. These figures were based on an average siltation rate of 3.45 million cubic meters of sediment per year. However, since 1979, because of upper watershed deforestation and agricultural practices, the yearly siltation rate has averaged 9.6 million cubic meters per year (Louis-Jean, 1985).

In July 1987, a heavy rain in Port-au-Prince caused an estimated \$1 million worth of damage. Flood waters tore the blacktop off streets, washed houses into ravines, and left hundreds homeless. Damage would have been minimal if the hills surrounding the city still had their protective forest canopy. In summer 1986, heavy rains and flooding from upper watersheds in the southern peninsula caused an estimated \$5 to \$6 million worth of damage to downstream irrigation systems in the Les Cayes plain. Once again, deforestation and loss of porous upper soil layers contributed significantly to the extent of the damage.

THE INSTITUTIONAL CONTEXT

Many government agencies, private organizations, and international donors have joined in the effort to protect and manage Haiti's environment and natural resource base. Problems caused by lack of coordination were due as much to the diverse responsibility assigned to each public agency as to the need for a coherent and agreed-upon natural resource policy. Nearly every area of natural resource management included involvement by more than one government agency. Also, much of the most successful work in natural resource management has been done by NGOs, working independently and with little communication or exchange of ideas among themselves or with their government counterparts.

Government Involvement

Responsibility for managing the environment and natural resources in the public sector was assigned to the MARNDR. Responsibilities of the Division of Natural Resources (DRN), one of four divisions within MARNDR, included forestry, watershed management, irrigation, fisheries, and environmental management. Although most soil conservation and reforestation work conducted by the government occurred within DRN, other governmental units were also involved.

The Division of Rural Development managed soil conservation and reforestation projects immediately upstream from their large infrastructure projects in the plains. The Bureau of Energy and Mines was interested in reforestation because of its involvement in fuelwood and energy conservation. Special government units, such as the Artibonite Watershed Commission (ODBFA), were set up to address problems of national importance. ODBFA was responsible for reducing the sediment load entering the Pelegre hydroelectric plant's impoundment lake. Early in 1987, a special supraministerial body was established to coordinate high-priority issues of critical national importance such as reforestation, adding yet another layer of government.

The Rural Code of 1962 is the principal law governing management and protection of the environment. There are also many policies and regulations on tree cutting, land use, soil erosion, and other natural resource issues. As of 1985, the body of laws, decrees, presidential orders, regulations and communiques on environmental matters contained 107 entries (Bloch, Lambert, and Singer, 1987).

The Haitian government does not have the resources to enforce these laws. For example, shortly after the ouster of President Duvalier in 1986, widespread tree cutting occurred in the Forêt des Pins and the high mountain region around Peak Micaya and Morne la Visite, the areas of most of the remaining densely forested lands in Haiti. The cutting was brought under temporary control with the intervention of the army. However, tree cutting has continued to a limited degree and is not expected to stop until employment opportunities and alternative means of livelihood are developed in these mountainous areas, or until a stable source of funding can be procured for forest guards.

Involvement of Nongovernmental Organizations

Haiti has attracted many NGOs, both secular and religious, mostly from the United States and Canada. The long history of NGO involvement in the country includes well-known secular groups such as CARE and Save the Children and religious groups such as the Mennonite Central Committee and the Catholic organization, CARITAS. Churches in the United States and elsewhere have provided financial assistance to local churches in Haiti and have recently expanded their religious work to include soil conservation and tree planting.

Disenchantment with the government during the Duvalier years caused some donors, particularly USAID, to bypass the public sector and fund projects for natural resource management directly with NGOs, especially projects for reforestation. Not surprisingly, friction developed between the NGOs and MARNDR over the use of different technical approaches and the allegation that NGOs hired the best agronomists away from ministry projects with higher salaries and other benefits. As a result, MARNDR recently announced that all new NGO projects must obtain ministry approval before implementation. Furthermore, new legislation will require

that MARNDR approve all NGO applications for permission to work in Haiti. At the field level, MARNDR technicians have begun requesting NGOs to submit project descriptions and work plans for review. Time will tell whether these new requirements will result in improved or better coordinated management of Haiti's natural resource base, or increased bureaucratic friction and complications.

Donor Involvement

USAID is by far the major donor in the area of natural resources. In 1981, the agency funded the Agroforestry Outreach Project exclusively through NGOs to plant 5 million trees per year. That program has been very successful and has involved some 172 different NGOs and local groups under the direction of the two principal umbrella organizations, CARE and the Pan-American Development Foundation (PADF). In 1987, after three years of research and baseline studies, USAID initiated a watershed management project covering all watersheds running south from Peak Micaya on the western end of the southern peninsula. USAID also funded the project to reduce the sediment loading from the watershed above the Pelegre dam through a combination of land management techniques. USAID and the World Food Program have funded smaller watershed projects using Food-For-Work.

The French have supported two very successful watershed management projects on the southern peninsula. The Food and Agriculture Organization (FAO) has provided technical assistance to the ministry and to a watershed management training center at Limbé, in the north near Cap Haitien. The Swiss also support the training center at Limbé. The World Bank has supported the work of the National Forest Service within DRN. The Inter-American Development Bank has funded watershed management projects in an effort to protect their investments in downstream infrastructure. The European Economic Community, the Canadians, and the Germans have all become increasingly involved in funding small watershed management projects.

Until the political violence erupted in late 1987, there was mounting pressure by the donors to commit more funding to reforestation, soil conservation, and other watershed management activities. Because of recent political events, however, donor

contributions in direct support of government projects have been either significantly reduced or eliminated altogether. Work in the private sector, however, has continued although it is occasionally subject to local political disruptions.

WATERSHED MANAGEMENT IN HAITI -- AN OVERVIEW

Haiti has experienced over 30 years of watershed management activities (Bureau, 1986). Early projects concentrated on the vegetable growing areas in the hills above Port-au-Prince. Emphasis was on creating raised berms along the contour, constructing rock walls, and digging contour canals to stem erosion on individual plots of land. In addition, dry-wall check dams were built in ravines to stem gully erosion. The main objective was to control the physical movement of water and soil. Later, as people realized that land degradation was a function of both erosion and reduced fertility, composting and vegetative barriers -- including grass strips and live hedgerows -- were recommended. Tree planting has been promoted, particularly by the Agroforestry Outreach Project, primarily as a means to increase farm incomes and, only secondarily, to protect the environment by conserving the soil, maintaining fertility, and producing fodder and compost.

Because of Haiti's rough terrain, the country has distinct watersheds that are well suited for clearly defined project boundaries. Different groups in adjacent valleys work in isolation with little or no coordination of activities. This may have worked for a time, but problems occur when farmers participating in a project in one valley discover that the farmers working with another project in the next valley follow a different set of rules. This is even more confusing when a farmer owns plots within two different project areas.

With some exceptions, techniques for arresting soil erosion were, until recently, determined by project planners with little input by the farmers. Project managers paid farmers to install the recommended techniques. Soil conservation measures were superimposed on farmers' land with little effort to integrate new techniques with existing agricultural practices. As a consequence, few of the techniques took hold and many project interventions were abandoned after funding ran out and farmers

were no longer paid to maintain conservation structures. In fact, some farmers felt it to be in their best interest to let the rock walls or contour ditches deteriorate so that the next project would pay them to do the repairs.

Table 1 summarizes two opposing approaches for watershed management that have evolved over the years. Although projects have shifted in their design from approach A to B, differences remain and policy conflicts continue.

TABLE 1
DIFFERING APPROACHES TO WATERSHED MANAGEMENT

Policy	Approach A	Approach B
Watershed coverage	100 percent	Parcel by parcel
Conservation measure	Structural: contour canals, rock walls	Vegetative: grass strips, hedgerows
Motivation	Direct payment	Extension, credit, demonstration plots
Sustainability	Low: work stops when project ends	High: work continues
Cost per hectare	High	Low
Results	Achieved quickly	Achieved slowly
Spill-over effects	Low or nonexistent	High
Receptivity to problems by project staff	Downplayed: seen as impediments	Explored: seen as clues to solutions
Agricultural inputs	Provided free	Provided at cost
Relation to existing farming systems	Superimposed upon existing practices	Integrated with farming practices
Measurement indicators	No. of hectares treated or linear meters installed	No. of farmers involved and plots treated

Haiti's past experience with watershed management projects emphasized the need for:

- Policy analysis;
- Consensus on goals and objectives;
- Better coordination among projects; and
- Improved effectiveness and sustainability of individual projects.

An institutional structure was needed as a forum for the exchange of project ideas and technical information, a structure that would create an institutional memory to ensure that new watershed projects would not repeat mistakes and would resolve the kinds of conflicting policy issues presented in Table 1. To function effectively, such an institution would require the trust and confidence of all three sectors -- the government, the NGOs, and the donor community. It would need sufficient independence to resolve conflicts between projects and the leadership to forge a coordinated national strategy, integrating existing donor and NGO strategies to guide future investments in watershed management.

HISTORY OF STAB

Early in 1985, the Minister of Agriculture, frustrated by the lack of progress in reversing the degradation of Haiti's watersheds, turned to USAID, FAO, and the World Bank, and asked each to supply an advisor in natural resources to work under the leadership of the director of the DRN. Shortly after the arrival of the advisors, DRN hosted a three-day seminar on watershed management and invited all organizations and individuals involved in managing Haiti's watersheds to attend, including representatives from government agencies both within and outside of MARNDR, the NGO community, and the international donor community.

The large attendance at the seminar underlined the tremendous interest and widespread involvement of many organizations. Equally evident was the urgent need to resolve conflicting approaches and project-related issues.

Formation of Initial Secretariat

In response to recommendations by seminar participants, an informal secretariat was formed within DRN and made up initially of the director of DRN; the expatriate advisors from USAID, FAO, and the World Bank; the chiefs of the key services; an NGO representative; and two field agronomists. Shortly after its formation, the initial secretariat produced a report entitled *Guidelines for Watershed Management*, which identified elements critical to project success. These included:

- Sufficient water, plant material, fertilizer, improved seeds, and other agricultural inputs;
- Adequate public infrastructure, such as market-access roads, wells, and public cisterns;
- Secure land tenure;
- Credit for the purchase of agricultural inputs and labor;
- Extension, local organization, and leadership for stronger involvement and motivation of local farmers;
- Training of project technicians and participating farmers;
- Critical background information such as soil maps and soil characteristics to guide the choice of conservation techniques; and
- Flexibility in project design allowing more responsive interaction with the local farmers and ability to address new problems as they emerge.

The report drew from the combined experience of those both within and outside the ministry and was widely distributed. It was presented to a special meeting of the donor community to emphasize the need for a consistent national policy on watershed management. The report recognized that smaller projects with limited resources would not be able to handle each issue on their own. Accordingly, smaller projects were encouraged to work closely with larger ones to help meet their needs for rural credit, training, plant material, and rehabilitation of market-access roads. The report recommended that projects that were operating in isolation, and often at odds with one another, share their resources and experiences on a regional basis. A new set of ground rules for watershed management projects was created by the

report. As a result, when new donor initiatives were presented to the ministry, they were reviewed and evaluated using the report as a guide.

The success of the informal secretariat came not only in writing the report, but in demonstrating that it was possible for individuals from different sectors and with different backgrounds to agree on politically sensitive policy issues that had been unresolved and in conflict for some time. This experience prompted the ministry to seek funding from USAID to establish a more permanent institution, to be called the Secretariat Technique à l'Aménagement des Bassins Versants, or STAB.

Formation of STAB

STAB's two main objectives were to develop a clear and cohesive national program for watershed management, and to improve the effectiveness and sustainability of projects. Activities in the government, NGO, and donor communities had to be carefully assembled into one, cohesive program in which, at a minimum, distrust and disruptive conflicts would be eliminated and, ideally, close working relationships established. The mechanism for achieving this was the Committee of Reflection.

A diagram of how STAB was to operate and the program it was intended to build is presented in Figure 3. Figure 4 highlights activities that were already in place at the time STAB began in February 1987. The shaded blocks indicate weak points in the system. For example, there were over 100 projects with no connection to a national strategy or action plan. There was little monitoring or evaluation and no attempt to incorporate the findings from evaluations into the design of new projects. The resources were there, institutional financial and human, but they were not coordinated. STAB's role was to fill in the missing pieces and improve ongoing work so that the program flowed as depicted in Figure 3, providing feedback and reinforcing the process.

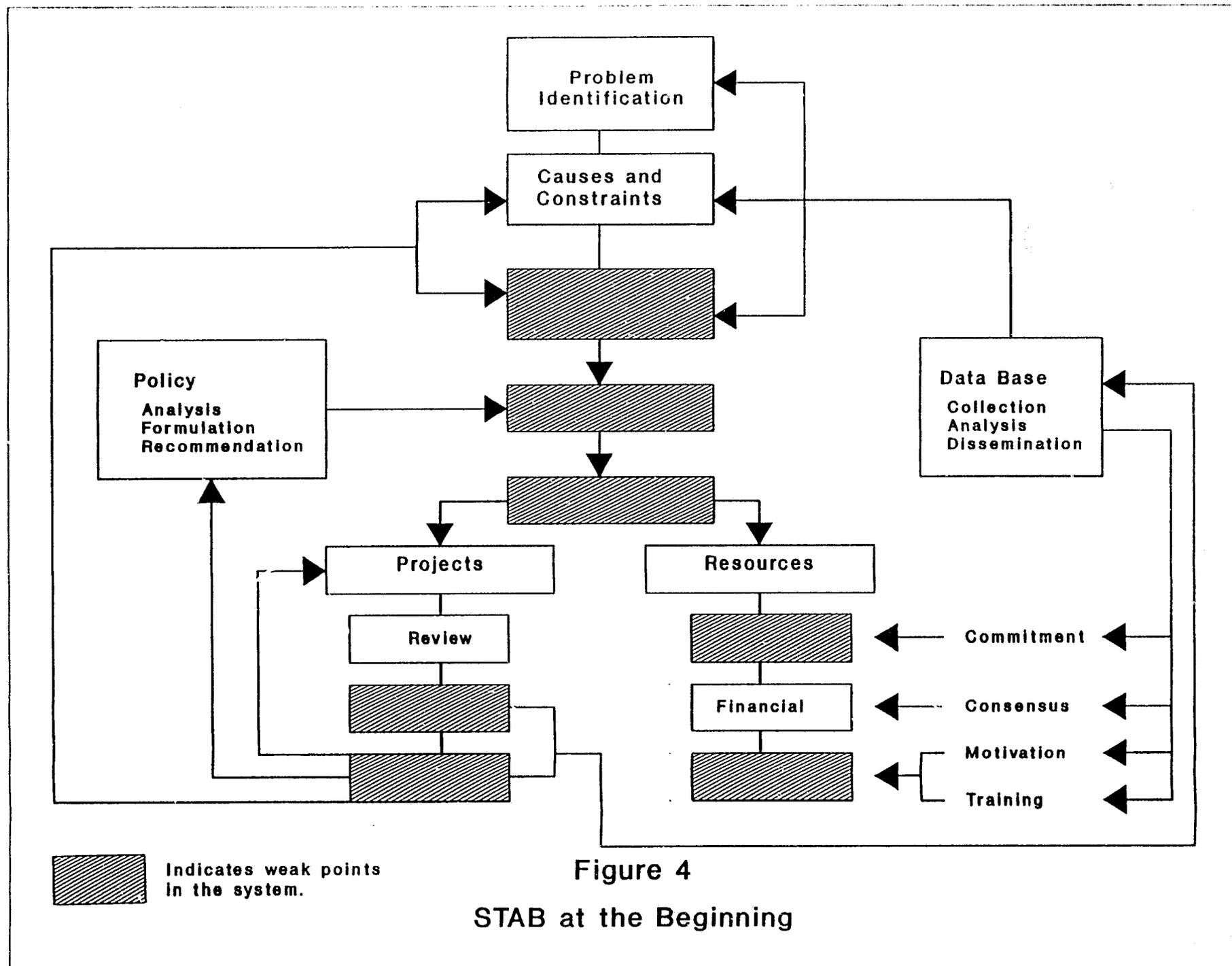


Figure 4
STAB at the Beginning

Strategy and Action Plan

STAB's role in strategy development was to:

- Identify problems, causes, and constraints;
- Establish clear national objectives;
- Identify existing and needed resources, both human and financial;
- Establish a national consensus on priorities for new project interventions; and
- Develop technical approaches and guidelines for project interventions in different agro-ecological zones.

Policy Analysis

Table 1 identified the main areas of policy conflict between watershed management approach A and B. The two most critical conflicts concerned the use of direct payment through Food-For-Work and the choice of conservation measure-- either structural or vegetative. Additionally, there were national policies and decrees related to the use of public lands and land tenure that needed to be reconsidered.

For each of these issues STAB needed to:

- Identify and analyze policy conflicts;
- Present options and alternatives to resolve these conflicts;
- Reach agreement on the new policy with regard to the donors, NGOs, and government agencies; and
- Communicate the new policy to project managers and monitor the results.

Data Base Development

Soil and slope classifications posed particular problems since at least three different systems, including those used by the United States Department of

Agriculture, the French, and the FAO, were being used in Haiti. Data of this type were usually collected with a limited, project-specific objective in mind. With careful planning this same information could be gathered in a consistent format, allowing it to be used for multiple purposes and included in the ministry's national data base.

Project-related data were also needed to monitor projects in different parts of the country. In data base development, STAB's role was to:

- Contribute to the ministry's existing natural resources data base and ensure that new project information was collected in a compatible format for easy entry into the national data base;
- Develop a project-tracking and information data base that identified type of project, location, environmental and socioeconomic conditions, technical approaches used, individuals involved, land area effected, number of farmers involved, and budgetary information; and
- Develop maps of existing projects and agro-ecological conditions to determine where new project interventions were most needed or would be the most effective.

Information Exchange

Just as important as the need to develop the comprehensive data base was the need to compile, package, and make information accessible. Project data and documentation are often lost or discarded after a project ends or an evaluation mission has completed its report.

STAB's responsibilities were to ensure that:

- Current information on natural resources was made available in an easily understandable format for decision makers, planners, and implementors;
- Research findings, new approaches, and watershed management techniques were appropriately documented, made available, and disseminated; and
- Project-related and research reports were saved and made accessible in one central location

Project Review

Although STAB was intentionally not given operational responsibilities for managing projects on a day-to-day basis, members of the staff had extensive experience in project management. Consequently, STAB was responsible for reviewing and approving proposals to ensure that new projects:

- Address the policy issues listed in Table 1;
- Address the issues listed in the initial secretariat report;
- Respond appropriately to ecological and social conditions within the project area;
- Collect adequate base-line data for midterm and postproject evaluation;
- Identify farmers' needs and involve farmers in project planning;
- Identify adjacent projects to avoid potential conflicts and ensure cooperation and collaboration; and
- Propose feasible project objectives that conformed with national objectives.

Project Evaluation

Because so many projects had failed, it was critical to determine the reasons why and integrate these findings in new project design. STAB's role here was to:

- Define what made a project successful and establish clear indicators for measuring:
 - On-the-ground improvements, for example, linear meters of conservation structures or number of hectares treated,
 - Indirect improvements, for example, reduced peak flows and sediment loadings,
 - Socioeconomic improvements, for example, numbers of people trained and increases in farm income,
 - Degree of sustainability, for example, chances for continuation after project funding stops, and

-- Extent of spillover effect, for example, degree to which farmers outside of the immediate target population applied the recommended techniques;

- Define the constraints and problems that contribute to project failure; and
- Ensure that evaluation findings are included in the design of new projects.

Training

Analysis was needed to determine needs for technical as well as motivational and organizational training. Donors and large NGOs had their own training programs for their own people and, in the case of the donors, for government personnel. STAB worked to:

- Define who should be trained: project managers, local leaders, and individual farmers; and
- Identify the type of training required: technical, organizational, and motivational.

Research

From its work in project evaluations and policy analysis, STAB was to identify research needs and recommend additions to ongoing research programs within the ministry and its Faculty of Agriculture. Working through DESFIL, STAB was to keep informed of and disseminate relevant new findings of international research institutions.

Funding for STAB

USAID/Haiti provided funding for STAB from two main sources. First, two expatriate advisors were hired through a buy-in to the DESFIL project. Through the project's association with DESFIL, the advisors were able to stay in touch with research findings and new approaches to watershed management. Additionally, DESFIL provided the short-term services of an institutional advisor to help strengthen STAB as a viable entity within the ministry.

The second source of funding came from USAID's Title III PL 480 funds that supported the Haitian director and host-country staff. The staff included:

- Two agronomists responsible for the inventory and monitoring of projects;
- A geographer and two technicians charged with developing in-depth analyses and mapping atlases of Haiti's 30 major watersheds;
- A librarian to develop and manage a documentation center for housing publications related to specific projects and natural resource management in general;
- A computer analyst to serve as the link between STAB and the ministry's effort to computerize natural resource mapping, as well as to help establish STAB's project information base and documentation center on the computer; and
- A small administrative staff including an accountant, secretary, two drivers, and a messenger.

Title III PL 480 funds were also used to pay local Haitian firms to conduct project evaluations. In this way, STAB was able to develop an indigenous cadre of private consultants in natural resources to replace or provide an alternative to the steady stream of expensive expatriate experts.

MAJOR ACCOMPLISHMENTS

Institution Building

STAB began what was to have been a four-year effort in February 1987 and continued in full operation until the end of December 1987, a period of almost 11 months. Because of political events in Haiti, all USAID assistance to the government was cut off, thereby terminating the funding of the two expatriate advisors. Because the PL 480 contract had already been signed, the Haitian staff was able to continue working through September 1988. STAB's accomplishments during its first 11 months of operation are discussed below.

STAB had to make itself known and respected in order to be included in the official and unofficial loops of decision making within both the ministry and the donor community. It had to establish itself as a workable institution with sufficient support and recognition to function effectively. Early on, STAB worked with a World Bank/FAO team designing a new institutional structure for the MARNDR. Recognizing the institutional model provided by STAB, the team recommended that the ministry be redesigned and that technical secretariats such as STAB be established for other important areas, such as livestock, irrigation, and forestry.

The Committee of Reflection was established by STAB to provide an institutional forum for information exchange and resolution of conflicting policy issues. The committee included representatives from all organizations involved in watershed management in Haiti and provided STAB with its own channels of communication with donors and NGOs. Without the committee STAB would have had to rely on the ministry's formal and sometimes cumbersome official institutions for communicating with these groups.

Project Monitoring

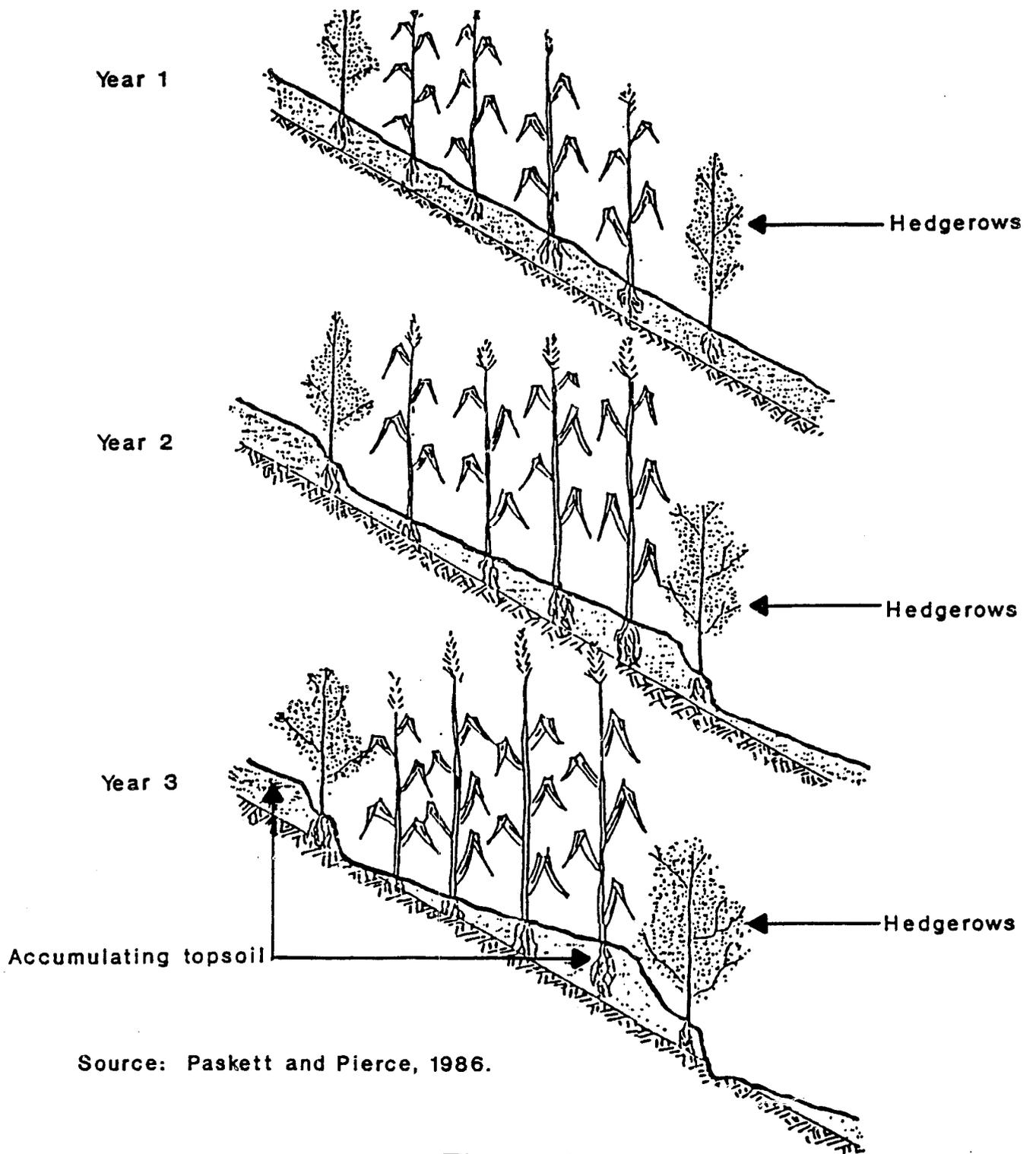
A tremendous amount of resources and attention have been spent in managing Haiti's watersheds. An important function of STAB was to ensure that resources were targeted effectively and that a workable network was developed so that sound technical approaches and innovations could be shared and incorporated into new project designs. Shortly after STAB was established, it began an inventory of all ongoing watershed and watershed-related projects. Two teams were dispatched to every region of the country to locate projects and collect project information. One hundred and sixteen projects were identified. Questionnaires were completed on each project and results entered into a computerized tracking system. It was the first time that detailed information on all projects operating in Haiti had been collected in one place.

Project Evaluations

It was obvious from the large number of projects inventoried that Haiti was not suffering from a lack of attention or concern about its soil erosion and deforestation problems. The question was how to combat these problems more effectively, and how to encourage the spread of new technologies and approaches beyond the immediate target population. The countryside is dotted with abandoned projects that failed because the technological solutions were inappropriate or had not been introduced effectively. One can see entire hillsides lined with contour canals that did little to control erosion, but which took up 20 to 30 percent of the area out of cultivation; collected topsoil at the bottom of the canals; and, in some cases, actually resulted in mud slides.

Where projects were effective in halting erosion and reinstating some protective vegetative cover, the techniques were so labor intensive and expensive that farmers immediately adjacent to the project site would not adopt them. Figures 5 and 6 illustrate the two main techniques for stopping erosion -- contour canals and hedgerows. In one case, the per-hectare project costs were estimated to be about \$5,000. In another case near Kenscoff, land that had been reclaimed through an intensive system of terracing, mulching, and composting was returned to the local farmers only to have the precious topsoil lost to erosion and the land abandoned the following year.

Success and failure are difficult to define. Success can be judged solely within the context of the project as meeting narrowly defined objectives, such as treating 100 hectares with contour canals or planting a predetermined number of trees. Projects of this type usually "work" as long as there is money to pay farmers for treating their lands. However, it is unrealistic to assume there will be enough project money to treat all eroded hillside land in Haiti, at costs ranging from \$250 to \$500 per hectare. For this reason, success must also be judged by whether farmers adjacent to, but not within, the project boundaries improve their agricultural practices -- without subsidies, free inputs, or direct payments of any kind.



Source: Paskett and Pierce, 1986.

Figure 6
Model of the Build-up of Small
Terraces behind Hedgerows

Thus, STAB placed high priority on the following questions:

- Is there a spread effect or spillover in the use of recommended techniques?
- Are neighboring farmers sufficiently convinced and motivated to install the new techniques without direct payment?
- Are the technological changes sustainable or do farmers revert back to their old ways when the project terminates?

Not many projects could answer yes.

One of the few examples of success occurred in the project at La Vallée du Jacmel. A farmer bought a steeply sloping, highly eroded piece of basaltic farmland for the minimal amount of \$10 and diligently applied all the techniques recommended by the project, such as planting vegetative barriers along contour lines, digging and hauling organic matter to fill compost trenches, and green manuring with leguminous plant material. By following these organic farming practices he was able to transform his property into productive farmland, which he was able to sell for \$250 two years later.

Two Requests for Proposals were issued to Haitian consulting firms to conduct project evaluations. The first was for comparative evaluations of watershed management techniques and approaches in three geographic areas and the second for in-depth evaluations of the 22 largest watershed projects. The evaluations were intended to, first, uncover the best technical solutions and, second, identify ways to transfer these technologies onto adjacent lands. The evaluations provided an opportunity to assess and compare the effectiveness of different donors' approaches, particularly between the two approaches outlined in Table 1. Results of STAB evaluations were then fed back into the design of new projects as STAB became increasingly involved in the review and approval of ministry projects and work proposed by the NGOs. Additionally, some donors, such as the EEC, began to routinely send STAB all new project proposals for review and comment. Also, USAID took the position of not funding any new PL 480 watershed projects unless they had been reviewed and approved by STAB.

Data Base Development and Information Exchange

Results from the project survey were entered into a computerized data base that included all pertinent data: project sponsor, project director, funding levels, major activities, approaches, and project location by agricultural district and watershed. STAB's monitoring team then paid a second visit to each project to: (1) collect more specific budgetary information in order to develop national aggregate data on, for example, the amount of money spent annually on soil conservation and the average per hectare treatment costs; (2) locate specific project activities on large-scale maps; and (3) share technical information and successful techniques with project implementors.

STAB collaborated with another USAID-financed project to develop a geographic information system (GIS) using the Critical Resource Inventory and Evaluation System (CRIES) created by Michigan State University. The GIS already contained computerized maps at the national level on a scale of 1:100,000 that had been digitized into the system from maps developed from 1978 aerial photos. The maps contained information on soils, rainfall, altitude, existing land use, land capability classes, and political boundaries. Working with STAB technicians, the GIS office produced a national watershed map delineating the 30 primary watersheds, secondary and tertiary watersheds, down to the 415 smallest watershed units. Computerized maps were then generated indicating which of the 415 units contained projects for soil conservation, reforestation, or watershed management. These maps were useful in determining the location of new projects.

A documentation center was established to house all project-related information such as feasibility studies, design studies, and soil analyses of proposed project areas. The center also served as a natural resources library and included audiovisual and training materials. As work progressed, STAB technicians started developing technical bulletins that documented various techniques that had proved successful in stopping erosion, improving the survival rate of trees, composting, and introducing new plant species for specific purposes.

Conflict Resolution and Policy Development

The inventory and evaluations uncovered several examples in which conflicting policies worked at cross purposes, to the overall detriment of watershed management objectives. For many years the donors had worked independently from one another, and the NGOs were almost totally autonomous. The donors had developed approaches and techniques to meet their own objectives, and the government accepted most donor assistance with little policy input. A myriad of approaches developed with, for example, one project paying farmers to plant trees on their own land, a second providing free trees, a third providing trees at a subsidized price, and a fourth attempting to get farmers to buy trees at the real project cost, which would allow a sustainable supply of trees when the project ended. These differences often resulted in conflicts or project failures. A farmer would not buy a tree if he knew the project in the next valley was giving them away and would become even more resentful if other farmers were being paid to plant trees. Another source of conflict was whether farmers should be paid to install soil conservation measures on their land. When farmers associated with the USAID-financed farming systems project in Fond des Frères discovered that their counterparts in Saut Mathurine were being paid under PL 480 for comparable work, the project came to a halt.

One of the most politically sensitive policy issues in Haiti concerned the use of Food-For-Work. For many years, Food-For-Work had been used in government projects to pay farmers to install contour ditches and rock walls to combat erosion and reduce runoff. Although this approach was successful in quickly covering target areas with these types of conservation measures, it eliminated the initiative of farmers to do this work on their own. Furthermore, it did not encourage continued maintenance of the structures. In some cases, farmers felt it was in their long-term interests to let the structures deteriorate, in the hope that project sponsors would return and pay them for rehabilitation.

STAB addressed these issues through the Committee of Reflection and resolved them through open discussion with the government, donors, and NGOs. One outcome from these discussions was the decision made by the World Food Program to restrict Food-For-Work to community activities such as road rehabilitation or construction of

community cisterns and not allow it to be used to pay for work on individual farmers' land.

Strategy Development

Developing an effective strategy for watershed management in Haiti involves first, understanding the problem of natural resource degradation; second, establishing a coherent set of objectives; third, anticipating and addressing technical and institutional constraints to achieving the objectives; fourth, assessing training needs and required human and financial resources; and, last, developing consensus on a plan of action by engaging key individuals in the government, NGO, and donor communities.

During its brief existence, STAB assembled the necessary background information and established itself as a credible institution for developing a national strategy. Donors began to rely on STAB for technical advice in the design of projects. NGOs looked to STAB to identify sources of financing and to share technical information. The documentation center showed a steady increase in the number of people using it. The Committee of Reflection successfully took on the difficult issue of the appropriate use of Food-For-Work. Maps were generated that indicated the location of soil conservation and reforestation projects and were used to determine the location of new projects.

Research

Although STAB was not intended to conduct research, its work in analyzing constraints and in evaluating projects raised a number of technical questions that needed answering. STAB was able to review the research plans of the ministry's Faculty of Agriculture and suggest new areas for investigation. Working through DESFIL, STAB was also able to take advantage of the work of the international agricultural research centers in fragile lands management.

Training

STAB's budget provided for both long- and short-term training including funding for two Master's-level degrees. Through PL 480, STAB set aside funds for training 40 community leaders and Haitian project managers in natural resource management, at either the training center in Limbé or the French-funded training center in the south at Sulignac. STAB also served as the link between the ministry and USAID in matching training needs with available USAID scholarships.

LESSONS LEARNED

Several lessons drawn from the STAB experience may be applicable to similar situations in other countries. These are discussed below.

Origins of STAB

The idea of a secretariat originated with the minister himself whose views were shared by the director of DRN. Having strong institutional support at the beginning was crucial to STAB's success -- the idea of the secretariat was not something superimposed by donors but grew from a need recognized within the ministry. Furthermore, STAB was not designed by a team of outsiders working under a short time frame. The author served as natural resources advisor to the ministry for over a year before STAB was created. During this time he was able to understand what was needed and what would work. Finally, and perhaps most important, the author was able to work closely with the director of DRN in choosing STAB's director. Criteria for this choice were professional commitment and demonstrated abilities in managing a successful watershed project in the field. Thus, STAB had certain advantages from the beginning, which could be factored into the design of similar projects in other countries.

Initial Strategy

STAB's first order of business was to develop a project information data base to quickly determine who was doing what and where. Next, STAB needed to evaluate the effectiveness of specific management approaches and techniques. Finally, armed with good quantitative information, STAB was in a position to move into conflict resolution and strategy development. These last activities were politically sensitive and were to be addressed only after the necessary background information had been gathered and analyzed.

This approach was met at first with impatience by those who expected STAB to immediately issue policy proclamations and set national strategy. But it turned out to be effective because, by the time STAB was ready to set policy, it had established a credible project information data base, had developed strong personal ties with the key actors in watershed management, and knew more about what was happening in the country's watersheds than any other institution. In a situation that required collaboration and, in some cases, a change in policy by organizations over which STAB had no direct authority, it was important that STAB first establish a track record and a degree of institutional credibility.

Program versus Project Management

STAB represented a new approach. Unlike other units in the ministry, its charge was limited to long-range program development activities such as information exchange, project design and evaluation, conflict resolution, and strategy development. STAB had no daily project management responsibilities. Theoretically, most division directors and section chiefs were responsible for both program and project management. In practice, however, most managers were constantly distracted by project-related crises, such as an accident to one of the jeeps, no gasoline for trucks to transport the trees from the nursery to the planting site, new plant material held up in customs, or goats running loose in research plots. Consequently, little program development was undertaken. That is why it was made clear from the beginning that STAB's director and staff would focus solely on the longer-term issues

and problems associated with developing a national watershed management program. This was the main reason why STAB was one of the few units in MARNDR that was able to initiate its own agenda, rather than having to constantly respond to project-related crises.

Institutional Pitfalls

STAB had to be sensitive to several different points of view. From an institutional perspective it was important to recognize and allay these concerns early on. First, from the ministry side, there was a potential turf battle between STAB and the existing Watershed Management and Soil Conservation Service, which directed the government's watershed management projects. This situation was ultimately resolved when the donors told the ministry that they would not fund projects until they had been approved by STAB.

Second, the NGOs were apprehensive about intervention and external dabbling in their affairs, which they were constantly guarding against government interference. Over time, however, the NGOs became strong supporters of STAB and began to use the secretariat to resolve and negotiate conflicts between local NGO and government projects.

Third, the donors had a wait-and-see attitude, coupled with skepticism about the formation of another government institution that required regular attendance at meetings. The attendance issue was handled by only calling meetings of the Committee of Reflection when something specific needed to be discussed. The donors came to respect STAB's expertise and as a result began requesting STAB review and approval on project documents.

Independent Channels of Communication

Prior to the creation of STAB, the ministry had established its own official channels of communication with donors and, in some cases, NGOs. The Direction of External Affairs and the position of NGO coordinator had been created for this purpose. To function effectively, however, STAB had to establish its own

communication links. This was done primarily through the Committee of Reflection. STAB made additional contacts through presentation of its program to each major donor. Personal and professional connections were made with field people during project monitoring and site visits. An important side benefit of the project inventory was to let people know about STAB and establish contact with every project in the country.

POSTSCRIPT

Because of political events in Haiti, the author's contract was terminated on December 31, 1987, along with all other projects in direct support of the government. Because the Title III PL 480 contract had been signed prior to the cut off of United States aid, the Haitian staff had the funding for continued operation through September 1988. Negotiations are underway to utilize residual funds to continue at least one more year through September 1989. According to USAID, continuation of STAB was selected as a priority because both USAID and the Haitian government's Title III office believe the funds were well managed and the other donors value the contributions made by the Committee of Reflection. Other donors have expressed interest in funding STAB, but, as of early September 1988, all were backing off from any new financial commitment to government programs.

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