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DESFIL
Development Strategies for Fragile Lands

An Information Management System for Effective Natural Resource Management Programming in Haiti

A Concept Paper

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Mr. Mike Benge
DESFIL Acting Project Officer
Agency for International Development
Washington, D.C. 20523

Dear Mr. Benge,

As mentioned in my transmittal of the DESFIL Team's concept paper, "Institutional Approaches for Ameliorating Environmental Degradation in Haiti," we would be forwarding the complementary paper, "An Information Management System for Effective Natural Resource Management Programming in Haiti."

The purpose of the proposed system is to build on existing activities in order to respond to the heightened importance that the USAID/Haiti environment program will be receiving. It is our view that such visibility will require a system based on common references in order to regularly assist project and program managers from participating organizations, USAID/Haiti and USAID/Washington, and interested government officials and donors as they quickly mount, monitor, and evaluate larger and more comprehensive natural resource management strategies. In proposing this system, this concept paper takes into consideration the observations reported by the external project reviews. It also anticipates the close scrutiny USAID's environmental activities will receive within the government, including Congress and numerous external parties. Further, it is our view that this information management system would help monitor the "outcome type" impacts basic to assessing progress for the various project activities listed within the two "strategic elements" proposed by the USAID Environment Task Force to Haiti.

As with the first concept paper, if so requested, we are poised to move quickly to develop a full proposal. We already have developed contacts with personnel associated with CARE, PADF, Auburn University, and other USAID-supported projects who are knowledgeable about existing information systems and have indicated their interest to share relevant information. Some have indicated an interest to work with us further if DESFIL were asked to proceed with an activity.

As with the first concept paper, copies are included for Bill Sugrue, John Lewis, John Michael-Kramer, and Twig Johnson. Also, since it has been brought to my attention that John Becker is very much interested in these activities, I have included copies of both papers for him. If additional copies are needed, please do call.

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The DESFIL Team hopes that this information will be of interest to you and your colleagues, and we look forward to collaborating with you.

Sincerely,

Sandra Ritter for

David Bathrick
DESFIL Project Supervisor

cc. Mike Philley

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I. Introduction: Natural Resource Management and Information Gaps in Haiti

The consensus in the reports on environmental conservation in Haiti is that there have been many projects but little sustainable success (White 1992, Comino 1988, Murray 1990, Pierce 1988). Despite decades of assistance from numerous international agencies, Haiti's environmental degradation continues and its environmental problems actually have worsened. The heart of the matter--identifying which NRM technologies are appropriate for rehabilitating Haiti's watersheds, and how to promote farmers' adoption of the new technologies--has not been addressed systematically. The evaluation reports on NRM projects in Haiti consistently note that adequate information about those two essential development questions, particularly about farmers' priorities, is lacking (White 1992, Brown et al. 1993, Murray 1990). The reports generally point out that data collection has been sporadic, has not produced solid information bases, and has not disseminated the information necessary for appropriate programming. This information deficit exists at the level of projects, programs, and international donors.

A review of the documents from Haiti indicates what is needed to improve the NRM information base and provide a sound basis for strategic programming. Information is needed about Haiti's diverse social groups and ecological settings, about the resources and perceptions farmers bring to NRM, and about the range of technical solutions for different locales. Project documents also indicate that a participatory approach is essential in order to *involve farmers in the process of identifying NRM problems and solutions*. Sytematic data collection and analysis that produces an information base accessible to donors is necessary. DESFIL has a model NRM Information Management System (IMS) that can meet these needs.

DESFIL's IMS has been designed to help USAID field missions with a variety of environmental management issues, including data collection and management, M&E, and programmatic options. It consists of a relational database that allows for long-term data collection, stores both social and biological data, and facilitates analysis. It can store both farmer- and community-level data. This IMS is designed to track the indicators for project monitoring and evaluation, and to provide the information necessary for strategic programming and for institutional assessments. It is geo-referenced, using the Geographic Information System. Its software makes it user-friendly and facilitates sharing information across multiple locations and computers. Because a DESFIL model system already exists, adapting it to Haiti will be cost-effective. The key objectives of DESFIL's IMS are to produce solid information bases that document site-specific knowledge accumulated about NRM, and to share that information development agencies. Creating good information bases will enable project managers and USAID to report effectively to Congress, and to the Government of Haiti and other donors.

II. The Status of NRM Information in Haiti

This preliminary literature review indicates that the lack of systematic information and documented"lessons learned" about NRM and tranferring technology in Haiti has hampered progress. One result has been donors' conflicting programmatic approaches to resource conservation. This has confused farmers and allowed them to play off projects to their own

advantage; it has not promoted consistent progress in environmental conservation. Another result of the lack of information on how to transfer appropriate technology has been high project costs and low economic benefits for the beneficiaries, despite efforts to counteract these problems. The ultimate result is that, although some information management systems are operating, Haiti does not have a sound information base for designing and implementing a range of viable, farmer-friendly NRM programs, particularly in the current context of increased development expectations. Based on this review of project evaluations, this is due to *the historical lack of organized data collection for systematic and comprehensive tracking of projects' progress and impacts,* so that any "lessons learned" about transferring technology--both positive and negative--largely have been lost to the donors.

A. Specific Deficiencies in Information and Data Collection Systems

Although some useful information on NRM certainly is available, project reports and evaluations have identified some consistent deficiencies in the information base. The major faults reported in the M&E systems were that they: 1) did not focus on and include farmers in the data collection process; 2) did not include women and other important social groups in their samples; 3) were not well focused and did not collect useful information; 4) did not use personnel time and project money efficiently; 5) were run by project implementors and were not objective; and 6) were not directed at operational and monitoring activities related to project implementation.

The lack of participatory data collection and lack of focus on farmers' perceptions has been one problem with M&E systems in Haiti (Brown et al. 1993, Comino 1988, ARD 1992, Murray 1990). Brown stated that the M&E system for the PLUS project should "focus on obtaining knowledge of farmers' needs and to see that those needs are met on a sustainable basis." Data collection should provide more information about farming households: "There is a need for more farm-level analyses" (Murray 1990). Identifying and implementing NRM interventions should be a bottom-up, participatory process based on data collection in collaboration with farmers (Comino 1988, Brown et al. 1993, ARD 1992). The data that evaluate project impact should include farmers' evaluations and diagnoses, which would include them in programming also. Most M&E systems in Haiti did not use a participatory approach and did not incorporate farmers into the information-collection process. As a result, there is a *lack of information about and understanding of the household resources and perceptions that farmers bring to NRM.*

Haiti is highly diverse, socially and ecologically. Evaluation reports have pointed out that it is necessary to understand this diversity in order to understand which types of farmers need which types of interventions. Data collection has not reflected this diversity, particularly in the case of *women* (Brown et al. 1993, Comino 1988). The PLUS project needs a "better focused gender analysis by an expert to gain a greater understanding of the role of women" (Brown et al. 1993). The needs and options for *landless farmers*, another significant social group, also require further exploration and documentation (White 1992).

The data collection systems in Haiti did not necessarily produce useful data (Brown et al. 1993, Comino 1988, ARD 1992). Part of the problem was that they were focused on projects' technical aspects (tree species selection, survival and growth rates) that did not

include farmers' resources and perceptions. Several Targeted Watershed Management projects never were evaluated primarily in terms of their progress toward major goals (Murray 1993). Performance indicators were not ground-truthed or were unclear and difficult to rank (Brown et al. 1993). Several projects collected information and then found that it was incomplete or of limited value (Brown et al. 1993, ARD 1992, Murray 1990). The lack of useful data and resulting information gaps obviously had a negative effect on strategic programming.

M&E systems did not consistently use personnel time and project money efficiently. They have been characterized as "cumbersome" (Comino 1988) and a drain on technical and administrative staff time (Brown et al. 1993). The general consensus is that they should be streamlined for efficient use of time and money, and that they should strike a balance between efficiency and collecting good data (ARD 1992).

Agencies implementing their own M&E systems has resulted in a lack of accurate, objective project data. For example, the agencies in the PLUS project, CARE and PADF, did not report accurate data on tree survival, growth, and planting rates (Murray 1990). They designed their own data collection systems and focused them on the technical aspects of their projects that were easy to track, which did not provide a well-rounded information base for sound programming. Limited, narrow data thus has been collected. PADF actually stopped collecting data because it was not useful (Brown et al. 1993). The socio-economic, farmer-level factors that influence participation in NRM projects were not explored adequately or documented by these or other projects. Another problem with internally designed systems was that the "absence of an effective M&E system resulted in an unacceptable level of flexibility by contractors in managing projects" (Murray 1990). The problems with an objective system to monitor and evaluate project progress and impact continue in the current PLUS project. The overall history of data collection in Haiti shows that it has been spotty, narrowly focused, and subjective. This points to the need for establishing an objective, integrated, and consistent system that will facilitate strategic programming.

Implementing projects should be a participatory process of diagnosis and problem solving. This can be accomplished by incorporating farmers into the monitoring process and by orienting it toward providing information for continuous project adjustment and planning. M&E systems in Haiti have not used this approach, so there has been a lack of "feedback loops to orient projects" (Comino 1988, ARD 1992). *Data collection has not been directed at operational activities related to project implementation* (Brown et al. 1993). Obviously, this is another impediment to sound programming.

C. Improving the Situation

All of these problems with data collection indicate what can be done to improve it, in order to improve NRM programming, in Haiti's diverse social and ecological context. Using a participatory approach to involve farmers in the process of identifying NRM problems and solutions is essential. So is a sound knowledge of farmers' resources and perceptions, based on accurate data. The data must reflect Haiti's diverse social groups--women, the landless, labor exchange groups--in order to facilitate appropriate programming and technology

transfer. Accurate, useful information must be generated consistently to build an information base that integrates social, environmental, and technical data. The information also must be useful for assessing institutional performance, given the array of PVOs, NGOs, and rural groups that are working on NRM in Haiti, and the need for sustainable, effective impact. The information collection system should use project time and money efficiently. And the system should be sustainable: local personnel and institutions must be given the capacity to run it. It is eminently feasible to set up data collection systems with these characteristics. The following section proposes one model.

III. DESFIL's Information Management System for Natural Resource Management Programs

DESFIL has developed one "NRM Information Management System" that has been designed in collaboration with the Africa Bureau/SD/PSGO/NRM Unit in order to help USAID field missions collect and analyze a range of data to address specific environmental problems. Currently it is being tailored to the site-specific requirements of the NRM program for USAID/Senegal and DESFIL expects to establish the system there in 1995. The system has generated considerable interest there and efforts now are underway to expand it to neighboring countries such as Niger and Mali. The IMS also could be adapted for Haiti, where USAID plans to support projects to reduce environmental degradation by introducing sustainable resource conservation interventions. DESFIL's IMS will 1) generate the scientific and management information necessary for designing, implementing, and monitoring effective NRM programs; 2) facilitate participatory research in order to improve local decision-making about NRM; 3) include women in sustainable NRM; 4) analyze and disseminate information on NRM in a timely and convenient manner; and 5) generate data for evaluating and reporting on program impact and institutional performance. *It can build on previous work in Haiti and thus help fill the information gaps identified above.*

A. A Relational Database

The heart of DESFIL's IMS is a *computerized, relational database* structured according to the NRM analytical framework, that is used in conjunction with other information collection tools. The relational database is designed to store and analyze diachronic data from the social and biological sciences. Social science data includes information on policies, institutions, legal systems, and household-level socio-economic factors that affect local men's and women's NRM decisions. Biological data includes information on local natural resource bases, agricultural productivity, environmental degradation, and potential conservation interventions for improving NRM. The objective is to structure a *local, regional, and country-specific database* in order to collect information over time and use it to 1) identify the social and biological factors that influence people's decisions about NRM; 2) facilitate project programming and M&E; and 3) contribute to the development community's knowledge about sustainable conservation interventions, which includes the Environment Center and USAID/Haiti. Information from different regions and countries will be comparable because the databases are standardized (structured according to the NRM analytical framework) and the definition of key research terms is standardized. The databases are geo-referenced, using the Geographic Information System (GIS).

DESFIL has a prototype database and a working glossary of key terms. The database consists of a set of computer files that can be adapted to specific locations in order to characterize farming households, men and women farmers, and users/non-users of traditional and modern NRM practices. The database also is designed to store information on community-level characteristics (infrastructure, access to natural resources), policies that affect local resource use, the technology used for agricultural production and NRM, and farmers' perceptions about NRM. Information from previous Haiti projects could be put into the database in order to create a central, computerized source of information on environmental problems and the result of donors' interventions in Haiti. The database must be adapted to Haiti's specific environmental and social contexts, and it must build on USAID's previous work there. This can be done by setting up the database and the process of data collection in one area, working closely with project personnel until it runs smoothly, and then expanding it to other areas. The methodology for designing and implementing DESFIL's IMS are discussed in Section III below.

B. Additional Tools for Data Collection

It is important to note that DESFIL's NRM IMS is a *dynamic, site-specific process* rather than a static structure. The array of tools for information collection used in conjunction with the database thus depend on specific, local programmatic needs and capacities. The array includes but is not limited to: videography, aerial photographs, Landsat and other satellite imagery, documents from other development agencies, and data from local surveys (Rapid Rural Assessments, Participatory Rural Appraisals, KAP surveys, gender-specific focus groups, baseline surveys, M&E data, institutional assessments, needs assessments, informal field surveys). The existing literature indicates that information on gender, institutional performance, and household resources--among other topics--is needed in Haiti; the appropriate tools to collect this information can be identified. DESFIL's multi-disciplinary team has the expertise to assist the development agencies working in Haiti 1) to decide which tools are appropriate for their specific information needs and 2) to design, pretest, and use the instruments to collect data.

The IMS thus consists of a relational database, with hard copy archives and data from the Geographic Information System. Different levels of data--individual, household, community, national--are collected from a range of sources and stored in the database. This will provide a well-rounded information base for understanding and planning locally appropriate NRM strategies.

C. Information Management and Sharing: Hypertext

Software options to access and analyze the information in the database are available from DESFIL. *Hypertext* is the optimal method for accessing and sharing NRM data. It can link together not only text but also graphics, photographs, sounds, narration, and video. Hypertext is a database that has active cross-references and allows a reader to jump to different parts of the database as desired. A hypertext database can be conceptualized as a network of nodes and links, in which different documents are the nodes and the cross-references are the links. Rather than turning pages to find information, the reader is "linked" to the desired information by key words. This makes it faster and easier to find

information on specific topics. The user browses, or traverses nodes and links looking for information, with a little training in computer concepts and knowledge of the subject. Another advantage of hypertext is that documents can be shared across multiple locations/computers, which allows collaboration in both reading and writing documents. These connections allow users access to a great amount of information.

Implementing DESFIL's IMS in Haiti would have both immediate and long-term benefits, in terms of disseminating information about NRM. It would contribute to USAID's immediate goals and activities in Haiti and, in combination with the information generated by DESFIL in the Sahel, it would contribute to the Environment Center's objective of synthesizing information. Creating standardized relational databases in different regions and countries and using hypertext ultimately would give field missions and the Environment Center access to global NRM information. This would facilitate sharing knowledge about "lessons learned" from NRM programs among the field missions and with other donors. DESFIL thus can contribute to the Center's plan to assist USAID and its field missions to "obtain, understand, synthesize, and transfer appropriate knowledge from technical and scientific research to developing countries and their local institutions to solve specific environmental problems" (USAID 1994).

IV. DESFIL's Methodology for Data Collection

A. Data Collection as an Iterative Process

Data collection, analysis, and dissemination should be an iterative process. It is the *ongoing information feedback* between the different actors involved in NRM--farmers, policy-makers, project personnel, the mission, the Environment Center--that will identify viable strategies for resource conservation in different locales. The other advantages of a feedback system are that it provides a basis for 1) monitoring and evaluating project impact; 2) tracking performance indicators over the short- and long-term; 3) orienting project activities; and 4) making programmatic decisions. Conceptualizing data collection/analysis/dissemination as a continuous process, rather than as distinct, short-term activities, also will help the Environment Center build a central library to collect global knowledge about appropriate NRM interventions and "lessons learned" from projects. DESFIL's NRM IMS thus is designed to work as an iterative process. The overall goal of this process is to build rich information bases that will, over time, inform development practitioners about the process of changing peoples' relationship with their environments.

B. Building Local Capacity

DESFIL's premise is that *local capacity and management* is necessary to make an IMS sustainable in the long-term. Primarily, this means that national staff should be trained to enter data into the relational database, analyze it, and disseminate it in periodic reports. This will be possible using the Paradox software program, which DESFIL has chosen because it has a range of functions and is user-friendly. National staff also must have basic training in collecting field data and sampling techniques. DESFIL's role is to assist USAID/Haiti (and the other agencies and donors that will participate in the expanded program) to set up the relational database and to help decide what types of data it needs to

collect, particularly field-level data. DESFIL also can provide the expertise to set up the field research (sampling, instrument design, defining variables, coding data) and supervise the early data collection surveys. However, our goal is to build local capacity for ongoing data collection so that we become a consultant whose expertise is called upon only when necessary. The last assessment of the PLUS project notes that heavy dependence on expatriate institutions are a major weakness and make some activities unsustainable. Supervision and periodic consultation will be necessary to keep the entire system on track, and to respond to USAID's strategic plans. Supporting political decentralization through local institution-building is one way of addressing the goal of building local capacity.

C. Provisional Methodologies for Sampling and Data Collection

Previous projects report that there is significant social and ecological diversity in Haiti. This means that the research population must be carefully targeted in order to reflect the heterogenous groups that make decisions about NRM. Women-headed households, landless households, small landholders, food producers, and cash crop producers have been identified by previous projects as important groups to include in a research sample. Certainly there are regional differences in the rural population, which will necessitate defining regional samples for data collection. This is another reason for establishing the IMS in one area and then expanding it region by region.

The type/s of data collected will depend on USAID/Haiti's program, the projects that currently are operating, and the information already available from M&E activities. The first step in creating the relational database and deciding what type/s of data to collect will be to review the existing information base in order to identify significant gaps. USAID's strategic plan to simultaneously support local democracy and governance, in order to rehabilitate local natural resources, indicates that a focus on community-level social institutions and organization is needed. Information on the local social and economic context can be the basis for planning local development.

V. Proposed Start-Up Activities

This concept paper is the first step in responding to USAID's information needs and expanding activities in Haiti. The next steps, to continue the process, are:

1. Expand on initial contacts with projects and NGOs, in order to collect more documents for an in-depth review of the information available on NRM in Haiti.

2. Meet with development practitioners such as project personnel and the USAID Environment Task Force to Haiti, to collect more information, including information on strategic plans for NRM.

3. Based on the available information and discussions, start adapting DESFIL's IMS and database to Haiti. This adaptation is a process; it can be started based on the existing literature, and then modified through field work.

4. Organize the information, in order to put it in DESFIL's IMS database. This will begin building a multi-faceted information base on Haiti.

5. Conduct an exploratory field trip to Haiti, to collaborate with the USAID mission, in order to mutually determine the mission's information needs, to identify the tools necessary to generate that information, and to continue adapting the database to local and country-specific needs.

BIBLIOGRAPHY

Associates in Rural Development, Inc. *Projet Sove Te: Final Report of Project Activities.* Port-au-Prince: Prepared for USAID/Haiti, September 1992.

Brown, D.G., A. Grimes and M. Fontaine. *Design Assessment: The Productive Land Use Systems Project.* Washington, D.C.: LAC TECH II Project, April 1993.

Comino, S.P. *Planning and Implementing Sustainable Agroforestry Projects with Local Participation: Lessons Learned from the Haiti Agroforestry Outreach Project--A Project Report.* Cornell University: In Partial Fulfillment for the Degree of Master of Professional Studies, May 1988.

Murray, G. F. *Terraces, Trees, and the Haitian Peasant: An Assessment of Twenty-Five Years of Erosion Control in Rural Haiti.* Prepared for USAID/Haiti, October 1979.

Pierce, T.H. *Watershed Management in Haiti: The STAB Experience.* Washington, D.C.: Development Alternatives, Inc., DESFIL Project, October 1988.

U.S. Agency for International Development, Bureau for Global Programs, Field Support, and Research Center for Environment. *Proposed Strategic Objectives and Program Outcomes for the Strategic Plan of the Center for Environment.* Washington, D.C., November 1994.

White, T.A. *Landholder Cooperation for Sustainable Upland Watershed Management: A Theoretical Review of the Problems and Prospects.* EPAT/MUCIA, July 1992.

_____. *Peasant Initiative for Soil Conservation: Case Studies of Recent Technical and Social Innovations from Maissade, Haiti.* EPAT/MUCIA, July 1992.