

UNDAC RAPID ENVIRONMENTAL ASSESSMENT

Pakistan Flood 2010

Mission report



1. Introduction

Over the course of July and August 2010, Pakistan has experienced the worst monsoon-related floods in living memory. Heavy rainfall, flash flood and riverine floods have devastated large parts of Pakistan since 22 July, the swollen waters then poured across the Khyber-Pakhtunkhwa. The heaviest flooding moved southward along the Indus River from severely-affected northern regions toward western Punjab and the southern province of Sindh.

The number of affected is currently estimated to be more than 20,6¹ million. To date more than 1,800 people have died, and at least 1.9 million homes have been either damaged or destroyed. It is feared that these numbers will rise.

To strengthen the assessment and coordination capacities of the UN OCHA Country Office and the UN Humanitarian Coordinator, a United Nations Disaster and Coordination (UNDAC) team was deployed to Pakistan from August 10th till September 10th 2010. As part of the UNDAC team activities a Rapid Environmental Assessment was undertaken in order to identify any urgent or life threatening secondary environmental risk or impact.

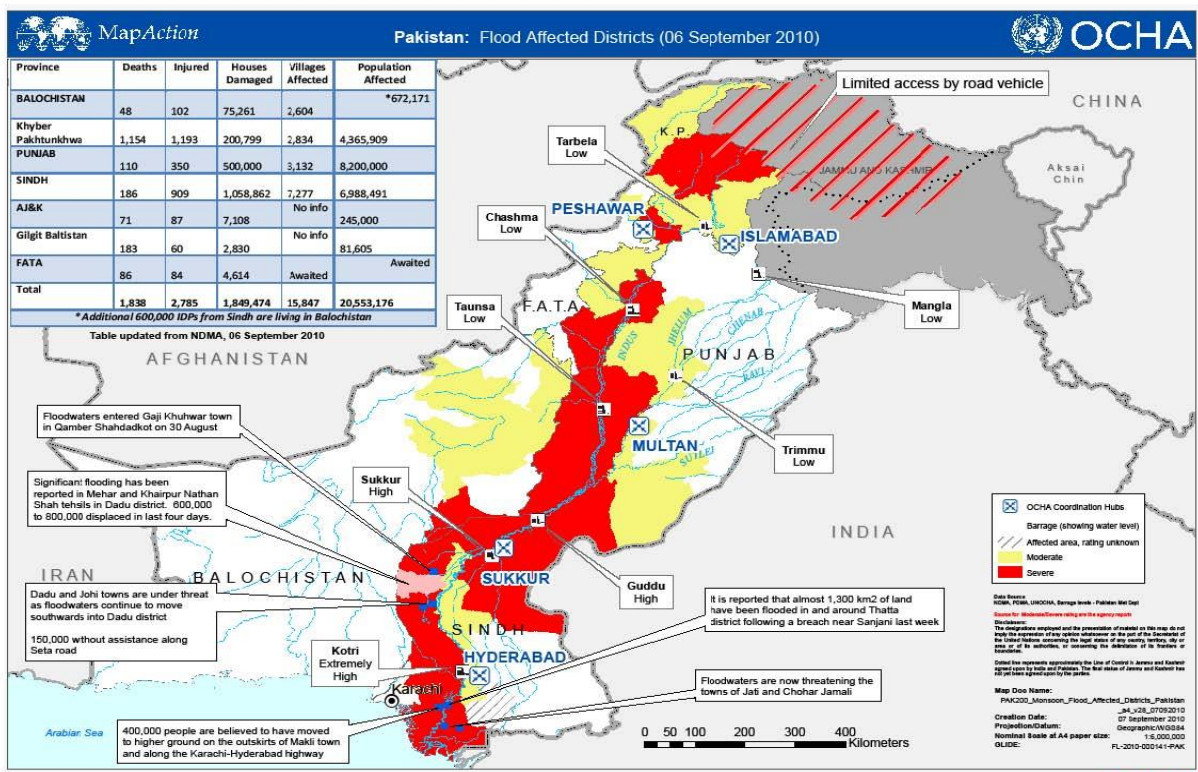


Figure 1: Overview of Flood affected districts as of 6 September 2010.

¹ Situation 30 September 2010

2. Strategy

The Rapid Environmental Assessment was carried out in three stages:

- Through open sources (such as internet) environmental risk in the affected areas were identified. In addition important infrastructural and industrial facilities containing hazardous materials in the affected area were also identified.
- Important information was collected through meetings, interviews and discussions with national environmental authorities, national authorities, other UN organizations, and NGOs. See Annex 1 for an overview of key stakeholders and their activities regarding the flood response.

UNDAC has, in cooperation with different organisations including the Swiss Development Cooperation/Swiss Humanitarian Aid, Pakistan Environment Protection Agency, Sustainable Development Foundation, Sustainable Development Policy Institute and national environmental experts, supported a process to identify the environmental effects of the floods.

An overview was made of the short, medium and long term environmental effects in order to inform the humanitarian response priorities, well as to inform the decision-making process from early recovery to reconstruction. The overview can be elaborated upon if and when more information will be available on the current and future situation.

- Field assessments were performed in the affected areas of Sindh (Karachi and Hyderabad). These visits also provided the opportunity to directly obtain additional information from local authorities.

3. Observations and findings

General

One third of Pakistan has been affected by the flood. Due to the scale of this disaster (the flood covers more than four provinces) and the limited access to the flooded areas, limited opportunity existed to carry out physical assessments.

In addition, the situation in each province is different. Not only the geographical situation but also the level of impact of the flood varies. While up north the water was receding, in the south the disaster was in full swing. This means that all follow up action, approach and implementation may differ at a provincial level or even differ per site. For example the early recovery activities have started in the province Khyber-Pakhtunkhwa, while in Sindh humanitarian relief operations were starting just now.

The primary focus of the relief efforts was on evacuations and the provision of food and shelter, with little to no attention being paid to potential environmental emergency situations. It is expected that the full scale of the environmental impact can only be established in the time to come.

The widespread scale of this disaster and its impact on the environment could also provide opportunities address a number of root causes of the floods, including for watershed management and forestation, as well as disaster waste management, the use of pesticides and the effluent of industrial plants. Some of the impact is acute and must therefore be addressed immediately. Others are of a more long term nature and may be addressed during the recovery and rehabilitation phases. In this first stage the focus must be on the short term and acute environmental issues.

Few urgent environmental issues having an immediate impact on human life and health were identified. Yet in spite of the very poor information available and limited access to the affected areas, it is strongly recommended to undertake more detailed environmental assessments of potential acute environmental emergencies in the weeks to come.

The proposal is to start with the northern and middle provinces where the water is receded and is focused on the short term impacts:

1. pollution (industries, storage of pesticides, waste),
2. water quality
3. slope instability
4. loss of livestock
5. resource pressure from rebuilt houses and energy

Also start as soon as possible with the assessment in the southern part of the country where inter alia can be focused on pollution, water quality, quantity and quality of the mud and debris deposition.

Annex 2 gives an overview of the short, medium and longer term environmental impact and the identified actors.

The following risks were identified.

Settlements (IDP)

The displaced population could strain natural resources. Although no reports have been received, the need for fodder, firewood and building materials (for temporary shelters as well as for the reconstruction) presents a serious risk. The Swiss government takes into consideration (in cooperation with the NGO's and national authorities) to stimulate the building of environmental friendly houses.

If not dealt with correctly, the sanitary situation in the IDP camps could pose an environmental problem. This will depend on where and how long the IDP camps will be established. WWF Pakistan hopes aid will come in less packaging material such as plastic bottles.

The floods worsened the already existing inadequate conditions of the drainage system of wastewater and of the disposal of waste, leading to an important increase in health risks. It is likely that due to the swelling, the river waters (previously contaminated by the spill of the sanitary system) will come into contact with wells for drinking water.

Water quality

There are many treats for the drinking, surface and groundwater. Water could be polluted trough chemicals from industrial activities and spills, dead livestock, sewage and pesticides. The risk for health, nature and livestock depends on several factors for example the concentration and nature of the pollution. These issues need more



investigation and where possible measures must be taken in order to avoid contamination.

Biodiversity

A rapid assessment carried out by Wetlands International in the northern affected provinces shows severe damage to livestock, the natural forest, plantations, habitat of wildlife, fish resources and some of the species. Damage at the different levels has impacted the ecosystem. For example, the damage to rice paddies has also affected the birds because they are important feeding grounds. More investigation is recommended to the medium and longer term.

Sedimentation

The flood has washed away a huge land area and has brought with it a tremendous quantity of sand and silt. It has silted the agriculture. The flood has also silted up canals and is expected to have an adverse impact on reservoirs, dams and barrages. Trough the silting of the channels, water will stay on the fields and in the villages longer with the results of health and environmental problems.

Several sources have reported that the mud that stays behind after the receding of the water is very compact and could possibly limit the scope of crops suited for local agriculture.

In addition, the quality of the mud/sludge is unknown, especially around the industrial areas, where sediments of possibly leaked chemicals could pose a medium and long term risk.

Through erosion, the agricultural land that has washed away could be polluted with pesticides and chemicals and will settle down stream (especially from land on which cotton has been cultivated.)

In order to determine the quality of the mud, samples and analyses are necessary.

Agriculture

80 percent of the population depends on agriculture and livestock. The crops affected were cotton, sugarcane, rice, pulses and tobacco. Seeds, fertilizer and agriculture tools vanished. The lack of grazing area poses an immediate risk.

Debris left behind on agricultural fields will constitute a problem after the water has receded.

Slope instability

Many landslides have been reported in different parts of the country, limiting access. Unstable slopes furthermore pose a significant risk for the villages downstream and their reconstruction efforts.



In many places soil erosion has been reported. Especially in narrow valleys, acres of land have been washed away. Even cemented embankments schemes have been damaged.

Pollutions

• *Oil and chemicals spills*

Media has reported oil spills from different depots. No verified information has been obtained from either the companies involved or the authorities.

No information is available on the type and quantities of the spilled oil and whether any spilling is still ongoing.

In the northern part of the country several petrol stations have reportedly been affected causing spillage of hydrocarbons. It is estimated that in total 520 m³ of oil products would have been spilled. Based on known data, the medium impact on the environment seems slight (source Dutch environmental institutes).

The actual damage to the environment depends on different issues, including the amount that was spilled, the flow of the water and whether the pollution has been stopped.

- *Pesticides*

The PAK-EPA has reported the flushing of 500 tons of pesticides from a storage site. It could not provide detailed information on the type of substance, its amount or location.

In the affected area, there are numerous (obsolete) pesticide stocks, unfortunately only very little information is available on the exact location, its amount and its current state.

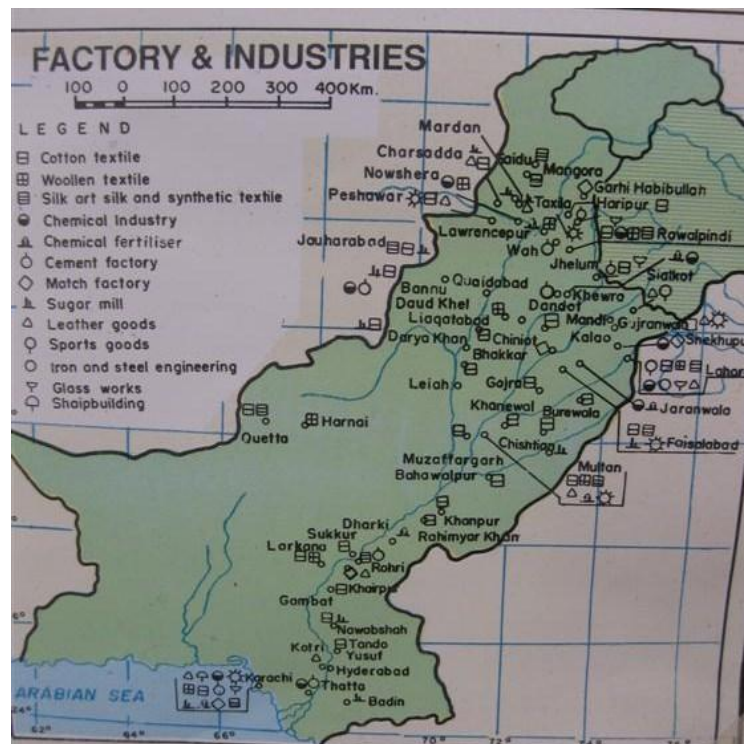
- *Industrial sites*

There are many industrial zones in Pakistan containing small and medium-sized industries. It is not clear whether some of these zones have been affected through the flood. In the south of Pakistan many leather and or tanning industries are located in the vicinity of rivers and other water. If affected, these could possibly constitute a short or a longer term risk (copper and chromium). In addition many textile industries are located in the middle of Pakistan, this could constitute a risk through the storage of dyes, biocides and pesticides.

- *Disaster Waste*

It is common practice to operate informal dumpsites near communities. The storage of waste, its exact location, the amount, kind of waste and its current state are important data in order to establish an indication of the impact.

The washing away of previously existing waste sites, the debris from damaged houses and infrastructure will pose a serious challenge for the clean-up and reconstruction phase.



4. Conclusions and recommendations

The disaster in Pakistan has developed over the couple of months and is still in full swing in the south. Due to the scale of this disaster and the limited access to the flooded areas, limited opportunity existed to carry out any substantial physical assessments. Most of the information in this mission report is based on the expertise of the national and local government and the different NGO's.

The situation and the environmental impact is different in the four affected provinces. For example in the north and middle of Pakistan are many landslides and erosions reported while in the south is expected a problem with the deposit of the mud and debris. The tidal wave in the north and middle of Pakistan has destroyed the infrastructure, the drainage system and many houses.

In the south the infrastructure and the houses are more intact, thanks to the relatively slow rising of the flood (an exception are the houses built of mud close by the river). The overall situation can be considered as serious. The environmental issues need more investigation firstly to get an image of the current situation and secondly to identify the future risks.

The following issues were identified as potential urgent matters, requiring attention by the Pakistani authorities:

- The water quality (pollution of surface and groundwater due to chemicals and bacteria)
- Slope instabilities.
- Pollution through oil and chemical spills, the flooding of pesticides storages, disaster waste.
- Loss of livestock
- Resource pressure from rebuilt houses and energy

The following medium term follow-up issues are identified :

- The quality and quantities of the mud deposition
- The debris deposition.

Recommendations

Coordination

It is apparent that several organisations are working on rapid environmental assessments with different scopes and objectives. A coordinating platform would be needed where the various outcomes can be shared in order to avoid any duplication of efforts and resources as well as to identify gaps and opportunities for complementary action. The environmental situation of Pakistan is a crosscutting issue and should therefore be taken into consideration in all aspects of this nation's reconstruction.

Maintain, support and expand the environmental network that has emerged in response to this flood. This network could grow to be the platform previously mentioned. The participants in this network have widespread expertise and experience on all environmental issues imaginable. It is recommended that the Pakistani authorities take the lead.

Assessments

Initiated by the Pakistani authorities, carry out a detailed environmental needs assessment in all the affected provinces in order to get more detailed information about the situation. This information is mostly available on provincial, district and municipality level. Cooperation with local authorities, (national and international) organisations and NGO's is strongly recommended.

In addition, depending on the outcome of the assessments , chemical specialists are needed. The need for expertise could be different for the various provinces.

Proposed approach:

- Collect the information from the already carried out assessment. Identify the gaps that have not been assessed. Start with the assessment in the northern and middle provinces and as soon as possible the southern province.
- Focus on the short and medium term matters.
- Consider the help of (international) experts.
- Address the risks into response planning at the local, regional and national levels.
- The Pakistani authorities should consider discussing with other (national and international) organisations possible collaboration or/and implementation. Collaboration options could possibly include technical support.

Annex 1. Overview of key stakeholders and their activities

- One of the key Government actors is the Ministry of Environment. The Ministry develops plans, policy and programs regarding environmental planning, preventing pollution and preserving ecology including physical planning and human settlements, urban, water supply, sewages and drainage.
- The Planning Commission is a governmental institution for economic and social development with an overall objective to develop the resources of the country as rapidly as possible in order to help improve the welfare of the people.
- A Planning Committee, especially focused on the reconstruction, has been established. Environmental concerns are not integrated or part of the committee. The Committee intends to invite the Ministry of Environment to take part in this planning committee.
- The Pakistani Environmental Protection Agency (PAK-EPA) is a department of the Ministry of Environment and responsible for the implementation of the Pakistan Environmental Protection Act in the country. The Act provides for the protection, conservation, rehabilitation and improvement of the environment, for the prevention and control of pollution, and promotion of sustainable development. The EPA has intends to establish a working group with the concerned stakeholders for a integral approach of the different environmental issues.
At the Provincial Level, EPA is responsible for the preparation of the annual National Environment Report; it surveys, measures and monitors pollution and takes action against polluters; they promote awareness of environmental issues. The Provincial EPA assumes the responsibility of all environment related work delegated to them by the National - EPA.
- NGO's and other environmental organizations in Pakistan, for example WWF and IUCN, are active. They have established a good working relationship with the government and are cooperating in various fields.
- Regional and Local authorities play an important role in the relief and reconstruction efforts at their respective levels.
- The World Bank (WB) and the Asian Development Bank (ADB) are conducting a damage need assessment (DNA) regarding the impact of the flood. This assessment is primarily based on questionnaires. Environmental impacts of the flood are included in the DNA. However, due to limited access to affected sites, it is not expected the results will yield a great level of detail. At the end of the UNDAC mission the results weren't available.
- The United Nations Development Program (UNDP) works with the Government, civil society and development partners in four broad areas; Poverty Reduction and Gender, Democratic Governance, Energy and Environment and Crisis Prevention and Recovery. The UNDP/Ministry of Environment's Pakistan Wetland Program already undertook a "Rapid Assessment of Flood Impact on the Environment in Selected Affected Areas of Pakistan".

Annex 2. Overview of the short, medium and longer term environmental impact

This table gives a overview of the short, medium and longer term environmental impact and the identified actors.

Settlements (IDP)

Possible damage	Short term	Med. term	Long term	Identified actors ²
Resource pressure from rebuilt houses	X	X	X	Cluster Community restoration, Housing program Pakistan, NGO's e.g. SDF, SDFI
Resource pressure from energy inefficient cooking stoves and fuel	X	X	X	Shelter and non food items cluster, camp management cluster of UNHCR if operational. NGO's e.g. SDF, SDFI
Waste from Sanitation (latrines at camp sites)	X			UN clusters, NMDA, PDMA, Camp management cluster of UNHCR
Solid waste. <ul style="list-style-type: none"> Waste from medical and household Waste from food, shelter, household distribution. 	X			Cluster WASH, NMDA, Clusters rebuilding
Impact on cultural and historical sites			X	Ministry of Culture, department of Archaeology UNESCO

Water quality

Possible damage	Short term	Med. term	Long term	Identified actors
Ground water pollution: due to dissolution of chemicals to groundwater.		X	X	Local governments EPA Wash cluster
Surface water pollution due to bacteria (for example due to death cows).	X			Local governments Wash cluster
Pollution due to sewage.	X	X		Wash cluster Local governments
Pollution of drinking water: -bacteria -chemicals	X	X	X	WHO Wash cluster Local governments

² Not limited

Biodiversity

Possible damage	Short term	Med. term	Long term	Identified actors
Changing of the habitat through the sedimentation of coastal areas, along river banks and lakes			X	Ministry of Environment NGO's e.g. SDF, SDFI, WWF IUCN
Change of the water flora and estuarine habits due to brackish water.		X	X	Ministry of Environment NGO's e.g. SDF, SDFI, WWF IUCN
Loss of natural vegetation		X	X	Ministry of Environment IUCN NGO's e.g. SDF, SDFI, WWF

Sedimentation

Possible damage	Short term	Med. term	Long term	Identified actors
Mud deposit: <ul style="list-style-type: none"> including contamination of agriculture land quality and properties of the mud 		X	X	Ministry of Environment Ministry of Agriculture EPA Local governments
Silting up of agricultural land, water reservoirs, dams, irrigation channels (see agriculture)		X		Ministry of Environment Ministry of Agriculture EPA Local governments

Agriculture

Possible damage	Short term	Med. term	Long term	Identified actors
Lack of seeds for next season		X		Ministry of agriculture Provinces
Livestock: <ul style="list-style-type: none"> loss of livestock availability of the forage and the productivity of the grazing areas 	X	X	X	Ministry of agriculture Provinces Local government
Not proper working irrigation system.		X		Ministry of agriculture Provinces Local government

Soil conservation

Possible damage	Short term	Med. term	Long term	Identified actors
Erosion			X	Provinces, Local government NGO's e.g. SDF, SDFI, On-farm

				Water Management
Slope instability	X	X		Provinces, Local government NGO's e.g. SDF, SDFI

Pollution

Possible damage	Short term	Med. term	Long term	Identified actors
Debris deposition: -pollution on agricultural fields -asbestos (in the demolition waste)		X	X	Ministry of Environment EPA Industry
Industrial incidents: -leakage of chemicals -fuel station -storage tanks -pesticides storage -radioactive substance -dumping/landfill site	X	X	X	Ministry of Environment EPA Industry Local government Districts