1. Study Background

The small islands of the Caribbean have seen very active hurricane seasons during the last 10 years As a result, countries of the Caribbean region experienced devastating effects which posed serious threats to human lives, human settlements, and the productive sectors. The agriculture sectors of various Caribbean countries have been affected to varying degrees by these hurricanes. The reports of the damage assessment conducted has included damage or complete destruction of cash crops, livestock and poultry production, farm land and farm infrastructure and the fisheries sector. A lot of emergency response was provided for the agriculture sector, including assistance for fisher folk, small scale farmers, and their livelihood. Different types of intervention were provided also by FAO which focused on reducing the vulnerability of persons affected by these meteorological events. The assistance which helped beneficiaries to regain self sufficiency and supported governments' efforts to improve disaster response capabilities included,

(i) Emergency distribution of agricultural inputs to the most affected communities to get ready for the next agricultural campaign;

(ii) Technical assistance to governments to strengthen national institutional frameworks for early warning;

(iii) Technical assistance to exchange and share information and best practices in the region.

However, the devastating effects of the strong hurricane seasons of 2004 and 2005 highlighted again the limited long-term impact of emergency response for sustainable development and the establishment of a more comprehensive disaster risk management approach. In particular, the Governments of Cuba, Jamaica, Haiti and Grenada, among the worst affected countries during the 2004/05 seasons, stressed that more emphasis should be placed on addressing "preparedness" for mitigating the impact of these unforeseen events and implementing better and efficient emergency responses and rehabilitation work in the agriculture and livestock sector. In response to the request of these 4 countries, in particular and recognizing the importance of agricultural production in the economies of these countries against the background of the high vulnerability to meteorological hazards, FAO was asked to design a project which takes cognizance of past and ongoing DRM work done in the Caribbean region with a view to addressing the problem in a more permanent way, applying FAOs agricultural perspective as entry point.

In this framework, the FAO launched the regional TCP "Assistance to improve Local Agricultural Emergency Preparedness in Caribbean countries highly prone to hurricane related disasters" which has subcomponents in Cuba, Grenada, Haiti, and Jamaica,

The project acknowledges that all four countries have their own Disaster and Risk Management (DRM) frameworks which address preparedness issues to different extents and through various types of interventions; that there are also many players involved in DRM in the Caribbean (i.e. UNDP, USAID, the Caribbean Disaster Emergency Response Agency (CDERA), etc). However, in spite of the above, it build on the assessment that there is still a shortcoming in linking long term development planning within the agricultural sectors to the reality of recurrent natural hazards and improving prevention and preparedness measures. With a view on agriculture and livestock sectors, DRM is addressed mainly at regional and national levels, with insufficient links with the communities and farm levels. In addition, there is a gap between immediate emergency agriculture response (such as input supply) and recovery-rehabilitation work that

should deal with sustainable land and water management in order to mitigate the effect of natural hazards on the fragile ecosystems of most Caribbean countries.

The project objective was therefore formulated as "to assist governments of participating countries to support the food security of small farmers operating in the most hazard prone areas by improving institutional frameworks and technical options for hurricane-related disaster preparedness, emergency response and post-emergency agricultural assistance" (FAO, 2006), more specifically the project will contribute to the improvement of disaster preparedness in the agricultural sector and strengthen inter-sectoral linkages and coordination. It aims at concrete recommendations for improving the institutional frameworks and technical options in the agriculture sector for hurricane related disaster preparedness, emergency response and post-emergency agricultural assistance. The project will produce three main outputs addressing specific target audiences.

(i) Local communities/small scale farmers: Identification, demonstration and replication of locally adapted good practices for response preparedness and assessment of demand responsive training related to innovative preparedness activities.

(ii) Local Government Departments: Inputs to local action plans for timely, efficient and demand responsive emergency operations to minimize adverse effects of hurricane related disaster on the agricultural sector and integration of agricultural issues into local level contingency planning.

(iii) Government and relevant ministries (rural and agricultural ministries) and international community: Recommendations and best practice examples to enhance national and local preparedness in national and international post-emergency agricultural rehabilitation programmes.

In Haiti, specifically, the project recognizes and builds on the fact that many FAO-sponsored projects such as the OSRO/HAI/401/CAN[1] (as well as projects sponsored by other donors), initiated in response to Hurricane Jeanne were typical emergency-assistance projects, consistent with the stated objective to reduce the vulnerability of farmers living in areas affected by extreme weather conditions. In spite of being successful in re-gaining food security in the affected countries the projects proved to be limited in terms of efficiently addressing any of the underlying vulnerabilities which caused the devastating size of the impacts observed over the 2004-2005 cyclonic year. This eventually led FAO to also support a paradigm shift in Haiti oriented towards a more proactive, holistic and preparedness-based approach to cope with hurricanes and other weather-related disasters (FAO, 2005).

This report presents the project implementation outcome in Haiti during phase 1 (June 2006 - January 2007). Project implementation is done in close collaboration with government DRM programs, other agriculture and livelihood emergency and development operations; the project is jointly executed by the Ministry of Agriculture and FAO.

[1] Other projects of this same type include OSRO/HAI/403/NZE, TCP/HAI/3004, OSRO/HAI/502/EC.

1.1 NATIONAL HAZARD RISK CONTEXT

Haiti is a republic constituted by the westernmost third of an eponym Island[2] whose Dominican Republic, on the Eastern side, occupies the remaining two thirds of the total land area. This island which is located in the Indies archipelago at the entrance of the Mexican gulf, is the second largest in size (after Cuba) among the four West Indies, and is surrounded by Cuba to the North-West, Jamaica to the West, and Puerto Rico to the East (Refer to Figure1).

Spatially, Haiti covers 27,500 square kilometres and extends itself between 18.02° N and 20.09° N of latitude, and between 71.61° W and 74.48° W of longitude. It is politically and administratively divided into ten departments [3] which each is subdivided into communes themselves individually further subdivided into communal sections (Refer to Figure 1).

Figure 1 Geographic location of the Republic of Haiti within the Caribbean region

Source: the Author

1.1.1 Framework conditions shaping the vulnerability to natural hazards

Haiti is ranked among the poorest countries in the World and is considered the poorest of the Western/American Hemisphere: the national per capita Gross Domestic Product, GDP amounts to US $332.00 and is the lowest of the Caribbean region. Additionally, high inflation rates contribute to a constant decrease of the purchasing power of the consumers (MARNDR, 2007). Ca. 4,000,000 Haitians, about 55% of the total population (MARNDR, 2007) live below the US $1.00 a day poverty line and 76% below US $2.00 a day poverty line. Poverty is mainly a rural phenomenon with an incidence of 69% and 86% for the US $1.00 and US $2.00 poverty lines respectively in rural areas (IMF, 2007). By contrast, 23% of the Port-Au-Prince Metropolitan area population and 57% of the other cities residents live below the US $1.00/capita/day poverty line (MARNDR, 2007).

[3] Actually and by the year 2003, the Haitian authorities decided to create a tenth department, the Nippes, by splitting the Grande Anse area into two approximately equal-size departments. The available geographic dataset used to design the presented maps has not been updated yet to incorporate the mentioned changes.

The following points flag some of the structural problems and features of Haiti, which in combination with the natural hazard context, negatively impact on poverty, development and food security in the country.

- **Population growth** According to the Haitian Institute for Statistics and Informatics (IHSI) 2000 census results, Haiti had 7,959,000 inhabitants, divided into 52 females and 48 males out of every 100 individuals. The approximate annual growth rate is 2.3%[4]. With 69.7% of its population aged less than 30, Haiti has one of the youngest populations in the World; life expectancy (53.7 years), however, is the lowest in the Caribbean region[5]. Furthermore, with about 300 inhabitants/km^2 Haiti is the second most densely populated country in the region (behind Barbados); and around 2/3 of the population is rural (MARNDR, 2007). Black people of African descent are 95%, dominating the total population, made up for the rest of mulatto and white people[6].
- **Governance**
- **Unemployment** Crucial issue since the total labor force accounts for 41.1% of the population of which 54.40% is aged between 15 and 64 years (IHSI, 2003). The occupation rate is 65%, with 82.1% of informal self employed and 12.75% private and public sectors employees (MEF, 2005). The public sector contributes a mere 0.6% of overall employment (IMF, 2005), while agriculture employs two-thirds of the work force, the service: sector 25%, and industry 9% (CDERA, 2003).
- **High dependence on agriculture** Agriculture is the leading economic activity employing 46% of the existing labor force, thus sustaining 70% of the population (CDERA, 2003) and contributing up to 27.58% of the GDP (MEF, 2005). Despite a downward drift in its contribution to the GDP from 47% to 24% over the 1970-1996 period, and to 27.58% in 2005, (Smucker et al, 2000; MEF, 2005), it still provides a third of the commodity exports[7]. According to IHSI (2005), agricultural land covers 59% of total surface area with a rate of cultivation of 90%. On average, 80% of the rural households have access to 1.8 parcels of land, which they own in 80% of the cases; average size in ha is 0.99 ha (IHSI, 2005). A limiting factor for Haiti's agriculture is that it depends on the use of predominantly mountainous, rough terrain characterized by generally steep slopes (CDERA, 2003) ; 57% of the agricultural land is located on smooth to steep slopes[8], and is to a large extent (60%) exposed to medium to high [water] erosion risks[9].
- **Land degradation** In spite of its originally rich natural resource endowment, the agricultural sector has become increasingly vulnerable during the last decades due to the combined negative interplay of increasing population pressure, environmental degradation, inefficient land use systems, poverty, overall governance problems in the country [10] and the high exposure to recurrent natural hazards. Recent data indicate, that 85% of the country's watersheds are either critically or totally deforested (MARNDR, 2007); the national dense cover forest accounts merely for 1 to 3% (OXFAM-Québec, 2003; IHSI, 2005; MARNDR, 2007); and the annual soil lost is estimated to 36.6 million

[4]That is: 200,000 people are being added each year to the national population which in 2007 may account for about 9,000,000 people. Using 2000 as a reference year, the Haitian population is expected to double in 29 years.
[5] Source: ECLAC, LC/CAR/G.600 (2000) at http://www.eclac.cl/publicaciones/xml/3/9933/carg0600.pdf
[6] Source: Central Intelligence Agency (CIA) 2003 at https://www.cia.gov/cia/publications/factbook/geos/ha.html
[7] Source: Inter-American Bank of Development, 1998.
[8] 63% of Haiti have slopes higher than 20% and 40% of the hillside cultivated land has slopes higher than 50% (ANDAH, 1999)
[9] The most water erosion vulnerable lands are also located in the lowland areas of the South East department where one of the two selected pilot site, Lavanneau, is located.

metric tons equivalent to 12,000 ha eroded on 20 cm deep/year (FAO, 1995

- **Wide spread illiteracy** The country's global literacy rate of 53% (CDERA, 2003) masks important discrepancies between genders (60% of men against 48.6% of women), and residence places (82% of the Port-Au-Prince metropolitan area residents, and 71.8% of the other cities' residents against only 38.6% of the rural area residents claiming to be literate (IHSI, 2005). This national literacy rate is also lower as compared to neighbouring Caribbean countries such as Jamaica (86.9%) and Dominican Republic (83.7%).[11]
- **Language barriers** Though it is officially claimed that two languages are spoken in Haiti, Creole is actually the dominant language spoken by 100% of the population, while French is only used by highly educated people. This situation constitutes a further discrepancy between non-educated and educated Haitians. Furthermore, since Haiti is mainly surrounded by Spanish and English countries, due to linguistic barriers it tends to be virtually isolated from its neighbours as far as cultural exchanges are concerned.

1.1.2 Natural hazards and disasters

As a consequence of its geographic location in the hurricane belt and its geological features, Haiti is exposed to many natural risks such as hurricanes, droughts, landslides, earthquakes and tidal waves. From 1909 to 2006, Haiti has faced 63 internationally recognized disasters mostly caused by climatic events, including 25 hurricanes and storms, 32 flood events and 7 droughts. Over the 20th century (actually in less than 100 years) these disasters killed 18,447 people and more than 6 million were affected (see Table1).

Hurricanes, landslides and droughts have had the biggest negative impacts on agriculture and livestock. The most severe disasters were caused by devastating windstorms and hurricanes, generally accompanied by heavy rainfalls followed by severe droughts (CDERA, 2003).

Hurricanes and other wet systems

During the period spanning 1909 - 2004, 47 windstorms and hurricanes hit Haiti, of which 19 major climatic events (FAO, 2005), while over the last two years six windstorms hit the country, and a hurricane or tropical depression sweeps through the country every two years, from June to November. Overall these events killed more than 14,500, affected 3,600,000 and caused extensive economic damages for US $4.4 billion. Flora (1963), Gilbert (1988), Gordon (1994), George (1998), and (Jeanne, 2004) were unarguably the most deadly, devastating and economically costly natural disasters to strike Haiti (see Table 2).

According to ECLAC (2005a), the passage of Hurricane Jeanne in 2004 almost completely wiped out the majority of the crops -e.g. sorghum, maize, eggplant, beans, and banana- on 7,767 ha in the Haut Artibonite and the eastern North West areas exploited by about 12,900 farm households and resulting in 843,440,409 HTG (Haitian Gourdes) of financial losses. Wild flooding waters also washed away 25,800 heads of cattle and poultry amounting for 20,918,844 HTG while extensively damaging important hydro-agricultural infrastructures for about 478,191,726 HTG on over 4,000 ha. The global damages to the agricultural sector amounted to US $37.0 million (ECLAC, 2005a). Jeanne and Ivan, the two most damaging windstorms of 2004, significantly affected the farm infrastructures in all departments resulting in capital losses equivalent of 5% of the GDP whose growth rate consecutively decreased from 0.5% to -3.8% in (BRH, 2004).

[11] Source: Institut de Statistique de l'UNESCO, Estimations du taux d'analphabétisme et de la population analphabète âgée de 15 ans et plus par pays, 1970-20015, Révision de Juillet 2002.

Floods

Torrential rains and flooding often come in the wake of other hydrological events like hurricanes and tropical storms. From 1959 to 2006 multiple flood events occurred, of which 32 particularly damaging to the production systems, including agriculture (See Table 3).

In Haiti, devastating impacts of flooding have been historically exacerbated as a result of soil erosion, itself a combined consequence of deforestation[12], inadequate land use systems, poverty, institutional inadequacies, and illiteracy.

Landslides

Due to the unevenness of Haiti's landscapes, its geology of permeable rocks and substrates and erosion, landslides sometimes extend to hectares of agricultural lands. According to OXFAM-Québec, these disaster events manifest themselves in three ways: moving of entire hillside panes, riverbank slide/erosion, and more or less long-distance land sliding. However, being rather localized, they are not extensively recorded. Landslides often have serious economic impacts, as they may for instance cause a river bed to deviate preventing drainage and irrigation infrastructure to work, or completely burying a town under layers of mud. Areas prone to this type of disaster include watershed systems in the South East and North departments where during the rainy seasons torrential waters mixed with eroded soils may flow down the hills, sweep away plants and livestock and cause heavy damages to agricultural fields and irrigation structures downstream.

The plains next to the riverbanks, mainly in basalt-originated soils, are prone to erosion caused by heavy rains. Tons of extirpated arable soils are carried along in swelling rivers to cause important farm-related damages to downstream crops and livestock.

Droughts

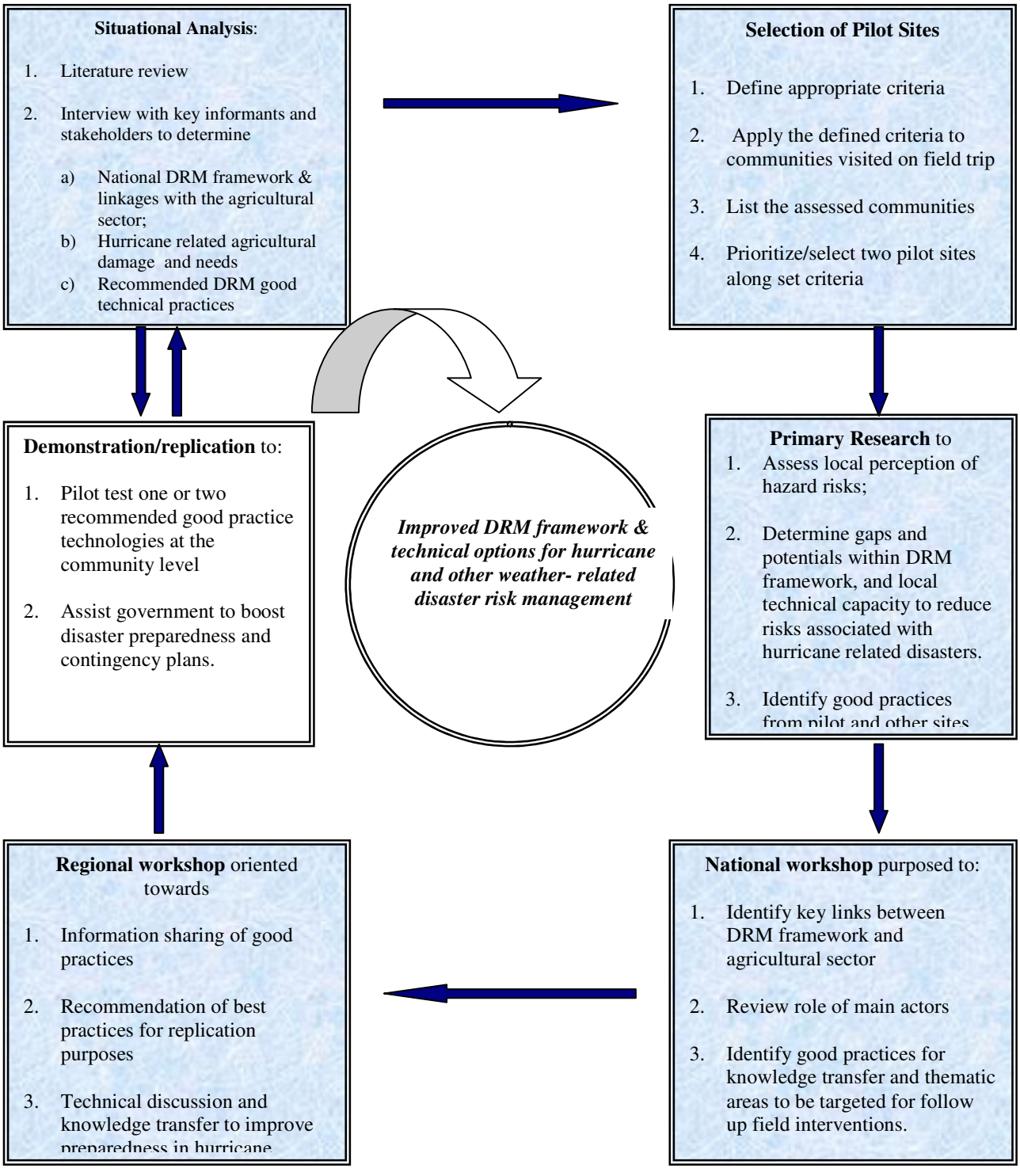
More and more areas in Haiti are now prone to drought, because of the degradation of the environment and the subsequent desertification process. The area hit by droughts is usually limited, however large areas are affected every 5 to 7 years, sometimes with nation-wide impacts. From 1968 to 2000 10 major droughts were recorded, affecting more than 1.5 million people (UNDP, 2005) (see Table 4). Furthermore, the Artibonite department hosts the sadly famous "Savanne désolée", the largest desert area of the country, constantly dry all year round. Cropping activities are a challenge in this area of Haiti and the population only survives thanks to food aid programs led by a number of NGOs.

[12] Only 1.5% of Haiti's natural forest remains and 25 out of the 30 national main watersheds are denuded (CIA, Fact Book, 2003 at http://www.cia.gov/cia/publications/factbook/geos/ha.html).

2. STUDY METHODOLOGY

The overall project implementation framework is presented in Figure 2. According to its design, the project is implemented in two phases: phase 1, which corresponds to this report, focuses on situations analysis in selected field sites; data collection on (a) national institutional set up for disaster risk.

Figure 2 Summary of the project cycle



The boxes in Figure 2 corresponding to Phase 1 are shaded in blue. The second phase will concentrate on the replication and dissemination of good practices on farmers' fields in participating pilot management, and (b) existing good practices for disaster risk management in agricultural sectors; and the preparation for inter regional learning exchange among implementation partner communities. During phase 1 three main tasks were addressed using different methodologies as presented in the following:

2.1 Literature review/situational analysis

Information was collected[13] from NGOs working in DRM and informal interviews with national experts, agronomists, and other professionals working in the DRM and agriculture sectors. Among the institutions contacted were the Ministry of Agriculture Natural Resources and Rural Development, CNSA, the National Center for Food Security, the Ministry of Interior and Territorial Collectivity, the Civil Protection Direction, UNDP, FAO, a number of international organizations and NGOs among which PADF, CARE-Haiti, Oxfam-GB, CARITAS, CRS, etc.

2.2 Selection of Pilot Sites

Two sites were selected for field implementation through field visits in each of the targeted zones.[14] The following set of pre-defined criteria was applied to evaluate the visited sites:

1. Evidence of ongoing activities in community due to prior FAO assistance or NGOs' interventions.
2. Vulnerability to hydro-meteorological hazards and multi-hazard exposure;
3. Frequency, impact and intensity of hazards in the last 5 years;
4. Presence of different agricultural production system (e.g. cash crop, subsistence and mixed farming);
5. Evidence of local capacity to respond and mitigate hydro-meteorological hazard risks - local knowledge peculiar to this area that is perceived as good practice;
6. Size of population at risk;
7. Relatively high dependence of local farmers on agriculture for their livelihood;
8. Level of cooperation with Ministry of Agriculture;
9. Presence of a groups and collaborative mechanisms at farm level.

2.3 Primary field research at pilot sites

A two-stage process was applied that included a transect-based observation of the site landscape followed by PRA-based semi-structured interviews realized with key informants, farmer focus groups, and individual farmers. A questionnaire for the focus group meetings and one for individual farmers were prepared. 10% of the 100 to 200 farmers participating in each focus

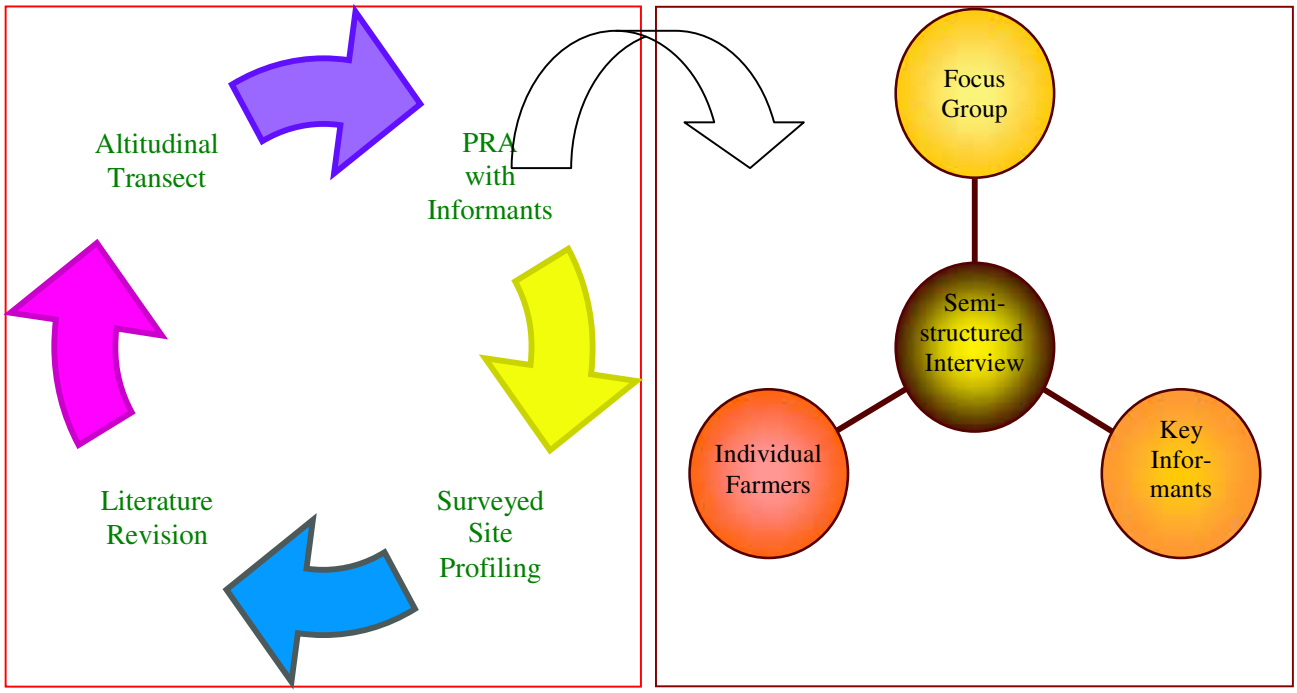
[13] Actually the data describing the Haitian DRM framework were initially collected by L. Charlestra (a former consultant on the project). Those were then evaluated, revised and completed by the current author.
[14] Visited zones were suggested through the literature reviewing and from recommendations of institutions working in the DRM and Agriculture sectors (such as CNSA, OXFAM-GB, the MARNDR, etc.).

group discussion meeting were individually interviewed, preferentially targeting household heads.

In total, 40 individual farmers were interviewed, and at least four focus group meetings held (one per surveyed site) throughout the study area. Completed questionnaires were cleared, cleaned, processed and analyzed. The main observed parameters, e.g. the descriptors for each listed good practice such as origin, implementation costs, etc., were tabulated in an appropriate matrix and arranged in series per pilot site from which the modal values and/or dominant trends were retained.

Furthermore, local risk, vulnerability and available resources were initially mapped using traditional mapping techniques and then moved to Map Info 7.0 software to make them more readily exploitable. Operating DRM framework and linkages with agriculture were determined through diagrams supporting semi-structured interviews from focus groups and/or individual informants. Livelihood profiling was outlined through general transect observation/information, focus group / community-level PRA sessions, key informant and site-level semi-structured interviews with individual farmers. DRM related good agricultural practice examples were documented in pilot and other sites using semi-structured questionnaires administered to individual farmers.

Figure 3 Diagram showing the PRA-based sequential method of data collection



Size of the surveyed population sample = 10% of group focus participants

3. STRUCTURE OF THE DRM SECTOR IN HAITI

3.1 The DRM institutional framework

Haitian authorities have been working on the possibility to establish an institution for Disaster Risk Management since 1983, when an organization for disaster prevention and relief (OPDES) was created to initiate response in case of disaster emergencies. The May 31, 1986 decree put OPDES under the Ministry of Interior (MICT). In 1997, the government created the Civil Protection Division (DPC) within the MICT, to coordinate response actions to disasters and manage risks. After Hurricane Georges in September 1998, Haitian authorities and international organizations committed themselves to draw a national plan for DRM (PNGRD) along with a more effective intervention system, to which UNDP provided active general support. The plan was presented and validated in February 2001 (UNDP, 2004) with the main objectives of:

(1) Acting on the risk causes and factors in order to reduce the negative impacts of disasters;

(2) Reinforcing response capacity at central, departmental, and communal/local levels.

Integrative part of a central action plan for the environment (PAE) the PNGRD was meant to tackle issues as diverse as: urbanization standards, territory planning, map analysis of vulnerability, decentralization and integration of the DRM thematic, and natural resources management (UNDP, 2004). In practice this concept is formalized through the coordination structure of the DRM national system.

3.1.1 The DRM National System

Components of the Disaster and Risk Management National System operating at a centralized level and their functions are the following:

National Committee for Disaster and Risk Management (CNGRD): is the central body of the DRM national system, including high-ranking government officials from each ministry or their representatives and the president of the Haitian Red Cross, its mission is to:

- Define the global DRM government policy
- Lead, coordinate and evaluate the implementation of the National Plan programs
- Promote regional integration of DRM issues.

Permanent Secretary Office for DRM is in charge of technical coordination of the DRM national system and includes representatives of all ministries. Its key responsibilities are*;*

- Convey the top orientations and decisions of the National Committee for DRM;
- Coordinate and implement the DRM National Plan

The Emergency Operation Center (COU*)* is an ad-hoc and representative entity activated in case of imminent disaster. It includes the representatives of all concerned ministries and of the Haitian Red Cross. Its overall mission is to promote, plan, maintain and coordinate disaster response operations at all levels.

The Civil Direction Protection (DPC) acts as the executive secretary office for both CNGRD and the Permanent Secretary Office, it is based on an administrative arm, a disaster coordination arm, and a risk coordination arm, and coordinates the entire DRM system;

Institutional and sectoral committees / thematic committees: Each governmental institution/ ministry is required to elaborate its specific sector DRM plan and to constitute its own committee which may eventually merge with others to form inter-institutional committees to work on particular thematic axes (e.g. urbanism and building codes, land planning and development, vulnerability and risk mapping, etc.). NB: the MoA contrarily to some other government institutions has not yet elaborated its DRM sectoral plan.

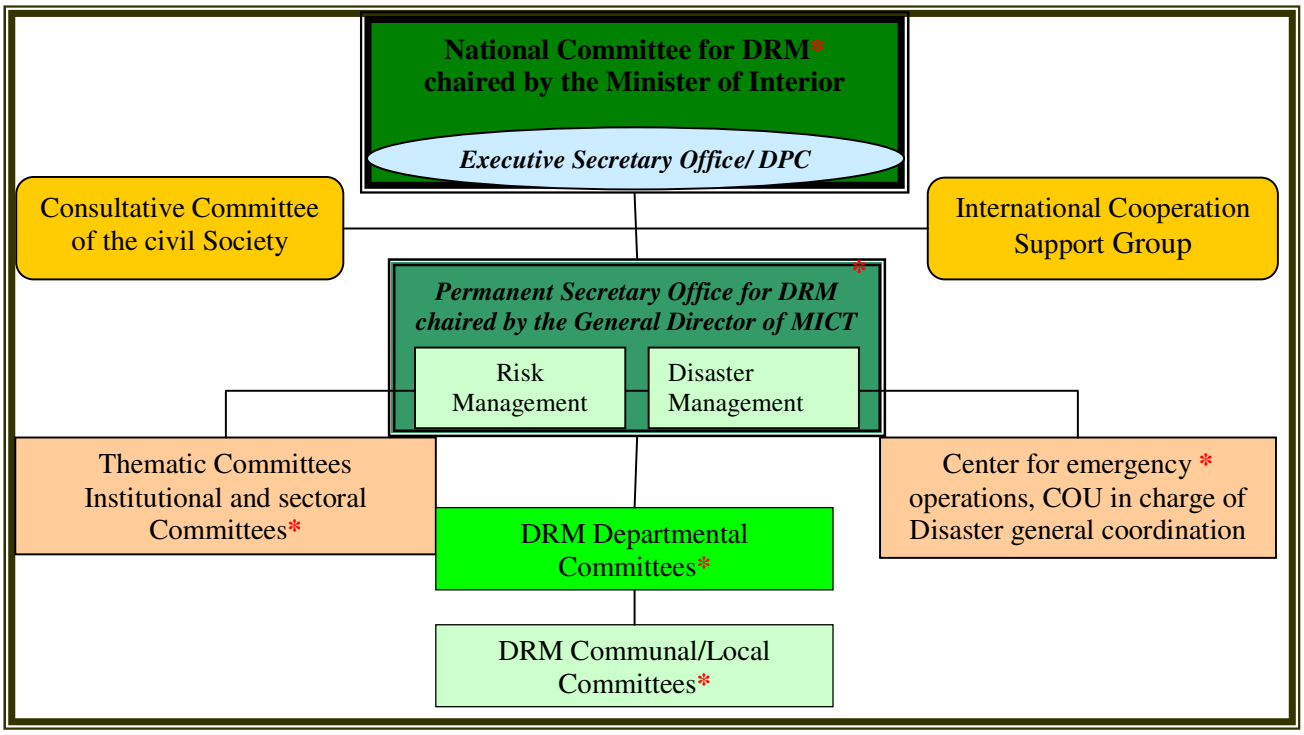
Consultative Committee of the Civil Society: Including individuals from all primary national sectors, its mission is the overall support the DRM process.

The International Cooperation Support group: Including a number of international agencies and NGOs operating in Haiti, its mission is to back up the DRM National System.

Departmental and communal structures: Operating at a more decentralized level, these structures' objective is the implementation of prevention and response actions. Under the supervision of the departmental or municipal representatives of the central government, they include the local mayor's offices, the other government departmental or municipal structures, Haitian Red Cross, NGOs, local community based organizations, and private sector institutions operating in the area.

The departmental and communal committees are responsible for preparing specific local-level action plans to effectively address the needs of the related population as far as DRM is concerned. They also participate in the disaster response coordination. State and autonomous institutions are represented in the DRM structure at all administrative levels but are often less committed in terms of active participation once the level of big cities.

Figure 4 The Haiti DRM National System organization chart[15]



[15] *Source: UNDP Haïti, 2004; Key: a red asterisk indicates where the MoA is directly represented*

3.1.2 Disaster preparedness and mitigation programs in Haiti

Disaster Risk management was hardly included in programs designed over the last 20 years. However, all the stakeholders agree on the complex interrelationships between sustainable development and DRM. According to OXFAM GB in 2001 agriculture and environment constitute the favourite domains of intervention and support for most local, national, and international institutions working for socio-economic development in Haiti. About 69% of the surveyed institutions were working in DRM and 50% were simultaneously involved in prevention and rehabilitation phases. Currently, most of the institutions working in DRM pursue the following objectives:

- Capacity building of institutions;
- Economic empowerment of marginalized populations
- Vulnerability mitigation through the promotion of sustainable use of natural resources.

3.1.3 DRM-based activities undertaken in the agriculture sector

Due to its unpredictable characteristics, DRM in the agriculture sector has historically been a rather secondary topic in Haiti's development programs. Institutions operating in agriculture and environment do not necessarily directly work in the DRM-Ag sector, preferring to address related humanitarian issues such as drinking water supply, relief food and medicine distribution during the response phase. Nevertheless, some actions are taken in the agriculture sector.

When disaster occurs, rapid assessments of needs are carried out by the government through the DPC structures and by local and international institutions and NGOs. Disaster assessment data are generally used to elaborate appropriate disaster relief projects to be submitted to the international and national communities. In this setting, FAO has historically been at the forefront in cooperating with the Ministry of Agriculture and other entities during the response and rehabilitation phases, using disaster damage assessment data it collected to write its own projects for funding FAO then generally executes the project jointly with the MoA. FAO/Haiti has implemented projects contributing to:

- Permanently assess disaster farm needs in collaboration with the Ministry of Agriculture;
- Provide stakeholders with statistical and technical information
- Provide farm inputs to affected farmers through community-based organizations.

In September 1998, after the devastating effects of hurricane Georges on localities in the South, the PADF launched the USAID funded Hurricane Georges Recovery Program which successfully:

- Raised awareness of disaster management and helped 22 communities to develop disaster mitigation, preparedness, and response plans.
- Introduced and distributed 463 tons of improved seed varieties to farmers;
- Implemented 27 subprojects, including the rehabilitation of two roads, seven irrigation systems and eight soil conservation projects);
- Increased ORE's capacity to improve the germ plasm and produce corn, bean and sorghum seeds to be distributed to farmers.

The Haitian NGO ASSODLO undertook a DRM project funded by Helpage International and ECHO in the highly vulnerable town of Fonds-Verrettes, repeatedly swept away by flooding. Among the project's achievements were:

- Community awareness raising;
- Community-based mechanisms and structures for disasters response;
- Mitigation of disaster impacts through reforestation.

After the May 2004 flooding and hurricane Jeanne in September 2004 OXFAM-GB targeted women-headed households in a food security program, which provided seeds and tools in rural areas around Gonaives. In Mapou staff and local counterparts revitalized the local economy by calculating the amount of seeds, tools and livestock required by the population, and allocating vouchers to beneficiaries for use in local fairs promoted on community radios, and through posters and banners. The sellers then redeemed the cost of the voucher from an OXFAM-GB funded local committee.

Following a severe drought in the North-West in 2002, CARE-Haiti distributed seed to 10,000 families in the most heavily stricken municipalities. Program strategies were discussed with the departmental representatives of the MARNDR. The seeds were inspected by CIDPSA, the controlling commission of the MARNDR, before delivery. After hurricane Jeanne, CARE launched a rehabilitation program in the Artibonite and North-West departments, centred on agriculture and livestock. The activities included road rehabilitation, cleaning and repair of damaged irrigation structure on 1,200 hectares of irrigated land, and soil conservation.

The NGOs CRS and CARITAS are about to implement an "Emergency, Disaster and Risk Management Project" funded by the World Bank aiming to reduce disaster vulnerability in 28 communes of the Grande-Anse and South departments. Activities will focus essentially on:

- creation and reactivation of DRM local and communal committees;
- designing of DRM sub-projects;
- revitalization of coordination platforms created in the departments.

Project achievements will be monitored and evaluated, and CRS will share information about results and lessons learned with counterparts.

Table 1 Activities undertaken by some institutions in agriculture and livestock related DRM

Institution	Intervention area	Activities
MARNDR	Country wide	• Damages and needs assessments • Coordination of activities carried out in the sector through the DDAs and S/DDAs
FAO	Country Wide	• Damages and needs assessments • Input distributions (seeds, tools, livestock) • Livestock vaccination campaigns • Rehabilitation of irrigation structures
PADF	Aquin, Vieux Bourg, Chantal, Ducis, Camp-Perrin	• Creation of communal and local DRM committees • Training of committee members on DRM themes • Raising public awareness about disaster preparedness and mitigation • Improved seed and tools production and distribution • Rehabilitation of irrigation systems • Soil and water conservation projects
ASSODLO	Fonds-Verrettes (West)	• Raising public awareness about DRM; strengthening relationships between communities and DPC structures • Creation of disaster preparedness committees • Reforestation projects
CARITAS	Country wide	• Seeds and tools distribution • Restocking (related to pig farming) • Rehabilitation of irrigation systems
Action-Aid	North-West, South-East, West	• Provision of credit (in kind) to farmers • Seeds, tools and livestock distribution • Capacity building in conservation & agro-forestry
OXFAM-GB	Cap-Haitian, Gonaïves, South-East	• Raising public awareness about DRM Seeds, tools and livestock distribution • Soil and water conservation
CARE-Haiti	NorthWest, Artibonite	• Raising public awareness about DRM Emergency preparedness planning • Seed distribution • Poultry restocking • Soil and water conservation • Rehabilitation of irrigation canals
CRS	South, Grande Anse, North, North-West	• Creation of communal and local DRM committees • Development of mitigation projects

Sources: Adapted from Charlestra (2006, unpublished) and others

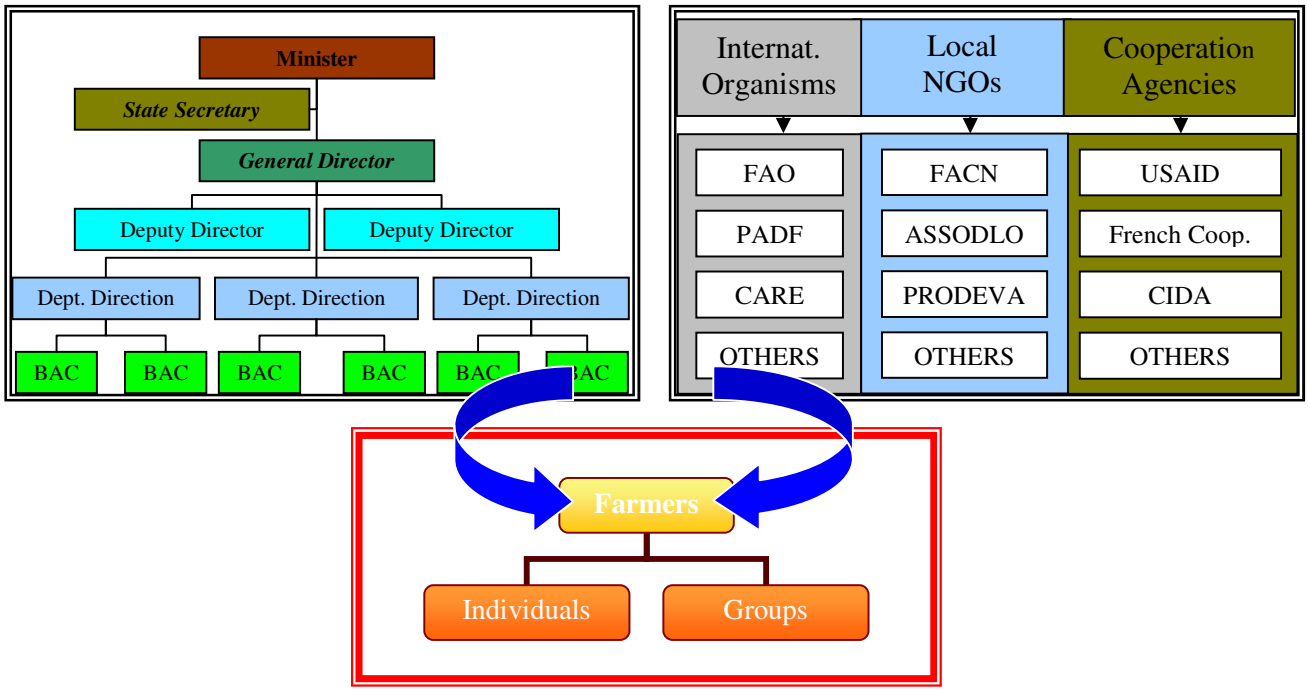
3.2 The Agriculture Institutional Framework

3.2.1 Characteristics of the farm sector in Haiti

The Haitian farm extension system is supported on the one hand by the Ministry of Agriculture and on the other by international organisms, local NGOs, and international cooperation agencies under the Ministry of Planning and External Cooperation umbrella. Those two parties work separately or jointly with individuals and/or grouped farmers to whom they provide technical training and farm inputs such as tools, seeds, fertilizers, etc (see Figure 5), generally free of charge except for the seeds for which small contributions may sometimes be requested. Support provided to farmers is generally not DRM-related. However, after weather-related disasters, relief is delivered to the farmers, including farm-related material. The projects operating within the DRM-Agriculture interface are generally meant to address post-disaster farm issues rather than preparing the farmers to cope with disaster impacts in advance.

The extensive assistance Haitian farmers are used to receiving is likely to negatively affect their creativity and ingenuity, while constituting bad heritage for upcoming programs based on sensitization and motivation to trigger positive behavioural changes).

Figure 5 The Haiti agriculture national framework organization chart



3.2.2 Representation of the Agriculture sector within the National DRM system and existing links

The agriculture sector is directly represented at different levels of the National DRM system by the MoA, though its presence is more perceptible at a decentralized level. The MoA has not designed its intra-institutional DRM sectoral contingency plan yet, so it does not presently cover a leadership position within the DRM national system, and is left to support the DPC/MICT-led decisions in times of disaster.

Present links between the DRM system and the Agriculture sector include: (a) methodical organization of the planned activities), (b) exchange of all relevant data, (c) projects implementation, (d) monitoring, and (e) evaluation. In general, these links are weak, however, they tend to become more effective during the response phase when relief is being rush-delivered to the disaster-stricken as the DPC needs to collect information related to damages at farm-level to prepare damage assessment reports which will ultimately be submitted to donors for emergency relief request.

Moreover, DRM programs in Haiti have historically evolved at a two-fold level to formally include an agriculture-dedicated component on one hand, and on the other to encompass all phases of a disaster instead of being limited to the response phase

as happened in the past. This positive change dates back to Hurricane Georges in 1998, when multi-phase agriculture-based DRM projects were officially designed as the way forward to sustainability in the sector. Though response is still prevailingly the phase addressed DRM related programs implemented in Haiti also address:

- Preparedness, by raising the public awareness and capacity building of committees at different levels (training).
- Response, through input distributions (seeds, tools, livestock)
- Mitigation, through actions to protect the environment (soil conservation, reforestation)
- Rehabilitation, through road repair and rehabilitation of irrigation infrastructures.

The strength of the DRM system is the partnership between the DPC, national and international agencies, NGOs, the civil society and local communities. Moreover, the integrated creation and strengthening of municipal and local DRM committees is important in committing communities and making the process effective. Finally, training and mitigation actions such as soil conservation, roads and farm infrastructures rehabilitation undertaken in most recent DRM projects constitute invaluable investments for longer-term development in the concerned areas.

On the other hand, however, gaps and weaknesses characterize past and ongoing programs, among which:

- Lack of well-trained local evaluators;
- Weakness in the evaluation approach in the agriculture and livestock sector;
- Too much emphasis on response actions rather than on prevention and mitigation on one side, and rehabilitation and reconstruction on the other;
- Lack of cash and inadequate inputs such as improved seeds to disaster-stricken farmers;
- Lack of synergy between actors and consequent tendency to duplication;
- Lack of full involvement of targeted populations in the DRM process.
- Insufficient scope of programs and failure to meet the multiple needs of stricken communities;
- Once needs are established, distribution is undertaken on an equal footing; as such, those beneficiaries who have lost more than others feel that the distribution process is not equitable. In extreme cases, relief was granted to individuals who had not been affected by the disaster;

3.3 The DRM-Agriculture interface: some recommendations for improvements

The following is proposed:

1. The resolutions and provisions decided in the Haitian DRM National Plan which provides a good framework for local issues should be applied by initiating assessments and updating drills;
2. The generally top-down relationship existing between the Ag and the DRM sectors needs to evolve towards a more participative, dynamic, productive, and permanent type and a participative and egalitarian approach should shape the relationships between all stakeholders of the two sectors at all levels;
3. An effective decentralization to the lower administrative levels is recommended, since MoA local representatives is often hampered and remains inefficient since not being authorized to take quick decisions without first reporting to a senior officer or to headquarters, stopping or slowing down the scheduled activities;
4. Local DRM committees created under the impulse of the DPC and the Haitian Red Cross (and dedicated to coordinating training, information sharing, and emergency relief delivery to benefit the population at the local/rural level) should be permanently activated, and trained. Small stipends paid to committee members may ensure an overall better performance
5. It is recommended that the DRM inter-institutional committee dedicated to coordinating DRM sectoral committees be activated;
6. It is recommended that the MoA DRM sectoral committee be activated with mandate to ultimately elaborate, validate and execute agriculture sector-wide contingency plans related to DRM issues at any phase. It should eventually be turned into an autonomous DRM direction provided with adequate resources in view of timely achievement of the scheduled agriculture-related DRM tasks decided in the DRM National Plan;
7. Future watershed management projects, of which the MoA is in charge, should link to disaster and risk management priority framework;
8. Timeliness of early warning and of relief coordination efforts must be prioritized as a key to the success of DRM efforts.

Table 2 Links between DRM & Agriculture sectors and improvement recommendations

Administrative level of action	DRM phase	Links	Recommendations
Central	Before Disaster	Information Planning Execution	➢ Independent direction of DRM sectoral committee at the level of the MoA for a greater efficiency ➢ Finalization of the inter institutional plan for DRM by the DPC/Permanent secretary's office for DRM
	During Disaster	Information Planning Execution	➢ None
	After Disaster	Planning Information Execution Monitoring Evaluation	➢ Preparation and implementation by the DPC of the scheduled sectional response plan with actions and initiatives to undertake in the aftermath of a disaster
	All phases	Planning Information Execution Monitoring Evaluation	➢ More efficient coordination and clearer definition of responsibilities between the DPC and the Permanent secretary's office for disaster and risks management and the other concerned branches of the executive power ➢ Greater involvement of the Ag sector in DRM
Departmental	Before Disaster	Planning Information	➢ A clear definition of the roles and responsibilities of each sector as well as of the links between them is recommended within the existing departmental-level contingency plan; ➢ Involvement of the Ag sector in the design of the DPC funded hurricane related warning messages.

Level	DRM phases	Links	Recommendations
Departmental	During Disaster	Planning Information Execution	➢ Availability of adequate resources to the Agriculture sector for the timely collection, processing and dissemination of natural hazard related early warnings
	After Disaster	Planning Information Execution Monitoring Evaluation	➢ Involvement of the agriculture sector representatives in the DPC post-hurricane season evaluation.
	All phases	Planning Information Execution Monitoring Evaluation	➢ Direct participation and attendance of senior executives from the agriculture departmental direction to scheduled meetings would be recommended;
Communal/Local	Before Disaster	Information	➢ Promotion and implementation of DRM based good practices to help reduce risks likely to occur in the farming system while reinforcing its overall production capacities ➢ Risk assessment as an integral part of the design and implementation process of the selected appropriate practices ➢ Appropriate training of MoA local representatives
	During Disaster	Planning Information Execution	➢ Availability of personnel from both sectors

Level	DRM phases	Links	Recommendations
All levels	All phases	Planning Information Execution Monitoring Evaluation	➢ Anticipation to January of the hurricane season related prevention activity campaign ➢ Focus on complementarities between risk management and disaster management within the DRM cycle;