



United Nations Environment Programme

برنامج الأمم المتحدة للبيئة • 联合国环境规划署
PROGRAMME DES NATIONS UNIES POUR L'ENVIRONNEMENT • PROGRAMA DE LAS NACIONES UNIDAS PARA EL MEDIO AMBIENTE
ПРОГРАММА ОРГАНИЗАЦИИ ОБЪЕДИНЕННЫХ НАЦИЙ ПО ОКРУЖАЮЩЕЙ СРЕДЕ

Haiti Earthquake response effort UNEP Haiti Rapid Environmental Assessment and follow-up Update 1 February 2010

Introduction

UNEP completed an interim Rapid Environmental Assessment (REA) on 17 January. This REA is updated on a two-day basis or upon major developments. The following report integrates all work to date, as at 1 February.



Background

UNEP has a country programme in Haiti and at the time of the quake on Tuesday 12 January, had a total of 10 staff (3 international, 5 national, and 2 international partner staff) on station or visiting. The team is now responding to the disaster as part of the wider international relief programme. One part of the UNEP response is to conduct rapid environmental assessments.

By February 1, 3 senior international staff, 3 national staff and two drivers were active in Haiti – one international staff supporting disaster response operations and management, and the Country Programme Manager and national technical staff covering the 8 humanitarian Clusters, as well as daily meetings with the Government, the Country Team and the Humanitarian Forum.

UNEP's main counterpart in Haiti before the earthquake, the Ministry of Environment, is now operational. Meetings with the Minister and ministerial commissions are held on a regular basis and joint work and field missions are being carried out, both at the national and departmental (Southeast) levels.

Update and initial findings

Field-based work over the period 13 January - 1 February in Port-au-Prince, Jacmel, Leogane, Grand Goave, Petit Goave and Tomazeau, has identified a number of major environmental issues for the short and medium term.

Post-Conflict and Disasters Management Branch

15, Ch. Des Anémones, 1219 Châtelaine (Genève), Switzerland

Tel.: +41 (0)22 917 85 30 • Fax : +41 (0)22 917 80 64 • E-mail : postconflict@unep.ch



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Acute issues

The following acute issues have been assessed in outline:

- **Oil and chemical spills:** One small oil spill was reported resulting from a damaged coastal oil terminal tank. A number of shipping containers with unknown contents had fallen into the sea at the container port. By 21 January some residual diesel spills remained in the Port-au-Prince bay area. No new information on relevant oil spills has been collected. Considering the number of sunken containers and the increased marine traffic in the port, this issue will continue to be monitored, and an in-depth study will be conducted when logistically feasible.



- **Fires:** A number of small fires occurred at destroyed warehouses and at a petrol retail station. Burning of solid wastes in place has been observed since 18 January, due to the accumulation of solid wastes in provisional shelters. Solid waste collection is progressively being organized but is far from sufficient.
- **Toxic waste:** No incidents reported or investigated.
- **Landslides:** Multiple small landslides are visible on the hillsides of Port-au-Prince. Inland landslides were also observed on the Route Nationale no. 2, on route to Jacmel and between Grand Goave and Petit Goave. Very little secondary movement is reported or noted so far, mainly due to the coral sand geology and dry conditions. Many more slides are anticipated after the first heavy rains. An important amount of sediment is expected to run to the sea, creating additional damage to the marine ecosystem.
- **Impacts on coastal and marine ecosystems:** It has been reported that local small-scale tsunamis took place on the day of the main earthquake, on both the southern and northern coasts of the southern peninsula (Jacmel, Grand Goave and Petit Goave). The population of Grand Goave has reported casualties linked to these tsunamis. Visible changes in coastal geomorphology can also be observed in some areas of Grand Goave, where formerly emerged land and associated vegetation is now one meter below sea level. The impacts of these changes and expected massive sedimentation as a result of landslides are yet to be determined.
- **Toxic waste:** No incidents reported or investigated.
- **Hydrological changes in impacted areas:** Additional water level rises have been reported in the Azuei and Trou Caiman lakes. In addition, the appearance of numerous springs in the vicinity of the lakes has been observed, with many springing up in houses across local communities. A field visit to the lakes area showed that a significant number of houses and cultivated land had been affected by these new springs, which are causing localized flooding. In addition, an increase in the turbidity of the lakes has also been observed. The effect of these hydrological changes on drinking water sources has yet to be determined.

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Resource pressure from displaced populations: The massive ongoing population displacement represents an immediate pressure on local resources. It was reported by the DPC that out of 1,000,000 IDPs, 900,000 are settled in urban areas (700,000 in Port-au-Prince and 200,000 in other locations) and 100,000 in rural areas (Gressier, Leogane, Petit Goave and Grand Goave). As of 25 January, more than 235,916 people had left Port-au-Prince (the most important destination is Artibonite, with 62,573 people arriving). It was reported that approximately 13,360 houses had been destroyed in the affected areas.

UNEP is maintaining an alert for new reports of acute issues.

RESPONSE AND EARLY RECOVERY ISSUES

A long list of medium-term environmental concerns and opportunities are noted and discussed below.

Waste management

Domestic solid waste/sanitation: Domestic solid waste is generally piled up in the streets and burnt in place, although waste collection has already started in the main streets. Joint actions have been initiated by UNDP, UNICEF and UNEP to support DINEPA in its efforts to develop concrete measures to respond to the emergency and to develop a strategy for waste management in the medium and long term. Six thousand workers are already engaged in cash-for-work programmes run by UNDP. A field visit to the main waste disposal area of Port-au-Prince (Truitier) revealed that large amounts of mixed wastes (including demolition material and other) were being dumped in the area.

Medical waste: Emergency response operations are currently generating a very significant amount of medical waste. In the hospitals inspected to date, waste is temporarily piled up and is starting to be picked up by municipal waste trucks. An independent system for medical waste disposal is now in place in Truitier as a result of the actions carried out by DINEPA with the technical assistance of UNEP, WHO and UNDP. The system was visited on 27 and 30 January and was found to be working properly. A discrepancy was noted however, between the quantity of waste generated and the amount that was actually disposed, signaling that measures are needed to improve the waste collection chain.

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Demolition material: In the epicenter and highly affected areas, the percentage of destruction or severe damage to buildings and other structures is 60-80%. The volume of demolition waste potentially generated by the recovery and reconstruction operations has yet to be technically estimated, but will likely be in the tens of millions of tons. There are many opportunities to reduce the impact of this anticipated massive programme. Recycling efforts are already being observed, but debris is also being dumped in large quantities on the roadside. Dumping of demolition material in Truitier was observed during a field visit on 24 January. In addition, a field visit to the domestic disposal area of Truitier and Route Nationale No. 1, near Port-au-Prince, on 30 January showed that a large amount of demolition material is being disposed of along the Route. UNEP is supporting the development of conceptual principles on debris management in Port-au-Prince and its environs which would feed into the development of a Debris Management Strategy. The following notes are now available: Conceptual principles for debris management; ToRs for designing the debris strategy in Haiti; and Needs for equipment for demolition of damaged buildings. Explorations on partnerships with a potential executor (like UNOPS) are underway to proceed to execution.



Bodies: Thousands of bodies have been taken from the streets and building search and rescue operations and collected for burial. No more bodies can be observed on the streets. Six mass graves have been dug at Titayen, Route de Solino, Cimetière de Port-au-Prince, Delmas (Acra), Pernier (Petionville), and Cimetière Route des Frères. UNEP inspection is underway to determine the impacts of mass graves on local environmental resources. Field visits were carried out to the mass graves of Cimetière de Route Frères, Cimetière de Port-au-Prince, Cimetière de Pernier and Titayen. At the Titayen site, four-meter deep graves with a four meter depth were dug. However, bodies were clearly visible in graves that had a depth of less than one meter. There is no population at risk downstream from the site, but some sulfured springs that are used by local inhabitants for medical and religious purposes could be affected. This will need to be further investigated. Meanwhile, tens of thousands of bodies are expected to be trapped in collapsed buildings. Putrefaction and associated health risks are rising.

Secondary spills and hazardous chemicals: The salvage and recovery process will in time work over a large number of badly damaged small industry and storage sites. This implies a risk of oil and chemical spills at a later stage. The extent and impact of Persistent Organic Pollutants (POPs) from sources like damaged electric transformers also need to be assessed. Between 75-80% of low tension transformers and 30-40% of medium tension transformers are lost. This means that around 100 transformers are destroyed and that oil spills (POPs) are observed.

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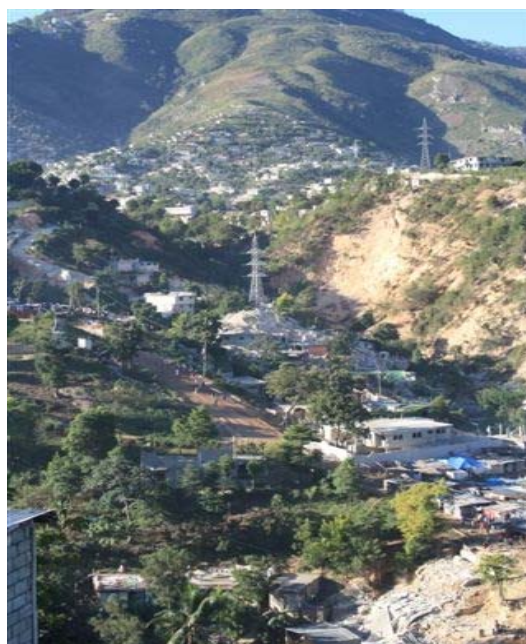
Energy demands of the displaced population/energy generation

In excess of one million people are reportedly displaced, with several hundred thousand based in urban open spaces. These settlements will urgently need energy for cooking. The historical choice of charcoal is both extremely expensive and scarce, and is also unsustainable. Fuel wood options are very limited in the Port-au-Prince area. There is a major opportunity for switching directly to propane gas, however this is an expensive alternative. No damage has been reported to the Peligre dam and hydro-energy plant. Damages were reported to the Carrefour power plant, however. Experts are expected to assess the situation.



Geological and flood risks for rebuilt camps and for road network

Many damaged housing areas will be further degraded by the earthquake as it has destabilized slopes and blocked drainage lines with debris. There is a high potential for building back better and disaster risk reduction through improved hydrology, slope stabilization by revegetation and geological engineering work. A similar situation was observed on some of the routes linking Port-au-Prince and Petit Goave (Rte Nationale No. 2), and Leogane and Jacmel (Rte. Nationale No. 4), where deep cracks in the road and unstable slopes were observed. UNEP is facilitating a process to develop sound studies on geological risks, by organizing a mission of high-level experts to develop the study.



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Green food and cash for work schemes

The quake has destroyed the Port-au-Prince regional economy for the medium term at least. Several million will be economically affected. It is anticipated that the most vulnerable will be assisted with large-scale food and cash for work schemes. Opportunities exist with UNEP partners (WFP, UNDP, ILO, OIM, and FAO) to direct these schemes to green/sustainable/DRR activities such as clean-up, urban catchment rehabilitation and reforestation.

New settlements

It is anticipated that new settlements will be placed outside of the current Port-au-Prince area – as this is far more economical and practical than rebuilding some areas to earthquake standards. There are opportunities to influence these initiatives to improve their sustainability (see Cluster Shelters).

Environmental impact of massive population displacements

Reports indicate massive population movements to less affected rural and urban areas in the western part of the southern peninsula, and in the central and northern part of the country. While this could represent an opportunity to launch a rural development programme, it adds additional pressure in the short term on the already exhausted natural resource base. Indeed, the Government has said that it would be desirable that 40% of the displaced population be directed towards agricultural work.

Following up the assessment

The UNEP strategy for turning the assessment findings into action is to integrate the findings at the earliest possible stage of the response and recovery process. This is already occurring. The UNEP model for achieving this is to provide a centralized technical assistance facility to a wide range of partners – following on from the model that was operating very successfully prior to the earthquake.

Environment mainstreaming in Clusters' activities

With the aim of mainstreaming urgent environmental issues in the disasters response, organized in the frame of the clusters' work, UNEP staff is currently participating in 8 clusters: Water and Sanitation; Health; Temporary Shelters; Agriculture; Food Aid; Education; Logistics; and Early Recovery. Some relevant issues are:

- **Shelter cluster:** UNEP's support was requested to assess a site in the area of Croix-des-Bouquets where temporary facilities to accommodate 100,000 people and a new definitive settlement are being planned. UNEP preliminary assessment and considerations are underway. Each participant in the cluster was requested to make an integrated evaluation of the most important among the already existing temporary shelters sites. A total of 329 sites currently exist. UNEP is carrying out assessments of Carradeux and Route de l'Aéroport.
- **Early Recovery cluster:** The cluster became operational on 19 January. The issues of waste management, demolition materials, energy for displaced populations and geological risks were raised as environmental priorities to be immediately considered in early recovery plans.
- **Health cluster:** The issue of hospital wastes was raised as a priority action and discussions are

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underway between UNDP, WHO/PAHO, UNEP and the counterpart DINEPA to execute immediate actions in the 18 hospitals.

- **Water and sanitation cluster:** Support to develop a system for waste management with DINEPA is ongoing as a joint effort between UNDP, UNICEF and UNEP. Consultations and field visits are underway to determine possible changes in water sources as a direct impact of the earthquake.
- **Agriculture cluster:** The cluster became operational on 21 January. The potential of agricultural development to reduce the pressure of the displaced population on natural resources was raised as a key issue to be dealt with.

More information can be found in the corresponding cluster reports.

UNEP, 1 February 2010, Port-au-Prince

For further information, please contact:

- Mr. Asif Zaidi, Operations Manager, Post-Conflict and Disaster Management Branch, UNEP, on asif.zaidi@unep.org
- Mr. Antonio Perera, Haiti Country Programme Manager, UNEP, on antonio.perera@unep.org

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