Indian Ocean Tsunami Disaster of December 2004

UNDAC Rapid Environmental Assessment in the Democratic Socialist Republic of Sri Lanka

Joint UNEP/OCHA Environment Unit

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Section 1: Introduction

Overview

On 26 December 2004, an earthquake measuring 9.0 on the Richter scale struck the west coast of Northern Sumatra. This was followed by aftershocks ranging from 6.3 to 7.0. The earthquakes triggered powerful tsunamis up to 10 meters in height that caused immense damage and loss of life in coastal areas of the Indian Ocean.

Tsunamis and urgent environmental issues

Acute environmental impacts with immediate effects on human lives and direct relevance to humanitarian response efforts can be expected in the face of such a disaster. The Joint UNEP/OCHA Environment Unit (Joint Unit), integrated in the Emergency Services Branch of the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), is the principal United Nations mechanism mandated to assist countries facing environmental emergencies. The Joint Unit is supporting Rapid Environmental Assessments (REA) in the region, in collaboration with the United Nations Disaster Assessment and Coordination (UNDAC) teams mobilized to assist national and international response to the tsunami crisis. The objective of the REA is to identify acute environmental issues with immediate implications for human lives and response efforts, and based on this, to provide humanitarian and other partners with effective support and analysis.

In Sri Lanka, the REA identified:

- No major life-threatening environmental emergencies resulting from the tsunami;
- Urgent environmental concerns related to the management of tsunami debris, and sewage and sanitation issues in locations where displaced people are being offered emergency shelter;
- Coordination issues and re-mapping needs; and,
- Longer-term environmental issues that, while not the focus of this report, do require further attention.

Methodology

In response to the tsunami disaster in Sri Lanka, the Joint Unit supported the deployment of two full members of the UNDAC team, one funded by the Swiss Agency for Development and Cooperation, and another from the Federal University of Parana, as well as a third expert from CARE International who worked in collaboration with the UNDAC team.

These experts conducted the REA using a combination of approaches. Immediately following the UNDAC team deployment, a quick assessment was undertaken to identify, in particular, whether the tsunami had resulted in any hazardous chemical spills or similar contamination.

Following this evaluation, the environmental experts undertook a collaborative and more detailed REA. This included an assessment of issues from the perspective of relief organisations working in Colombo, as well as visits to affected communities in Ampara, Batticaloa, Galle and Trincomalee Districts. The REA was based on a methodology developed by the Benfield Hazard Research Center and CARE.
International with support from the Joint Unit, USAID and the Norwegian Ministry of Foreign Affairs.

A draft REA report was issued on 24 January 2005, and followed up with site-specific assessments and assistance to act on the issues identified.

The assessment process also took note of results from other evaluations conducted in Sri Lanka, including work by the World Conservation Union (IUCN) and Coral Reef Degradation in the Indian Ocean.

This report describes REA findings and makes recommendations to ensure that support and assistance can be mobilized and coordinated effectively to reduce environmental risks.
Section 2: Key Findings

Overview

The key environmental findings from the REA are as follows:

- While there is damage to the natural and built environment in affected coastal areas, there are no major life-threatening environmental emergencies in Sri Lanka as a result of the tsunami.
- Areas of acute environmental concern requiring immediate attention include management of tsunami waste and debris, and sanitation and sewage issues in settlements.
- While not the focus of this report, there are a number of longer-term issues that require further assessment.

Other key findings include:

- Specific coordination needs to enhance environmental risk mitigation efforts.
- Remapping needs to ensure effective reconstruction efforts.

Key Environmental Findings

Management of waste and debris

The tsunami created significant amounts of waste and debris including metal structures, vehicles, plaster, concrete blocks, bricks, wooden planks, organic waste and dead fish. This waste needs to be managed in an environmentally sustainable manner. The REA found that current disposal methods, which generally involve dumping debris on wetlands, beaches or unoccupied land, can create environmental risks.

Initial clearing efforts are underway. These need to be followed by further processing of waste and debris. Much of the debris can be recycled for reconstruction or commercial uses, and both commercial and community recycling systems exist in Sri Lanka. Landfill disposal can be used for any remaining waste.

Local expertise and capacities in recycling, composting and environmental management can play a key part in clearing efforts. The government’s Central Environmental Authority (CEA) is attempting to promote environmentally sustainable debris disposal, but faces operational limitations. Organizations including the Italian Civil Defence, United Nations Environment Programme (UNEP), United Nations Development Program (UNDP) and Asian Development Bank (ADB), are considering or have proposed debris removal efforts.

Box 1. An emerging success: waste removal in Galle District

Removal of tsunami debris is essential to safety, health and sanitation. It also contributes to restoration of normalcy and community rebuilding.

A promising model has emerged in Galle, on the southern coast of Sri Lanka. Thousands of displaced people are being mobilised there through a pay-for-work scheme to clear public and private land safely and systematically, and reduce the amount of debris through recycling.

For the Galle model to be successfully used elsewhere, professional management and logistics coordination is needed, as well as additional financial support.

Preliminary indications are that initial debris clearing and recycling in a 1km stretch of urban area requires 2-3 days, with up to 400 workers per day. The heavy equipment requirement for a district-level clearing operation are estimated to be: two front-end loaders, four dump trucks, four tractors and tipping trailers, six back-hoes, 10 shredders, two bulldozers and two long-bed trucks.
At a district level, NGOs are implementing livelihood support activities such as cash-for-work initiatives that often involve debris removal. However, the REA found that these do not consistently meet current best practices. This is due to a lack of readily available guidance, practical procedures and resources. The REA also identified that NGO and local government operations do not have adequate access to funding to cover the cost of locally available heavy equipment to support debris collection, recycling and disposal.

Procedures have been piloted in Galle District in the south of the country to reduce waste and debris through recycling, ensuring systematic land clearance, and identifying requirements for disposal of debris that cannot be recycled. The model is based on a labour-intensive public works approach that also improves local livelihoods (see Box 1).
Sewage and Sanitation Management

Thousands of Sri Lankans were displaced from their homes by the tsunami. Sanitation and sewage management in sites being used to offer them shelter is an enormous challenge, particularly given the general unsuitability of some locations.

These internally displaced people (IDPs) are being sheltered in local centres such as schools, religious facilities and larger IDP camps. The REA identified a number of environmental and human health risks at some of these centers, including:

- The concentration of populations in locations with limited options for human waste disposal;
- Inadequate supplies of equipment to clear sewage;
- An absence of ways to safely dispose of sewage and other waste; and,
- A lack of experience on the part of some organisations in managing IDP sites.

Moreover, while it is planned to move IDPs from local centres to temporary settlements until more permanent solutions are available, land is in short supply. According to information gathered during the REA, this may create a risk that IDPs are situated in environmentally sensitive locations, including those subject to flooding. This could create or exacerbate environmental and humanitarian problems.

UNICEF has conducted site-specific assessments and is, in cooperation with the Sri Lankan Ministry of Urban Development and Water, seeking to improve the availability of equipment to clear sewage. The capacity of NGOs working on sanitation and sewage issues at IDP sites varies considerably, as does the level of available from local authorities for clearing and handling of sewage and waste.

This report makes a number of recommendations in relation to these findings.

Medium and longer term environmental issues

Tsunami survivors lost most, if not all assets during the disaster. Given the reported over-exploitation of marine resources before the tsunami, there is a risk that efforts to rebuild assets through fishing will result in additional damage to the environment. Some other possible activities such as sand mining, also have the potential for negative environmental impacts.

In many coastal areas, the tsunami increased the salinity of groundwater used for consumption and irrigation. Soil salinity was also increased, although these effects are likely to have been mitigated by rainfall. Some limited oil pollution, believed to be from damaged or sunken fishing vessels, also was noted in a number of locations. It is anticipated that this contamination will dissipate through natural degradation.

Tsunami damage to the marine environment, including lagoons, estuaries and wetlands, does not appear to have been significant, although this could be confirmed
through the more detailed assessments currently underway. Near-shore areas contain litter and debris, affecting the local environment as well as future use of these areas for fishing. Fish populations appear to have been affected to varying degrees, generally in proportion to the level of reef damage in the vicinity.

Damage to terrestrial ecosystems was limited to the near-shore areas. Assessments are under way to identify specific damage. Severe beach erosion was observed on the east and southwest coasts, particularly in areas where illegal coral mining reportedly occurs.

Other key findings

Coordination

Immediately following the tsunami, the inclusion of environmental issues into disaster management efforts at the national level was limited. The situation improved following the assignment of an environmental adviser to the Centre for National Operations (CNO), the mechanism responsible for overseeing immediate response efforts in Sri Lanka. The UNDAC team environmental experts had advocated for this particular assignment.

At the national level, relief and recovery efforts moved to a new phase on February 4 2005 following the closure of the CNO. The governmental Task Force for Rebuilding the Nation (TAFRN), Task Force for Rescue and Relief (TAFRER) and Task Force for Logistics and Law and Order (TAFLOL) are responsible for major elements of relief and recovery efforts. Information collected during the REA suggests that CNO closure may leave a gap in policy development and coordination on environmental issues.

The REA also found that some NGOs do not have sufficient capacity to identify, monitor or address negative environmental effects and that relevant government structures may need additional support for ongoing or planned response and reconstruction efforts.

Re-mapping Affected Areas

Re-mapping affected areas before redevelopment begins can ensure the identification of hazardous areas created by tsunami-induced changes, such as mass graves and locations vulnerable to flooding. Remapping is therefore an important tool to help to ensure that tsunami victims do not face new dangers when they resettle, and can also reassure affected populations of the safety of the locations where they rebuild.

Within the government, the Ministry of Urban Development and Water and the Survey Department have been tasked with mapping affected areas.

The governments of Germany, the Netherlands, Sweden, Japan and the US, along with the EU, UNEP and UNOSAT, reportedly have been or will be involved in remote sensing data collection of affected coastal areas.

The government has established a safe construction set-back ranging from 100-200 meters from the coastline. Affected populations need to be made aware of this so they know were they can start rebuilding homes.
Section 3: Recommendations

Management of Waste and Debris

1. Practical efforts such as the Galle District waste management project (see Box 1) should be scaled-up across affected areas. Expanded efforts should address all project aspects, including organisation, logistics, recycling, disposal, and landfill site selection and management. Donors should consider additional support for expanded efforts, under the overall coordination of UNDP.

2. UNDP may consider expanded efforts to identify NGO and local authority needs for resources, equipment and environmental expertise, and match these with donor offers. Donors and the international community should consider making available additional resources where there are gaps between identified needs, and the resources to meet them.

3. A common best practice approach to debris removal should be developed to minimise negative environmental impacts. Related guidance material should be translated into local languages and effectively disseminated. Coordination between a range of organizations is required to achieve this, under the overall direction of UNDP.

Sewage and Sanitation Management

In general terms, current and expected sanitation and sewage issues in settlements can be addressed through:

- The appropriate construction and management of latrines and waste collection systems in IDP settlements;
- An increase in equipment to clean and dispose of sewage and other waste;
- Training for organisations managing IDP centres to ensure that best practices in sanitation and waste disposal are followed.

Specific recommendations are as follows:

1. Office for the United Nations High Commissioner for Refugees (UNHCR) tools and experience in addressing refugee camp environmental issues (e.g. site screening and advocacy tools) could be adapted for Sri Lanka and disseminated. Related environmental training programs should be made available to NGOs and other personnel addressing IDP camp management issues.

2. Agencies that sponsor UN Volunteer should consider increasing environmental field support in IDP settlements through assigning environmental tasks to current volunteers, or short-term redeployment. The Joint Unit and CARE International should consider additional training of UN Volunteers where required.

3. An equipment and expertise needs assessment could be undertaken in IDP camps, and the results shared with the donor and international community. Donor and the international community should consider making available additional environmental experts and other resources where there are gaps between identified needs, and the resources to meet them.

4. Efforts should be supported to ensure affected populations are aware of new government set-backs from the shoreline.

Monitoring and screening activities

1. UNDP may consider expanded monitoring activities to ensure that assistance to tsunami survivors does not have unanticipated and unnecessary impacts on the environment.

2. A rapid screening of donor and international organisation projects – both planned and ongoing - could be undertaken by UNDP with donor support to ensure that negative environmental impacts are avoided or mitigated.

Re-mapping Affected Areas

1. Tsunami-affected coastal areas in Sri Lanka need to be re-mapped. Donors may wish to consider technical support and the provision of remote sensing data to appropriate government units, NGOs and affected communities.

Other issues

1. It may be possible to identify environmental 'lessons learned' from the tsunami and subsequent response efforts, based on this REA and other evaluations. Over the longer term, these could be consolidated, disseminated, and used to support future risk reduction activities such as training programs.
End Notes

i http://www.benfieldhrc.org/SiteRoot/disaster_studies/rea/rea_index.htm

ii Draft report is available at: http://www.benfieldhrc.org/SiteRoot/disaster_studies/rea/rea_index.htm
