

Designing environmental restoration programs in politically fragile states: Lessons from Haiti

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Haiti is a fragile state influenced by extreme poverty, a weak government, high natural disaster risk, and severe environmental degradation (de Sherbinin 1996; Howard 1998; Murray and Bannister 2004; ICG 2009). These elements of fragility are linked in a perverse web of interactions. Natural disasters prevent sustained economic growth, limit execution of strategic planning, and undermine poverty reduction programs. In turn, political instability results in shifting development strategies and fragmented ecosystem restoration initiatives. Political, economic, and environmental shocks weaken community-led efforts and have repeatedly derailed otherwise well-designed programs.

Short-term aid interventions in Haiti that focus on natural disaster relief and security have failed to patch these multiple areas of vulnerability and reverse the negative cycles that characterize Haiti's stagnant growth and environmental degradation. The absence of sustained engagement around core development needs undermines environmental stability and sustainable growth, which are critical for conflict prevention. Unfortunately, between 2002 and 2008, close to 40 percent of monetary aid has been allocated to public security and 12 percent to humanitarian recovery sectors, thereby leaving efforts for long-term development and sustained strategic planning underfunded. According to figures from the Organisation for Economic Co-operation and Development, humanitarian aid as a portion of official development assistance (ODA) increased from 0.2 percent in 2002 to over 20 percent in 2008 (OECD 2011). This represents an increase from US\$490,000 in 2002 to US\$175.47 million in 2008. The funds classified as ODA increased from US\$209 million in 2002 to US\$694.36 million in 2008. The United Nations peacekeeping operations reported a 2008 budget increase from US\$574 million to close to US\$1 billion in 2010. This represents a significant increase in funding for peacekeeping operations since the current UN peacekeeping mission was launched in Haiti in 2004 (UNSC 2009; OECD 2011).

The 2010 earthquake spurred new foreign aid totaling billions of U.S. dollars. The Haitian government and donors currently have the opportunity to use the large-scale aid to stabilize the fragile natural and political environments while also improving the previously stagnant performance of development indicators.

POLITICS, POPULATION, LIVELIHOODS, AND NATURAL DISASTER RISK

Although Haiti has not gone through large-scale violent civil conflict, compared to other case studies in this book, its government and public institutions have been severely weakened since the collapse of the Duvalier regime in 1986. The Duvaliers held the presidency of Haiti under Francois Duvalier from 1957–1971 and his son Jean-Claude Duvalier from 1971–1986.

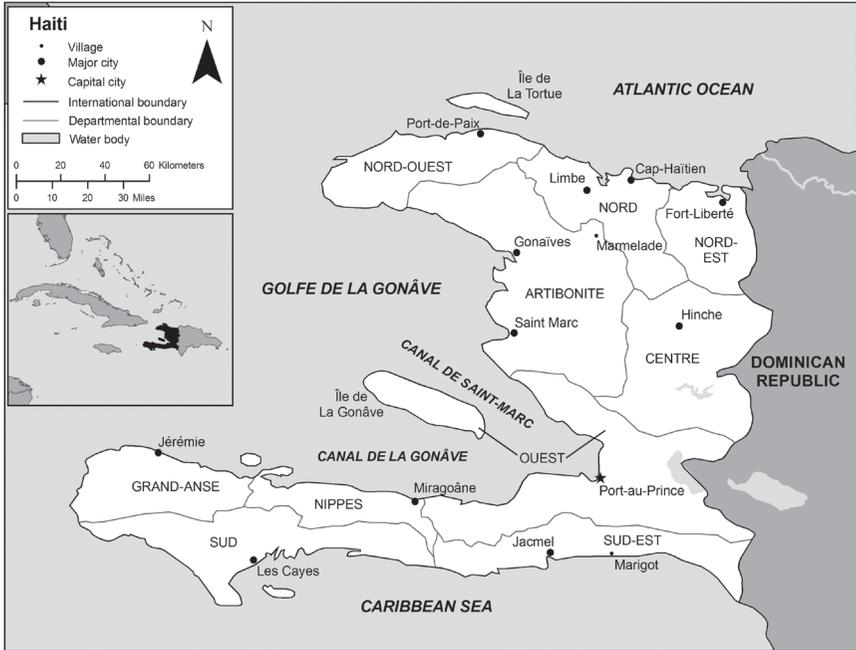
The collapse of the regime was followed by competition for power, which was often violent. As internal security weakened, local gangs grew in dominance and threatened stability. President Aristide took office in 1991, but shortly thereafter a coup d'état forced him into exile. More unrest and violence followed, which led to a halt in funding for foreign aid and an embargo on trade. Aristide was reinstated in 1994, and aid resumed with his return. The following year René Préval was elected president, taking office in 1996. The two were former political compatriots, but Aristide formed his own party and was reelected president in 2000 in a highly protested election.

Civil unrest and violence continued and escalated sharply in 2004 when President Aristide was again forced from office (Arthur 2010). The United Nations Security Council authorized the United Nations Stabilization Mission in Haiti peacekeeping force in April 2004 to support the transitional government and the Haitian National Police (UNSC 2004). The stated goals of the operation, which continues today, are to assist with the restoration and maintenance of the rule of law, public safety, and order in Haiti, critical components to sustaining environmental restoration and economic development.

Haiti was seeing a marginal increase in some areas of development, but widespread protests in 2008 and the devastating 7.0 earthquake on January 12, 2010, caused significant setbacks (Arthur 2010; Blanford and Messner n.d.). The disaster weakened governance through significant damage to infrastructure and a tragic loss of key human capacity. In 2011, the Fund for Peace continued to classify Haiti as a failed state, ranking the country as one of the world's weakest in every dimension of state failure (Blanford and Messner n.d.). The earthquake further weakened the already vulnerable system. Sixty percent of government and administrative buildings were destroyed, including the Presidential Palace, ministry buildings, and the national parliament. More than 16,000 civil servants died in the quake, and many immediately left the country. Although many have returned, the government's core capacity and workforce was reduced by 33 percent after the earthquake (UNDP 2010). Therefore, there remains a great need to increase the capacity of the government of Haiti in addition to supporting project specific objectives.

Land tenure and political dynamics

The current land tenure system, a reflection of the turbulent political development and lack of enforced legal frameworks, undermines development. The current



land tenure ownership in Haiti functions mainly around undocumented customs and practices, without a comprehensive land registry, and a historical account of multiple systems. Although there is a legal framework for a cadastre, it has never been fully implemented. The current land tenure system is characterized by unresolved arrangements and large numbers of farmers maintaining multiple small parcels. These two pressures discourage optimization of land, private investment, and the use of modern technology, thereby slowing economic development and food security.

The social structure under the Duvalier regime, enforced by the militia called the Tonton Macoutes, created local leaders who consolidated control over many industries and farmer cooperatives. Under the authority of the militias, many people lost land. The Tonton Macoutes controlled the coffee plantations in southwestern Haiti, which were known for their high-quality coffee beans and productivity. The fall of the second Duvalier regime created a power gap in the rural areas as militias and political elites were removed from power. Many business and property owners also abandoned certain areas, leaving a void in land management (Farmer 1994). With the departure of the organizational unit and an accompanying foreign embargo that caused coffee prices to plummet, the plantations quickly collapsed and markets decayed. The land is now being cultivated for subsistence crops and deforestation rates have increased dramatically (CIESIN 2010).

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Most land titles have been passed down informally from one generation to the next. The complex mix of both formal and informal systems developing over several decades and centuries of different government approaches has generated layers of legal pluralism, the reform of which would require a strong government effort to enforce. During the period of political transition in the late 1980s, a window opened for land reform (Smucker, White, and Bannister 2000). The agriculture and agroforestry development community in Haiti debated how best to design programs around insecure land holdings, taking into account the risk that many of the projects could create conflict over land by changing the land's value.

These debates in the late 1980s took place in the context of the 1987 land reforms. Section H of the 1987 constitution deals with property in general and Title IV establishes limited foreign land ownership. Article 248 calls for the establishment of the National Institute for Agrarian Reform (INARA), which was created in 1995. INARA's purpose is to "organize the revision of real property structures and to implement an agrarian reform to benefit those who actually work the land. This Institute shall draw up an agrarian policy geared to optimizing productivity by constructing infrastructure aimed at the protection and management of the land" (GOH 1987). From 1996 to 2000, President Préval continued to support INARA by enacting the first major agrarian reform in Haiti in more than 170 years (GOH 1996a). INARA redistributed a limited portion of the fertile area of the Artibonite Valley to 1,600 families (GOH 1996b).

Livelihoods and population pressures

With an annual per capita gross domestic product (GDP) of US\$646 in 2009, Haiti is the poorest country in the Western hemisphere (World Bank 2011). Eighty percent of Haitians live under the poverty line of US\$1.25 per day (World Bank 2010). In 2009, a study found that 35 percent of fifteen to twenty-four year olds were unemployed (IHSI 2009). A youth bulge is expected in 2020 that will bring a 32 percent increase in the labor force and 16 percent increase in the dependent population as compared to 2005 (Arthur 2010).

Agriculture is the primary source of livelihoods for over 40 percent of households and makes up roughly 80 percent of Haiti's GDP (CNSA 2010; World Bank 2010). Haiti's agricultural sector is limited by topography, erosion risk, and natural disasters that make crop yields insecure (Swartley and Toussaint 2006). Crop yields have been stagnant since statistics have been collected, while elsewhere the use of fertilizer and improved seed varieties have brought large gains (see figure 1; World Bank 2010). Eighty percent of farmers fail to produce enough food to feed their families (WFP 2008).

Haiti's national production of cereal decreased by 4 percent between 1961 values and 2009, whereas the Dominican Republic has increased its production by 142 percent (figure 1).

Haiti imports a little more than half of its food (Matthews and Stokes n.d.). Volatility in the price of food imports imposes hardships on the population. A

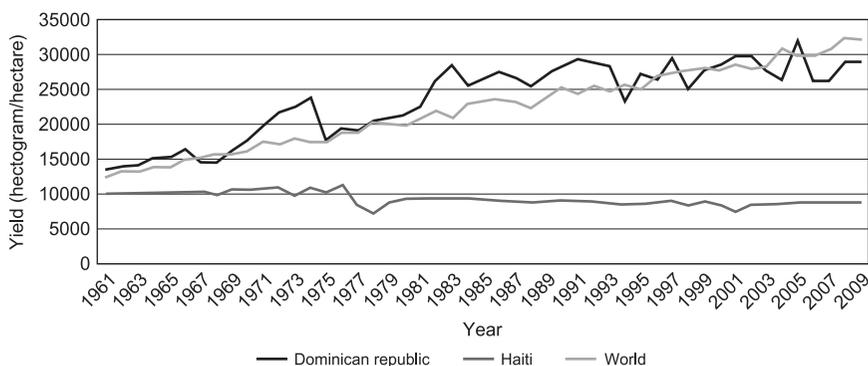


Figure 1. Cereal yield in Haiti and the Dominican Republic: Opposite trends

Source: FAOSTAT (2010).

42 percent spike in rice prices in 2008 was followed by violent protests leading to the resignation of the prime minister (CNSA and FEWS-NET 2008; Arthur 2010).

As discussed above, foreign aid has been erratic, limiting its ability to address livelihood problems in a sustained manner. The growing population corresponds with increasing pressure on the natural resources that sustain basic livelihoods.

Natural disaster vulnerability

Haiti is exposed to risk from storms, droughts, and earthquakes. The human impact from such exposure is heightened by environmental degradation, inadequate infrastructure, weak zoning, poor building material and construction, and ineffective early warning and preparedness systems.

Hurricane season occurs from June to November, often with devastating effects. Between the years of 1909 and 2010, Haiti has been directly struck by thirty-one tropical cyclones, almost one every three years (EM-DAT 2011). These are reported tropical cyclones. In addition, there are localized storms and windstorms not captured in this database. One recent major hurricane in 2004, Hurricane Jeanne, damaged or otherwise destroyed the staple crops in the Artibonite Valley, Haiti’s key agricultural region. The loss of important crops, including sorghum, maize, eggplant, beans, and banana on 7,767 hectares in the Artibonite and the northwest areas impacted the incomes and livelihoods of over 12,900 households. These areas were estimated to have experienced losses of over US\$20.6 million. Hurricane Jeanne and the subsequent hurricane, Ivan, were the two most damaging windstorms of 2004, significantly affecting the farm infrastructures in all departments, resulting in capital losses equivalent to 5 percent of Haiti’s GDP. These two hurricanes killed a combined estimated total of 14,500 people, and impacted over 3.6 million people nationwide. The damage caused by these events was initially estimated to be over US\$4.4 billion (FAO 2007).

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Four years later, four hurricanes struck Haiti within the space of two months, causing significant economic, environmental, and human losses. Hurricanes Fay, Gustav, Hanna, and Ike caused an estimated 700 deaths, and affected an additional 250,000 people. Damages were estimated at around US\$900 million, which at the time accounted for approximately 15 percent of Haiti's GDP (ICG 2009).

Major hurricanes such as these have damaged the natural and man-made systems designed to blunt the adverse effects of such events, meaning that Haiti is now more vulnerable to extreme weather events than ever before. These storms cause loss of viable land for agriculture, crops, and a significant amount of livestock. The hurricanes have also damaged major infrastructure including water and sanitation systems, jeopardizing public health. Telephone and electrical systems have been destroyed, limiting communication and access to basic services. Roads and bridges have been damaged or completely destroyed, making it impossible to access many areas throughout the country (ACT International 2009).

To address this overall risk, there have been dual approaches: 1) continuous efforts to slow and reverse deforestation on a national scale, and 2) the construction of flood reduction infrastructure. One widespread effort to repair the forest landscape was the Agroforestry Outreach Project, which was launched in 1981 and funded by the U.S. Agency for International Development (USAID). The project continued with intermittent breaks through 2000 and resulted in several programs that reached over 300,000 residents, including hillside restoration and forestry schemes (Murray and Bannister 2004). The 1980s reforestation project, with an initial budget of US\$22.8 million to replant 30 million trees, created the analysis and knowledge for what Gerald F. Murray and Michael E. Bannister argue was a critical shift in the approach to reforestation projects. The project started developing reforestation activities based on the principles of economically productive systems instead of conservation and protection approaches. They argued that economically productive approaches would maintain a long-term system by motivating farmers to protect and propagate those tree species (Murray and Bannister 2004).

Yet despite the large investment, the programs still have yet to demonstrate transformational change within the Haitian landscape. Overall, forest cover continues to decline and indicators including erosion rates, agricultural productivity, and land use and land cover show worsening environment degradation (UNEP 2010). Despite the large investment, forest cover has decreased by roughly 13 percent since 1990, and the current estimate is that less than 3 percent of original cover remains in the country (ICG 2009). With the increased pressures and demands of large-scale agriculture and an ever-increasing population, there is a critical need to increase watershed absorptive capacity to reduce flood risk while also providing key flood infrastructure to protect towns, agriculturally productive lands, and roads.

CHALLENGES FOR EFFECTIVE INTERVENTION

This section identifies challenges associated with prevailing aid and development practices in the country.

Planning time horizons

The majority of environmental aid projects identified in a 2010 UNEP study were funded for less than five years, a time frame too short to catalyze real change on a meaningful scale. In this 2010 evaluation of forty-three environmental foreign aid projects in Haiti, only eight were considered medium to long-term investments of over five years. Ten were short-term projects of three years or less, and the remaining twenty-five were considered to be medium-term of three to five years (UNEP 2010).

The process for internal fiscal allocations by donor countries' governments run counter to the objectives and design needs of environmental programs in Haiti. USAID is dependent on congressional allocations, which are vulnerable to shifts in U.S. policy and politics. This is reflected in the cycles of USAID funding, which allocate funds in tranches for up to three-year periods. A failure to renew the five-year Economic Development for a Sustainable Environment project (Développement Economique pour un Environnement Durable, or DEED project), discussed below, forced the watershed program to shut down after only three years (USAID 2010). Despite the large amount of aid, the lack of a commitment to long-lasting and sustained engagement by donors and funders has left Haiti falling short of broad goals for transformational change. Funding and support for USAID projects is unreliable despite long-term goals for aid. The Agroforestry Outreach Project (1981–2000) saw extended periods without funding, different project names, and intermittent activities due to shifting U.S. government policies (Murray and Bannister 2004; DAI 1990). A major effort to support reforestation using high-value trees such as mangos and cocoa brought some benefits in the 1980s and early 1990s, but the aid was cut following Aristide's ouster. Tree nursery subsidies and reforestation projects were cancelled, and the progress was undone (Murray and Bannister 2004).

As recently as 2010, post-earthquake, USAID is reported to have frozen budgets and shifted its strategy for ongoing agriculture and environment programs, threatening to halt ongoing watershed restoration work in several areas (Yale University 2010). This has caused major setbacks for project sustainability by undermining the impact of the program and creating distrust with local partners.

The Interim Haiti Recovery Commission (IHRC) and the Ministry of Planning were given the mandate by the Haitian government and the international community to address long-term recovery after the 2010 earthquake. Despite this, Haiti continues to struggle to create a framework under which donors can coordinate their efforts. The IHRC released their strategic vision one year after the earthquake, but it is characterized by general statements of purpose that are again focused on short-term recovery. There is only one, although vague, long-term goal: a portion of sustainable employment is to be allocated to mitigating risks from natural disasters (IHRC 2010).

A series of new planning frameworks is scheduled to be released by the government in the second half of 2011. This is an opportunity for donors,

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implementing partners, communities, and the government to coordinate long-term efforts around a matrix of needs and initial recommended actions.

In 2009, the total foreign aid to Haiti increased to close to US\$1 billion in net disbursements of ODA, and the post-earthquake period heard pledges (a majority of which remain to be funded) of close to US\$6 billion (OSE 2011). This period, post-earthquake, is almost certainly a boom phase of aid that will not continue at the same level beyond a recovery timeframe. To address the underlying environmental factors that increase instability, long-term commitments to restoration projects must be made and maintained. Long-term project staff, monitoring, and technical support should be maintained in addition to specific project funding.

Government capacity

The Haitian government's budget relies heavily on external aid, weakening its capacity in the long run and increasing its dependency on the generosity of foreign governments, which is vulnerable to global markets and foreign politics. The tax base does not provide enough revenue to sustain the annual government budget (USAID 2007b). This lack of funding undermines the ability of the government to take over projects once the donor-supported components are complete. As of June 2011, of the estimated US\$1.74 billion of aid funds dispersed after the earthquake from pledges made at the donors' conference in March 2010, approximately 8.8 percent, or US\$153 million, went towards loans and financing for the Haitian government and 14.9 percent, or US\$257 million, went to budgetary support (OSE 2011).

Development programs focused on the environment are not intended to develop ways to directly improve national financial sustainability. For instance, they don't result in significant increased tax revenue. Yet, they are dependent on services from the government system, such as law enforcement agents.

Incoherent internal governance and prioritization creates situations that have undermined development agendas. National programs suffer from a lack of implementation and repeatedly inconsistent leadership. This instability at the national level is reflected in the response by international donors. With changes in Haitian leadership and priorities, donors shift strategies and funding levels as seen above with sanctions or increased aid.

The government of Haiti also has an inconsistent commitment to long-term strategies and programs. There are numerous government agencies that have been created with the support of the country's political leadership and talented technical specialists. Yet many of these agencies with long-term mandates lose support with changes in political leadership and become weak shells of their intended organizations. The Comité Interministériel d'Aménagement du Territoire (CIAT) is an entity with an uncertain future. CIAT was created under the leadership of the former prime minister Michèle Pierre-Louis as an inter-ministerial body to coordinate land management. CIAT lacked funding and support from the ministries

that it is responsible for organizing, which undermined its mission and revealed the weakness of long-term planning within an unstable state (Yale University 2010). This, similar to other government initiatives, reflects the weakness in the political system in fragile states, which can undermine planning and national policies critical for long-term recovery and development.

Lack of comparable data collection, analysis, and evaluation

Donors and implementing agencies have a poor record of systematic and transparent monitoring on performance and development indicators for aid projects in Haiti, including data critical for national and regional management and planning platforms. Despite numerous projects collecting data across the country, there are no spatial information systems that accumulate data and provide near-real time information services to smallholder communities or health ministries and clinics.

National government agencies do not effectively coordinate their data collection, and large nongovernmental organizations (NGOs) collect numerous surveys, the results of which are often poorly circulated and are rarely integrated into Haitian decision-making systems (CIESIN 2010; UNEP 2010). The main geospatial data agency of the Haitian government, Centre National de l'Information Géo-Spatiale (CNIGS) is one successful case of an influential semipublic agency that effectively distributes data sets. Organizations use this data, but rarely do they design their data collection to systematically feed back into the national system. Relevant data sets could include household socioeconomic surveys, stakeholder analyses, lists of local organizations, census data, spatial data sets, infrastructure inventories, and data critical for decision-making and resource allocation across a variety of government agencies.

USAID grants require contracted entities to report specific indicators that are used to monitor the contractors' actions. The indicators reflect, for example, the number of beneficiaries, the number of organizations that have received training, or the number of items that have been distributed. These indicators are important for reviewing the performance of contractors and justifying assistance projects to U.S. constituents. Examples of aid-driven indicators also include the number of agricultural-related organizations benefiting directly from U.S. government supported institutions, or the number of vulnerable households benefiting directly from U.S. government assistance.

Projects in Haiti have not demonstrated monitoring efforts of indicators that reflect development changes over time or measure either the progress of individual project beneficiaries toward development objectives or landscape-level impacts. For instance, there is no coherent measurement of land cover rates of change to match the millions of U.S. dollars invested in reforestation schemes. There are no coherent monitoring systems of flood damage or flood risk reduction despite millions of U.S. dollars of investment in infrastructure.

It is also not yet standard practice to design indicators to support the government's or communities' decision-making processes. Such data collection would

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build information systems with frequent data reporting (DAI 2009). For instance, there is no clear registry of schools and health clinics with related capacity, which would help identify investment priorities for health care interventions and education programs. The data and monitoring that happens at the local level could be utilized in clear ways to help decision makers at any scale of governance. Currently, however, national ministries do not provide data back to local offices or have joint analyses to help improve delivery of systems or improvement in program design.

In addition to the lack of transparent data collection, the lack of available data also limits the planning capacity of existing projects. For example, the regional flow of labor and populations has not been assessed or integrated into environmental recovery programs, even though large movements of people increase pressures on resources and impact the reliability of reforestation efforts and other interventions. This information is critical to the design of development projects, both for introducing smart growth urban design and for ensuring that aid programs do not create incentives for continued cultivation and settlement of highly vulnerable or unproductive land.

OBSERVATIONS ON BEST PRACTICES

Based on the overview above, several emerging best practices can be identified. The tenets of successful aid coordination and project design presented here for Haiti are not drastically different from those applied to other countries. Many of the lessons learned, as highlighted in this case study, are linked with global efforts for aid reform but are applied in this chapter to the context of Haiti. At its core, the coordination between aid projects and local and national Haitian agencies remains inadequate. While techniques for environmental restoration have improved, they are not being implemented at the same rate. The development of national data collection systems that provide reliable feedback to local communities, regional planners, and national policy makers could greatly improve government decision making. Amid Haiti's instability, environment-based aid projects struggle to reconcile the shifting systems of Haitian politics, institutions, and subjectivities while achieving local results.

Enhancing coherence and continuity

Current designs show that program staff, implementing partners, and community leaders rotate frequently, with inconsistent funding windows and lack of partnership with local government agencies and local organizations. This undermines the consistency required to achieve successful project results on the time scale required to impact the root environmental factors. It also undermines critical relations with the community and sense of responsibility for project outcomes. Local dependency on aid carries a high risk of program collapse when funding for long-term objectives changes. The program staffing structure of employing foreign

staff and project-dependent local staff also undermines Haitian leadership of these programs after the short-term funding expires.

At a national level, aid programs should be designed to coordinate their efforts with other donor nations and NGOs using strategic plans as a platform for long-term commitments. This is consistent with the Paris Declaration on Aid Effectiveness, an agreement between over one hundred countries that provides a framework for increasing the effectiveness of aid programs through five core principles: national ownership, alignment with national strategies, harmonization of in-country programs, results-based design, and mutual accountability (OECD 2008). Currently, large donors coordinate in what appears to be a strategy of splitting the country into regions and themes. This has resulted in the segmentation of watersheds among donors.

The ability to coordinate aid programs requires both donors and national leadership to provide the frameworks for investment. The IHRC and the Ministry of Planning have no clear long-term vision and continue to struggle to create a planning framework under which donors can coordinate their efforts. Their strategic vision focuses on short-term recovery rather than long-term reconstruction. Planning processes are partially limited by external shocks and pressures and the inconsistent ability to secure long-term funds. Estimated time frames should vary by program, but should plan for achievements in five-year brackets, with ten-year strategies and planning of twenty years or more.

An example of a project that has continued to plan at the local level for ten years is the program in the area of Marmelade in northern Haiti, launched by the Canadian International Development Agency and the Food and Agriculture Organization of the United Nations. The project was managed by the Comité Communal de Concertation et de Planification de la Commune de Marmelade. The Marmelade program brings together the government of Haiti, NGOs, and community members under a joint, community-led planning structure that includes thematic and spatially driven community development boards. This allows integration across thematic sectors and projects by a variety of stakeholders, while giving maximum control to the community itself and spreading the risk of funding failure across all partners. It also maximizes technical inputs and regional planning efforts. The Marmelade community development board has maintained its presence within the communities beyond the project lifespan, with continued participation by both government agencies and NGOs at the ten-year post-project review (GRAP and CEGDL 2003; FAO 2007).

The previous projects examined in this chapter that demonstrate the greatest potential for long-term presence and influence are those that partner with local organizations as a fundamental principle of their program. These measures can help avoid the problems caused by overlapping, fractured programs that stop, start, and change focus. Programs that support joint funding and community involvement would benefit from integrated programs that maintain their presence when foreign aid fades. Examples of subcommittees within the Marmelade Community Development Board include committees to maintain clean water

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delivery systems, civil protection committees, watershed management committees, and agricultural savings teams.

By identifying the potential for inconsistent funding ahead of time, program structures can be adapted to support local involvement after funding has ceased or even with temporary interruptions in funding. Initiating a framework that encourages more long-term funding that is conditioned on performance, even if the funds are phased down over the years, can also complement program structures that support ongoing community, local NGO, and government involvement.

The post-earthquake period has seen a dramatic increase in attention to more effective planning with the Haitian Ministry of Planning. In fact, the ministry plans to release several key regional plans and related analyses following the publication of this article. These new national and regional government plans will again focus on integrated approaches to development, linking environmental restoration to food production and disaster risk reduction, as well as economic growth. Ideally, the appropriate ministry would use these frameworks to coordinate investments and projects that would be agreed to through a multi-stakeholder effort for each target region.

Designing programs with an ecological mindset

There are two limitations to the current patterns of program planning: 1) funding is distributed at politically defined administrative boundaries, and 2) most programs target lower watershed areas with higher population density instead of adopting watershed scale risk reduction strategies that target the entire catchment.

Interviews in rural areas with histories of large flooding events showed that people, “sleep with their eyes open,” out of fear that their homes and fields will be flooded (CIESIN 2010). Because of this prevailing risk and fear, aid programs are targeted at populations that face immediate risks rather than focusing on where the risk originates: the upper watershed areas. The investment of millions of U.S. dollars in immediate river correction infrastructure in downstream areas with the largest population density is far more frequent than investment in programs with a distinct long-term, watershed-scale, flood reduction–planning component (HRF 2010). As such, this tendency does not address the root causes of Haiti’s environmental vulnerabilities.

USAID has funded two main watershed restoration projects in Haiti over the last ten years. The DEED project, mentioned above, is focused geographically in two areas in the north: the watersheds of Saint Marc and Limbé. This project uses a market-based approach to integrate improved management of lands and other natural resource assets with expanded enterprise and job opportunities through the production of suitable high-value crops. DEED focuses on land use planning and links the management of natural resources to sound conservation practices, a critical component for promoting sustainable watershed management (USAID n.d.a; UNEP 2010).

The Watershed Initiative for National Natural Environmental Resources (WINNER) is focused on restoring the watersheds around Port-au-Prince and Gonaïves. This program focuses on agricultural intensification, improved rural infrastructure, good governance of natural resources, and public-private partnerships (USAID n.d.b). USAID has invested millions of U.S. dollars in the WINNER project, although it is unclear in what proportions funding has been allocated to upper catchment reforestation projects and downstream flood protection. However, based on public project reports, downstream investments are still not connected to an overall strategy for risk reduction and long-term catchment management (USAID 2010). This lack of comprehensive planning and coordination reduces the efficacy of these investments.

Because flood prevention infrastructure is being built without careful attention to the drivers of vulnerability, including both deforestation and loss of upriver flood protection systems, downstream communities are at greater risk. Analysis of the watershed of the Marigot River basin in the southeast part of Haiti showed that the flooding associated with the 2008 hurricanes caused the expansion of the riverbed to twice the size it had been in 2005, destroying critical agricultural land and water and road infrastructure (CIESIN 2010).

The 2007 USAID-funded Environmental Vulnerability Report provided a framework for measuring flood risk at a watershed scale across all of Haiti. This framework provides a critical tool for setting national policy priorities and developing coherent plans (Smucker et al. 2007). It provided the first national-scale analysis of available spatial data and identified those watersheds at greatest risk from environmental degradation and large natural storm events. On the other hand, this report did not provide any analysis at the local level.

Recovery efforts from disasters such as those described above do not demonstrate any large-scale, comprehensive restoration activities on a watershed level (USAID 2007a). Most planning and investment continue to happen around political administrative boundaries of communes, whereas the flood risk and erosion are occurring around ecological boundaries, which include multiple communes. Planning and investment for both environmental and socioeconomic development projects continue to be designed and funded around administrative boundaries. Targeting development programs around watershed boundaries is critical for long-term environmental restoration, especially in the southern and northern areas where watersheds are smaller than the Central Plateau and Artibonite. Many issues facing these small watersheds, like flooding, erosion, economic development, and infrastructure development, are not confined within commune boundaries.

Land use as an integrative planning tool

An emerging concept of program management is a watershed governing body that transcends administrative boundaries and includes multiple stakeholders in both appointed and elected positions. This body could maintain consistent

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oversight, with the support of technical staff from watershed restoration programs, and facilitate the integration of watershed objectives into commune- and municipal-based planning processes and funding objectives.

Land tenure and land scarcity in Haiti are relevant to long-term security. They are also components of the increased pressures on effective land management. Insecure land tenure systems can influence household and farmer decision making processes regarding management. This is particularly true of investments with long-term payoffs, such as tree planting or projects to increase soil fertility. Nonetheless, rural areas have an active informal land market across communes. The majority of Haitian farmers have landholdings that are often scattered throughout different areas of the watershed in several small plots (Versluis 2008). Therefore, the same individuals and families make decisions about upstream and downstream plots. This suggests the need for a management unit that covers the watershed geographic area and a review of land management rules by the community and government.

To maximize the impacts of their efforts, donors should integrate urban planning and regional planning into natural resource management and environmental restoration objectives. Identification of investment areas should take into account these plans and be conscious of the impacts of population growth and the vulnerability of watershed regions. Donors should consult with the Ministry of Planning to prevent duplication of efforts and integrate their efforts into regional and national plans. Land tenure and scarcity issues will increase as the population continues to grow. Plans should take into account the impact of the upcoming youth bulge and its potential to strain economic development and employment. The growing demographic needs to be economically accommodated, and careful attention should be paid to how decreasing access to land is addressed through development programs as watersheds and regions are rehabilitated over the coming years.

Developing robust monitoring systems

Several prominent studies have shown that improved national data collection and distribution platforms at both local and national levels would significantly support local planning and regional development (Smucker et al. 2007). For example, government ministries, rural extension agents, and academic centers have repeatedly identified the need for a national soil survey to support agricultural planning (CIESIN 2010). Isolated soil testing has taken place but with millions of U.S. dollars of aid investment in agriculture, there has been no effort to build a national inventory or map to help optimize these investments at a national scale. Development projects should reinforce national data and monitoring systems instead of operating independently.

CNIGS provides an example of how national data sets can create critical tools for both aid organizations and the national government. The lack of meteorological data, river flow data, agricultural production data, socioeconomic data,

or data on health trends means that planning and prioritization remain based on guesswork rather than rigorous technical designs (CIESIN 2010).

The lack of systematic infrastructure investments combined with the absence of reliable watershed scale data makes it impossible to accurately model hydraulic flow in the catchments to improve planning and location of flood prevention systems. Support for spatial planning and for local, regional, and national data monitoring is essential for adequate planning in a country facing multiple pressures and a need for environmentally sound interventions.

The 2007 USAID Environmental Vulnerability Report is an example of national-scale data collection and analysis that has led to specific policy recommendations for national planning (Smucker et al. 2007). This approach should be repeated at subregional and local levels to help guide investment and design programs. Aid programs should reinforce these systems with standardized spatial and statistical data that can be shared with the government. New studies should aim to support national data collection, management, and planning systems.

Reducing risks to natural and human shocks

Within the program and project design process, programs should adequately prepare for the risks of exogenous shocks. Proper risk assessments are necessary to identify potential for shocks such as market assessments, natural disasters, political turmoil, and global price fluctuations. Contingency plans such as diversification of economic production or reserving resource revenues for an emergency fund should be incorporated into project plans. An even higher priority should be placed on maintaining the support of local NGOs and local project leadership through shifts in political situations and funding gaps.

The increased frequency of large hurricane events has also frequently damaged investments in critical infrastructure. This was further impacted by the 2010 earthquake. Current projects tend to focus on immediate recovery. A broader focus involving reconstruction that includes reducing long-term flood risk can mitigate the impacts of floods in the future while supporting immediate recovery and relief needs.

Finally, political and market instability undermines critical planning processes. An integrated recovery and development strategy is required to maximize the opportunities provided by improved security and ensure that those security gains are sustained. Identifying and accounting for these risks can help to maintain long-term development despite other uncontrollable pressures on the economic and physical environment in Haiti.

CONCLUSION

The current approaches to aid reform have not achieved the catalytic change required for long-term sustainable development. This chapter underlines the need for projects that are coordinated under common planning frameworks at ecologically

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relevant scales. Projects should also provide for sustained financing for both the community and the project teams. Integrated programs that address multiple sectors simultaneously across spatially significant scales help reduce the multiple drivers and pressures impeding sustained growth and development.

Multiple community groups and organizations with expert knowledge are already in place across Haiti and within watersheds, ready to implement integrated programs if sustained funding commitments are offered by donors and communities and their participation is institutionalized within the project management structure. These efforts could bring the change required to stabilize development in positive growth directions and improve the resilience to the multiple vulnerabilities facing Haiti's degraded landscape. These efforts could also provide the underlying foundation required for reducing political instability and invigorating progress towards integrated development.

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