

**FAO AGRICULTURAL DAMAGE ASSESSMENT MISSION TO DOMINICA  
FOLLOWING HURRICANE DEAN  
TCP/DMI/3102**

**PRELIMINARY SUMMARY OF FINDINGS AND RECOMMENDATION  
September 17, 2007**

**Document prepared by the Global Information & Early Warning System (GIEWS) of the Trade and Markets Division in collaboration with the Emergency and Operation Service (TCEO) of the Technical Cooperation Department. The final assessment report is expected to be published at the beginning of October.**

### **Background**

The Commonwealth of Dominica is located in the Eastern Caribbean and is the largest and most mountainous of the Windward Islands with an area of 750.6 square kilometers. It has an estimated population of 71,000 of which about 20,000 live around the capital city of Roseau which is located on the south-west coast. The country experienced serious economic difficulties during the 1990s and recorded negative growth for 2001 and 2002 but this has subsequently been reversed with annual positive growth rates of over 3% from 2004. The agricultural sector plays a major role in the economic and rural development accounting for about 17 percent of GDP and 24 percent of employment. National policies have identified agriculture as a major agent for rural transformation and the attainment of macro-economic stability and sustainable development. Crop production led by banana is a primary foreign exchange earner and provides a major source of employment.

Hurricane force winds, torrential rains and high sea swells resulting from the passage of Hurricane Dean between August 16 and 17, 2007 severely affected all sectors of the Dominican economy including agriculture, fisheries and forestry. Wind gusts of up to 170 km/hr and precipitation in excess of 200 mm over a period of 18 hours resulted in swollen rivers, flash floods and landslides that caused extensive damage to agriculture, housing and infrastructure. Agriculture was the sector hardest hit by the storm with widespread damage in all growing areas throughout the country and losses of over 70 percent of total agricultural production. Over 3,200 farmers have reported some level of damage to their established plots while in excess of 3,000 fishers and vendors have had their earnings sharply reduced. The worst hit areas were the south, south-east, east and west regions. The areas in the south and east concentrate the more vulnerable population. Significant damage to infrastructure, with feeder roads made impassible as a result of landslides, fallen trees, mass debris and drain blockage also adversely affected access to farms.

The Government has sought assistance to address the most critical and immediate needs of the vulnerable farming and fishing communities that were affected by Hurricane Dean.

Loss of earnings as a result of the hurricane was estimated by the Ministry of Agriculture at US\$10.0 million and the cost of rehabilitation at US\$14.0 million. Under request of the Ministry of Agriculture, the FAO fielded a mission to conduct an assessment of damage and losses as well as to prepare project proposals for the rehabilitation of the agricultural sector. The Mission comprised four national consultants along with an international team coordinator and two FAO experts. The team commenced work on September 03, 2007 by spending the first two days conducting interviews with government institutions and international agencies in order to collect available information and data. The team then spent about 10 days of field visits to audit the data previously collected by the Ministry of Agriculture on the impact of the hurricane damage on the agricultural sector and to evaluate the effects on the most vulnerable groups. Preliminary findings and recommendations of the Mission are summarized below:

### **Crops sub-sector**

Prior to the hurricane tree crop production (banana, plantains and fruits) occupied an estimated 2 830 hectares or 66 percent of the island's 4 260 hectares under crop production. Some 1 890 hectares or 87 percent of the tree crop area were damaged by the passage of Hurricane Dean. Banana is the major export crop earning over US\$7.5 million annually which is more than half of the total foreign exchange that is generated from the sale of agricultural produce and some 20 percent of the country's total exports. Over 90 percent of the estimated 970 hectares under banana grown by 730 farmers was totally destroyed while for plantain, losses are estimated at 357 hectares, affecting 883 farmers. The export of plantain generates about US\$1.4 million annually. The other major tree crops including citrus, avocado and mango also suffered high losses of fruits and broken branches while coconut trees suffered extensive damage to their tops as a result of the high winds. These crops are also significant foreign exchange earners and are exported primarily by the local hucksters to the nearby islands. The export of these tree crops generate in excess of US\$2.0 million annually and provide employment for over 200 hucksters.

Dominica is also a major producer of root crops and these occupied an estimated 1100 hectares before the storm, generating about US\$1.4 million annually in the export trade and playing a major role in the food security of rural households. Some 720 hectares or 66 percent of the area planted were damaged by the passage of Hurricane Dean. Damage to dasheen and yam resulted mainly from the high winds, heavy rainfall and land slides. Other crops of significance that suffered high losses include breadfruit, hot pepper and passion fruit. Pineapple, a major fruit crop suffered minor damage, while coffee and the bay plant, used to produce an essential oil, were practically not damaged. Vegetable production in the open field, which occupied a relatively small 30 hectares, was completely lost. Out of 198 greenhouses for vegetable production prior to the hurricane 60 suffered serious damages. Thirty three of the houses suffered structural damages mainly because the plastic cover was not removed.

There is also a significant level of agro-processing using local raw materials including green papaya, passion fruit, hot pepper, grapefruit, orange and lime. The passage of the

hurricane has resulted in the complete loss the local raw materials resulting in the need for import and the resulting additional expenditure of foreign exchange. The main agro-processor normally purchases from about 200 farmers.

### **Livestock sub-sector**

The livestock sub-sector is relatively small contributing about 1.7 percent to GDP. Serious losses have been reported from 148 livestock farmers who lost over 2 200 animals, mainly poultry. In general the livestock farmers suffered varying levels of physical damage to farm buildings, livestock housing and pastures. Poultry production forms a significant part of the sub-sector and local production meets the domestic demand for eggs. Production of eggs declined following the hurricane following a reduction of 70 percent in the older flocks and of 30 percent in the younger birds. Broiler production is relatively small and losses resulting from the storm were less than 5 percent with a few exceptions where 70 to 80 percent of the birds were killed as a result of the roof crashing in on them.

Pork production provides a significant income to a number of rural households many of which were affected by the storm. Significant damage was caused to livestock housing, mainly to the roofs due to inadequate investment in construction materials. Substantial damage to water supply lines was also reported. Up to 70 farmers lost sheep and goats due to trees and/or housing falling on animals in confinement. Beef cattle production is predominantly small scale and cash derived from the sale of meat augments family income usually at special times of the year. There is also a small dairy industry that provides regular income to a limited number of small farmers. In general, damage to the dairy industry was mainly to infrastructure and little or no significant damage was reported to the animals. Serious damage to fencing was reported from some livestock farms, varying according to location.

### **Fisheries sub-sector**

The fisheries sub-sector employs approximately 3 100 fishers and fish vendors and contributes about 2.0 percent to GDP. The value of fish landings is about US\$ 2.2 million annually and most of the fish landed is consumed locally making a significant contribution to national food security. The damage to the fisheries sector varied according to the landing site location and the quality of the infrastructure. High damage to the sub-sector resulted from storm surges and high winds that ravaged boat sheds, destroyed fishing boats and equipment and rendered a number of landing sites inaccessible to fishers. The south eastern coast was the most severely affected leaving much damage to coastal habitats and the landing sites at Scotts Head, Stowe, Fond St. Jean and San Sauveur. At Fond St. Jean, the landing site was inaccessible to fishers from both land and sea as a result of deposition of large boulders. At Scotts Head, the main isthmus was cut off causing flushing of the water from the Atlantic Ocean into the Caribbean Sea. The Stowe and San Sauveur landing sites were also severely affected and required the clearing of boulders and debris following the passage of the storm.

The highest losses were reported for fishing gear mainly fish pots and fish aggregating devices (FADs). Fishers reported losing between 1 100 to 1 200 fish pots and several FADs. It is anticipated that more than half of the pots would remain lost resulting in ghost fishing and reduction of the fishery. Fishers with pots would have suffered high losses due mainly to the remoteness of the gear and their inability to respond quickly and safely to the hurricane warnings. Fishers also reported losing 15 outboard motors while 21 boats were damaged beyond repair. Damage was also reported for 30 boat sheds, 11 buildings and 7 locker rooms while four jetties were damaged.

Considerable coastal degradation occurred as a result of high seas, and a large amount of silt, mud and debris that was brought down by the rivers and other surface runoff. It has been observed that the current management of land based quarrying activities is adversely affecting fishing activities on the west coast due to high runoff levels into the sea. High rainfall level also increases the runoff of agro-chemicals from agricultural areas into the sea that results in algal bloom with the corresponding growth of algae that kills fish life.

### **Forestry sub-sector**

Maintenance of the forest cover is critical for Dominica so that it can promote its “Nature Island” image that is used as a major selling point for tourism. Dominica’s natural vegetation covers an estimated 51 770 ha or 65.7 percent of the land area. The impact of Hurricane Dean on the forest included defoliation, broken tree limbs, uprooted trees and landslides. The defoliation as a result of the hurricane is extensive and can result in accelerated erosion of the top soil, increased runoff, flash flooding and adverse impact on lives and property downstream. The damage to trees including broken tree limbs and uprooting was not excessive and not concentrated in any one area but scattered over wide areas. The Eastern Forest Range was the most affected by the winds resulting in loss of up to 35 percent of the forest cover while the Central, Northern and Roseau Forest Ranges were not so seriously affected.

The forest in Dominica plays an important role in the preservation of wild life and water resources. The wild life of the forest depends on seeds, fruits and young shoots to survive, as well as the forest cover for protection and opportunities for nesting. The damage to the forest will place survival of wildlife under significant pressure and could result in depredation of agricultural crops. The forest is also an important area for eco-tourism related activities including nature trails and national parks. Some of the trails were severely affected with broken branches, water erosion, flooding and uprooted trees.

### **Economic Impact**

The passage of Hurricane Dean is having a significant negative impact on agricultural production and livelihoods in Dominica. The crop destruction has resulted in the immediate suspension of banana exports to the United Kingdom and non-banana crops to the regional markets resulting in the loss of foreign exchange earnings in excess of US\$11.0 million in 2007. Worst affected by the Hurricane destruction are 3 000 farmers and their families whose livelihoods have been disrupted by the sudden loss of their cash

income. The passage of the hurricane has also virtually destroyed food crop production and thus is expected to adversely affect food security. Immediately after the storm, farmers were able to salvage some food crops, making them available on the domestic markets. Consequently, severe food shortages have not yet been experienced. However food availability in local markets is already diminishing, prices starting to rise and the situation is expected to deteriorate in the next few weeks. Farmers are suffering from a loss of income as for many their main source of earning was suddenly taken away. This loss of income is expected to reduce their purchasing power and therefore their adequate food intake, as well as affect farmers' ability to make loan and utility payments. Some farmers have started to rehabilitate their farms using their savings and others are expected to seek alternative forms of employment including fishing during the period of their farm rehabilitation.

Fish landings have decreased due to the loss of gear, damage of landings sites and degradation of habitats. This has had an immediate adverse impact on the earnings of over 3 000 fishers and vendors along with their families as well as the availability of fish as an important food source. Several fishers have been servicing loans and will now find it difficult to maintain their commitment for payment due to reduced income. The third quarter of the year is the main period for pot fishing and the high loss of pots as a result of the hurricane has resulted in a marked decline in fish landings. Fishers have begun the rebuilding of pots but previous experience has shown a tendency to use smaller size mesh wire after a storm resulting in the catching of smaller fishes and depletion of the fishery. Some fishers have integrated their income with farming activities, for example bay leaf production. In the case of the bay plant the crop has suffered only minimal damage and is being harvested at this time.

Damage to the forest cover is expected to be associated with accelerated erosion of the top soil, management of watersheds and water catchments, increased flash flooding and landslides and the potential for impacting on lives and properties down stream as well as adversely affecting the marine environment. Damage to the forest is also expected to impact on the wildlife habitat and the availability of food sources. It is anticipated that the wildlife would turn to agricultural crops for food resulting in further losses and hardship to farmers. Damage to the forest can also affect revenue generation for eco-tourism related activities that is an important selling point for tourism promotion to the island.

## **Recommendations**

### Immediate relief assistance

- Provision of inputs required for urgent rehabilitation including planting material, seeds, fertilizers, soil ameliorants, agricultural chemicals, small farm machinery and equipment;
- Supply of plastic / shade cloth for greenhouses;
- Material assistance for repair of irrigation lines;
- Supply of poultry feed, medication and other needed supplies;
- Supply of building materials for repairs to livestock housing;

- Provision of chicks to poultry producers and small ruminants for livestock farmers;
- Supply two week old broilers and feed to selected small farm families to enable them to produce their own meat;
- Supply of materials for the construction of fish pots, FADS and other fishing materials;
- Supply of material for the repairs to fishing boats, engines and boat houses;
- Supply of chainsaws for forest rehabilitation;
- Conduct training workshop on the maintenance and safe use of chainsaws.

#### Medium-term assistance

- Development of a project for a comprehensive land use management plan;
- Strengthening of farmer / fisher groups and associations to assist with disaster management.

#### ❖ **Crop sub-sector**

- Improvement of cropping practices to expand use of wind breaks, grass barriers, storm drains, contour planting and pruning;
- Promotion of cropping cycle to ensure maturity of selected food crops during the peak period of the hurricane season;
- Market development and expansion of crops that have shown greater tolerance to hurricane force winds;
- Development of hurricane disaster plans for farmers;
- Improvement of an agricultural information system;
- Improvement of agro-meteorological data collection;
- Develop (particularly for livestock) designs for farm structures that are more resistant to hurricanes;
- Development of crop insurance scheme for non-banana crops.

#### ❖ **Fisheries sub-sector**

- Development of disaster management plans for each landing site;
- Encouragement of fishing techniques to remove dependence on fish pots during the hurricane season;
- Conduct training of fishers in improved fishing gear and methods;
- Provision of grant funding to national Fishermen Cooperatives organization to develop revolving funds for the purchase of replacement gear;
- Conduct rehabilitation of landing sites to improve protection from high seas;
- Improve and expand locker room facilities;
- Conduct a study to determine the level of habitat degradation and impact on fishers as a result of the hurricane, other storm events and land based activities;
- Review the relatively large number of landing sites with an aim to develop 6 to 8 major protected sites for use during inclement weather;
- Develop and implement appropriate policies and management for land based facilities including quarries and dumps that affect the marine environment.

❖ **Forestry**

- Manipulation of canopy in parrot habitats to induce growth of wild life trees where seeds have fallen onto the ground;
- Implement maintenance and utilization work to remove fallen and vulnerable trees;
- Employment of chainsaw teams for maintenance and utilization within the forest reserve and national parks;
- Implement regular maintenance of forest trails;
- Develop a plan for the management of private forestry lands;
- Develop and conduct training for safety measures to be adhered to by staff, farmers, tour guides and all visitors to the forest;
- Conduct research on crop depredation by forest wildlife;
- Development of agro-forestry practices for steep slopes;
- Seek assistance for a project to conduct a study of current forestry ownership, land use practices and boundary demarcation.