TOPIC GUIDE:

Mainstreaming environment and climate change into humanitarian action

June 2015

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Quick reference guide

Click on the links in the guide to be taken directly to the sections that are of greatest relevance to you. Additional background information can be found in the Annexes to this guide.

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SECTION 1

Why should humanitarians care about the environment and climate change?

This section provides an overview of the key reasons that environmental and climate change issues are relevant in the context of humanitarian action, including in the initial, life-saving response phase.

1. **Disasters can trigger acute secondary impacts that threaten lives and livelihoods through the release of hazardous substances, or by significantly damaging ecosystems.** Early identification and mitigation of these impacts can save lives, livelihoods and resources in the immediate and longer term.

2. **The objective of humanitarian action is to save lives, alleviate suffering and maintain human dignity during and after disasters.** However, there are numerous examples of humanitarians undermining these very objectives by failing to take environmental considerations into account in their operations. Humanitarians have an important role in preventing and overcoming such situations.

3. **Decisions taken by humanitarians can get 'locked-in' establishing either sustainable or unsustainable patterns of resource use and raise or lower disaster vulnerability** in subsequent response phases. By ensuring that environmental issues are identified and understood as early as possible and that appropriate measures are taken, humanitarians can have a substantial positive impact long after the initial response phase.

4. **DFID's humanitarian policy sets expectations** that when funds are spent, projects adhere to international environmental standards and good environmental practice. This creates an obligation for humanitarians to understand what works, what does not, and what tools can assist them in addressing environmental dimensions of humanitarian response.

A call to action

"Destruction of livelihoods and deforestation as a result of brick production for humanitarian operations in Darfur. Dried up wells because of over-drilling for water by humanitarian organisations in Afghanistan. Ruined livelihoods from an over-provision of fishing boats and consequent fishing stock depletion in post-tsunami Sri Lanka. Failure to meet waste treatment standards leading to environmental contamination in Haiti and the largest outbreak of cholera in recent history.

These examples illustrate how humanitarian or peacekeeping actors, by failing to take environmental issues into consideration, undermine their purpose: to save lives and preserve and restore human livelihoods.

Ensuring that environmental considerations are taken into account at the earliest possible moment of humanitarian action can make a difference – for people and the environment."

Opening paragraph from *Environment and Humanitarian Action: Increasing Effectiveness, Sustainability and Accountability* (Pro-Act Network and Group URD, 2014).

5. **Improperly handled environmental issues can impede humanitarian response and recovery efforts.** For example, poorly handled post-disaster waste and debris can reduce physical access and create challenges in other sectors if waste pollutes water resources and reduces rebuilding options.

6. **There is a range of well-established, common-sense and often no-regrets interventions across sectors and humanitarian clusters** that can create short- and long-term benefits. Many simply require the use of existing tools, reference to past case examples or the use of readily available expertise. Humanitarians should be aware of these interventions and resources to support appropriate decision-making from the outset.

7. **Win–win situations can be achieved by considering the environment in a humanitarian response**. Examples include planting fruit trees in barrels in refugee camps to improve shade and nutrition or using labour-intensive public works to recycle rubble or stabilise slopes using an ecosystem approach.

8. Addressing environmental issues in humanitarian action **supports key humanitarian concepts and principles**, including the 'do no harm' principle and Sphere Standards.

9. Climate change can **change the distribution of key resources**, such as water. This, in turn, can reduce the predictability of humanitarian access and may contribute to risks of conflict in areas where water is increasingly scarce, with corresponding implications for humanitarians.

10. Climate change is changing the **frequency, intensity, duration, timing and distribution of natural hazards** and can lead to unprecedented extreme weather and climate events. This alters and increases the need for humanitarian action accordingly and underscores the need for humanitarians to understand the changing nature of climate risks if they are to build resilience effectively.

SECTION 2

The relationships between environment, climate change and humanitarian action

This section provides evidence of the relationships between environment, climate change and humanitarian action, describes the relevant humanitarian policies, and identifies key barriers to acting on the relationship. The evidence on relationships alone may not consistently justify raising the level of attention given to the environment in a humanitarian response, particularly during the most acute, life-saving phase. However, the evidence, taken together with the humanitarian policy basis and the fact that some barriers are entirely avoidable, may well do so. Moreover, there are no-regrets actions that can minimise the risk of negative environmental impacts, as illustrated in the case study, Challenges and no-regrets lessons from the field.

Case study 1: Secondary 'na-tech' threats from Super Typhoon Haiyan

Super Typhoon Haiyan struck the Philippines in November 2013. It demonstrated clearly how major disasters can have acute, secondary impacts, such as damage to infrastructure and industrial facilities, which add pressure to humanitarian priority setting and decision-making and, in some instances, alter or impede response operations (Nijenhuis, 2014). Indeed, the link between natural disasters and secondary technological or infrastructure-related emergencies have been identified as an emerging area of concern by the United Nations and given the term 'na-techs'.[1]

Millions of people were affected by the Super Typhoon Haiyan, and over 6000 were killed. During the typhoon, a power barge broke loose from its moorings in the Western Visayas region of the Philippines, penetrated oil tanks when it beached and caused a spill of an estimated 500,000 to 900,000 litres of bunker oil. The fumes from the oil spill at one point displaced more families into evacuation centres in the Western Visayas region than did the super typhoon itself. In this example, the 'emergency within an emergency' required immediate humanitarian assistance to provide emergency shelter to the families displaced by the spill and subsequent environmental expertise to support efforts to mitigate damage to the environment and local livelihoods.

More detail on the environmental emergency aspects of Super Typhoon Haiyan can be found in Nijenhuis (2014). For additional information on na-techs, see for example Vetere-Arellano et al. (2004).

2.1 Evidence for the main relationships

There is evidence for three main relationships between the environment, climate change and humanitarian action. There is also a growing body of evidence to support the use of specific interventions to address these linkages. In both cases, this evidence is incomplete and primarily field based.

[1] See for example this report of the UN Secretary-General: http://www.unisdr.org/files/resolutions/N1452549.pdf.

"Global challenges – such as climate change, population growth, food- and energy-price volatility, water scarcity and environmental degradation – are increasing risks for vulnerable people. They are eroding people's ability to cope with shocks, making crises more protracted and recurrent and undermining sustainable development. These trends have become as likely to cause humanitarian crises as disasters and conflicts."

From *Saving Lives Today and Tomorrow*, United Nations Office for the Coordination of Humanitarian Affairs (2014).

Relationship 1. Environmental conditions can **contribute** to the need for a humanitarian response or complicate humanitarian efforts. An example is when deforestation creates or compounds flooding and landslide risks. This relationship will change and in some cases deepen as a result of climate change, for example, where climatic conditions reduce biodiversity that is important to livelihoods.

Relationship 2. The physical or social nature of a humanitarian crisis can **damage the environment** and further harm disaster survivors and/or **create secondary threats** that may present greater risks than the initial hazard. Examples include an earthquake that destabilizes slopes and creates risks that linger for months or years; or a storm that damages an industrial facility to a degree that harmful chemicals are released into the air, water and food systems, as noted in *Case study 1: Secondary 'na-tech' threats from Super Typhoon Haiyan*.

"The intersection of natural and technological hazards is now receiving increasing attention. Countries' exposure to technological disasters triggered by natural hazards entailing complex and cascading threats is a growing concern."

From "The Report of the United Nations Secretary-General on the Implementation of the International Strategy for Disaster Risk Reduction, 2014".

Relationship 3. Humanitarian operations themselves can cause or contribute to negative environmental impacts, leading to further harm to disaster survivors. An example is when disaster waste is dumped in ways that pose additional risks to local populations, such as contamination of well water or destruction of fisheries.

2.2 Assessment of the evidence

The relationship between humanitarian action, climate change and environmental issues is complex, multi-faceted and has not been subjected to extensive comparative qualitative or quantitative research. Most of the evidence is based on anecdotal field observations. This means that the evidence has varying degrees of rigor. This Topic Guide, therefore, uses a combination of professional judgment and peer reviews to reach a conclusion as to the value of the evidence available. In general, the evidence presented in this document meets, at a minimum, the 'limited' criteria set out in the table of the *How to Note* (DFID, 2014, p20).

Evidence on the effectiveness of interventions to address environmental issues in humanitarian action is field based and has not been subjected to extensive comparative qualitative or quantitative research. Environmental impacts, particularly negative ones, are unlikely to be noted in reports on humanitarian responses. This is because such impacts are not often the focus of normal monitoring and evaluation and because organisations do not have a strong incentive to report on what may be considered failures. Furthermore, evidence regarding the environmental impacts of humanitarian interventions may be more negative rather than positive, which is a disincentive to reporting. There is not a large body of if–then evidence of what works to address environmental and climate issues during a humanitarian crisis (Kelly, 2013).

The strength of evidence varies according to specific topic areas. Table 1 provides an indication of this.

Topic	Strength of evidence	Issue area
Whether and how to integrate environment into humanitarian action	**Anecdotal but strong** evidence; see Section 3.7 for more details	**Environmental and climate** issues need to be integrated into the early phases of a response if they are to be addressed effectively.
	Moderate to strong field-based evidence; see Section 4 for more details	**Sector activities** in debris and waste, food security, livelihoods, shelter, water, sanitation and hygiene can have positive impacts on the environment and enable cost-efficient and effective humanitarian and recovery assistance.
	Moderate to strong evidence for post-conflict settings (Section 3.4) and in the context of gender issues (Section 3.6)	**Natural resources** are a significant asset in response and recovery and rebuilding livelihoods needs to be undertaken in an environmentally sound and sustainable manner to avoid conflict.
	Some evidence; see Section 4.4 for a discussion on stoves and Section 3.3 regarding energy-related efforts in the military	Methods to **reduce the environmental impacts of energy in a humanitarian response** and increase resilience are available; however, efforts are limited primarily to stoves and lighting for crisis survivors.
	Some evidence in the context of assets; see Section 3.6	**Women and girls** are specific beneficiaries of improvements to the environment in the post-crisis environment and there is evidence suggesting that specific actions can be taken to these ends.
	Some evidence across a range of areas including: gender issues (Section 3.6); urban recovery (Section 3.5); shelter (Section 4.2); and food security (Section 4.3)	**Land use and land tenure** are critical issues to consider in addressing environmental issues during a humanitarian response.
	Emerging evidence; this is an approach that merits further research and attention; see Box 2.	**Ecosystem approaches** to risk reduction and risk management are effective and should be integrated into the transition from humanitarian response to recovery and development.
	Emerging evidence of complex factors that influence conflict other than climate; see Section 3.7.	**Climate change** is already having an impact on conflict, security and fragility, and will continue to be a risk multiplier of conflict, insecurity and fragility unless it is effectively integrated into the building and management of resilience. However, other factors may be as, or more, important in precipitating conflict.
Evidence on actual integration of environment in humanitarian action	**Strong evidence** that a lack of evidence inhibits uptake of environment/climate issues in humanitarian action (Section 2.4)	A lack of research-based evidence of **links between humanitarian response and environmental impact or climate conditions** is hampering the uptake of a more environmentally sustainable approach to humanitarian responses.
	Some evidence that innovation can improve a response; see Case study 4 and Section 4.2	**Innovation** can improve environmental impacts in humanitarian operations, but there are significant barriers to introducing new approaches during a response.
	Some evidence to suggest that a lack of guidance is a barrier;	There is a lack of guidance on addressing environmental issues in **donor funding material** (e.g. requests for proposals). Limited follow-up on mitigation and monitoring

Topic	Strength of evidence	Issue area
	see Sections 2.4 and 3.2	reduce the integration of environmental issues into a humanitarian response.
	Some evidence; the evidence base is growing; see Section 3.5	**Environmental and livelihood conditions** can be improved in urban areas following a crisis, but the process is expensive, socially challenging and requires more time than may be available in a humanitarian response. This is an argument for *inter alia* greater coordination between and across climate change, humanitarian and development disciplines.
	Very limited evidence of any efforts; Section 2.4 discusses why	The humanitarian response considers/addresses its **environmental footprint.** There are only a few initiatives to this end.

Table 1. Summary of evidence for environmental issues in humanitarian action

2.3 Policy basis for integrating environmental considerations into humanitarian actions

- **There is a humanitarian policy basis for including the environment and climate change in humanitarian action.** Key humanitarian concepts and supporting documents define why and how these issues should be part of a humanitarian response, and also lay the foundation for integration of the environment and climate change into other elements of disaster risk management.

- **The humanitarian imperative** creates an obligation for the international community to provide assistance whenever it is needed. It states that ”action should be taken to prevent or alleviate human suffering arising out of disaster or conflict, and that nothing should override this principle”,[2] including possible damage to the environment. Where saving lives does unavoidable damage to the environment, this damage should be mitigated as part of the later response under the do no harm concept, for instance returning the site of an internally displaced persons’ camp to its pre-use condition.

- **The *do no harm* concept** states that humanitarian assistance should not result in harm to the disaster or crisis survivors (Collaborative Learning Project, 2004). The concept differs slightly from the environmental assessment approach, where the focus is on whether the harm to the environment is considered acceptable when compared to the benefits gained by the population affected. The do no harm concept and the environmental assessment approach can be bridged when three conditions are met:
  - Humanitarian assistance addresses immediate environmental issues to the greatest extent possible, recognising that saving lives takes a priority over other concerns.
  - Environmental damage done in the initial stages of a response is documented and addressed at later stages of a response.
  - Future disaster risks are reduced through crisis recovery and pre-crisis risk reduction and resilience building.

[2] See http://www.spherehandbook.org/en/the-humanitarian-charter/.

- **The Code of conduct for the International Red Cross and Red Crescent movement and non-governmental organisations (NGOs) in disaster relief**[3] includes attention to sustainability and "to environmental concerns in the design and management of relief programmes" (IFRC, no date, p4).

- **The Humanitarian Charter and Minimum Standards in Humanitarian Response**[4] **(Sphere Standards)** sets out expectations and indicators for addressing environmental issues during humanitarian operations. Although the Sphere Standards are relief-oriented, their basis in the Code of conduct links them to recovery.

- **The *good enough*[5] approach is often necessary for environmental issues** during humanitarian operations when full information damage, response plans and local conditions are not available. The good enough approach is taken from *The Good Enough Guide to Impact Measurement and Accountability in Emergencies* (Emergency Capacity Building Project, 2007). It recognises that options that are good enough for the immediate circumstance may need to be used during the humanitarian response, but there should be an incremental process of improving the sufficiency of assistance as the response develops over time. The good enough approach requires that humanitarian responses will be constantly reviewed and updated to refine what is good enough at each stage and for each set of operational conditions. Particularly in the case of the environment, the good enough approach requires that measures to address environmental issues are increasingly integrated into a response as time and conditions allow.

- **The good humanitarian donorship initiative**[6] asserts that in transition phases, donors must take account of short- and longer-term needs and ensure action is based on a rigorous context analysis.

2.4 Barriers to considering the environment and climate change in humanitarian action

Notwithstanding the evidence and the policy basis, there is only weak evidence that environmental issues are specifically and proactively incorporated into humanitarian action. Reasons for this include the following:

- The term 'environment' is often considered to be synonymous with 'ecology', rather than "the physical, chemical and biological elements and processes that affect disaster-affected and local populations' lives and livelihoods".[7] As such, environmental considerations may be viewed as a secondary development issue rather than one that is relevant to the acute stages of a humanitarian crisis.
- A United Nations report considered the impact of policy and practice on the environment and humanitarian operations and concluded: "[there is a] lack of system-wide accountability and responsibility. The fact that environment is everybody's responsibility, while at the same time nobody is being held accountable, has resulted in the 'tragedy of the commons' of the humanitarian sector. Humanitarian partners

3 Established by the Red Cross Movement and Caritas Internationalis, Catholic Relief Services, International Save the Children Alliance, Lutheran World Federation, Oxfam and The World Council of Churches, and later accepted by other NGOs.
4 See http://www.sphereproject.org/handbook/.
5 The 'good enough' approach is based on the Emergency Capacity Building Project (2007).
6 http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/7131.pdf.
7 Sphere Standards (2012)

have to date failed to operationalise environment as a cross-cutting issue within the global humanitarian architecture and no agency has the mandate to enforce the principles of environmental mainstreaming."[8]

- Donors and affected countries may have regulations that limit the application of environmental laws and regulations following a disaster, including environmental reviews.
- Social and political pressure to move beyond response to the recovery phase can lead to donors and affected countries bypassing legal requirements for environmental reviews or consultations with the affected parties.
- A common, but inaccurate, belief is that environmental assessments and reviews are necessarily slow, delay project implementation and increase costs.
- There is a lack of clear economic benefit in assessing the environmental footprint of humanitarian operations, particularly if there is no explicit donor requirement for such an exercise, and actors and activities change over short periods of time, making it difficult to assess environmental footprints.
- There is weak accountability for environmental impacts of humanitarian operations. For example, there is typically no system in place to monitor resource use and waste production.
- There is very limited evidence that donors or assistance providers are held accountable for failure to consider environmental issues in humanitarian response.
- Individuals or field offices may interpret their organisational mandate as only focusing on humanitarian assistance as opposed to environmental issues, often for one of the reasons cited above, even where institutional policy calls for attention to the environment (D. Stone, personal communication, 2014).

Case study 2: *No-regrets* lessons from the field

Rebuilding risk. Post-tsunami housing in Banda Aceh, the capital of Aceh province, Indonesia, was built in a flood zone, which re-created risk for the survivors (WWF and American Red Cross, 2010). As another example, the weak recovery planning in Haiti led to the creation of squatter settlements north of Port-au-Prince in an environmentally fragile area generally lacking sources of water and subject to flash floods and severe erosion. This, in turn, re-built risk and exacerbated risk factors stemming from fragile environments (Noel, 2012).

A no regret lesson is to rebuild and re-settle consistently in areas not subject to flooding or other risks, as indicated by an environmental assessment.

Depleting resources. A focus on immediately supplying water to the exclusion of natural resource management led to the overuse of groundwater in northern Darfur. This led to wells going dry, which compounded the water supply challenges. The situation was made worse by a lack of overall preparedness and planning for water needs (Tearfund, 2007).

A no regret lesson is to monitor the groundwater use of camps, apply water conservation practices to reduce demand and to find sustainable sources of water.

Recovery activities that compound risk. Brick making for security walls in Darfur led to deforestation, land degradation, a loss of farmland and conflict, thereby increasing the very risk the security walls were intended to mitigate (UNEP, 2007).

The no regret lessons are to (a) assess options for different sources of biomass to fire bricks or provide fuel (b) assess options for brick-making techniques that do not require firing, such as compressed stabilised soil blocks, and where possible implement these.

*In **all** of the above cases, a no-regrets lesson is to adopt a climate risk management approach that ensures decision-making is sensitive to climate risks. Even if new climate risks do not materialise in a given region, a climate risk management approach will help to address existing climate risk and variability.*

[8] Environment and Humanitarian Action: Increasing Effectiveness, Sustainability and Accountability (Joint UNEP/OCHA Environment Unit, 2014).

SECTION 3

Key entry points and corresponding strategies: linking evidence to action

This section describes the key junctures or 'entry points' at which the environment–climate–humanitarian action relationship can be most effectively acted upon, and provides strategies for doing so. They can be considered on their own or used to address the topics in Section 4.

3.1 Dealing with incomplete, field-based evidence on the role of environmental issues in humanitarian action

Six strategies can be used to reduce decision-making uncertainty that may arise when addressing environmental risks in humanitarian action:

1. **Pre-disaster planning.** Normal pre-disaster planning processes can be used to collect data on climate and environmental conditions for use once a disaster has occurred.[9] The multi-cluster/sector initial rapid assessment (MIRA) tool (Inter-Agency Standing Committee, 2014), being developed by the humanitarian community, provides for the collection of pre-disaster baseline information. The MIRA can be expanded to include climate and environment-related data. While pre-disaster recovery planning is generally very limited globally, where it does takes place it can incorporate climate data and plans to address changes in the climate and climate hazards resulting from, for instance, increased urbanisation.
2. **Making use of existing resources before and following a disaster**.[10] There is considerable data on the environmental aspects of disasters and on interventions to address them. For some disasters, the Joint OCHA/UNEP Environment Unit issues summaries of possible environmental impacts and issues and can also provide technical support on the environmental aspects of emergencies and disasters upon request. UNEP's Post-Conflict and Disaster Management Branch conducts post-crisis environmental assessments upon request in order to identify risks to health, livelihoods and security. Other resources can be found at these links: http://www.eecentre.org/, https://www.humanitarianresponse.info/ and http://geodata.grid.unep.ch/. Table 2 provides information on environmental assessment tools that can be used during different disaster phases.
3. **Constituting an environmental common interest group** that incorporates individuals in, or with knowledge of, the crisis-affected area. This group can be formal or informal, but should bring together individuals with a common interest in the environment and the crisis. An example of such a group is the Environmental Peacebuilding Working Group and their work on a briefing paper on the environmental aspects of the crisis in the Central African Republic.[11]
4. **Using precedent**. The lessons from one disaster can often be applied to other disasters, particularly within countries or regions that face recurrent disasters. The

9 Expanded based on Kelly (2005).
10 See Kelly (2005).
11 See www.environmentalpeacebuilding.org.

environmental issues related to post-flood shelter in Pakistan in 2009, for example, were generally the same a year later in 2010 (see *Case study: DFID support for housing after the 2010 Pakistan floods* for one set of lessons). Also, as noted above, many lessons can be considered no-regrets approaches. Lessons, while not perfect, can be very useful in informing decision-making.[12]

5. **Emphasising operational efficiencies.** Humanitarians can often advance environmental issues by framing them as improvements to the efficiency and effectiveness of humanitarian action. Examples include linking well-water sustainability to camp planning and management costs, rather than the environment alone; defining how to reduce the cost of energy for facilities through conservation and energy efficiency;[13] and pre-grinding grain to reduce transport costs and/or reducing the demand for fuel.
6. **Prioritising and using incremental approaches.**[14] Not all issues need to be, or can be, addressed immediately in the humanitarian response phase. Priorities need to be established, and the following can assist in this regard:
   i. An assessment of crisis-related environmental and climate issues, to set an agenda and define what issue needs to be addressed when.
   ii. A prioritised list of issues and corresponding actions that is updated as conditions change. Actions can be further divided into those that are easy (e.g. the provision of toilets) and others that are hard (e.g. constructing a sewage treatment facility). Easy issues should be addressed quickly to improve impact and reduce the length of the list while harder and/or complex issues need more concerted attention.
   iii. Continued engagement of decision-makers on environment-related issues, with these issues defined as an integral part of relief and recovery. Decisions made outside the main response structure and mechanisms are generally ineffective.

As an example, in post-conflict situations, the number of contaminated sites may exceed the amount of financing available for clean up and remediation, which in turn requires that sites be prioritised. In such a case, a transparent decision-making framework is required to allow stakeholders to rank and prioritise sites. This process should be informed by technical assessments that use the source–pathway–receptor approach to identify which sites pose the greatest immediate risks.

12 A collection of lessons learned on addressing environment in humanitarian action is available at http://www.environmentalpeacebuilding.org/library/?LibraryFilter=15

13 An example of this approach is the introduction of energy efficiency into UN facilities operations in South Sudan. See for example http://greenhumanitarians.files.wordpress.com/2013/12/unmiss_green-exchange.pdf.

14 Drawn from Kelly (2005).

Case study 3: DFID support for housing after the 2010 Pakistan floods

During the 2010 flooding in Pakistan, approximately 1.2 million houses were lost, primarily in rural areas and largely belonging to labourers and the poorer segments of society. Rebuilding houses with at least one room safe from floods was essential to flood recovery and rebuilding livelihoods. However, the estimated cost of US$750 for a basic house was beyond the means of the Government of Pakistan and donors.

The preferred means of rebuilding, using fired clay bricks and steel beams to support the roof, also had significant negative human and environmental consequences. Fired-brick production creates large pits that reduce land available for cultivation and can create insect breeding sites when standing water is present. Fuelling the brick firing process also uses combustibles, such as wood, plastic and rubber. This can contribute significantly to local air pollution and carbon dioxide generation.

Cleaner brick-firing technologies were available in Pakistan. However, the 6.6 billion fired bricks needed would still increase air pollution, greenhouse gas (GHG) generation and mining of clay. Furthermore, housing built over decades had to be replaced in only a few years, concentrating environmental impacts in a short period.

Using fired bricks required addressing the issue of indentured and child labour, a task that would have required considerable changes to the brick-making sector in Pakistan.

DFID worked with Pakistani organisations and UK lime consultants to develop a lime-stabilised mud-brick building model that resists flooding and costs 60% less than a fired-brick building of similar size. Using lime cement reduced carbon dioxide emissions by an estimated 90% compared to a similar fired-brick structure. The cost savings allowed DFID to support construction of a total of 45,000 houses, more than three times the initial plans, with a lower overall impact on the environment.

Source: M.W. Murray personal communication (2014)

3.2 Integrating environmental issues with humanitarian action

Humanitarian action generally moves through four phases:

- A period of short-term, immediate life-saving assistance to life-sustaining assistance in the **response** phase
- An overlap of relief and recovery assistance during the **recovery** phase
- A transition to **prevention and mitigation** and finally **response preparedness** as part of the non-crisis period.

It should be noted that there is overlap between these phases. For example, recovery planning should start during relief operations and disaster risk reduction should be integrated wherever possible, based on assessments. Nevertheless, the delineation can be useful to illustrate where and how the environment can be integrated into the broader humanitarian context, as illustrated in Figure 1.[15] There are numerous strategies to do so effectively.

[15] From Inter-Agency Standing Committee (2013).

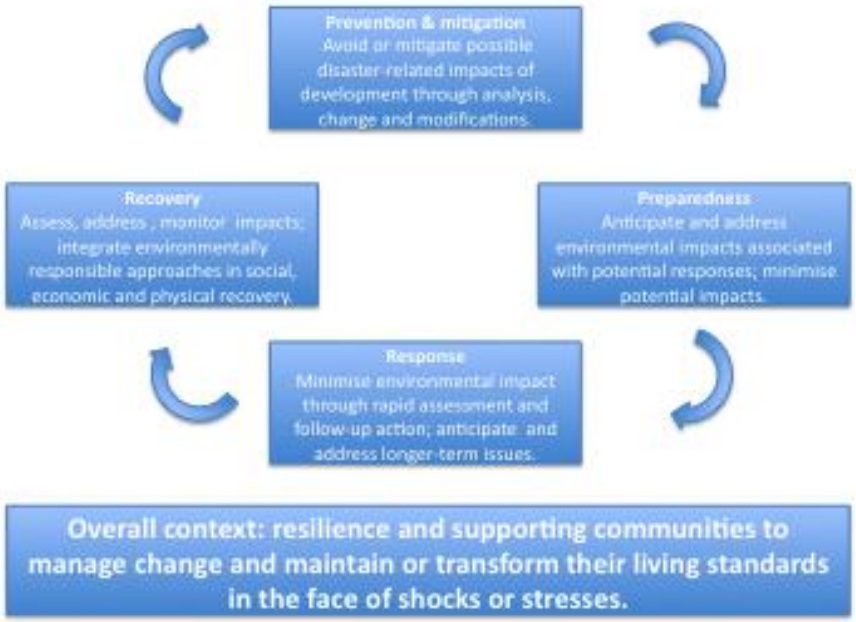

Figure 1 Integrating environmental and climate considerations into humanitarian action

3.2.1 Strategies

- **Early consideration of the environment.** Environmental issues can be addressed in any phase of humanitarian action. However, there is evidence that decisions made early in the humanitarian response phase can have long-term impacts, as described above in *Case study 2:* No-regrets *lessons from the field.* This means that in general, environmental issues should be identified and integrated into humanitarian action at the earliest possible time while there is still latitude to make any required course corrections. This does not mean that all *actions* must be taken during the response phase.

- **Ensuring leadership and accountability.** Figure 1 illustrates the overall environmental objectives for each phase of the disaster cycle. Key to achieving these outcomes is to address the lack of leadership and accountability for the environment during humanitarian action. According to one report, this should be done by donors and key humanitarian players as part of the *transformative agenda,* which was agreed to by the Principals of the Inter-Agency Standing Committee[16].

[16] From ProAct Network and Group UDR (2014).

- **Planning, assessing and monitoring.** Also key to achieving the outcomes noted in Figure 1 are planning, assessing and monitoring. As with development assistance, these are critical for an effective humanitarian response, including its environmental dimensions. The significant differences during a humanitarian response are that (1) humanitarian assessments are sequential and iterative and (2) humanitarian planning is done in an incremental manner as assessment results are available and as conditions change on the ground.

- **Identifying secondary impacts.** The **Joint UNEP/OCHA Environment Unit**, which is the primary international mechanism for mobilising and coordinating the international response to environmental emergencies, underscores the importance of identifying any major secondary environmental impacts resulting from a disaster during the immediate, life-saving response phase of humanitarian action. In their response framework, this is typically achieved using the **Flash Environmental Assessment Tool** in conjunction with the deployment of a United Nations Disaster Assessment and Coordination team, which is the United Nations' primary rapid response mechanism. Specialised teams of environmental experts, as well as equipment, including mobile laboratories, can be mobilised by the Joint UNEP/OCHA Environment Unit to address most issues identified through the use of the Flash Environmental Assessment Tool. See Box 1 for more information.

- **Understanding impacts.** The Norwegian Refugee Council has developed the **NRC Environmental Assessment Tool (NEAT) mobile application** ('app') to help users to understand the environmental context in areas rendered ecologically sensitive by climate change, urbanisation, increasing demand or other factors, and adapt projects accordingly. It has been designed to be simple and robust. It is intended as a foundation for embedding an understanding of key environmental issues within the organisation. Using this data, which is entered by the user through a yes/no, app-based questionnaire, NEAT provides users with an understanding of where negative impacts will most likely occur as a result of project activities. It identifies priority areas for which further assessment, and, potentially, mitigation work is needed. To date, NEAT has been tested successfully in the Democratic Republic of Congo and Jordan and will be used in Somalia in 2015.[17]

- **Donor demand.** With respect to planning, research in Haiti demonstrated that project implementers tend to expect the donor to indicate that environmental issues are to be brought into assessment, planning and implementation (Abrahams, 2014). While bringing environmental issues into assessment and planning is good practice, the reality is that this does not happen unless a donor indicates it is necessary. Therefore, humanitarians need to specifically flag that women/girls and the environment should be included in humanitarian response proposals and programming.

- **Monitoring** is also necessary to ensure that environmental issues are addressed during a humanitarian response. A useful monitoring approach is the **Environmental Mitigation and Monitoring Plan (EMMP**)[18]. The EMMP identifies both measures to be taken to address environmental issues (based on an assessment) and indicators of progress in the use of these measures. EMMPs can be very useful in organising and tracking the management of environmental issues when time or resources are limited in a humanitarian response.

17 J. Attwood, Norwegian Refugee Council, personal communication (2014).

18 US Agency for International Development (2011)

Box 1. The Flash Environmental Assessment Tool (FEAT)

The FEAT is a science-based assessment tool developed for use by field teams deployed immediately following a large-scale sudden-onset disaster. It facilitates the identification and prioritisation of locations that pose an actual or potential risk of technological accidents and corresponding chemical releases.

The FEAT translates large quantities of scientific information into usable outputs that are divided into three effect types: (1) direct effects on humans; (2) direct effects on nature and life support functions (such as drinking water, agriculture and fisheries); and (3) long-term effects on humans and the environment.

The use of FEAT can be the first step towards an inclusive disaster risk reduction programme following a disaster. More information can be obtained at http://www.unocha.org/what-we-do/coordination-tools/environmental-emergencies.

Source: Nijenhuis (2014) and Nijenhuis and Wahlstrom (2014)

Phase	General approach	Tools
Prevention and mitigation	Environmental reviews and strategic environmental impact assessments can identify natural hazards and sources of environment-related conflict Project-specific environmental reviews can identify negative environmental impacts that could contribute to a crisis and possible environment-related opportunities to reduce the onset or scope of a crisis	• Strategic environmental assessments (OECD, 2006) • Environmental reviews and impact assessments • Integrating natural hazards into the environmental impact assessment (EIA) process (Caribbean Development Bank, 2004) • Environmental reviews and impact assessments • Checklist-based identification of environmental issues associated with disaster risk reduction (see UNEP, 2014b)
Preparedness	Use environmental reviews to identify specific ways to define or implement specific environment-related activities to reduce disaster or crisis risk or impact	• Environmental reviews and impact assessments • Checklist-based identification of environmental issues associated with disaster risk reduction
Response (life-saving or sustaining assistance)	Use existing environmental reviews to identify critical issues in immediate response Rapid assessments can identify critical environmental issues framing an immediate response Use of environment-related lessons from other responses can help to identify critical challenges or opportunities	• FEAT (van Dijk et al, 2009). See Box 1 for more details • Rapid EIA (Kelly, 2005) • Sector-specific assessment tools (Kelly, 2008; Stone, 2005) • Environmental needs assessment in post-disaster situations: a practical guide for implementation (UNEP, 2008) • Environmental sector guidance for humanitarian operations (UNEP, 2014a) • Environmental marker for humanitarian operations (UNEP 2014b)
Recovery - including Social and	Strategic assessments as part of the recovery planning process to identify critical environmental issues	• Post-disaster strategic environmental assessment (Kelly, 2014). • Green recovery and reconstruction

Phase	General approach	Tools
economic recovery and physical reconstruction	Rapid environmental reviews to identify critical environmental issues framing recovery • On-going environmental review process to identify and address environmental issues during implementation of short-duration recovery projects • Engagement of local environmental groups and government agencies focused on the environment in assessments, planning and implementation	training toolkit (WWF and American Red Cross, 2010) • Environmental needs assessment in post-disaster situations: a practical guide for implementation (UNEP, 2008) • Global fund for disaster risk reduction (2013) • Sector-specific assessment tools (Kelly, 2008; Stone, 2005) • Environmental reviews and impact assessments • Integrating natural hazards into the EIA process (Caribbean Development Bank, 2004) • Natural resource management in transition settings (United Nations Development Group, 2013)
All phases	• Strategic-level assessment to strengthen all programming	• CEDRA is a strategic-level environmental risk assessment tool produced by Tearfund to assist local humanitarian and development agencies make their existing projects stronger against climate and environmental change. It is designed to be used across the work of the entire organisation (Wiggins, 2009)

Table 2. Environmental assessment tools for different phases of humanitarian action

3.3 Reducing the environmental impact of humanitarian operations

As noted, environmental conditions can contribute to the need for a humanitarian response or complicate humanitarian efforts. However, humanitarian operations themselves necessarily cause environmental impacts and provide an entry point for a variety of strategies. There are a variety of strategies for reducing this impact (or 'footprint'), although the evidence around their effectiveness is incomplete.

3.3.1 Strategies

- **Logistics.** The cost and energy implications of logistics are generally well understood. For example, shipping via vessel is less costly and more energy effective than shipping by aircraft. However, logistics staff do not usually decide how urgently assistance is needed, and thus the method of shipping. Instructions on the urgency of delivery are made at a programmatic level, where environmental costs and urgency trade-offs are not usually assessed. Providing information on the urgency with which supplies are needed, therefore, can be a useful strategy to guide less environmentally damaging forms of transport. Explored from this perspective, using heavy-lift helicopters after the 2005 earthquake in Pakistan to deliver shelter supplies before winter is justifiable, while flying bottled water from London to Pakistan for the same disaster is not.

- **Vehicle management.** The Fleet Forum provides guidance on vehicle management that can reduce environmental impacts.[19]

- **Transport reduction.** Guidance on purchasing assistance supplies locally, wherever possible, can be an effective strategy to reduce both the costs and GHG emissions associated with transporting supplies. Field experience demonstrates that this works when local supplies are adequate for the needs, markets are responsive to needs and supplying the needs locally does not otherwise damage the environment.

- **Alternate energy.** There is strong evidence for the energy and carbon saving potential of alternate energy in humanitarian operations from the US military. The authorities recognised that the supply of fuel to military operations in Afghanistan and Iraq had a significant human and economic cost, and a review of options identified energy sources that could reduce fuel needs. The introduction of these alternate energy sources and other changes to improve energy efficiency led to a reduction in lives lost and the cost of supplying fuel and water (Eady et al., 2009; Hearne and Scott, 2013). The US military is also exploring energy improvements for field camps (Anderson, 2013), an effort with potential application to camps for refugees and displaced people. A similar effort is underway within the UN Peacekeeping effort (see UNEP, 2012).

- **Military.** Where external military assets are involved in a humanitarian response they may provide examples of good environmental practice (e.g. waste management, energy generation, water use, etc.) that merit consideration by other humanitarian actors. Information on such cases can be found at http://proactnetwork.org/.

3.3.2 Examples of efforts to reduce environmental impacts

The International Committee of the Red Cross (ICRC) has been working on assessing and minimising their environmental footprint. Specifically, the ICRC has been implementing pilot projects to improve overall waste management, hazardous waste management and energy use, hazardous chemicals management, the procurement of office supplies, water use, transport management, and establish and maintain green spaces in cooperation with self-selected delegations (Oppliger, 2013). The ICRC has also launched the 'QSAND' project to bring environmental considerations into assistance efforts (BRE Trust, 2013), though results are not yet available.

A similar effort is underway at Action contre la Faim (Laconde, 2013). Groupe URD is leading a dialogue on environmental issues with French NGOs[20] and the French Red Cross may have conducted a life-cycle analysis of humanitarian operations in Haiti, Mozambique and elsewhere (Oberhofer et al, 2013).

19 See http://fleetforum.org/fleet-safety/environmental-impact-2/environmental-impact/.
20 See http://www.urd.org/IMG/pdf/URD_HEM_12_EN.pdf.

Case study 4: The Humanitarian Innovation Fund

Disasters and crises present opportunities for innovation to reduce the likelihood of future disasters. The DFID-supported **Humanitarian Innovation Fund** creates opportunities for innovation in environment-linked humanitarian responses and pre-crisis risk reduction.

As an example, the Humanitarian Innovation Fund recently awarded £2 million to the Moving Energy Initiative (MEI), which aims to increase access to sustainable energy among displaced people through low carbon, climate-resilient responses to humanitarian crises. The MEI will be implemented by a consortium led by the Global Village Energy Partnership and includes Chatham House, United Nations High Commission for Refugees (UNHCR), Practical Action, UN-OCHA, the Ashden Foundation and UNEP.

The Humanitarian Innovation Fund approach is based on:

1. **Recognition** of a specific problem, challenge or opportunity.
2. **Invention** of a creative solution or novel idea, which helps address a problem or seize an opportunity.
3. **Development** of an innovation by creating practical, actionable plans and guidelines.
4. **Implementation** of an innovation to produce real examples of changed practice, testing the innovation to see how it compares to existing solutions.
5. **Disseminating** successful innovations.

Additional examples can be found on the Humanitarian Innovation Fund website at: **http://www.elrha.org/hif/home**.

3.4 Post-crisis period[21]

The post-crisis period presents a variety of opportunities and pitfalls related to the environment. These issues have been most comprehensively studied in a project in post-conflict peacebuilding and natural resource management experiences led by the Environmental Law Institute (ELI), the United Nations Environment Programme (UNEP), the University of Tokyo and McGill University.[22] While this project focused on post-conflict situations, the information is relevant to other post-crisis situations. The strategies below are drawn from volumes in this project.

3.4.1 Strategies

- The evidence presented in *Assessing and Restoring Natural Resources* (Jensen and Lonergan, 2012)[23] provides a strong grounding from which to initiate a process to ensure environmental issues are integrated into, and addressed throughout, post-crisis recovery. Specific findings include:
  - Natural resource issues that are not addressed during post-crisis recovery can become the seeds of future conflict or undermine the prospects for consolidating a durable peace (Conca and Wallace, 2012).

[21] This text reflects comments from Ken Conca, School of International Service, American University, Carl Bruch, Environmental Law Institute and David Jensen, Head of Environmental Cooperation for Peacebuilding in the United Nations Environment Programme. The text is the authors' responsibility.

[22] See http://www.environmentalpeacebuilding.org/ for more details on this project and related activities.

[23] Other volumes in the seven book series cover peacebuilding and high value resources*, land issues*, water*, livelihoods and natural resources, governance and natural resources, and a synthesis volume (* indicates volumes published to date). Also see Jensen et al. (2014) and Jensen et al. (2013).

- Natural resources can complicate peace building. Specifically, high-value resources can generate tensions around contract fairness and transparency, benefit sharing and downstream environmental impacts. Renewable resources and land tend to generate tensions linked to customary and statutory ownership as well as equitable allocation between livelihood groups and economic sectors (D. Jensen personal communication, 2014).
- Community engagement is critical in addressing post-crisis natural resource issues (Anand, 2012).
- Understanding governance systems is critical in addressing natural resource issues post-crisis (Bruch et al., 2012). The scope of governance includes "…understanding elements of state capacity, reach and authority of the state especially in remote areas, perceived legitimacy and transparency of how the state makes, applies and enforces rules, and the interplay of formal and informal rule systems." (K. Conca, personal communication, 2014).
- Government buy-in is necessary for natural resources issues to be addressed over the long term (Bruch, et al., 2012; Bouma, 2012; Jensen and Lonergan, 2012).
- A watershed ridge-to-reef approach is useful in managing environmental issues (Gingembre, 2012). A ridge-to-reef approach contrasts with the sector and location-specific nature of many recovery projects. It incorporates a more comprehensive approach where, for instance, road rehabilitation linked to the promotion of export costs to stimulate livelihoods considers land tenure (Unruh and Shalaby, 2012), collateral unregulated tree harvesting, and use of pesticides that may cause downstream harm.
- Environment-focused assessments are necessary to define natural resource issues (including the potential for future resource-based conflict) and solutions, but have little impact if not integrated into recovery planning and funding (Kelly, 2012; Bouma, 2012; Jensen and Lonergan, 2012).
- Environmental hot spots, including unexploded munitions, are costly to address and need long-term commitments if they are not to pose long-term threats to recovery (Shimoyachi-Yuzawa, 2012; Tamer-Chammas, 2012; Thummarukudy et al., 2012; Briggs and Weissbecker, 2012).
- Ecosystem resilience has limits and cannot always be relied upon to provide services necessary for a full recovery to pre-crisis environmental conditions (Jensen and Lonergan, 2012).
- Governmental capacities are often limited post-crisis. This poses significant constraints to assessing and addressing environmental issues. These issues can be addressed through a combination of technical support, funding, and policy engagement, but will also require long-term commitments (Jensen and Lonergan, 2012; Conca and Wallace, 2012).

Case study 5: Developing alternatives to produce better outcomes in the post-crisis period

As reconstruction began in Banda Ache following the 2004 tsunami, concerns were raised that the demand for timber to build houses would lead to the uncontrolled cutting of trees.

This concern lead to a decision to rebuild using fired bricks. However, analysis indicated that approximately twice as much wood was needed to fire the bricks needed for one house than would have been required to construct a similar house from wood (Good, 2010).

This example illustrates that plans and decisions on relief and recovery should be based on an assessment of a range of environmental options, rather than on just one option. In this example, using fired brick may have still been selected as the best option given concerns about uncontrolled logging. However, the impacts could have been reduced by introducing firing methods that used less biomass, or other construction methods.

Box 2. Post-crisis trends to watch: ecosystem-based disaster risk reduction

The use of ecosystems as disaster risk reduction tools is gaining positive attention. For example, preserving or rebuilding 'eco-assets', such as forests, foreshore and mangroves, can cost less than other risk reduction measures (Sudmeier-Rieux et al., 2006) and promote livelihoods.

Although ecosystems approaches may still be considered 'unconventional', they are increasingly common in large-scale hazard management programmes either singly or in combination with traditional techniques, for instance in managing coastal flood risk in the Netherlands.

This trend is worth exploring further, particularly as experience with ecosystem approaches in smaller projects becomes more common.

See Gupta and Nair (2012), Shepherd (2008), PEDRR (2010), and UNEP (2013b) for similar evidence and justifications of an ecosystem approach. Additional information on ecosystem risk management can be found in the Topic Guide: Ecosystems Services (Roe, 2014).

3.5 Urban issues

Crises in urban areas have gained attention following the 2010 earthquakes affecting Port-au-Prince, Haiti, and Christchurch, New Zealand[24]. These experiences, combined with earlier research on disasters in urban areas, suggest that the recovery process in urban areas can involve a number of stages stretching over months or years. This, in turn, presents specific environmental considerations and opportunities. More broadly, there is evidence that rapid urbanisation is increasing the risk of environmental emergencies, such as fire, explosions and the dispersal of toxic substances. Furthermore, most emerging mega-cities are in coastal cities, which increases the risks from climate change impacts, such as storms, sea-level rise and storm surges[25].

[24] *Reconstruction Following Disaster* (Haas, et al, 1997) and *Crucibles of Hazard: Mega-cities and Disaster in Transition* (Mitchell, 1996).

[25] http://reliefweb.int/sites/reliefweb.int/files/resources/F_R_635.pdf

3.5.1 Strategies

- **Understanding and addressing specific urban hazards.** Urbanisation can create specific hazards. For example, concentrations of impermeable surfaces and dense populations can contribute to urban flash flooding or urban heat waves that would not have existed before the urbanisation process[26]. As well, land tenure and land use pose critical challenges to effectively addressing urban environmental and climate risks before or after a humanitarian intervention and for successful recovery. The Swiss Resource Centre and Consultancies for Development, and International Federation of Red Cross and Red Crescent Societies (IFRC) (2012) provide guidance on sustainable urban recovery.
- **Promoting effective governance.** Baker (2012), McClean (2010) and Satterthwaite (2006) make the case that managing environmental and climate risks in urban areas requires integrated governance systems that incorporate natural hazard management (e.g. local warning systems and hazard-based land use regulation), strong community engagement and urban planning, which considers changing environmental and climate conditions. In general, these efforts are expected to be part of the normal improvement of the management of urban areas, such as through slum upgrading or creating green spaces that serve as urban flood-ways, as discussed in Baker (2012) and the Association of Flood Plain Managers (2004).
- **Community-based urban efforts.** Baker (2012), Setchell (2008a, 2008b, 2008c) provide examples of community-based disaster risk management that reduces disaster risk. However, such efforts in urban areas often replace public services that are not being provided and contrasts with government efforts to improve services to address environmental hazard management. An example of the latter are the 'drain ducks' deployed by the government of Lagos to unclog drains and improve drainage.[27] (Maintaining drainage systems is often a significant post-crisis urban public works livelihoods support activity.)

3.5.2 Examples

- Haas et al. (1997) cite the example of Managua where a post-earthquake levelling of the city core did not result in rapid rebuilding as many pre-earthquake residents moved to peri-urban low-income neighbourhoods. Following the 2012 earthquake in Haiti, the government announced plans to open areas north of Port-au-Prince for urban settlement. Residents have moved to these areas, but only limited development support has been provided, leading to the creation of slum-like areas in an environmentally sensitive landscape with limited water and erosion and flooding hazards.
- The United States Agency for International Development's (USAID's) Ravine Pintade project in Port-au-Prince Haiti provides practical evidence of how combining community mobilisation and local risk management planning can work in urban areas (Global Communities, 2015). The project re-planned a small neighbourhood to reduce risks and increase usable space while repairing or providing transitional shelters for 1984 families taking into account hazard reduction options. However, the scale of the project was small. It remains a question of how similar efforts can be scaled-up to work with thousands of families and the variety of community structures found in urban areas.

[26] WWF/US is developing a manual on natural resource based flood management for USAID, which included materials on urban flooding. Further details can be secured from Anita van Breda, WWF/US *Humanitarian Partnerships programme.*

[27] http://www.radiolagosekofm.net/drainducks/

3.6 Women and girls

Specific evidence on climate or environment interventions to support women and girls is limited and tends to focus on particular cases. Women and girls are often presented as collectors and users of natural and other resources, such as water and firewood, but not necessarily fully in control of access to, or use of, these resources or having a significant level of control over the result of the use of the resources (UNEP, 2013a). Furthermore, there is case evidence of the risk of assault when women and girls collect these natural resources. There is also evidence linking the security of women and girls to the presence or absence of adequate lighting, for example at latrines. Following a disaster or during a crisis, the workload of women and girls collecting and contributing to the use of resources, for instance for rebuilding, increases, while other tasks undertaken by women and girls before a disaster remain the same or increase.

For cultural or legal reasons, women, and girls transitioning to adult status (e.g. through marriage), may not have legal or *de facto* ownership of natural resources (e.g. water supplies) or the physical infrastructure to which they contributed labour and physical resources, as in title to an owner-built house. Finally, in conflict situations and also where post-disaster living conditions are insecure, the safety and security of women and girls in collecting and using resources may be threatened by physical violence or death.

Another issue that relates to the particular vulnerabilities of pregnant women and children is the release of chemicals into the environment. A report by the Joint UNEP/OCHA Environment Unit on a 2010 lead poisoning disaster in Nigeria addresses this topic in more detail (Joint UNEP/OCHA Environment Unit, 2010).

3.6.1 Strategies

Environment-focused humanitarian assistance can be integrated into DFID's programmatic focus on women and girls through a variety of strategies including:

- **Prevent violence against girls and women.** Accessing resources can present a significant risk of violence against women and girls. As in Darfur and cases like post-disaster shelter in Haiti, a lack of assets to meet basic needs can place women and girls at risk of violence in terms of where and how they are located (e.g. insecure shelter or shelter with inadequate lighting), and how they meet needs (e.g. through the sex trade or involvement in trafficking). These issues are explored in more detail in Bradshaw and Fordham (2013). Another environment-related concern for women and girls is safe access to sanitation facilities. The solution is to construct gender- as well as age- safe [28] toilets and bathing facilities. There are a variety of guidance tools on this topic.[29]
- **Transfer power to girls and women**. A UNEP-led study on women, natural resources and conflict (UNEP, 2013a) presents case studies demonstrating the value of empowering women to play a significant role in managing natural resources.
- **Get assets directly to girls and women**. The on-the-ground links between women and girls, the environment and humanitarian operations indicate that it can be

[28] Some children do not use constructed toilets because there is a danger they will fall through the hole. Challenges also exist for the elderly, who may not have the mobility to use standard toilets or wash areas.

[29] See for example https://www.humanitarianresponse.info/system/files/documents/files/WASH%202012%20Tip%20Sheet.pdf and http://www.slideshare.net/HelpAgeInternational/access-for-all-securing-older-peoples-access-to-water-and-sanitation.

effective to provide women and girls with assets as part of humanitarian assistance. This can offset the need to collect natural assets from the environment to meet immediate basic needs to replace assets lost during a disaster or conflict. *Assets* is used here in the context of sustainable livelihood capital and is not limited to natural capital. Access to one type of asset (e.g. funds) can reduce the need to collect another (e.g. firewood).

- **Knowledge on hazards, disaster, coping and adaptation should be transferred to women and girls** to build human capital and crisis management capacities. Enarson (2001) provides a number of examples where hazard information was not, but should have been, shared with women, as well as examples where improved information-sharing increased women's abilities to address disaster risk. Cannon (2001) makes the same point. However, exclusively focusing assets on women and girls after a disaster or crisis can have a potential downside by disassociating men/boys from the benefits gained. Enarson (2001) quotes an example from rebuilding houses after Hurricane Mitch where providing building ownership to women and not formally recognising men's contributions led to social tension.
- **Prioritise schooling for girls.** The workload of girls, as with the whole family, increases during a crisis. Reducing this workload can allow girls more time for schooling. Typical interventions focus on reducing the time needed to collect natural resources (e.g. increasing the number of water points in a camp or relocation site), or providing families with the assets which girls would normally be expected to collect in return for the family allowing girls to allocate equivalent time to education. Note, however, that such exchanges require a high level of community and family interaction and monitoring, which may not be feasible in the immediate post-disaster period.
- **Transferring basic needs assets.** The limited evidence available suggests that transferring basic needs-linked assets to disaster survivors is the most immediate way to reduce the impact of a crisis on women and girls. Such transfers reduce the threat of violence, reduce the demands on the natural environment and increase the time available to women and girls to pursue normal and disaster management-related tasks, including girls' education.

3.6.2 Examples

The conflict in Darfur provides evidence of the woman/girl–environment linkages, but also illustrates the challenges of using evidence in an operational context. In the early phase of the Darfur conflict, families moved into camps for safety. However, there was concern that women and girls who left camps to collect firewood were subjected to rape and other violence. (Women remained responsible for a range of pre-conflict tasks, including cooking and childcare.) Women were said to collect firewood because if men did this task they would be killed.

Part of the response to this situation was the decision to provide women with simple fuel-efficient stoves. The expectation was that reducing the use of wood for cooking would reduce the need to collect firewood and thus the incidence of violence.[30]

However, interviews with camp residents near Nyala in 2004 revealed that the larger part of fuel wood collected was not for cooking, but for sale to secure food and other basic needs (Joint UNEP/OCHA Environment Unit, 2004). This need to collect natural resource in a conflict arose because many families in the camps had arrived with few belongings and

[30] A 2008 study by Stone et al. (2008) reported that for southern Darfur, most wood for cooking was purchased because of a lack of wood near camps. In such cases fuel-efficient stoves can reduce expenditures.

humanitarian assistance was meeting only 40–50% of their basic needs, reportedly because of limited means to deliver assistance.

Consideration of the links between the environment, women/girls and crisis can be expanded to incorporate climate issues and social roles. Kyrgyzstan provides an example where the post-independence economic crisis and climate-related shocks have led to an increase in male migration from rural areas. As a result, women and girls are increasingly responsible for animal herding in mountainous areas, a significant role change.

The Darfur and Hurricane Mitch experiences also present a significant caution. In determining what assets to transfer, it is critical to understand that physical assets may be destroyed, but a social fabric will remain (and is often strengthened by the crisis). Post-disaster efforts must address the needs of women and girls, while at the same time policy must understand the social context in which asset transfers occur to avoid harming social structures already damaged by disaster.

3.7 Disaster resilience and climate change in humanitarian response

> *"Given an increasingly frugal global economic system, combined with more uncertainty, rising populations, urbanisation and the increased risk of hazard-related disasters, climate extremes, and the changing nature of conflict and insecurity, humanitarian and development actors are trying to renew the way they frame the complex challenges they seek to address. Resilience has become the zeitgeist – a way to move current practice forward, to address risks holistically and, in doing so, challenge age-old questions about the humanitarian/development divide."*[31]

Humanitarian needs are predicted to continue to grow. An estimated 325 million extremely poor people will remain highly vulnerable to natural disasters in the 49 countries most exposed to natural hazards and climate extremes in 2030. An increased frequency and severity of shocks and mega-disasters is also predicted.[32]

Many of the shocks and stresses that vulnerable populations must contend with will result from climate change. A changing climate leads to changes in the frequency, intensity, size, scale, duration and timing of extreme weather and climate events, and can result in unprecedented extreme weather and climate occurrences.[33]

Short-term climate variability and its extremes influence the range and frequency of shocks that society absorbs or adjusts to. For example, some regions will need to prepare for flooding in areas where, historically, there have not been any. Others will

"A shift towards a more anticipatory and preventative approach to humanitarian crises is needed. Most crises can be predicted and, while they cannot always be prevented, the suffering they cause can often be greatly reduced.

But humanitarian aid today is overwhelmingly focused on responding after crises occur. Governments and their partners have failed substantially to reduce risks to the world's most vulnerable people. It is time for a fundamental change in approach."

- Saving lives today and tomorrow: managing the risk of humanitarian crises. United Nations Office for the Coordination of Humanitarian Affairs

31 Harris (2013)
32 DFID (2015)
33 Field et al. (2012)

need to routinely prepare for more severe storms than have been the norm. Longer-term climate variability can change and/or erode the productive base of society. For example, in some areas, warming oceans may damage coral reefs that support local fisheries, or make conditions inhospitable for crops that communities have traditionally relied upon.

The effects of climate change become more significant in the context of building resilience against disasters. Climate change increases livelihood-related vulnerabilities, such as stresses on water availability, agriculture and ecosystems, and can create new vulnerabilities for built infrastructure. Smaller or economically less-diversified countries face particular challenges in absorbing the losses caused by climate extremes.[34]

Risks associated with climate change, disasters and global shocks are becoming increasingly complex and interconnected. If these risks are not tackled, climate change will increase vulnerability and erode development gains. For example, in the next 20 years weather extremes, food and water scarcity, and climate-related public health threats are projected to displace between 150 million and 1 billion people.[35]

However, the humanitarian system remains overwhelmingly focused on response. For example, most humanitarian assistance is material (food, water and tents) rather than programmatic, *even when crisis is the norm*.[36] This suggests that crises that actually result from chronic vulnerabilities are being treated more like traditional, acute emergencies. This results in opportunities for providing support to vulnerable populations being missed. Prevention and preparedness funding has comprised less than 0.5% of all international aid over the past 20 years.[37] Furthermore, humanitarians typically work in a manner that is quite segregated from the development community.

Vulnerable people are being exposed to more complex risks. A failure to do things differently will undermine development gains and erode the effectiveness and value for money of aid. There remain calls for the current humanitarian system to reform in order to contend with a growing and more complex humanitarian caseload. For example, the cost of global humanitarian aid has increased threefold in the last 10 years, the sizes of appeals have increased substantially over the last decade and the number of people targeted by this assistance has doubled over the same period.[38] The gap between resources and humanitarian needs is growing.[39]

DFID has produced guidance on the integration of resilience into crisis management (DFID, 2011c). This guidance includes; a Topic Guide on disaster resilience (Combaz, 2013); resilience and innovation (DFID, 2012c); conflict, climate and environment (DFID, 2014b); climate change, education and the environment (DFID, 2015a) and national governance of climate finance (including examples of national funds retained specifically for national disasters (DFID, 2015). The United Nations High Commissioner for Refugees has published a paper that proposes strategies to protect people who cross borders because of climate change-related issues.

34 Field et al. (2012)
35 DFID (2015)
36 UNOCHA (2014a)
37 UNOCHA (2014a)
38 UNOCHA (2014a)
39 See for example http://www.unocha.org/cap/appeals/overview-global-humanitarian-response-2014.

One way to tackle increasingly complex risk, rising needs, and limited financial resources is through increasing the resilience of vulnerable populations and taking a broader risk management approach, rather than an approach primarily focused on response[40].

Finding long-term, sustainable solutions to humanitarian crises through building resilience requires integrated, coherent and complimentary responses. However, Combaz (2013) concludes that "… evidence of what creates disaster resilience, or its effects on humanitarian and development outcomes, remains limited (and) takes the form of isolated qualitative case studies that are sector-, hazard- or context-specific. There are few rigorous evaluations of development and humanitarian interventions that have aimed to build disaster resilience: many resilience-building programmes date back less than a decade. Third, the geographic scope of the available evidence is limited, with few studies from fragile or conflict-affected states and a concentration on a small number of regions and events."

Nevertheless, there are numerous opportunities for action.

- **Integrating resilience in strategic planning**. For example, the United Nations Office for the Coordination of Humanitarian Affairs notes in its new strategic plan that "To end humanitarian aid dependency and more sustainably reduce vulnerability, initiatives have been launched with the aim of responding to protracted crises and/or recurrent natural disasters through resilience programming and closer alignment between humanitarian and development actors."[41]

- **Integration of climate risk information**. Many humanitarian organisations have produced reviews, policies or guidelines on how climate change affects the groups with whom they work. However, with a few notable exceptions, there is far less evidence that climate science is directly informing their humanitarian planning.[42] Humanitarians need to ensure that information on climate risks is included in humanitarian action. More specifically, they need to use not only historical climate data, as this will become increasingly unreliable as a predictor of future risks and events, but also forecasts that reflect changing climatic patterns. The case example from West Africa illustrates this potential, as well as opportunities to address the fact that climate risk information is not always provided in a format that is useful to humanitarians.

- **Funding.** There is increasing evidence that financing chronic vulnerabilities through humanitarian assistance without linkages or synergies with other sources of finance is unlikely to effectively address the root causes of vulnerabilities and reduce the pressure on humanitarian assistance. Specifically:
  - There are opportunities for greater collaboration between climate, development and humanitarian donors.
  - The global humanitarian community could explore options for funds such as the Consolidated Appeal Process and Central Emergency Relief Fund to be more climate risk informed and to support multi-year resilience building.
  - There are options to enhance dialogue with donors to increase their appetite for pre-emptive funding. It is noteworthy in the West Africa case example, donors did not initially respond to the request for pre-emptive funding. In this instance, funds were ultimately accessed from the IFRC Disaster Emergency Relief Fund.[43]

[40] UNOCHA (2014a)
[41] UNOCHA (2014b).
[42] See for example http://www.humanitarianfutures.org/wp-content/uploads/2013/11/HFP-Planning-for-future-climate-change-crises-Discussion-Paper.pdf.
[43] Braman et al. (2010)

- Climate adaptation finances should be used in an integrated manner that better links to and supports:
  - Disaster risk reduction and management, such as risk identification and hazard mapping
  - Resilience building to shocks and stresses, both before and after disasters
  - Early recovery, including cash-for-work.

- **Use of good practice.** There are many good practice examples from field organisations successfully blending climate adaptation funds with finance for resilience, disaster risk reduction, social protection and humanitarian response. These kinds of initiatives help create a new kind of humanitarian framework with greater emphasis on risk reduction and building resilience and less on crisis response.

- **Connecting communities of practice.** There is an opportunity to better coordinate and share resources and lessons between the climate, resilience and humanitarian communities. At a global level, these include the post-2015 Development Agenda, the United Nations Framework Convention on Climate Change Conference of the Parties in Paris in December 2015, as well as the World Humanitarian Summit and Sendai Framework for Disaster Risk Reduction.

A multi-hazard and multi-partner case example in Nepal

The powerful 7.8 magnitude earthquake that struck Nepal on 25 April 2015 caused widespread death and devastation, illustrating all too clearly the extent to which the country is at risk from natural disasters. One effort to address this risk that will undoubtedly receive substantially more attention in the months ahead is the Nepal Risk Reduction Consortium (NRRC), which is led by the government and coordinated by the United Nations. The NRRC brings together a variety of development and humanitarian players in an innovative partnership that is designed to bridge institutional divides and increase preparedness in five 'flagship' areas, each coordinated by a different agency – school and hospital safety (lead agency ADB/WHO), emergency preparedness and response capacity (lead agency UNOCHA), flood management in the Koshi River basin (lead agency World Bank), integrated community based disaster risk reduction/management (lead agency IFRC) and policy/institutional support for disaster risk management (lead agency UNDP). The UK joined the NRRC in 2011. Its climate and disaster resilience programmes in Nepal focus on strengthening the institutional architecture for disaster risk reduction and supporting a multi-hazard approach to risk reduction in vulnerable communities. Overall, the UK efforts are designed to increase the resilience of the population to earthquakes and other shocks.

Source: DFID 2012b.

- **New partnerships.** At an institutional level, opportunities exist for partnerships between humanitarian organisations and climate science information providers. The partnership between the International Research Institute for Climate and Society, based at Columbia University in New York, and the IFRC to improve response and preparation capabilities, provides an example of this,[44] as does the Nepal case example.

[44] See for example http://www.climate-services.org/sites/default/files/IRI-IFRC_Case_Study.pdf.

- **Early warning.** There are opportunities to improve preparedness to climate risk by having early warning systems not only for sudden-onset hazards, but also for creeping hazards such as the salinisation of water resources.[45]

3.7.1 Strategies

1. **Adopting a resilience approach to humanitarian affairs.** Overall, the humanitarian community needs to take a broader risk management and resilience approach to all facets of its work. DFID defines this as "identifying where different areas of our work can complement and enhance one another". Also, DFID identifies the need for a common analysis that supports a coherent approach to risk, financing mechanisms that allow early, predictable and sustained commitments, early warning systems that lead to early action and a stronger interface between humanitarian and development actors.[46] Importantly, this in turn, requires that organisations assess their structures, processes, incentives and cultures.[47]

2. **More effective use of data.** Increasing resilience requires the integration of climate change data and scenarios into policies, programmes and planning. This, in turn, requires an understanding of past trends, present experiences and future projections of hazard occurrence, climate variability and the range of effects of climate change on the area and population concerned. The more effective use of data also requires, in turn, the partnerships and structural abilities to build institutional and stakeholder capacity to use climate information and better collaboration between humanitarian and development actors. This latter could be achieved, for example, through common vulnerability assessments and planning in crisis-prone contexts.

3. **Assessing resilience.** Tools such as the IFRC Vulnerability and Capacity Assessment can be used to assess a population's vulnerability to hazards and its capacities to respond to them.[48] To assess resilience after a disaster, humanitarians can identify the key factors that define resilience levels of an affected population. Possible indicators include disaster risk reduction and governance, risk assessment, knowledge and education, risk management, vulnerability, and disaster preparedness and response (Twigg, 2009, from Combaz, 2013). Assessment of resilience should include a perception-based approach using questions such as, "Do you feel resilient? If not, then why not?"). DFID also has a key performance indicator to measure the number of people with improved resilience as a result of a project intervention.[49] Successful assessment requires the participation of, and action by, the population at risk.

4. **No-regrets actions.** Identify and promote no-regrets climate resilience actions that support broader resilience programming. Examples include:
   a. Climate risk management changing crop varieties in response to natural year-to-year variability in weather; for example, drought/flood-resistant varieties such as 'scuba rice'
   b. Implementing social safety nets and insurance initiatives and investing in early warning systems and improved weather prediction
   c. Avoiding building on flood plains, reducing leakage from water systems and reducing practices that cause environmental degradation and soil erosion

45 Birkmann and von Teichmann (2010)
46 DFID (2011a)
47 Based on UNOCHA (2014, p5).
48 https://www.ifrc.org/en/what-we-do/disaster-management/preparing-for-disaster/disaster-preparedness-tools1/
49 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/328254/BRACED-KPI4-methodology-June2014.pdf

d. Adopting measures with strong co-benefits, such as ecosystem-based flood protection by restoring mangroves or coral reefs, which reduces flood risk, supports livelihoods and promotes ecosystem health.

Joint assessment and planning between humanitarians and development actors in crisis-prone areas is also a no-regrets action.

5. **Funding.** There are numerous opportunities to make existing funding pools more risk informed and more focused on longer-term resilience-building measures. This requires a combination of advocacy, appropriate data and better linkages between the funding objectives of humanitarians and development actors. Furthermore, climate finance can be used in more integrated ways that augment the effectiveness of other funding streams and generate outcomes in areas such as resilience and disaster risk reduction, as illustrated in the Ethiopia case example.

Integrated climate finance approaches create more holistic outcomes in Ethiopia

Despite impressive progress, Ethiopia continues to face enormous challenges including rapid population growth, regional instability, pervasive poverty and increasingly frequent climatic and economic shocks. The number of food-insecure people is increasing. Within this context, DFID has found ways to use climate financing in more integrated and effective ways that delivers not just narrow 'climate change' results, but also resilience, development and humanitarian gains.

The Ethiopia Productive Safety Nets Programme gives predictable cash or food payments to 7.8 million chronically food insecure people. Rather than being a traditional, palliative solution involving the dispersal of food items, the programme helps beneficiaries to undertake projects, such as soil and water conservation and the construction of schools and clinics, with corresponding food-security, climate resilience, health and education outcomes. The payments also ensure that households have sufficient food, which allows them to make investments in other areas. By building resilience to food insecurity that is brought on by factors including climate shocks, the programme can ensure that humanitarian assistance is not the *de facto* norm, but brought to bear only when needed.

Source: DFID 2012a.

SECTION 4

Key topic areas

This section provides information on topics of concern to DFID advisers in a humanitarian response. The tables provide general information on the topic area, related environmental issues, typical interventions and additional evidence and information. More background and resources are contained in the Annex.

4.1 Water, sanitation and hygiene (WASH)

Issue	Most humanitarian WASH efforts focus on the short-term provision of potable water, sanitation and hygiene promotion activities, solid waste management, drainage and vector control in response to damaged infrastructure and/or displacement.
Environmental impacts	• WASH activities are linked to the environment through the use of, and potential damage to, natural resources, particularly in terms of sourcing water and disposing of waste and modification of environmental conditions to minimise vectors. • Initial response may overexploit ground or surface water resources for immediate life-sustaining interventions. Early planning is needed to reduce and remediate these impacts over time. • Initial WASH responses (e.g. water provision) may be needed for months or years while permanent solutions are put in place. Water and sanitation systems may need to transition to semi-permanent operations, with resulting impacts on the environment.
Interventions	• Ensuring the sustainability of ground and surface water supplies by conducting assessments, implementing water conservation measures and planning for the appropriate disposal of liquid waste. • Ensuring the physical resilience of water and sanitation services to disasters is an effective strategy to reduce disaster impact. • Alternative technologies for excreta and solid waste management (e.g. biogas and composting) can work, but can require considerable time and effort to become sustainable. Alternative solutions must be rigorously examined to determine their immediate and longer-term effectiveness. • Recycling and composting solid waste and the incorporation of excreta where culturally appropriate, can work to improve livelihoods by generating income and offsetting costs (e.g. compost as fertilizer replacing purchased fertilizer). However, these efforts need to be linked to livelihood recovery for maximum effectiveness.
Additional information	• Successful WASH interventions depend on identifying and addressing cultural, social and economic factors. • Recovery planning for WASH infrastructure needs to start immediately after the onset of the crisis as it often takes time to complete implementation. • Failing to assess the sustainability of water supplies can worsen humanitarian conditions and contribute to conflict over water access and environmental damage. • Considerable effort is often put into providing potable water in crises, but there are numerous examples where less attention is paid to safe excreta and waste disposal. • Systems for managing waste or excreta are often not well developed,

	even in middle-income countries. Effectively managing the excreta and waste generated following a crisis may require a significant capital investment in building or expanding liquid and solid waste management capacities, as was seen following disasters in Haiti, Macedonia, Chile and the Philippines. • Portable toilets are often used to collect excreta, particularly in urban areas. However, the disposal of the excreta often presents major challenges. Some portable toilets use deodorizing chemicals that lead to significant negative environmental impacts, as was noted in Haiti after the 2010 earthquake. • Providing water without sanitation and hygiene services is ineffective and can lead to sanitation, health and social problems, and environmental contamination. • Failing to consider long-term needs and costs for sustainable excreta and solid waste disposal is ineffective. • The lack of a clear programmatic focus on waste management does not work. Waste management is often an 'orphan issue' that is not clearly managed by the shelter, WASH or health sectors, which can lead to: waste management problems, increased vector breeding sites, disease spread and avoidable environmental damage. **For key resources, see in particular the WASH cluster page (http://washcluster.net), which includes a variety of tools including the following environmental good practices compilation (http://washcluster.net/resources/gwc-environmental-best-practice-emergency-wash-operations-2/)**

4.2 Shelter

Issue	*Shelter* refers to structures that provide protection and the location and surroundings where they are built. It also refers to associated support services including water, sanitation, hygiene, livelihoods support, energy (e.g. lighting and cooking fuel). It includes the education needed to meet the basic human right to shelter and the social and economic activities associated with shelter, such as home-based enterprises, gardens and shops. From operational and environmental perspectives, shelter can be considered as the process of rebuilding settlements.[50]
Environmental impacts	• Environmental impacts are generally associated with sourcing construction materials, the location of settlements and the package of activities associated with a settlement. These include livelihoods, provision of energy (wood and charcoal), WASH, food security and governance systems. • Environmental risks increase as one moves from emergency relief to recovery because of the high volume of resources needed for rebuilding shelter and because rebuilding attempts to replace or repair in 2–3 years what normally takes decades to build. This, in turn, can lead to unsustainable exploitation of local resources.
Interventions	• Minimise the use of resources, including resources for construction methods and materials, energy, transport and operation of the shelter unit.[51] • Reduce the impact of geophysical, hydrological and climatic hazards on those who occupy new or repaired housing. Reduce risks related to land tenure and access.[52]

[50] The concept that post-disaster shelter reconstruction should use a settlement approach has been developed by USAID's Office of Foreign Disaster Assistance.

[51] See The Green Recovery and Reconstruction Training Toolkit (WWF and American Red Cross, 2010) for details on managing resource use and Billups et al. (2014) on energy efficiency in post-crisis shelter.

	• Reduce the need for energy over the life of a shelter or settlement for cooling, heating and maintenance.[53] • Designating specific environmental management criteria and performance indicators for grants and contracts is effective and provides official direction to project management to consider environmental issues. • Ignoring land access/land tenure issues and the degree to which shelter is occupant-owned or rented is ineffective.
Additional information	• Donors may distinguish between emergency and transitional shelter versus developmental aid for permanent shelter. However, from an operational and environmental perspective, shelter after disaster should be seen as an integrated process that considers environmental impacts and optimises the use of natural resources. • Large permanent shelter operations often need donor and member state environmental reviews. Preparing for these reviews early in the humanitarian response facilitates a smooth transition from emergency to permanent shelter and addresses significant environmental issues and provides for incorporating innovation into the process. • Using local organisations and supporting local economies to provide environmental awareness training and coordinate shelter provision is an effective strategy. **For resources, see in particular the Environment in Shelter site, which includes assessment tools (http://www.environmentinshelter.org/home/); the document, Housing, Land and Property: Top Ten Resources for Shelter Actors (http://tinyurl.com/p9busey); the Global Shelter Cluster website, which contains an environmental community of practice (https://www.sheltercluster.org/Global/Pages/default.aspx); and the Green Recovery and Reconstruction Training Toolkit, which provides guidance and policy approaches (http://green-recovery.org)**

4.3 Food security

Issue	Food security involves assuring an adequate supply of food, meeting nutritional needs and cultural expectations, before and after a crisis. Achieving this can lead to a variety of environmental challenges.
Environmental impacts	Impacts and issues can arise along the food security continuum, including: • Food production: soil conservation, seed selection, pest management. • Food processing: effluent treatment, use of potable water supplies, energy sources. • Food transport and storage: carbon dioxide emissions, waste disposal, pest management. • Food use: storage, pest management, cooking. • Improving environmental conditions (e.g. no-tillage planting, multi-cropping and border cropping, etc.).
Interventions	Assuring adequate availability of, access to and consumption of, food following a crisis is normally accomplished through:[54] • Increasing food production, access and income before a crisis. • Providing cash, credit[55] or food directly to crisis survivors. Food tends to be preferred where market supplies are inadequate and cash or credit where market supplies are adequate. • Re-establishing production, markets and irrigation, transport and

52 This focus incorporates the build back better approach (Kennedy et al., 2008), which includes living in a safer environment.

53 T. Corcellis personal communication (2014); also see Billups et al. (2014).

54 The first three points are drawn from USAID (1992).

55 Credit can be provided on the form of debit cards, transfers to bank accounts or transfers to mobile phone-based fund transfer systems.

	processing infrastructure after a crisis to enable normal access to food • Introduction of new crops, plant varieties, animal strains to increase food production and market supplies.
Additional information	• The focus of environmental sustainability needs to be on the whole food security system post-crisis as opposed to any one specific issue. • EIAs are critical for identifying and managing food sector direct, indirect and cumulative impacts given the complexity of the interventions in this sector. • Single-focus interventions (e.g. provision of seeds or livestock) generally have unintended environmental consequences. • Relief and recovery interventions can address pre-crisis food security related environmental issues, but generally require a long-term approach. • Provision of agrochemicals without safe use components tends to result in environmental contamination and indirect (e.g. misuse of containers) and cumulative (e.g. surface water contamination) impacts. • It is essential to address land tenure insecurity. • Income should not be dependent on environmentally unsustainable occupations. Changes to food production or access systems need to consider expected changes to the climate, and recognise that changes to specific food security systems and climatic conditions will have gender impacts. **For resources, see in particular the Emergency Food Security Assessment Handbook (https://www.wfp.org/content/emergency-food-security-assessment-handbook), although the environment receives relatively minor coverage; ACF International's manual on food security and livelihoods assessment (http://tinyurl.com/p5yaytf), which includes the physical environment in the assessment process, but does not place livelihoods and food security in a broader environmental context; and, The Livestock Emergency Guidelines and Standards (http://www.livestock-emergency.net), which can be used to define interventions and impacts in the livestock sector post-crisis.**

4.4 Energy

Issue	Energy is essential for the delivery of humanitarian assistance, supporting the lives of disaster survivors, and supporting camps of refugees or internally displaced populations.
Environmental impacts	• Accessing energy, for example collecting wood for fuel, can have a significant impact on the local environment. In some cases it can also impact distant locations, for instance where fuel wood is purchased and transported from distance site to a camp (D. Stone, personal communication, 2014). • Energy from combustion is a source of pollutants that create pollution and can lead to health concerns, particularly when wood is burned indoors. • Combustion of fuels releases GHG that contribute to global warming. • The natural environment can recover from some excessive fuel wood collection. However, the more intense and longer the fuel collection efforts, the greater damage that can be expected. In Darfur, even the roots of trees are dug out as a source of fuel, limiting natural grow-back and possibly changing environmental conditions over the long term (D. Stone, personal communication, 2014).
Interventions	• A common post-disaster action is the provision of fuel-efficient stoves to improve the efficient use of fuel (usually wood), reduce indoor pollution (where cooking takes place indoors) and reduce demand on local forest resources. Biogas stoves can also be an appropriate choice. • One humanitarian actor needs to be responsible for the procurement of sustainable energy sources for camps to avoid the situation where camp

	residents find their own sources, often from protected areas and forest reserves. • Renewable energy options for camp lighting such as solar lanterns can also be considered.
Additional information	The effectiveness of stoves is variable. Reviews have noted that:[56] • Not all engineered stoves provided to displaced people are more efficient than some traditional stoves. • The stove provided should be based on a needs assessment taking cultural cooking preferences into account. Failure to do so leads to rejection or subsequent sale of stoves. • New, unfamiliar stoves need to be tested in similar camp-like conditions before the launch of large-scale distribution. • The provision of stoves needs to be backed by training, monitoring and extended support. Small-scale pilot projects, without sustained support, should be avoided. • The choice of stove provided is often biased by donor or partner preferences: this does not lead to wide-scale uptake and is rarely sustainable. • Lessons learned in stove and fuel management should be contextualized at the start of projects seeking to address fuel concerns; what works in one location may not work in another. • Stoves should not be considered in isolation. Good cooking practices, together with tree planting to compensate for vegetation removed, should be encouraged. • Planting trees needs to consider local land tenure issues as in some locations tree planting can be seen as a claim on land. **For resources, see in particular the following website with tools to select the best fuel-efficient stove in humanitarian action: http://www.energytoolbox.org/cookstoves/.**

4.5 Debris and waste

Issue	Disasters can create *debris,* defined as the physical remains of the damage caused by hazards such as a flooding, earthquake or warfare. Disaster survivors and humanitarian action can also both produce *waste*, including medical and biohazard waste. Unexploded ordinance (UXO) may be found in debris and waste, but are not considered either since they remain functional.[57]
Environmental Impacts	• Debris may be disposed in a haphazard manner (e.g. dumping in water courses, dumping on previously cleared land), impede relief and recovery operations and degrade water sources. • Debris and waste burning can lead to air, ground and water pollution unless done appropriately (e.g. controlled incineration). • New post-disaster health-care providers can create problems with organising safe disposal of health and infectious waste even when pre-crisis systems continue to function. This is because new entrants are not always aware of existing disposal systems. • Recycling of debris can also introduce hazards if toxic materials such as asbestos are not removed.
Interventions	• The post-conflict phase requires collection, processing, reuse/recycling and environmentally safe disposal of waste and debris. Options differ depending on the nature of the waste and crisis.

[56] These reviews are: Uganda (Academy for Educational Development, 2007); Darfur (Academy for Educational Development, 2008); Stone et al. (2008); Stone (2010); and ProAct Network (2012).

[57] See http://www.jmu.edu/cisr/journal/18.1/feature/lauritzen.shtml for a review of challenges facing a combined debris/UXO clearance operation.

Additional information	• Many countries lack the systems necessary to handle waste in normal times, and what systems do exist can become quickly overloaded post-crisis[58]. • Debris management is often not an immediate area of operational attention following a crisis as it is seen as less important than WASH services, food and shelter. • *Debris* should not be included in the normal waste management system since it can lead to faster than planned filling of landfill sites and reduce the future value of landfill sites as sources of commercial methane production.[59] • The conceptual division between debris and waste is not often recognised on the ground, leading to a mixed waste streams and disposal challenges. • Individuals, enterprises and NGOs that recycle and re-purpose debris are often not well identified in the formal economy or in relief and recovery systems. This can make it hard to empower them to take on large volumes of debris following a crisis. **For resources, see in particular the Environmental Emergencies Centre guidelines on disaster waste management (https://docs.unocha.org/sites/dms/Documents/DWM info sheet_sml.pdf); Planning for Natural Disaster Debris Guidance (http://www.epa.gov/osw/conserve/imr/cdm/pubs/pndd.pdf); and the Global Partnership on Waste Management (http://tinyurl.com/k3utkgw).**

4.6 Land tenure and land use

Issue	Land tenure and land use includes issues such as the interface between hazards (e.g. flooding) and land used for farming and housing. Social conflicts can be generated by overlapping land tenure systems; for example when local customary practices do not align with national statutory requirements. Land title and the disproportionate number of vulnerable people living in disaster-prone areas are also central issues.[60] Gender issues can also be important, particularly when people are responsible for collecting natural resources in locations with contested land tenure or in hazardous locations.
Environmental Impacts	• Some types of land use create environmental challenges and increase disaster risk. Some forms of land tenure reduce the ability to mitigate these risks.
Interventions	• Changes in land use to reduce hazard impacts are often defined through pre- or post-crisis hazard impact mapping. This information is important to changing the degree of hazard associated with land use and its development should be encouraged as part of the recovery planning process. However, by itself, this information is insufficient to trigger changes to safer land use and land tenure arrangements. Interventions to reduce risk, and particularly environment-related risks generally focus on: • Developing an understanding of the land tenure situation and doing no harm through the accidental or indirect assignation of land rights; • Direct management of land use, for instance by restricting land use and

58 See United Nations Environment Programme (2007b) for challenges on managing debris through national systems.

59 For examples see Kelly (2005) and http://www.unep.org/disastersandconflicts/Introduction/PostCrisisEnvironmentalAssessment/UNEPsEnvironmentalAssessments/tabid/54635/Default.aspx).

60 Reale and Handmer (2011); Mitchell (2010)

	building protective structures; or • Changing land use, for example reducing livestock levels where pastures are stressed.[61]
Additional information	• Land users without *de jure* or traditional rights to manage land and associated natural resources and infrastructure face significant challenges in limiting hazard impacts. • The ability to influence land use to reduce hazard impacts often needs to extend beyond where the hazard-threatened populations live, for example where flooding is due to upstream watershed changes. In most cases, those who have limited or no tenure over where they live or work will have limited abilities to change land use in more distant locations. **For resources, see in particular the Global Shelter Cluster document, Housing, Land and Property: Top Ten Resources for Shelter Actors (http://tinyurl.com/p9busey).**

4.7 Livelihoods

Issue	Livelihoods focus on how people are assured the means to live: "A livelihood comprises people, their capabilities and their means of living, including food, income and assets. Tangible assets are resources and stores, and intangible assets are claims and access." (Chambers and Conway, 1992). They are frequently a part of donors' post-crisis assistance efforts.
Environmental Impacts	• Many livelihoods lead to environmental damage. Similarly, post-crisis livelihoods interventions can lead to direct, indirect and cumulative environmental impacts. Developmental interventions can use project or strategic impact assessment to identify and manage these impacts, but relief and recovery support to livelihoods (e.g. food for work) often do not consider indirect or cumulative impacts. • Efforts to increase livelihood-supporting asset transfers following a crisis can focus on an overly limited number of livelihoods and lead to over-exploitation of natural resources. As an example of a strategy to avoid this, USAID's Office of Foreign Disaster Assistance limits distribution of chain saws following a disaster so that they do not become a means for increased deforestation. • Conflict and competition related to scarce resources may increase when conflict or disaster exacerbate resource scarcity. They may also ebb and flow on a seasonal basis depending on resource availability. • Coping and survival strategies can result in the overuse of natural assets to generate income. More broadly, in the absence of economic opportunities, affected populations may shift livelihood strategies and adopt maladaptive livelihoods that are unsuited to the capacity of the local environment. • Crises often result in short- or long-term displacement. Migrants may engage in unsustainable livelihoods to meet immediate needs. Generally the longer migrants remain away from their homes, the greater negative environmental impacts from these unsustainable livelihoods. That migrants are the cause environmental damage should be confirmed before any interventions based on this presumption are accepted or funded.
Interventions	• The environmental focus on livelihood activities is to ensure that they are sustainable, both environmentally and socially. • The direct and indirect environmental impacts of survivor livelihoods need to be assessed. Assessment provides a basis for specific programmatic interventions at policy and operational levels to minimise or avoid negative environmental impacts and avoid conflict.

[61] Mitchell, (2010); Real and Handmer (2011); Katz (2010); Chagutah (2013); Land Tenure and Management Unit (2011); and United Nations Human Settlements Programme (2010)

	• A diversified livelihood strategy (e.g. one that includes farming, wood working and cell-phone charging) can address the risk of one strategy failing (Khinmaung and Kelly, 2007). This approach can, however, make it difficult to gain large-scale acceptance of single livelihood activities.
Additional information	• Changing unsustainable livelihoods takes time and resources, requires social change, and faces a limited range of practical alternative sustainable livelihood options. • Livelihoods are often gender (and ethnically) specific, with specific positive and negative linkages to various livelihood strategies. • Supporting livelihoods requires a conflict-sensitive approach. This can help to avoid situations where one livelihood group benefits, or is perceived to benefit from support. Such situations can create grievances in other groups. • Failure to consider direct, indirect and cumulative impacts leads to unintended negative impacts on livelihood support. • Where livelihoods support has more than one use (e.g. providing credit, tools), collateral impacts on the environment can be expected unless control measures are implemented in advance. • Impact assessments can help to avoid or manage negative environmental impacts that occur as part of any livelihood support effort. • Single-task interventions (e.g. tree planting) usually only work to transfer assets and have no long-term positive impact on the environment. • Livelihood interventions (e.g. cash/fund/food for work) can contribute to improving environmental conditions where asset transfer is a tool but not the prime objective of the intervention. **For resources, see in particular World Wildlife Fund's Environmental Stewardship Review for Humanitarian Aid (http://tinyurl.com/kra7xk2); Environmental Guidelines for Small-Scale Activities in Africa: Environmentally Sound Design for Planning and Implementing Development Activities (http://www.encapafrica.org/EGSSAA/EGGSSA-front-&-back-cover.pdf); Measuring livelihoods and environment dependence (http://www.cifor.org/library/3341/measuring-livelihoods-and-environmental-dependence-methods-for-research-and-fieldwork/); and Livelihoods and climate change (http://www.iisd.org/pdf/2003/natres_livelihoods_cc.pdf).**

4.8 Climate change

Issue	Short-term climate variability and its extremes influence the range and frequency of shocks that society absorbs or adjusts to, while long-term climate variability can change and/or erode the productive base of society[62]. This, in turn, results in increased risks, in particular for the world's most vulnerable populations.
Environmental Impacts	• Climate change impacts are can be region specific. Climate change can change the distribution of key resources such as water, the frequency, intensity, duration, timing and distribution of natural hazards, and can lead to unprecedented extreme weather and climate events.
Interventions	• There are numerous sector-specific approaches such as integrating climate change into sustainable livelihoods approaches, or anticipating new disease vectors using climate risk information and acting accordingly. Turnbull et al. (2013) provide examples across sectors. • Adopting resilience and climate risk management approaches in planning and

[62] Parry and Carter (1985)

	programming can help to ensure that decision-making is sensitive to climate risks. Even if new climate risks do not materialise in a given region, a climate risk management approach will help to address existing climate risk and variability. • At the global level, the Sphere Standards include guidance on incorporating climate issues into relief and recovery (Sphere Project, 2010). • The climate change impacts of humanitarian operations themselves can be reduced. A registry of indicators for monitoring humanitarian assistance is being developed by the humanitarian community and may improve tracking climate impacts.[63] Many interventions noted in other sections of this document have GHG reduction co-benefits. For example, introducing fuel-efficient stoves may be seen as addressing climate concerns. However, the effectiveness of these stoves in reducing fuel consumption in humanitarian settings has been questioned. Other areas where climate concerns may link with humanitarian interventions include the use of solar panels, biogas digesters and shelter design. Acquiring quality carbon offsets for air travel, performing energy audits of offices and field operations, assessing the climate impact of different approaches to shelter,[64] vehicle fleet management systems, and efforts at recycling and reuse can all be appropriate GHG reduction strategies.
Evidence	• Prevention and preparedness funding that could build resilience to climate risks comprised less than 0.5% of all international aid over the past 20 years. • Humanitarian caseloads and costs are increasing, with climate change as a substantial driver and multiplier of risk. • There is very little evidence that the humanitarian community is consistently engaged in any way to reduce its own contributions to the GHG that cause climate change.
Additional information	• Evidence on the integration of climate concerns into humanitarian operations is limited. Efforts may be taking place but are not generally captured in the literature nor are they common knowledge. **For sector-specific information see Turnbull et al. (2013).** **For examples of partnerships to make better use of climate risk information, see http://www.climate-services.org/sites/default/files/IRI-IFRC_Case_Study.pdf.** **For tools to assess vulnerability and capacity, see for example https://www.ifrc.org/en/what-we-do/disaster-management/preparing-for-disaster/disaster-preparedness-tools1/**

63 See https://ir.humanitarianresponse.info/.

64 See Billups et al. (2014).

Glossary

Business case "[T]he rationale for choosing a project, programme, or approach to funding (referred to collectively as an intervention)" (DFID, 2011b).

Climate "Climate in a narrow sense is usually defined as the average weather, or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years. The classical period for averaging these variables is 30 years, as defined by the World Meteorological Organization. The relevant quantities are most often surface variables such as temperature, precipitation, and wind. Climate in a wider sense is the state, including a statistical description, of the climate system." (Field et al., 2012).

Climate change "A change in the state of the climate that can be identified (e.g. by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings, or to persistent anthropogenic changes in the composition of the atmosphere or in land use" (Field et al., 2012).

Climate risk management Managing climate-related hazards and associate vulnerabilities in ways which avoid, reduce or mitigate impacts on individuals and society.

Crisis An emergent or on-going event that threatens normal individual, community, social or corporate activity with significant negative impact.[65]

Disaster "A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources."[66]

Disaster relief Assistance provided immediately after a disaster to address life-saving and life supporting requirements. Can be provided by disaster survivors, unaffected neighbours or external parties. Note that disaster relief can be considered humanitarian assistance.

Disaster risk reduction "[T]he concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events" (Sphere Project, 2011).

Emergency "[A]n unexpected occurrence or sudden situation that requires immediate action [...] It may involve communities (as a disaster does) or individuals (which a disaster does not)" (Porfiriev, 1995).

Environment "[T]he physical, chemical and biological elements and processes that affect disaster-affected and local populations' lives and livelihoods. It provides the natural resources that sustain individuals and contributes to quality of life." (Sphere Project, 2011).

Environmental assessment "[A] systematic process of evaluating and documenting information on the potentials, capacities, and functions of natural systems and resources in order to facilitate sustainable development planning and decision-making in general, and to anticipate and manage the adverse effects and consequences of proposed undertakings in particular."[67]

65 Adapted from Lagadec (1993).

66 http://www.unisdr.org/we/inform/terminology#letter-h

67 http://web2.concordia.ca/iaia/index.php?f=detail&reference_id=3&start=20

Environmental review "[T]he process of reviewing a project and its potential environmental impacts to determine whether it meets federal, state, and local environmental standards."[68]

Humanitarian assistance Assistance provided in response to a humanitarian crisis, generally focused on immediate life-saving or life-sustaining needs, but can also include longer-term life supporting assistance, for instance in protracted conflicts or displacements.

Humanitarian crisis "[A]n event or series of events which represents a critical threat to the health, safety, security or well-being of a community or other large group of people, usually over a wide area. Armed conflicts, epidemics, famine, natural disasters and other major emergencies may all involve or lead to a humanitarian crisis that extends beyond the mandate or capacity of any single agency."[69]

Humanitarian response Incorporates the "needs assessment and analysis; strategic response planning; resource mobilisation; implementation and monitoring; and operational review and evaluation"[70] necessary to provide humanitarian assistance.

Internally displaced persons Persons who "have not crossed an international border to find sanctuary but have remained inside their home countries. Even if they have fled for similar reasons as refugees (armed conflict, generalized violence, human rights violations), internally displaced persons legally remain under the protection of their own government – even though that government might be the cause of their flight."[71]

Livelihood "[T]he capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base."[72]

Mitigation "The lessening or limitation of the adverse impacts of hazards and related disasters."[73]

Na-tech "Accidents initiated by a natural hazard or disaster which result in the release of hazardous materials are commonly referred to as natech or na-tech accidents. This includes releases from fixed chemical installations and spills from oil and gas pipelines."[74]

Natural resources "Resources produced by nature, commonly subdivided into non-renewable resources, such as minerals and fossil fuels, and renewable natural resources that propagate or sustain life and are naturally self-renewing when properly managed, including plants and animals, as well as soil and water."[75]

Preparedness The knowledge and capacities developed by governments, professional response and recovery organisations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions.[76]

Protracted crisis "[T]hose environments in which a significant proportion of the population is acutely vulnerable to death, disease and disruption of their livelihoods over a prolonged period of time. The governance of these environments is usually very weak, with the state having a limited capacity or willingness to respond to or mitigate

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68 https://www.hudexchange.info/environmental-review/

69 http://humanitariancoalition.ca/info-portal/factsheets/what-is-a-humanitarian-crisis. Note however, that the UN Office for the Coordination of Humanitarian Affairs (UNOCHA) makes a distinction between humanitarian and disaster assistance.

70 https://www.humanitarianresponse.info/humanitarian-programme-cycle

71 http://www.unhcr.org/pages/49c3646c146.html

72 http://www.eldis.org/vfile/upload/1/document/0901/section1.pdf

73 http://www.unisdr.org/we/inform/terminology#letter-h

74 http://enatech.jrc.ec.europa.eu

75 http://cmsdata.iucn.org/downloads/en_iucn__glossary_definitions.pdf

76 http://www.unisdr.org/we/inform/terminology#letter-h

the threats to the population, or provide adequate levels of protection." (Harmer et al., 2004).

Recovery "The restoration, and improvement, where appropriate, of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors."[77]

Reconstruction The rebuilding of physical infrastructure, including shelter and commercial, industrial and agricultural facilities, following a disaster.

Refugee "A refugee is someone who has been forced to flee his or her country because of persecution, war, or violence. A refugee has a well-founded fear of persecution for reasons of race, religion, nationality, political opinion or membership in a particular social group."[78]

Resilience "[T]he ability of countries, communities and households to manage change, by maintaining or transforming living standards in the face of shocks or stresses – such as earthquakes, drought or violent conflict – without compromising their long-term prospects." Department for International Developed, 2011f).

Risk "The combination of the probability of an event and its negative consequences."[79]

Secondary impact This term refers to impacts on infrastructure or industrial facilities that are triggered by a natural disaster or humanitarian catastrophe.[80]

Vulnerability In a humanitarian assistance context this is "the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard."[81] In a climate change context this is "a function of exposure to climate factors, sensitivity to change and capacity to adapt to that change."[82]

77 http://www.unisdr.org/we/inform/terminology#letter-h

78 http://www.unrefugees.org/site/c.lfIQKSOwFqG/b.4950731/k.A894/What_is_a_refugee.htm

79 http://www.unisdr.org/we/inform/terminology#letter-h

80 http://www.unocha.org/what-we-do/coordination-tools/environmental-emergencies.

81 http://www.unisdr.org/we/inform/terminology#letter-h

82 *Climate Change Risk and Vulnerability: Promoting an Efficient Adaptation Response in Australia*, Australian Greenhouse Office (2005, p*ix*).

Relevant organisations

American Red Cross was involved with World Wildlife Fund-USA on greening recovery and reconstruction following the 2004 South Asia Tsunami and the 2010 Haiti earthquake. While there appears to be an institutional commitment to incorporating environmental issues into operations, challenges of institutional memory have been noted due to staff turnover.

Green Cross International[83] is a Swiss-based NGO with associated organisations in 30 countries. Green Cross focuses the "combined challenges of security, poverty and environmental degradation to ensure a sustainable and secure future" (Green Cross International, 2010).

Groupe URD[84] is an NGO involved in humanitarian assistance, environmental issues and other humanitarian-related topics. Groupe URD has promoted both sustainable and environmentally efficient technologies for use in disasters and an awareness of the environment in the humanitarian context. Groupe URD collaborated with UNEP/PCDMB on the development of a training program on environmental issues and humanitarian assistance: "Mainstreaming the environment in humanitarian action".[85]

Inter-Agency Standing Committee (IASC) established humanitarian clusters. The clusters with the most active engagement in environmental issues are the Global Shelter, WASH, the Camp Coordination and Camp Management and Logistics Clusters, More information can be found in Kelly, 2013.

International Committee of the Red Cross (ICRC) integrates environmental sustainability into its operations (International Committee of the Red Cross, 2012). The ICRC has developed a Framework for Environmental Management in Assistance Programmes (International Committee of the Red Cross, 2009) that details conceptual and practical approaches to integrating environmental considerations into humanitarian operations.

International Federation of Red Cross and Red Crescent (IFRC) in Geneva has been involved in humanitarian-related environment issues as a co-convener of the Global Shelter Cluster and with other parts of the Red Cross movement engaging in issues such as climate change, for example through their Climate Change Centre.[86] The IFRC has made efforts to systematically incorporate sustainability into post-disaster relief and recovery assistance via the Quantifying Sustainability in the Aftermath of Natural Disasters (QSAND) project, a collaboration with BRE International and the BRE Charitable Trust. The initial focus of the project is a tool to "inform and measure the sustainability impacts and performances of various stages in the disaster timeline" (BRE Trust, 2013). The project, a field-testing stage and [87] an on-line version is being considered.

Joint UNEP/OCHA Environment Unit (Joint Unit)[88] mobilises and coordinates international response to environmental emergencies, provides support to UN members environmental emergency missions and supports OCHA in coordinating responses environmental aspects

83 www.gcint.org
84 http://www.urd.org/?lang=en
85 http://www.urd.org/Course-Mainstreaming-the
86 http://www.climatecentre.org/
87 The author is a reviewer of BRE materials.
88 http://www.unocha.org/what-we-do/coordination-tools/environmental-emergencies

of disasters. This mechanism is separate from the UNEP Post Conflict and Disaster Management Branch (see below).

Norwegian Refugee Council (NRC) has periodically engaged in environmental issues related to refugees. For instance, the NRC funded a review of environmental conditions in a refugee camp in Burundi (ProAct Network, 2009) and the integration of environmental issues into the Camp Management Toolkit (Norwegian Refugee Council, 2008). More recently, NRC commissioned a report on environmental assessment and accountability in the humanitarian sector for the NRC (Phillips et al., 2012) and an Environment in Shelter and Settlement Programs website[89].

Post Conflict and Disaster Management Branch (PCDMB), United Nations Environment Program[90] is based in Geneva and focuses on:

Post-crisis assessments;
Post-crisis environmental recovery;
Environmental cooperation for peace building; and
Disaster risk reduction.[91]

ProAct Network[92] is a Swiss-based NGO focused on the nexus of environment disasters/conflict, climate change, natural resource management and sustainable development. ProAct provides assistance with integrating these concepts and themes into cross-sector projects, policies and the Inter-Agency Standing Committee (IASC) Clusters (see above). The ProAct web site[93] contains documents on disasters, conflict and the environment for both IDP and refugee operations.

Sun Mountain International[94] is a firm specialising in environmental issues related to development and disasters. Sun Mountain led the Rapid Environmental Impact Assessment: Haiti Earthquake, 12 January 2010 (Sun Mountain, 2010), developed the "Haiti programmatic environmental impact assessment for temporary shelter" (Sun Mountain 2010b) and "Site selection, development and decommissioning for temporary relocation and resettlement sites" (Sun Mountain 2011) reports.

Swedish Defence Research Agency (FOI)[95] includes a division of CBRN Defence and Security that works on environmental and health issues related to military operations. This unit has been involved in development of deployment guidance on environmental issues (e.g. for peace keeping operations in a specific country), collaboration with UN Department of Peace Keeping Operations (DPKO), NATO and others on environmental guidance for peace-related operations and technical support to MSB (see below).

Swedish Civil Contingencies Agency (MSB)[96] is a part of the Swedish Government that deals with domestic civil defence and foreign disaster assistance. MSB has technical assistance agreements with the Joint Unit (see above) and UNHCR. It has provided expertise to the Joint Unit and others following disasters, most recently Typhoon Yolanda in the Philippines. MSB has been closely involved in the development of guidance on post-disaster debris management (Joint UNEP/OCHA Environment Unit, 2010).

89 http://www.environmentinshelter.org/home/
90 http://www.unep.org/disastersandconflicts/
91 Drawn from http://www.unep.org/disastersandconflicts/Introduction/tabid/51921/Default.aspx.
92 The author is an affiliate of ProAct Network.
93 http://proactnetwork.org/
94 The author has worked for Sun Mountain at various times.
95 Based on information provided by *Division of CBRN Defence and Security*, FOI.
96 https://www.msb.se/en/About-MSB/

UNHCR has long been involved in addressing refugee-related environmental issues. As the IASC Cluster lead for shelter and co-lead with the International Organization for Migration for camp coordination and camp management, and as a leading funder of relief and support operations, UNHCR defines the salience of and resources allocated to environmental issues. Specifically, if UNHCR's operations do not include environmental issues, then they are unlikely to be included in the response. UNHCR has a wealth of experience and information on environmental issues related to camp management, particularly in East Africa.[97]

World Wildlife Fund[98] together with other environmental NGOs, was involved in a USAID-funded project focusing on conflict and environmental issues from 1988 to 2001 (see Shambaugh et al., 2001). Following the 2004 South Asia Tsunami, World Wildlife Fund-USA collaborated with the American Red Cross on integrating environmental considerations into the ACR post-tsunami recovery program. This resulted in screening and guidance documents and the development of *Green Recovery and Reconstruction: Training Toolkit for Humanitarian Aid* (2010).[99] Modules cover project design, monitoring and evaluation, environmental impact assessment tools and techniques, strategic site selection and development, materials and the supply chain, construction, water and sanitation, livelihoods, disaster risk reduction and greening organizational operations.

97 Available at http://www.unhcr.org/pages/49c3646c10a.html and http://www.unhcr.org/3b039f3c4.html

98 The author worked for WWF on the GRRT development and use; on the flood manual; and on the Environmental Dimensions of Sustainable Recovery project.

99 Available at http://green-recovery.org/.

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Annex 1. Energy

Additional information

- Alternative energy sources such as solar panels are used increasingly in humanitarian operations. Solar powered streetlights are common in camps and light emitting diode (LED) lights are replacing conventional lights or lanterns. The benefits were demonstrated by the introduction of LED lights by DFID following the 2010 floods in Pakistan. Here, the LED lights reportedly saved energy and abated the generation of 16,185 tons of CO_2 per year compared to hydrocarbon-fuelled lamps (Murray, 2013).

- Large-scale assessments of alternate energy options in humanitarian relief operations do not appear to have been completed. Experience suggests three challenges with implementing alternative energy approaches in humanitarian operations:

    - Alternate energy sources may cost more to procure and operate than conventional sources, making them difficult to justify strictly on a lowest cost basis (C. Setchell, personal communication, 2014). This is likely to become less relevant as systems become more commercially available.
    - Operating requirements may exceed local capacities and require extensive training and support. For instance, capacities needed to manage an off-the-grid solar panel and battery system may not be available in rural areas or unsustainable after the end of external funding.
    - Alternate energy sources can subject to theft, and the facilities where they are installed to attack. A threat assessment may be appropriate for expensive systems, as well as provisions for alternate energy sources if the main source is damaged or stolen.

- The use of alternate energy sources often has a strong gender component, for instance in the use of solar-powered lights to improve the security of toilet facilities at night.

Additional resources

The US Agency for International Development has developed a tool kit for selecting the best stove approach for the disaster conditions.[100] The Women's Refugee Commission is supporting a fuel and firewood initiative to address the health and violence consequences of fuel collection and use. This initiative includes a matrix and decision trees for guiding the provision of support to women on fuel and cooking issues.[101]

[100] Academy for Educational Development (2010)

[101] For details see http://womensrefugeecommission.org/programs/fuel-and-firewood.

Annex 2. Debris and waste

Additional information

- From an environmental perspective, debris and waste management should focus on:
    - Reducing the volume of debris and waste managed;
    - Maximising the volume of waste and debris that can be reused, recycled or repurposed; and
    - Disposing of waste or debris that cannot be reused, recycled or repurposed in ways that minimise negative impacts on the environment and on settlements adjacent to disposal sites.
- Post-crisis debris and waste management are not often considered in pre-crisis recovery plans,[102] and core management policies may be lacking. Based on recent experiences,[103] four key lessons can be identified:
    - Environmentally sustainable debris management should be part of pre-crisis planning.
    - Sustainable management of debris and waste should be included in relief and recovery plans from the outset. Relief and recovery cannot proceed effectively if debris remains.
    - Debris and waste management should be based on recycling, repurposing, and reuse to limit disposal requirements.
    - Upgrades to waste management systems and facilities should be implemented post-crisis to handle increased debris and waste volumes and reduce future health, sanitation and environmental risks. In many countries there is an absence of correctly designed landfills and most waste and debris is deposited in unplanned dumps (P. Berg, personal communication, 2014).
- The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal[104] applies to movements of disaster debris across borders of 170 signatory states. If cross-border movement of debris is anticipated, then the Basel Convention Secretariat[105] should be consulted early in the planning process.
- Planning for debris management is essential. It can take weeks or months for effective debris management operations to start in the absence of pre-disaster planning. This delay can constrain the recovery process as reconstruction cannot start in earnest until debris is removed. Furthermore, improperly removed debris causes negative impacts on the environment, settlements and individuals. A piecemeal approach to debris and waste management does not work and can create additional environmental problems. Health-care and infection-carrying waste can be safely managed if a comprehensive management system exists or is established post-crisis.
- Assessing local and national debris and waste management capacities and expanding these capacities to address disaster-generated debris/waste is an

102 An example of a pre-disaster debris management plans can be found at http://www.calema.ca.gov/Recovery/Pages/Debris-Management.aspx. An example of a manual on planning for debris management can be found at http://www.nj.gov/dep/dshw/toolkit.pdf.

103 See Joint UNEP/OCHA Environment Unit (2011); Crisis Prevention and Recovery (2013); and Office of Solid Waste and Emergency Response/Office of Solid Waste (2008).

104 http://www.basel.int/TheConvention/Overview/tabid/1271/Default.aspx

105 See http://www.basel.int/Home/tabid/2202/Default.aspx.

effective strategy. The capital costs of upgrading national-level capacities can be significant but in many cases, this cost is necessary to assure safe long-term waste and debris disposal. The example of the installation of a sewage treatment facility in Port-au-Prince following the earthquake provides an example of this.[106]

- Reusing, recycling and repurposing are effective strategies. However, they often require an initial investment to find organisations to do the work, provide training and market development and engage over the longer term, particularly when these efforts are part of a livelihoods support effort.
- Debris management and waste clean-up campaigns provide mechanisms to transfer assets to crisis survivors through labour-intensive public works. However, these efforts need to be based on an environmentally sustainable debris and waste management plan and not just move waste and debris from one location to another.

Tools and resources

The following publications and links provide additional information on environment, debris and waste management post-crisis:

- Disaster Waste Management (Joint UNEP/OCHA Environment Unit, 2011)
- Guidance Note: Debris Management (Crisis Prevention and Recovery, 2013)
- Planning for Natural Disaster Debris Guidance (Office of Solid Waste and Emergency Response/Office of Solid Waste, 2008)
- US Environmental Protection Agency:
    - http://www.epa.gov/epawaste/conserve/imr/cdm/debris.htm
    - http://www.epa.gov/region5/waste/solidwaste/debris/disaster_debris_resources.html
- Global Partnership on Waste Management: http://www.unep.org/gpwm/InformationPlatform/WasteManagementGuidelines/tabid/104478/Default.aspx
- UNDP Guidance Note on Municipal Solid Waste Management (United Nations Development Programme, 2014)

106 See http://www.golder.com/global/en/modules.php?name=Newsletters&op=viewarticle&sp_id=194&page_id=1100&article_id=681.

Annex 3. Food security

Additional information

- Evidence indicates that the following need to be considered during all phases of humanitarian response:
    - **Food security systems** (production, processing, transporting and distributing food) may have been causing environmental damage prior to the crisis based on unsustainable cropping and livestock production systems, agrochemical use, land conversion (e.g. from forest to pasture), procedures used for food transformation and the lack of treatment of waste. In some cases, these problems contribute to hazard impacts during disasters. For example, excessive tilling may lead to erosion and mud flows.
    - **Quick interventions** to re-start food production systems do not always take into account environmental impacts or operational sustainability and may lead to limited positive impacts on food security. An example is the introduction of new seeds dependent on fertilizers that local populations cannot afford.
    - **Development and relief interventions** can have negative impacts on food security ranging from changing groundwater levels in ways that affect low technology irrigation to introducing exotic species that adversely affect damage food security.[107]
    - **Interventions to re-start food production** do not always address underlying environmental risks such as the introduction of plant diseases or exotic species that out-compete indigenous plants.
    - **Opportunities to address underlying environmental issues** related to food security can be hard to address through short-term post-crisis assistance.
    - **Title and tenure of land** may unclear clear, contested, lead to limited investment in sustainable agriculture and focus on short-term excessive extraction of benefits (e.g. overgrazing).
- These issues require that assessment of environment–food security linkages be an early part of any humanitarian response focusing on food security.
- The Humanitarian Charter and Minimum Standards in Humanitarian Response (Sphere Project, 2011) provides standards and indicators for managing and minimising the environmental impacts of improving food security following crisis, including:
    - **Food security and nutrition assessment standard 1**: Where people are at increased risk of food insecurity, assessments are conducted using accepted methods to understand the type, degree and extent of food insecurity, identify those most affected and define the appropriate responses. Assessments are key to understanding the food security–environment links.
    - **Cash and voucher transfers standard 1**: Access to available goods and services. Cash and vouchers are ways to address basic needs and protect and re-establish livelihoods. Pre-crisis livelihoods should be assessed to identify changes needed to reduce negative environmental impacts.

107 See http://www.irinnews.org/report/72563/swaziland-alien-plants-invading-agricultural-land. More on invasive species can be found at http://www.issg.org/ and http://www.issg.org/is_what_are_their_impacts.htm.

- **Livelihoods standard 1**: Primary production. This relates to ensuring that primary production mechanisms are protected and supported. Production systems should be assessed to identify negative impacts and opportunities for positive environmental outcomes.
- **Livelihoods standard 2**: Income and employment. When income generation and employment are feasible livelihood strategies, women and men should have equal access to appropriate income-earning opportunities. Livelihood strategies should be assessed in terms of negative and potential positive impacts, and changes supported where appropriate.

- The environmental impacts of livestock and land use to support livestock should be an integral part of humanitarian planning and programming, including in many urban contexts. Consideration should include:

  - Small and large livestock;
  - Pasturing by women/girls and men/boys;
  - Overgrazing;
  - Land use and land tenure systems; and
  - Livestock herding patterns and commercial livestock operations, all of which have strong links to environmental activities (but are often not well integrated into humanitarian responses).

Finally, food security activities should sustainably increase productivity and resilience while reducing the production of GHG.[108]

Tools and resources

Food security related tools and resources tend to incorporate the environment only by reference or as one factor among others. For instance, the *Emergency Food Security Assessment Handbook* (World Food Programme, 2009) refers to environmental issues but does not provide in-depth information. ACF International's manual on food security and livelihoods assessment (ACF International, 2010) includes the physical environment in the assessment process but does not place livelihoods and food security in a broader environmental context.

The *Livestock Emergency Guidelines and Standards* (2009) can help define interventions and impacts in the livestock sector following a crisis. Where pastoralist and farmers are both present in intervention areas, a specific need is to consider cross-sector and cumulative impacts, which may require a strategic environmental assessment (see Organisation for Economic Co-operation and Development, 2006).

These documents and tools to assess food security are useful in identifying environmental aspects of food security crises and may provide a more focused result on food security–environment linkages.

[108] Adapted from Food and Agriculture Organization (2010).

Annex 4. Land tenure

Additional information

There is increased awareness of the importance of land use and tenure in post-crisis reconstruction. For example, the Global Shelter Cluster includes expertise on land tenure in their support to shelter providers[109] and post-crisis assistance is shifting from a focus on shelter alone to focusing on *settlements,* in which land use and land tenure are key considerations and protection concerns are linked to land tenure and safe resettlement.

At the same time, physical interventions such as changing land use require clarifying land rights and assuring land tenure. These outcomes take time, require empowerment of those at risk and are linked to governance improvements. These interventions can also face strong resistance since they can lead to *de jure* and *de facto* power structure changes.

Short-term, post-crisis interventions can change hazardous land use but are unlikely to have broad or wide impacts. Real change in land use and improving land tenure arrangements are long-term efforts and should be part of pre-crisis risk management, including developmental efforts to reduce disaster risk and build resilience.

[109] See https://www.sheltercluster.org/References/Pages/Housing-Land-and-Property.aspx for more information on shelter, land tenure and property rights.

Annex 5. Water, sanitation and hygiene: integrating environmental considerations[110]

Additional information

General guidance

- Water resources: Water should come from sustainable supplies. If this is not possible then water conservation measures should be used to extend the life of unsustainable sources and a shift to sustainable sources should be made as quickly as possible. Efforts should be made to restore overused sources where possible.
- Water treatment: Surface and underground water generally needs to be treated before consumption.[111] Some common chemicals used for water treatment or as disinfectants, such as chlorine,[112] can have a negative impacts on the environment if not handled and disposed of properly.[113]
- Excreta disposal: Key environmental issues related to excreta disposal are:

    - Land contamination from open field defecation and subsequent surface water contamination;
    - Groundwater contamination from poorly sites or constructed toilets;
    - Improper disposal of excreta once collected from latrines or toilets; and
    - The use of water for cleaning, which can result in a rapid filling of latrines and contaminated run-off from toilets.

    A range of methods for environmentally sound excreta disposal has been developed, including using excreta to generate biogas. Davis and Lambert (2002) provides an overview of approaches to excreta disposal.

- Solid waste management:[114] A failure to appropriately manage solid waste can lead to environmental contamination, deposition of waste in drainages leading to flooding and an increase in vectors and vector-related sanitation and health problems. Solid waste management provides opportunities to support livelihoods through waste collection, recycling and reuse (e.g. composting to produce fertiliser).[115]
- Drainage: Drainage activities must ensure that water sources (e.g. wells, pipe stands, washing areas) do not cause pools of stagnant water and that muddy areas or similar sources of vector breeding or groundwater contamination do not form; and rain water does not cause pools, ponds and muddy areas that provide vector breeding sites and reduce hygiene. Managing drainage involves interventions to address specific sources such as soak pits for tap stands, swales for rain run-off and retention ponds in areas subject to heavy precipitation. These activities often overlap with shelter and settlement work, can fall between organisational responsibilities and need focused coordination and targeted inclusion in projects.

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110 This text includes comments of Rick Bauer, Norwegian Refugee Council. The text remains the responsibility of the author.

111 Water may be potable at source, but treatment is often necessary in delivery to users, including household *point of use* treatment. See http://www.sswm.info/category/implementation-tools/water-purification/hardware/water-purification-emergencies/pou-water-p.

112 Note that chlorine is considered a dual use chemical; it is commonly used for water treatment but can also be a weapon.

113 See WASH Technical Paper on Water Treatment Waste Management: http://www.washcluster.info/?q=content/wash-technical-paper-water-treatment-waste-management.

114 A distinction is made between the solid waste and debris, e.g. damaged concrete following an earthquake. For more details see Section 4.2.

115 See http://www.washcluster.info/?q=content/wash-technical-paper-re-use-and-recycling.

- Hygiene promotion: Successful hygiene promotion requires sustainable water sources and environmentally sound waste disposal. Hygiene messaging and promotion can focus on maintaining good environmental conditions through proper liquid and solid waster disposal.
- Remediation: Where temporary waste storage sites are used, plans and projects are needed to remove and remediate the sites as was done in south-western Sri Lanka as part of the overall waste and debris management program.
- Vector control: [116] Environmental management to eliminate vectors, for example, removing or reducing vector breeding and nesting,[117] is the preferred method to control vectors. Chemical control may be necessary for short periods in major health crises but requires attention to safe use and management, including container disposal and worker safety. In practice, vectors are often controlled using chemicals in the short term, as non-chemical control often requires changes in personal and social habits and awareness campaigns. However, chemical methods are generally not sustainable, can harm the environment and the persons applying the chemicals, and contribute to post-treatment increases in vector populations. Chemical control may be necessary for disease control, while environmental management can be used for prevention. Limited and targeted use of chemicals such as a treated bed nets where flying insects are vectors, is an effective supplement to managing overall environmental conditions. Environmental management is often less costly and more effective over the long-term than chemical control measures. See CARE International and ProAct Network (2010) on chemical control options.

Core Policies Related to the Environment and WASH

The Humanitarian Charter and Minimum Standards in Humanitarian Response (Sphere Project, 2011) provides standards and indicators on WASH-related interventions and the environment, including:

- Water supply standard 1. Access and water quantity: the selection of water supplies should consider environmental impacts and sustainability.
- Excreta disposal standard 1. Environment free from human faeces.
- Vector control standard 2. Physical, environmental and chemical protection measures: a combination of site selection, drainage and environmental and chemical control methods should be used to safely control vectors.
- Vector control standard 3. Chemical control safety: chemical control methods should assure human health and the environment are protected and control methods do not create resistance to control chemicals.
- Solid waste management standard 1. Collection and disposal: the environment is not contaminated with solid waste, including health care and infection-carrying waste, and means are available for appropriate waste disposal.
- Drainage standard 1. Drainage work: Crisis survivors have an environment that is free from water erosion and wastewater.

116 "WASH interventions typically deal with reduction of water borne breeding sites for mosquitoes and flies, and distribution of insecticide treated bed nets for prevention. Spraying is typically the domain of health departments and specialized agencies like MENTOR." (Bauer, 2014).

117 See http://www.washcluster.info/?q=download/file/fid/349.

Additional resources

The Green Recovery and Reconstruction Training Toolkit (Worldwide Fund for Nature, 2010) provides guidance and policy approaches for the following WASH-related areas:

- Water and Sanitation (Module 7)
- Environmental Impact Tools and Techniques (Module 3)
- Strategic Site Planning and Development (Module 4)
- Disaster Risk Reduction (Module 9)

Other useful resources include:

- Davis and Lambert (2002), *Engineering in Emergencies: A Practical Guide for Relief Workers*, Second Edition, RedR/IT Publications.
- WASH Cluster Environment Cross-Cutting Issues pages: http://www.washcluster.info/?q=cross-cutting-issue/environment, including
    - Potential Environmental Impact Checklist for Common WASH Interventions: http://www.washcluster.info/?q=content/potential-environmental-impact-checklist-common-wash-interventions
    - The Environment, Water, Sanitation and Hygiene: Key Concepts and Considerations in Emergency Response: http://www.washcluster.info/?q=content/environment-water-sanitation-and-hygiene-key-concepts-and-considerations-emergency-response
    - Environmental Best Practice in Emergency WASH Operations: http://www.washcluster.info/?q=content/environmental-best-practice-emergency-wash-operations
    - WASH Technical Paper on Water Treatment Waste Management: http://www.washcluster.info/?q=content/wash-technical-paper-water-treatment-waste-management
    - WASH Technical Paper on Re-Use and Recycling: http://www.washcluster.info/?q=content/wash-technical-paper-water-treatment-waste-management
    - WASH Technical Paper on Reducing the Environmental Impacts of Vector Control Chemicals in Emergencies: http://www.washcluster.info/?q=content/wash-technical-paper-reducing-environment-impacts-vector-control-chemicals-emergencies
    - WASH Technical Paper on Disaster Waste Management: http://www.washcluster.info/?q=content/wash-technical-paper-reducing-environment-impacts-vector-control-chemicals-emergencies
- Emergency Sanitation Project (a multi-agency initiative on alternative sanitation solutions): http://www.emergencysanitationproject.org/
- Sustainable Sanitation Alliance fact sheet on emergency and reconstruction: http://www.susana.org/lang-en/library/rm-susana-publications?view=ccbktypeitem&type=2&id=797

Annex 6. Shelter

Additional information

- Since the 2011 update of the *Sphere Standards*, a transitional shelter approach has been an integral part of the guidance on shelter and non-food items (Sphere Project, 2011). Recommended solutions are: transportable, transferrable (i.e. re-usable) and transformable (i.e. can be upgraded).
- In terms of environmental impact, shelter designs that reuse or re-purpose materials or allow structure upgrades can have a positive impact on resources use during reconstruction. Conversely, approaches where different shelters or different sets of materials are required for each phase may increase stress on the environment (Kennedy, 2014).
- Land tenure and access issues overlap considerably with environmental concerns. This is often because land is considered a natural resource and the location of settlement sites following a crisis is frequently subject to complex tenure and governance issues. For more information see Global Protection Cluster and Shelter Cluster (2013), Swiss Resource Centre and Consultancies for Development and International Federation of Red Cross and Red Crescent Societies (2012), and https://www.sheltercluster.org/References/Pages/Housing-Land-and-Property.aspx.
- Challenges faced in implementing an environmentally sound response include:
    - Multiple actors: Shelter sector responses are often complicated by numerous actors providing a variety of types of shelter using differing mechanisms;
    - Access to resources: Timely, legal and sustainable access to natural and other resources, including environmentally safe land, is a general challenge in moving survivors from at risk-locations to new environmentally sustainable housing sites;
    - Transition time gap: There is often a significant time gap between emergency and transitional shelter construction, and permanent shelter solutions. A transitional approach to settlements and infrastructure has been less well articulated than the transitional approach to individual shelters. In Haiti, it was later recognised that too much attention was paid to transitional shelter, and too little paid to permanent shelter. It is not uncommon for transitional shelter sites to become permanent, but often without necessary support systems (e.g. water, sewage, roads, etc.).

Additional resources

- Background on humanitarian shelter and settlement issues is available from Shelter Centre (2010) and the Shelter Centre website (http://www.sheltercentre.org).
- The Humanitarian Charter and Minimum Standards in Humanitarian Response (Sphere Project, 2011) provide standards and indicators related to managing and minimising the environmental impacts of shelter provision following crisis, as follows:
    - Core Standard 3. Assessment: The priority needs of the disaster-affected population are identified through a systematic assessment of the context, risks to life with dignity and the capacity of the affected people and relevant authorities to respond.
    - Shelter and Settlement Standard 1. Strategic planning: Shelter and settlement strategies contribute to the security, safety, health and well-being of both displaced and non-displaced affected populations and promote recovery and reconstruction where possible.

- Shelter and Settlement Standard 2. Settlement planning: The planning of return, host or temporary communal settlements enables the safe and secure use of accommodation and essential services by the affected population.
- Shelter and Settlement Standard 3. Covered living space: People have sufficient covered living space providing thermal comfort, fresh air and protection from the climate ensuring their privacy, safety and health and enabling essential household and livelihood activities to be undertaken.
- Shelter and settlement standard 5. Environmental impact: Shelter and settlement solutions and the material sourcing and construction techniques used minimise adverse impact on the local natural environment.
- Non-food items standard 4. Stoves, fuel and lighting: The disaster-affected population has access to a safe, fuel-efficient stove and an accessible supply of fuel or domestic energy, or to communal cooking facilities. Each household has access to appropriate means of providing sustainable artificial lighting to ensure personal safety.

Key assessment tools and resources include the following:

- Shelter Cluster Environmental Checklist (http://proactnetwork.org/proactwebsite/media/download/resources/EA-Tools/Kelly_Emergency%20Shelter%20Environmental%20Checklist-V%201_2005.pdf). This is designed for use at shelter sites to identify salient environmental issues, and can be used to review shelter plans. Developed in Sri Lanka, this tool has been used in Haiti and the Philippines.
- The Global Shelter Cluster provides information on overall shelter response specific to environmental issues (https://www.sheltercluster.org/References/Pages/CrossCutting.aspx).
- The Shelter Centre (http://www.sheltercentre.org), is an excellent resource for post-disaster emergency and transitional shelter issues, including documents on environmental issues.
- The Humanitarian Library (http://humanitarianlibrary.org/) has materials from the Shelter Centre web site and other materials related to humanitarian assistance.

Annex 7. Livelihoods

Additional resources

Van Breda et al. (2010) provide guidance on assessing and addressing the environmental impacts of livelihoods.

Tools include:

- World Wildlife Fund's *Environmental Stewardship Review for Humanitarian Aid*[118]
- US AID's *Environmental Guidelines for Small-Scale Activities in Africa: Environmentally Sound Design for Planning and Implementing Development Activities* (Africa Bureau, 2007).[119]
- The book, *Measuring Livelihoods and Environment Dependence*, available at http://www.cifor.org/library/3341/measuring-livelihoods-and-environmental-dependence-methods-for-research-and-fieldwork/.
- Livelihoods and climate change: http://www.iisd.org/pdf/2003/natres_livelihoods_cc.pdf.

Other assessment tools (e.g. Kelly, 2005, Groupe URD, no date) and UNEP's *Environmental Needs Assessment in Post-disaster Situations: A Practical Guide for Implementation* (United Nations Environment Programme, 2008) can be used to assess and address environmental aspects of livelihood support programming.

Standard environmental and strategic impact assessments will also identify significant environmental issues within livelihoods development assistance in a normal developmental context.

[118] Available in GRRT Module 3, Environmental Impact Tools and Techniques (Worldwide Fund for Nature, 2010).

[119] Currently being revised.

Annex 8. Climate change

Additional information

- The application of disaster risk reduction concepts to prevention, mitigation and recovery should inherently include climate hazards and climate change, particularly for development project related disaster risk reduction. However, there is no clear evidence that climate-focused disaster risk reduction efforts are incorporated into development programming or assistance. In the Sahel, for example, Gubbels (2012) argues that a greater focus on disaster risk reduction and building resilience to climate risks has yet to take place despite recurrent emergencies. Miles (2013) argues that addressing disasters requires different approaches from addressing climate change, and the two should not be addressed in a single process.
- Climate concerns can be integrated into humanitarian responses by adopting climate-sensitive approaches common in the non-humanitarian sphere, for example reducing or offsetting the use of aircraft or energy use audits. However, an effective driver for these efforts is not clear. The Sphere Standards (Sphere Project, 2010) advocate for climate-sensitive humanitarian assistance, but the operational incentive to climate integration needs a stronger monitoring of both impacts and methods used, and of financial incentives. Implementers need to be assured that proposing measures to incorporate climate considerations do not reduce the likelihood of funding.

Additional resources

- DFID has funded an effort on Climate Smart Disaster Risk Management. While it is more focused on disaster risk reduction, the materials are also relevant for climate-sensitive recovery programming. Details are at: http://www.eldis.org/go/topics/resource-guides/climate-change/key-issues/strenghtening-climate-resilience/climate-smart-disaster-risk-management/climate-smart-disaster-risk-management#.VD2UWxYppQI and http://community.eldis.org/.59d5ba58/CSDRM-publications.html and in Harris et al. (2012).