

Joint UNEP/OCHA Environment Unit
Profile of Potential Environmental Risks
Cyclone Indlala - Madagascar- 5 April 2007
TC-2007-000034-MDG

Disclaimer

This profile is not a conclusive list. Other risks may be possible from sources that are not readily identifiable. The information sources used are public websites. All efforts are made to screen the websites for accuracy and currency.

Objective:

The objective of the Profile of Potential Environmental Risks (PPER) is to alert the UN Country Team after the natural disaster to potential secondary risks posed by large infrastructure and industrial facilities containing hazardous materials located in the affected area. This information can be shared with local and national authorities. Any actual secondary risk should be addressed at the earliest possible stage.

Event:

The cyclone Indlala struck the northeastern coast of Madagascar on 15 March arriving with winds of more 230km/h. The storm also continued to unleash torrential rains. On 30 March it was reported that 126,017 people were directly affected by cyclone Indlala. At least 88 people were killed and 30 disappeared, with about 30,000 left homeless, or deprived of all their belongings. Access to most affected areas continues to represent a major obstacle for delivery of humanitarian assistance. New tropical depression/cyclone JAYA is expected to land on the North East (Antalaha) Coast of Madagascar in the night between 2 and 3 April.

Summary of findings:

The following large infrastructure and industrial facilities may pose a risk

- **Cement plants** can be associated with incineration of hazardous waste, in addition to using fuels like coal, oil, petroleum coke, and natural gas.
- **Food processing** (meat, shellfish, fish, dairy, breweries, sugar, etc) can be associated with using ammonia, freons (cooling) and sulphur dioxide, which are corrosive and toxic substances.
- **Tanneries** can be associated with toxic corrosives such as trivalent chromium sulphate, sodium slats, arsenic, cyanide, ammonium sulphate, sulphuric acid, lime and aniline.
- **Detergent (soap) industry** can be associated with solvents, alkalis and phosphates which are flammable and corrosive.
- **Textile industry** often uses benzene, naphthalene, acids, alkalis, chlorine, bromine, sodium nitrate, ammonia, sodium sulphate and metals. These substances can be flammable, toxic, corrosive and oxidizing.
- **Artisanal mining** is often characterized by poor technical standards and heavy rains/floods can lead to mine collapse. In addition, (small) quantities of fuels, explosives, metals and ammonium nitrate might be present.
- **Pulp and paper mills** are known to use acids, alkalis and chlorine.
- The stability of **hydropower dams** might also be affected increasing a risk of dam collapse.
- **Petro-chemical industry (refinery)** can have large quantities of inflammable and explosive fuels.

The Joint UNEP/OCHA Environment Unit :

The Joint UNEP/OCHA Environment Unit is the United Nations mechanism to mobilize and coordinate the international response to environmental emergencies caused by natural disaster, technological accidents and complex emergencies.

Information sources:

Infrastructure Risks	Source of information
Nuclear Facilities	<ul style="list-style-type: none"> • http://www.iaea.org/programmes/a2/index.html • http://www-pub.iaea.org/MTCD/publications/PDF/cnpp2003/CNPP_Webpage/pages/countryprofiles.htm • http://www.iaea.org/worldatom/rrdb/ • http://www.grid.unep.ch/data/download/gnv181.gif • http://www.worldenergy.org/wec-geis/publications/reports/ser/nuclear/nuclear.asp
Large hydrodams.	<ul style="list-style-type: none"> • http://www.worldenergy.org/wec-geis/publications/reports/ser/hydro/hydro.asp •
Large Chemical/Industrial Industries	<ul style="list-style-type: none"> • http://www.pops.int/documents/implementation/nips/submissions/default.htm • http://www.chem.unep.ch/pops/pcdd_activities/inventories/default.htm
Gas/Oil: Refineries, Pipelines, explorations sites	<ul style="list-style-type: none"> • http://www.eia.doe.gov/emeu/cabs/index.html • http://www.worldenergy.org/wec-geis/publications/reports/ser/gas/gas.asp • http://www.lib.utexas.edu/maps/map_sites/oil_and_gas_sites.html
Mining activities	<ul style="list-style-type: none"> • http://www.worldenergy.org/wec-geis/publications/reports/ser/coal/coal.asp • http://www.worldenergy.org/wec-geis/publications/reports/ser/uranium/uranium.asp • http://minerals.usgs.gov/minerals/pubs/country/2005/mzmyb05.pdf • http://www.camec-plc.com/Investors_Media/RNS/2004/rns_025.php
Hazardous waste storage sites	<ul style="list-style-type: none"> • http://www.basel.int/natreporting/compilations.html
	<ul style="list-style-type: none"> • Conseil pour la réduction des accidents industriels majeurs (CRAIM). <i>Risk Management Guide for Major Industrial Accidents intended for municipalities and industry</i>. 2002 Edition. • International Atomic Energy Agency (IAEA). <i>Manual for the classification and prioritization of risks due to major accidents in process and related industries. Inter-agency Programme on the Assessment and Management for Health and Environmental Risks from Energy and other Complex Industrial Systems</i>. 1996. • UNEP Industry and Environment (IE). <i>Hazard Identification and evaluation in a local community. Technical report n°12</i>. 1998. • UNDAC <i>Field Handbook</i> • <i>Emergency Response guidebook 2004. A guidebook for first responders during the initial phase of a dangerous goods/hazardous materials incident.</i> • UNEP. <i>APELL for Mining. Guidance for the Mining industry in raising awareness and preparedness for emergencies at local level. Technical report N°41</i>. 2001

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