



USAID
FROM THE AMERICAN PEOPLE

CONSULTANT REPORT

Local Government Disaster Preparedness Assessment Limbé and Montrouis Watersheds

AUGUST 2009

This publication was produced for review by the United States Agency for International Development. It was prepared by DAI.

Local Government Disaster Preparedness Assessment:

Limbé' and Montrouis Watersheds

Program Title: Développement Economique pour un Environnement Durable

Sponsoring USAID Office: USAID / Haiti

Contract Number: EDH-I- 00-05-00004-00

Contractor: DAI

Date of Publication: AUGUST 2009

Author(s): C.Kelly

EXECUTIVE SUMMARY

The USAID-funded, DAI administered DEED Project commissioned a study to (1) *Evaluate the status of disaster planning and local government capacity for the same in DEED project communities* and (2) *Articulate a plan for DEED to best achieve its participatory disaster preparedness planning commitments*. The study was conducted from 22 July to 7 August 2009 and involved document review, key informant meetings and site visits to the Limbé and Montrouis project areas.

Key findings of the evaluation included:

- Local capacity to plan for and respond to disasters is relatively strong in disaster preparedness and response, but needs development in risk assessment and mitigation.
- Community-level disaster management efforts need to focus on several additional hazards, including wind and drought.
- Local interest in disaster preparedness is strong but faces challenges with inadequate resources, capacities and information on risks.
- The DCP takes a decentralized approach to disaster planning, providing training and technical support through a variety of projects and mechanisms.
- The National Geographic Information Services Center has capacities and experience in mapping floods and other hazards.
- DEED's collection of data for land use planning is a significant resource for community-level disaster risk management.
- DCP's community-based disaster planning approach complements DEED's watershed-based project approach.
- DEED project impacts can be strengthened and preserved by a formal integration of risk reduction into project activities and approaches.

Key recommendations include:

- Expand DEED's work in disaster risk reduction to include wind and drought hazards and support to local disaster management committees, in partnership with other USAID projects and DCP and partners.
- Develop site-specific hazard management plans for hazard locations identified through hazard mapping using community-based methods.
- Map flood zones for Limbé/Bas Limbé at the 1:3000 to 1:5000 scale.
- Improve the informal early warning system in the Limbé watershed.
- Develop and disseminate agriculture risk reduction guidance for floods, wind, hail and drought.
- Incorporate risk reduction into infrastructure-related activities.
- Incorporate environmentally friendly approaches into project infrastructure interventions.

INTRODUCTION

The report covers a consultancy for Development Alternatives International (DAI) in Haiti to-

1. Evaluate the status of disaster planning and local government capacity for the same in DEED - *Developpment Economique pour un Environnement Durable* - project communities
2. Articulate a plan forward for DEED to best achieve its participatory disaster preparedness planning commitments within this current context.

A list of specific tasks undertaken is provided below. The requested outputs from the consultancy include:

- A concise report in two parts:
 1. Detailing the status and capacity of the local governments, with prevailing knowledge, attitudes and practices vis-à-vis current disaster preparedness programming and,
 2. An action plan for DEED that is congruent with both the local need and opportunities as well as DEED's mandate and funding;
- A brief presentation to USAID and other stakeholders at the conclusion of the STTA.

Specific Tasks Undertaken

1. Conducted a critical assessments of local government capacity to plan for and respond to disasters
2. Examined whether local governments in the project and neighboring areas have worked with other programs in land use planning or have **Local Development Plans which may inform DEED's approach to watershed** management planning and disaster preparedness
3. Evaluated the relevancy and status of the National Disaster Preparedness **Office's (DCP)** approach in communities
4. Reviewed current disaster preparedness program approaches and progress by other projects and assistance providers which may relevant to DEED
5. Visited the Montrouis and Limbé project zones and interviewed project staff and community representatives on the history and results of local disaster preparedness activities
6. Visited the National Geographic Information Services Center to assess their information on disaster and risk management information and the forms they make this available
7. Reviewed community opinions with regards to disaster preparedness opinions and interest in involvement in disaster preparedness activities.

The consultancy was carried out between 22 July and 7 August, 2009. The full terms of reference for the consultancy are provided in Annex A, with a schedule of activities and persons met provided in Annex B.

PART ONE – DETAILED REPORT

DISASTER RISK MANAGEMENT

The consultancy ToR refers to disaster preparedness. Disaster preparedness generally focuses on actions to prepare to respond to a disaster, including plans and drills, warning systems, building skills needed to respond following a disaster (e.g. first aid training) and creating stockpiles.¹ Reducing the possible frequency of a disaster or the scale of a hazard impact contributing to a disaster, is not *usually* included in preparedness activities.

DEED project documentation focuses on the broader issue of reducing the impact of natural hazards through watershed management.² This objective requires going beyond simply preparing for a disaster (that is accepting that disasters will occur) to incorporating disaster risk reduction concepts and measures into watershed management strategies and activities.

Conceptually, the risk posed by a potential disaster is defined by the *magnitude* and *frequency* of a hazard event and the vulnerability of an individual or social group to the impact of the hazard event (see Annex C). The broader approach to dealing with disasters would be based on a *disaster risk management* strategy incorporating preparedness, mitigation and other, often development-based, risk reduction measures.³

A disaster management approach may seem a considerable step beyond simple disaster preparedness. However, most of the natural hazards in the project areas (e.g., drought, floods, high wind, landslides) are watershed focused. Incorporating measures to reduce the impact of these hazards is an integral part of watershed management strategies as well as a way to prevent future losses to project participants, investments and outputs.

DISASTER RISK MANAGEMENT IN HAITI - OVERVIEW

Haiti's disaster history, hazards, vulnerabilities and risks are relatively well documented at a national level, but the specificity and availability of frequency and impact information diminishes as one goes to the community level. A summary list of hazards encountered in Haiti is provided below, with hazards reported in Limbé (L) and Montrouis (M) noted.

¹ See <http://www.unisdr.org/eng/library/lib-terminology-eng%20home.htm> for a range of disaster-related definitions.

² See table on page 21, **Economic Development for a Sustainable Environment** IQC Work Order Proposal.

³ Disaster risk management can be seen as the application of practical measures to reduce disaster risk while recognizing that some risks cannot be reduced to inconsequential levels and preparedness and response measures are needed to protect against immediate threats to lives and livelihoods.

A long term increase in disaster impact (i.e., human and economic losses) in Haiti is likely linked to the increase in population leading to:

- More people in hazardous locations, and
- Changes to local environmental conditions (e.g., reduced water retention of soils).

Haiti's Hazards

A Summary List

- Drought (L, M)
- Flooding (flash, river, urban)
- Sea surge (tidal, storm-related and seismic generated) (L, M)
- Earthquake (L, M)
- Hail (L, M)
- Coastal erosion (M)
- Subsidence
- High wind (L, M)
- Landslide and other forms of mass wasting (L, M)
- Fire (urban and wild-land)
- Disease (human and non-human animal and plant) (L, M)
- Displaced populations (internal and from neighboring or near-neighboring countries)
- Air and water pollution
- Erosion (L, M)
- Deforestation (L, M)
- Road, sea and air transport accidents (M)
- Building collapse
- Chemical spills (terrestrial and marine)
- Industrial and mining waste
- Ground water contamination
- Civil unrest
- Armed insurrection

This conjunction of people and hazards appears to be a particularly significantly contributor to the increase in disasters in regional urban areas in Haiti (e.g., Limbé, Gonaives, Arcahaie).

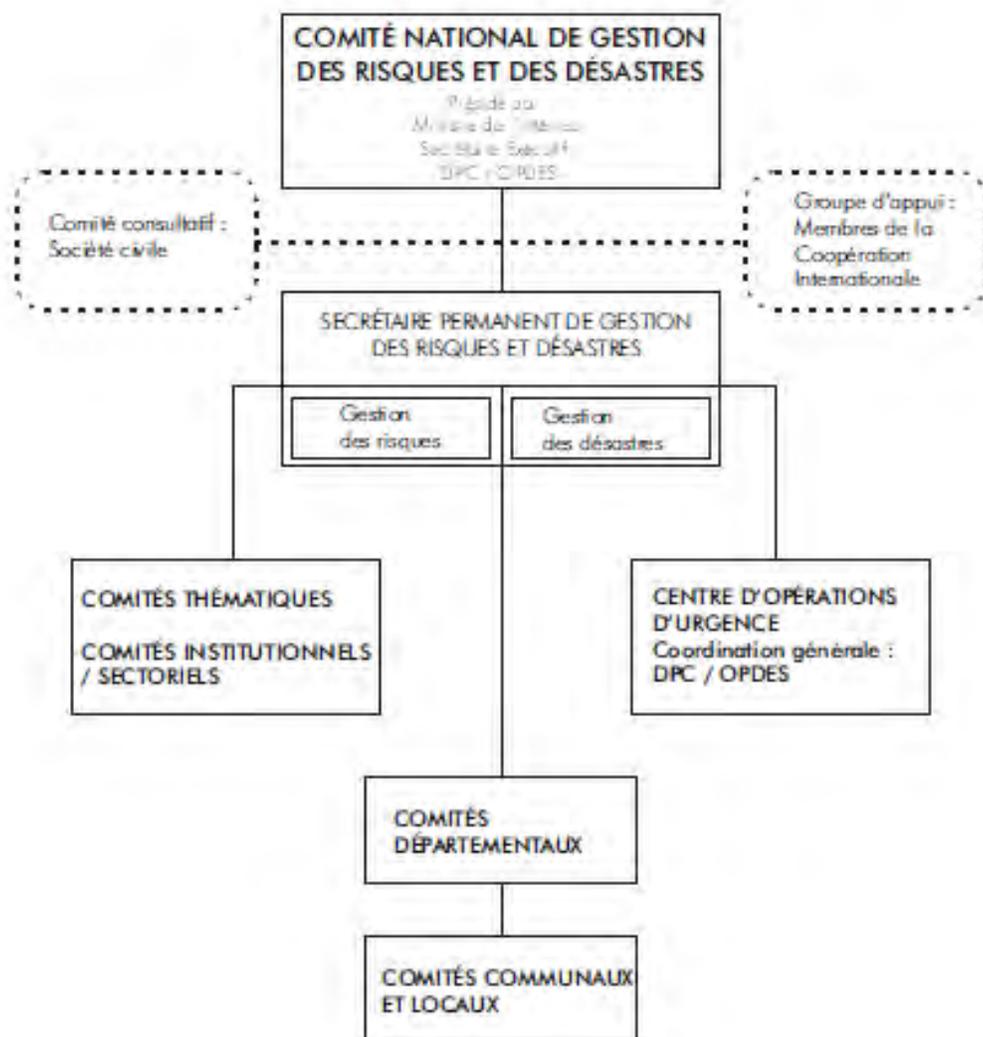
The lack of spatial planning incorporating hazard impact assessments has clearly contributed to a worsening of hazard impacts (disasters) than should be the case. In particular, there has been an increase in occupation of flood zones and on or below mass wasting (e.g., landslides, sheet erosion, land slips, etc.) sites. This situation makes the understanding of local weather conditions and management of flood and mass wasting sites of considerable importance, locally as well as nationally.

The current focus on flooding and landslides, in Haiti should not obscure the fact that there are a number of other potential disasters facing the country with devastating impacts on lives and livelihoods. Consultations in the Limbé and Montrouis basins indicate that high winds may contribute to significant economic hardship due to agriculture damage.⁴ Drought and dry conditions are also a significant problem in both basins. While both hazards may not be immediately deadly to humans, the economic consequences can lead to reduced food intake, outmigration and other impacts on human development and social wellbeing. Erosion and deforestation are hazards with longer term

⁴ There is historical evidence that wind-related commercial crop losses can lead to severe malnutrition due to the loss of income to purchase food, but such impacts may not occur for several months following the wind event.

impacts and animal and plant disease are can be local, chronic hazards.⁵

Disaster management in Haiti is governed by a *Plan National de Gestion des Risques et des Desastres* (National Risk and Disaster Management Plan)⁶ and *Plan National d'Intervention* (National Disaster Response Plan)⁷. Disaster-related activities take place through the structure set out below, with national, Department, Commune and section involvement.



⁵ Both Limbé and Montroius are subject to seismic hazards. While earthquakes and related mitigation measures are not covered in this report, improving overall disaster management will increased capacities to respond to earthquakes when they occur. Work under the HIGHER component of the LOKAL project should incorporate seismic risk reduction into local development of zoning and building codes.

⁶ http://www.protectioncivile.gouv.ht/Plan_Nat_GRD.htm

⁷ http://www.protectioncivile.gouv.ht/Plan_Nat_PNI.htm

Under the *Plan National de Gestion des Risques* each Commune should have a *Commitee Communal de Gestion des Risques ets Dedastres*. In some locations subsidiary committees have been established at the section level. (Development of these committees has involved assistance from the World Bank, European Union and USAID, among others.)

The Ministry of Interior and Local Government leads overall disaster management efforts. The national-level coordinating and response structure is the *Secretariat Permanent de Gestion des Risques et des Desastres*, The Ministry's Department of Civil Protection (DCP) serves as the administrative core to the *Secretariat* and overall coordinator for risk and disaster management.

The Ministry of Agriculture plays a lead role in centralized flood early warning. The Ministry of Plan oversees post disaster recovery and is developing a disaster-related planning capacity with World Bank funding. The Ministry of the Environment does not appear to have a specific role set out in terms of flood early warning, hazard mapping.

Information on who in the Government leads on disaster risk reduction is somewhat unclear. Haiti does not yet have a formal Disaster Risk Reduction Platform⁸. One source indicates that the Ministry of Plan is expected to take on oversight of risk reduction efforts. Another source indicated that disaster risk reduction comes under the *Secretariat Permanent* and thus can be coordinated by the Department of Civil Protection.

The impact of recurrent disasters on Haiti has been recognized for several decades, with a corresponding history of efforts to reduce the impact of disasters undertaken by the Government of Haiti, donors and non-governmental organizations. Current disaster management efforts focus on building a national capacity to manage disaster events and extending this capacity to the Department and Communal levels and below.

The lead actors supporting the development of disaster management capacity in Haiti include:

- USAID/OFDA: Training on needs assessment and temporary shelter management and support to DCP (via directly and UNDP).
- European Union: Risks management and community risk management.⁹
- World Bank: Developing local disaster management committees and building national disaster management capacity¹⁰
- Inter-American Development Bank: Early warning and capacity building¹¹
- UNDP: Improving disaster preparation and response capacities; reinforcing disaster management strategies, structure and tools; and advocacy for disaster management structures in Haiti.¹²

⁸ See <http://www.preventionweb.net/english/hyogo/isdr/mechanisms/>

⁹ See <http://www.protectioncivile.gouv.ht/5.2%20Fiche%20de%20projet%20-%20Union%20Européenne.pdf>

¹⁰ See <http://www.protectioncivile.gouv.ht/Fiche%20de%20projet-Banque%20mondiale.pdf>

¹¹ See <http://www.protectioncivile.gouv.ht/Fiche%20de%20projet-%20BID.pdf>

- NGOs (including OXFAM, IOM, French Red Cross, PADF, Plan, Catholic Relief Service, Action Against Hunger, Concern, various Red Cross Societies): Development and support of local disaster management committees focusing on disaster preparedness and response planning. Note that some of these activities are funded through World Bank, European Union or USAID funds¹³ for the development of local disaster management capacity or other purposes.

It is clear that more effort has gone into preparing to respond to a disaster than the broader range of risk reduction actions possible in the humanitarian and developmental sectors. As one contact phrased it, improving disaster response is a low-hanging fruit, with immediate benefits in reducing the loss of lives and improving local capacity to manage disasters. However, the need for reduce risk is recognized in the *Plan National de Gestion des Risques* and by a number of key actors in improving disaster management in Haiti.

FINDINGS

The results of the consultancy have been consolidated under the following eight sections based on the tasks outlined in the ToR and other critical issues identified during the consultancy.

LOCAL CAPACITY TO PLAN FOR AND RESPOND TO DISASTERS

The GoH has established local disaster management committees (*Comite Communal de Gestion des Risques et Desastres* - "CCGRD") in almost all communes in the country. These committees have developed disaster response plans with training and support from the World Bank, European Union, USAID and other actors (e.g., Oxfam in Limbé). The current plans focus on the allocation of tasks and responsibilities to respond to expected disasters and are updated annually with the advent of the hurricane season.

The CCGRD plans represent a good start in organizing the community response to the expected disasters, most specifically flooding in most of communities visited. The process of developing these plans creates a capacity within the committees to respond to other disasters in addition to flooding and hurricanes (the focus of current concern). However, the risk assessment component of the planning process has a very limited scope and does not clearly define the relative importance of different hazard intensities (e.g., level of flooding, intensity of wind) or relative and comparative risks to the community.

CCGRDs appear to be strong from the perspective of government and civil society involvement in response. One committee was reported to have 30 members. The standard disaster plan format use by DCP provides for a clear allocation of tasks and responsibilities. It is unlikely

¹² See <http://www.protectioncivile.gouv.ht/Fiche%20de%20projet%20-%20PNUD.pdf>

¹³ The European Union funding for local disaster management capacity development has ended.

communities with functioning CCGRDs will lack the organization and personnel to implement evacuation and immediate response. (There is likely overlap with the prospective watershed

management committee membership, CCGRD membership and other community-based committees for similar purposes.)

CCGRD capacity is weak due to a lack of resources and, to a degree, by a lack of detailed information on hazard zones, hazard impact and hazard occurrence. As raised in a number of conversations, while a CCGRD is able to evacuate people in the face of flood or hurricane warnings it does not have the resources to care for the evacuees once they were in shelters. If these resources were not available in a shelter, it is less likely people will evacuate, evacuate in a timely manner, or remain in a shelter even when this is a safer location than their normal residence.

Appropriate information is a multifaceted challenge. There is considerable local knowledge on some hazards in some communities, although not all the hazards present are always recognized in relation to their potential impact. As is generally the case, local perceptions are conditioned by recent events: the floods of 2008 have made flooding an immediate concern, whereas wind damage, not common in 2008, was less of an expressed concern. As a result, it is possible that some hazards will become disasters without the CCGRD taking action because they are not looking for the warning signs.

The local understanding of the potential scale of a hazard impact may be based on one large event (e.g., 2008 floods) and not incorporate the realization that floods of less intensity can also result in serious damage. As a result, flood evacuation may be too large for the actual flood area, creating the appearance the evacuation was a mistake and lessening the likelihood of evacuation in the future and imposing unnecessary burdens on individuals being evacuated from non-threatened locations.

Finally, information provided from external sources about hazards (e.g., flood warnings) may not be spatially accurate enough to enable a CCGRD to provide accurate local warnings or conduct evacuations in a timely manner. Discussions in Limbé and Montrouis suggested that alerts from Port au Prince, although received and treated seriously, do not always match the occurrence of flooding events. Contacts in Marmalade reported they may, at times, not receive official warnings and, as in other locations, depend on unofficial channels, e.g., Radio Guinea, or cell phone calls.

The overall effectiveness of these unofficial warning channels could not be fully assessed. However, such systems are reported to be used regularly in the Limbé drainage (people calling from Marmalade to Limbé to warn of heavy rainfall and possible flooding). The lack of cell phone access in the mountains behind Montrouis limited the use of this approach in this area.

The information challenges noted above are relatively manageable at the communal scale using a combination of appropriate technology and capacity building. Two elements of this process which link to DEED's work are:

1. An improvement in the local understanding of hazards through mapping and, for the Limbé basin, and,

2. An increased formalization of the current unofficial flood warning system to include better data and systematic use of the results.

COMMUNITY INTEREST IN DISASTER PREPAREDNESS

Based on conversations with individuals already involved in CCGRDs, as well discussion with DCP and NGO staff, it appears that there is a continued interest in disaster preparedness in both watersheds.

An issue, however, is the lack of resources the CCGRDs have vis-a-vis their responsibilities, as noted above. In all CCGRD related meetings a request was made for supplies to enable the committee to do their assigned tasks. Any work with CCGRDs will need to be based on an understanding that DEED is not able to fund response-related requirements. Unfortunately, if these response-related resources are not provided from some source, the overall effectiveness of the CCGRDs will likely diminish quickly, limiting the impact of assistance to the CCGRDs provided by DEED or other sources.

DCP APPROACH TO LOCAL DISASTER PLANNING

DCP takes a decentralized approach to local disaster planning. Training has been provided to CCGRDs nationwide along with guidance on how to develop disaster plans. The World Bank and European Union have provided funding for this training through a variety of NGO-based projects. The IADB/Ministry of Agriculture Flood Early Warning project also provides training to local flood management committees which have overlapping membership with CCGRDs.

Annual campaigns associated with the advent of the hurricane season are used to update the plans. Training on shelter site management and damage assessment is being developed by OFDA/USAID and will lead to further development of CCGRD capacities in these areas.

Aside from the resource issue noted above, the DCP approach to local disaster planning appears to be effective when considering the resources and capacities available. Where the DCP effort can be improved is in strengthening the capacity of communities to manage and reduce risk, a process which needs to also include a range of ministries and the private and non-governmental sectors.

NATIONAL GEOGRAPHIC INFORMATION SERVICES CENTER (CNIGS) CAPACITIES

CNIGS has been working with the DEED project on mapping the project basins and reportedly has a range of capacities necessary for hazard, vulnerability and risk mapping. Of particular

relevance to DEED, the Center has been working on a detailed flood impact mapping for Gonaives (largely completed), Cabaret, Leogoane and Les Cayes.¹⁴

The CNIGS flood mapping work involves creating a detailed inventory of physical infrastructure in the target locations, assigning attributes to the inventoried units (e.g., house, office) and also noting the level of damage from recent flooding. A lack of precipitation and river gauge data and the short reaction time of the drainages involved means that a precipitation-response model and elevation data was not used to generate quantitative flood zones. Instead, a historic-benchmark approach (using the level of the last great flood) is used to define flood levels.

Unfortunately, as precipitation and/or river gauge data is not available for the benchmark floods (the 2008 flood in the case of Gonaives), the flood zoning can be hard (but not impossible) to link to future precipitation and flood events. As the flood maps developed by the Center are of historic flood levels they should be improved by the addition of data on based elevation, precipitation and river flows so that the maps can be used for planning future flood prevention and mitigation actions.

One advantage of the CNIGS collection of detailed data on infrastructure attributes is that this information can be used to generate a surrogate indicator of vulnerability. In this process, each structure is assigned a (economic) value based on style of construction, size and likely contents, and given a defined use (e.g., rental house, church, office building, etc.). A combination of the value of the building, the nature of the construction used for the building, and the type of use can be used to determine the level of socio-economic vulnerability of the owner or occupant. The flood zoning is then used to determine whether all, some or none of each building or contents would be damaged in a

Ministry of Agriculture-Inter-American Development Bank Flood Early Warning Project

The Inter-American Development Bank (IADB) has funded a project with the Ministry of Agriculture to develop flood warning systems for the following areas: Port au Prince, Leogoane, Petit Goave, Jacmel, Cavaillon, Les Baraderes, Camp Perrin, Arcahaie, Cabaret, St. Mark, Artibonite and Port au Paix. The project involves flood zone mapping, creating and training local flood warning committees, installation of precipitation and river flow monitors, warning sirens and communication systems to a central monitoring site. The project seeks to combine appropriate technology and flood models with participatory flood warning. The flood zone mapping process being used is somewhat different from that used by the CNIGS and is being done by a company under contract.

¹⁴ A general flood risk map of Haiti at 1:100,000 has been produced by CNIGS. Other national-level hazards maps exist but are not at a scale useful to the DEED project work. For local disaster planning, base data is needed at scales as great as 1:2,000 or 1:3,000 to generate maps at scales of 1:3,000 or 1:5,000 for flood zoning. Scale of impact needs to be a core consideration in defining data collection for hazard mapping to avoid producing maps of no value in local planning.

projected flood. The results can be segregated by location, user, level of damage, level of flooding or other attribute.

LAND USE PLANNING AND DISASTER RISK MANAGEMENT/PREPAREDNESS PLANNING

There is considerable overlap between the data needed for land use planning and disaster planning in the two watersheds. Most of the land use challenges relate to either mass wasting (landslides, sheet erosion, land slips, etc.), flooding or drought, the three of the most spatially frequent hazards in the watersheds. All three hazards, together with wind and hail (associated with severe weather) all impact directly on agriculture production and economic and human wellbeing.

However, the scale of interventions needed to address these hazards is significant even in the smaller drainages in the Montrouis project area. The frank challenge is to establish logical limits to the integration of land planning and disaster preparedness planning given the specific focus and expected outputs of the DEED project. DEED's watershed resource and selective hazard mapping processes will generate a data base which can be used for a wide range of land use planning and disaster management tasks (e.g., by DCP, HIGHER/LOKAL).

LOCAL DEVELOPMENT/DISASTER PLANS IN NEIGHBORING AREAS

Discussions did not indicate the existence of any formal development plan-related disasters plans or such planning in areas neighboring the Limbé or Montrouis project areas. LOKAL's HIGHER project is involved in disaster risk assessments (and presumable some level of disaster planning) in the Limbé, Bas Limbé and Marmalade communes. Other communes to be covered include Acul du Nord, Cap Haitian, St Marc (adjoining the Montrouis project area), Petit Goave, Cabaret (adjoining and slightly overlapping the Montrouis project area), Cite Sole, and Gonaives (adjoining the Limbé project area). A link with the HIGHER/LOKAL project in collaborative disaster-related planning was initiated during the course of the consultancy. Further collaboration should develop over the remaining 17 months of DEED efforts.

CURRENT DISASTER PREPAREDNESS PROGRAM APPROACHES RELEVANT TO DEED

A basic approach to disaster preparedness (and risk reduction in general) in Haiti is to conduct community-level assessments and use this information to plan improvements in local disaster response and risk management. Where resources allow, this local information, which may include risk assessment data, is integrated into a geographic information system (GIS) and aggregated to the regional (Department) and national levels.

This approach has been followed by DCP and associated projects (e.g., Oxfam in the Limbé area and CRS in the South and Grande Anse Departments), although not with a full GIS integration. Like most community-based disaster management efforts, DCP procedures for

developing CCGDRs¹⁵ include a risk mapping process¹⁶ which appears to be similar to the mapping process used by DEED. However, the communal risk maps developed by DEED are more recent and have the advantage of being eventually integrated into a geographic information system structure.

Were the current DCP approach could be strengthened is in the collection and use of quantitative data on hazard locations and impact zones. This is most evident for flooding, with only limited data base development underway to date, as discussed above. However, detailed mapping of landslides and wind impact zones would also significantly improve disaster planning and risk reduction activities.

Further, a detailed hazard mapping in urban areas¹⁷ could be used to develop a more detailed inventory of infrastructure in hazard zones. This inventory (as a data base) complements a similar, more limited inventory developed as part of the disaster planning process by the CCGDRs and has several eventual uses, including:

1. Assessing relative vulnerability and risk,
2. Estimating potential disaster damage under different scenarios,
3. Determining actual damage following a disaster event and
4. As a base for land use planning.

The first and fourth uses should be of interest to the HIGHER/LOKAL project, while the second and third would be of use to DCP and partners. DEED can make the data available to interested parties but would likely only consider the fourth use in conjunction of natural resource management interventions.

DISASTER RISK REDUCTION AND DEED PROJECT ACTIVITIES

Discussions and field visits suggest that DEED has not fully integrated risk reduction/disaster preparedness into project activities. A first area of concern is the impact of weather-related hazards on agriculture and related activities. For instance, reducing the impact of wind or hail does not seem to be fully integrated into assistance efforts. As a consequence, even local events could damage agriculture production, resulting in

- Economic losses,
- A worsening of food security (it is presumed that a good part of agriculture production directly or indirectly supports food security) and
- Disruption in progress towards project objectives.

¹⁵ **Formation et Renforcement des Capacites des Comites de Gestion des Risques et des Desastres**, United Nations Development Programme/Haiti, 2008.

¹⁶ **Guide de Travail pour l'Elaboration d'une Carte Communale de Risques**, La Direction de la Protection Civile, no date.

¹⁷ Focusing data collection on urban areas is more effective than covering all of a basin. However, "urban" can be defined to include any significant settlement, thus including most of the population and non-farm assets in the assessment process.

Addressing these issues can be accomplished through a combination of hazard mapping and the definition and promotion of more hazard-aware agricultural methods.¹⁸

A second area of concern relates to infrastructure interventions, particularly roads and culverts/bridges, but also soil/erosion conservation works. The basic issues are whether the infrastructure:

- Is designed to survive maximum flows and rainfall rather than average flows (it is the maximum flows which lead to damage),
- Is designed to maximize collateral environmental benefits (e.g., tree planting and soil conservation to manage water off-flows from road surfaces) and
- Uses cost and environmentally appropriate structures to manage erosion and water flows.

An example of the last issue is demonstrated by (non-DEED project) interventions in the lower Montrouis River. Gabions are being used in one area to direct the river, while used-tire/vegetation had been installed in another location to maintain river banks.



Decisions on whether to use gabions or concrete walls to “train” a water course or to stop landslips, or to use bank protection (as in the case of used tires and vegetation) or other environment-based structures should be based on:

- Costs, benefits and sustainability, and
- Recognition that in some locations flooding or landslides will overwhelm control structures and these structures and the surrounding areas (e.g., fields, gardens, orchards) need to be designed to absorb these impacts.

In many cases, it is less costly, more sustainable and at least as effective to use “soft” approaches to flood management than the traditional hard approaches.

¹⁸ An example of hazard-aware methods can be found in **Good Practices for Hazard Risk Management in Agriculture: Summary Report Haiti**, TCP/RLA/3101, FAO Haiti, March 2007.

PART TWO - Recommended Actions

The following eight recommendations are based on the considerations summarized here below:

- Development of basic disaster risk management plans for the communes in the watersheds is being undertaken by the Department of Civil Protection together with a number of donors and implementing agencies.
 - Communes in the project watersheds have basic disaster response plans.
 - These plans need to expand to encompass a greater range of risk management efforts to reduce the impact of disasters on lives and livelihoods.
 - Watershed mapping as being done by DEED can contribute to a better understanding of the location and impact areas of significant hazards.
 - Mitigating many of the significant hazards in the two watersheds involves actions related to natural resources management.
 - DEED's mapping and other interventions provide data and experience for other parties involved in commune development and disaster management.
1. **Expand deed's work in disaster risk reduction in the project watersheds to include wind and drought hazards and provide data and maps on flood, mass wasting¹⁹, wind and drought hazard locations to CCGRDs and partners to improve local and watershed level understanding of the location and at-risk areas of these hazards.**

This recommendation can be accomplished through a combination of local input into the mapping process (e.g., defining wind and drought zones) and outreach to explain the hazard maps to the CCGRDs. The maps provided should be at a scale which allows visual identification of the hazard origin and impact zones, and the built infrastructure in the impact zones.

2. **Develop site-specific hazard management plans for locations identified in the mapping using community-based methods.**

The management plans will focus on (1) the nature of the hazard, (2) the frequency of the hazard, (3) the impact of the hazard, (4) what can be done to address the hazard, and (5) who can take action to address the hazard. The plans can be developed on a sub-section basis, but are probably most logical on a drainage/sub-drainage basis. Expertise from disaster risk reduction projects (e.g., CRS's work in the South and Grande Anse Departments or from outside Haiti) can be used to complement locally available information on hazard management options. The identification of who can take action to address the

¹⁹ Landslides, slope failure, slumping, sheet erosion, land slips, rock falls, etc.

hazard should include other USAID projects as well as the World Bank and other funding for commune disaster management capacity building.

3. Develop flood zone maps for Limbé and Bas Limbé urban areas at the 1:3000 to 1:5000 scale.

Flood mapping for these two urban areas is needed to reduce risk and preserve assets for a large number of the individuals and economic infrastructure in the watershed. Either of the approaches used by CNIGS or the IADB Early Warning project can be used for this mapping, but the mapping needs to include sufficient detail (1) to allow for prospective mapping of future floods, not just produce a map of historical flooding for reference, (2) for an identification of the physical and value attributes of all the built infrastructure (buildings, roads, bridges, businesses, churches, schools, clinics, etc.) and (3) human occupation frequency²⁰ in the mapped areas. The attribute data collected during the flood zone mapping should be shared with other projects (e.g., HIGHER/LOKAL) for use in developing risk assessments and risk mapping for Limbé and Bas Limbé.

4. Improve the informal early warning system in the Limbé watershed.

These improvements can involve the systematic collection of rainfall data, collection of river level data at Limbé, the development of input-output tables and development of clear messages for sharing alert information. This work can be done by present project staff working through the watershed committees and producer groups, as well as the CCGRDs.

The project should also monitor the implementation of the IADB flood warning/mapping work in Archaie, St. Marc and Cabaret to support these efforts where necessary and to replicate if appropriate.

5. Work with HIGHER/LOKAL and local authorities in Limbé/Bas Limbé on flood management incorporating structural and non-structural approaches.

Structural approaches should incorporate natural resource-based (“soft”) management approaches (e.g., use of vegetation to manage and slow water flows) rather than a full reliance on hard-structure (e.g., concrete walls) methods to address flooding problems. Local

²⁰ This is calculated based on the number of hours per day and which hours of a day a person is present in a specific building. The total number of hours per day an individual is in a specific building is totaled for all the people occupying a building during a 24 hr period. The resulting number indicates the number of persons at risk of an event affecting a building in any one 24 hr period. The hour by hour data (number of people in a structure on average each hour of the day) indicates the population at risk for an event taking place at a specific time, for instance, flooding in the evening.

authorities and community members should be engaged in discussions on the cost and benefits of soft versus hard approaches to flood protection to highlight conditions in which approach is most appropriate, affordable and sustainable.

6. Develop agriculture (crops and livestock) risk reduction guidance for floods, wind, hail, drought and provide wide dissemination and promotion of this guidance.

Existing documentation on agriculture risk management should be refined for the two watersheds and expanded to include a wider range of actions.

7. Incorporate risk reduction (primarily to rainfall, flooding and wind) into infrastructure construction/rehabilitation, and incorporate green/environmentally friendly approaches where appropriate.

Typical infrastructure projects should be reviewed to (1) define how disasters cause damage, (2) what steps can be taken to minimize or avoid this damage and (3) what environment-focused interventions (e.g., run-off retention, slope stabilization, etc.) can be added to projects to improve their natural resource management impact. To a large extent, the process of identify impacts and solutions can be experience-based (i.e. asking technically competent why something failed and how to avoid the problem in the future). However, focused research into good practice disaster risk reduction for infrastructure may be needed to frame discussions and expand awareness of possible mitigation options.

8. Incorporate risk reduction (primarily to flood, wind and fire) into project supported facilities and productive infrastructure.

All project-supported facilities should be reviewed with respect to the need for flood proofing, wind impact (e.g., shutters and roof straps) and fire, with remedial measures taken when necessary.

ANNEX A – STATEMENT OF WORK

I. Background and Justification

The DEED Program is initiating broad scale investments in sustainable natural resource management at the scale and density needed to produce future positive landscape level changes in environmental, infrastructure, and economic vulnerability in the watersheds of Limbé and Montrouis along with their market/enterprise shed. DEED uses an integrated participatory approach to plan, monitor, and implement activities that support this goal. Productive activities undertaken in each watershed have been identified based upon community demand and preferences, in light of a series of market and production potential analyses that help determine the financial and economic viability of prospective enterprises.

DEED’s longer term vision is to foster a sustained commitment to stewardship in each of the watersheds. At the core of this is the larger goal of the program to develop functional watershed planning structures within the communities, and to provide relevant and tailored watershed planning tools for the local governments and citizenry to use to take sound decisions about the future of the landscape. Central to these are first the Watershed Management Committees (WMCs) and the principal tool is a locally inspired and developed Watershed Management Plan. While these plans will look into the aspects of infrastructure and land use, a key component will be workable and realistic disaster preparedness plans.

Haiti does not yet have a legal or administrative/regulatory framework to constitute WMCs. Work is under way in the legislature to enact such a framework. Legislation already targets the strengthening **of Local Governments. DEED’s approach is to work within the existing framework, using opportunities** to introduce concepts and individual tools to the local representatives (ASECs, CASECs and Mayors) through their offices and informing eventual local stakeholder organizations of the work and their own roles. This is the approach that DEED will use with the Disaster Preparedness Planning element of its work.

This short-term technical assistance consultancy is focused on assessing the state of disaster preparedness planning, the existence of structures or mechanisms, the local organizational capacity and functionality, and local policies and political commitment to disaster preparedness within the Haitian context today. The consultant will examine individually the local government bodies (urban, **communal or sub communal (sections) in each of DEED’s two watersheds. Likewise, other donor programs such as OXFAM (around Limbé for example) or the World Bank (LICUS – several locations) will need to be examined as a way of better informing DEED’s work. USAID supports disaster preparedness capacity-building through some other programs as well (ex: LOKAL – the local government strengthening initiative).** This consultancy will assist DEED in charting a better path for implementing its own program for its communities.

The proposed STTA will be undertaken by Mr. Charles Kelly, a recognized disaster planning and assessment specialist for 30 years, with direct experience in USAID, the Caribbean and Haiti.

II. Objectives

The objectives of the assignment are to:

1. Evaluate the status of disaster planning and local government capacity for the same in the DEED communities;
2. Articulate a plan forward for DEED to best achieve its participatory disaster preparedness planning commitments within this current context.

III. Consultant Tasks

1. **Conduct critical assessments of each of the local government(s)' capacity to plan for and respond to local disasters** (particularly flooding and landslides);
2. Examine whether local governments (project or neighboring) have worked with other programs in land use planning or have Local Development Plans underway that may inform DEEDs approach to watershed management planning in general and disaster preparedness in particular;
3. **Evaluate the relevancy and status of the national disaster preparedness office's approach in communities** (where this might exist in principal or fact);
4. Review current disaster preparedness program approaches and progress of other donor agencies (and other USAID programs) that may be relevant to DEED;
5. Visit the two project zones Montrouis and Limbé) to interview project staff and community representatives on the history and results of local disaster preparedness activities;
6. Visit the National Geographic Information Services Center (CNIGS) to understand the status of their information on disaster and risk management information and the forms they make this available;
7. Review current community opinion on disaster preparedness – previous or current experiences; willingness to engage on the subject or their ability and interest to participate in such a program.

V. Outputs and Deliverables

1. A concise report in two parts: 1) detailing the status and capacity of the local governments, with prevailing knowledge, attitudes and practices vis-à-vis current disaster preparedness programming and, 2) a proposed action plan for DEED that is congruent with both the local **need and opportunities as well as DEED's mandate and funding**;
2. A brief presentation to USAID and other stakeholders at the conclusion of the STTA.

V. Supervision

Mr. Kelly will work under the direction of the Haiti-DEED COP, but collaborate closely with the regional coordinators and their staff

VI. Work Week

A six (6) day work week during the time in country is authorized for this assignment.

ANNEX B – SCHEDULE AND PERSONS MET

Date	Time	Person/Activity	Title/Organization	Contact Information
22 July	1130	Arrive Port Au Prince		
	1530	Mike Godfry: Introductory briefing	DEED Chief of Party, Development Alternatives International (DAI)	Mike-godfrey@dai.com
23 July	0900	Mike Godfry: ToR review and planning.	DEED Chief of Party	
	1100	CJ Hendrix	DEED Project Geospatial Consultant	hendrix.cj@gmail.com T: 50936567993
	1330	Myrlene Chrysostime: Project background and task requirements.	Natural Resources & Environment Manager, USAID/Haiti	mchrysostome@usaid.gov , T: 50936703013
23 July		Research and work on the report.	DAI	
24 July	1400	Elvire Douglas: WVI disaster preparedness work.	World Vision Haiti/Port au Prince	
	1500	Marie Alta Jean-Baptiste: GoH disaster planning and risk reduction.	Director, Direction of Civil Protection, Ministry of Interior and "Collectivites Territoriales"	5092228231, 2282537, 4162228, altajeambaptiste@yahoo.com
25 July		Review of background information.		
26 July	0900	Julia Leonard: OFDA activities in Haiti and background to disaster-related project elements.	OFDA/USAID, San Jose	37012856, jleonard@ofda.org
27 July	0745	Flight to Cap Haitian		
	0930	Nick Hobgood: Briefing on visit and plans.	DEED Regional Coordinator, Cap Haitian	38699185, Nicolas_hobgood@dai.com
	1100	Valery Laguerre: Oxfam involvement in DRR.	Community Disaster Preparedness, Oxfam/Cap Haitian	
	1330	Risk and Disaster Management Committee: Disaster history, disaster plans and planning process.	Limbé Commune	
	1500	Nick Hobgood: Site visit plans and results.	DEED Cap Haitian	
28 July	0830	Discussions with DEED Staff on watershed committees	DEED Cap Haitian	
	0930	Mon Premier Celicourt: Disaster planning and risk reduction.	Mayor, Limbé	34768909
	1100	Geogremain Prophete: Disaster planning, risk reduction and operations.	Head, Department of Civil Protection, North (Cap Haitian)	
	1400	Disaster Committee members: Disaster history and disaster planning.	Bas Limbé	
28 July	0945	: Disaster activities and	Haitian Red Cross, Cap	

		community work.	Haitian	
	1230	Disaster Committee members: Disaster history, disaster plans and planning process.	Marmalade	
30 July	0645	Flight to Port au Prince		
	1000	Martin Bush: Arrival briefing	DEED Regional Coordinator, Montrouis	38482593, Martin_Bush@dai.com
	1130	: Disaster history, disaster plans and planning process.	Mayor, Arbricots	
	1230	Ti Bois visit		
	1400	Discussions with DEED staff on disaster risk reduction options.		
31 July	1000	Wilson Dor, Christophe Sellers: Disaster history, disaster plans and planning process.	Montrouis (Sectional) Disaster Committee	
	1100	Site visits: Montrouis river and port for La Gonaïves		
	1300	Martin Bush : Briefing on visit	DEED Montrouis	
	1430	Mike Godfrey: Briefing in field trip and results.	DEED/Port au Prince	
1 August		Document review, research and report drafting		
2 August		-	-	
3 August	1000	Gina Porcena Meneus	General Director, National Center for Geo-spatial Information	34646462, gporcena@yahoo.com
	1330	Marie Florence Cadet (Meeting conducted via email due to difficulties accessing USAID facilities.)	USAID/Haiti	mcadet@usaid.gov
4 August	1300	Helliot Amilcar	Technical Officer, IADB Flood Early Warning Project	34620676, 37542126, helliotamilcar@yahoo.fr
	1600	Jean Arsene Constant	Technical Assistant, Program for the Reinforcement of Local Capacities for Risk Management	34583929 herbekman@yahoo.fr
5 August	0900	Ross Gartley	Operations Officer Sustainable Development Dept. Latin America and the Caribbean, World Bank/Haiti	(509) 3701-1316 rgartley@worldbank.org
6 August	0910	Myrlene Chrysostime, Carl Anderson, Mike Godfrey: Project Debrief.	Senior Governance Advisor, Governance Office, USAID/Haiti	caanderson@usaid.gov T: 50922298039
	1010	Meeting with the <i>Commite Communal de Gestion des Risques ets Dedastres; review of consultancy outputs and DEED and LOKAL projects</i>	Attendance list available from DCP.	
	1400	Draft report review w/Mike Godfrey		
7 August	0855	Depart Port au Prince		

ANNEX C – BACKGROUND - DEFINING RISK

A specific **Risk** of damage from a disaster is defined by the occurrence of a

- **Hazard** event, defined as a function of *magnitude* of event and *frequency* of the impact and
- **Vulnerability**, defined as a function of *exposure* to the hazard event, *values* at risk and *susceptibility* to damage.

The community-based risk assessment process is basically participatory rural assessment methods with a fixation on the hazards as well as the social and economic factors. Local representatives are asked to map their community and add details, including hazard (e.g., flood) sites, infrastructure, etc.

Vulnerability is usually first defined by susceptibility to the impact of damage, usually in terms of wealth (values at risk), with the more wealth equating to susceptibility. (The conceptual model flubs it a bit here, and accepts that someone with more wealth may suffer more damage – lose more than a poorer person – but still have more resources with which to recover.)

Depending on the desired scale, poor communities, poor neighborhoods, poor families or poor individuals are then located on the map drawn earlier, thus defining exposure.

All this can be done on a piece of flip chart and, depending on the size of a community, normally takes a day or two.

An obvious challenge in Haiti is the lack of accurate data on hazard frequency and magnitude, both usually based on historical data. This can, in part, be overcome, by using local knowledge to create a frequency and impact data base and using specialists (e.g., geologists, soil scientists, etc) to develop projects as to event occurrence and impact (e.g., this hillside will have a landslide in the next 3 years and hit this area). Two procedures for integrating this projective type assessment into the community assessment process (one faster and cheaper than the other) have been developed and could be applied in Haiti.

Where DEED brings considerable value to the process outlined above is in their development of **relatively precise geospatial data base (“geographic information system” – GIS)** for the Limbé and Montrouis basins. This level of detail (and capacity to overlay and integrate various data sets) is what is normally missing (because of cost) in most community-based disaster risk management programs. The GIS also allows integrating new data into the GIS, such as changes in road conditions or input-output data for river flow, which can make the risk assessment process more precise over time.