Addressing energy efficiency and climate neutrality in humanitarian shelter and housing

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Workshop **'The future of social housing: environmental and social challenges and the way forward'**

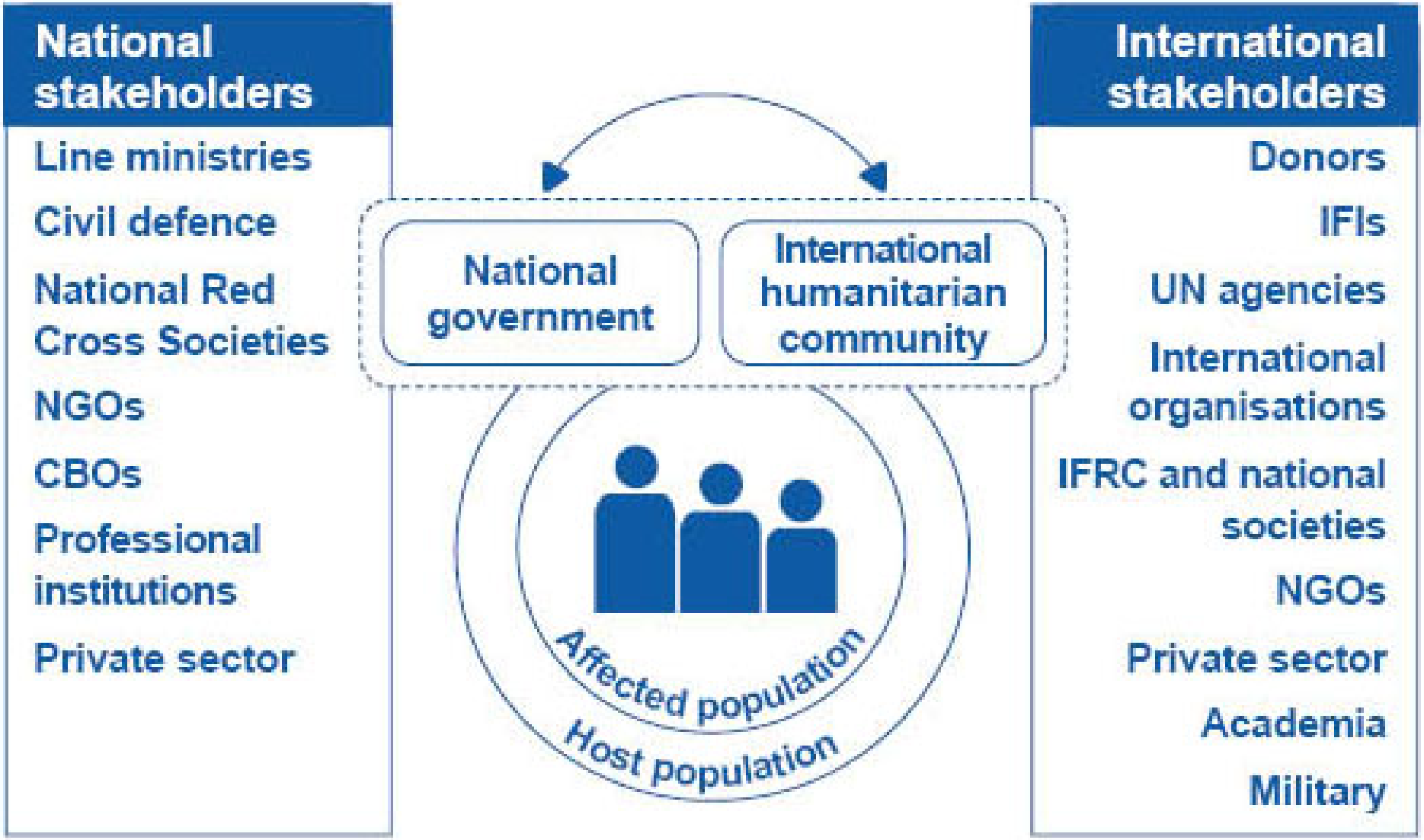
Presentation contents

1. Humanitarian shelter and housing
2. Energy efficiency
3. Climate neutrality

1. Humanitarian shelter and housing

shelter centre

connecting and supporting the humanitarian shelter community responding to settlement and reconstruction needs after conflicts and disasters



Shelter after disaster: strategies for transitional settlement, UN, DFID, Shelter Centre, 2010
http://sheltercentre.org/library/shelter-after-disaster

1. Humanitarian shelter and housing

Shelter or housing, for those not affected but displaced, are:

- essential for survival
- essential for economic recovery
- essential for disaster risk reduction

1. Humanitarian shelter and housing

Around 50% of urban populations are tenants*

Around 80% of shelter and housing is built by those affected*

Needs in CAR are very different to those in the Philippines:

– in CAR, the environment is a fragile critical factor for survival

– in the Philippines, reconstruction often replaces in a few months what has taken decades to build, with the consequent environmental impacts

*** These are estimates, as accurate statistics do not exist**

1. Conclusions

Disasters as an environmental opportunity, if preparedness is undertaken and if a longer-term approach can be sustained, however the trend before the disaster often continues after

Who benefits? [the world]

– the affected population

– the host population

Who is responsible and accountable?

– if an EiA is undertaken, who acts, with which resources?

– national legislation may be insufficient and/or unenforceable

– there is no ‘international right to the environment’

2. Energy efficiency

2.1 Preparedness

2.2 Emergency

2.3 Transition and recovery

2.4 Tools

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2.1 Preparedness

What is the most appropriate, not effective, energy activity?

Remembering what works: national institutional memory

Limiting building damage: zoning, standards and building codes

– lack of public/political will for development and enforcement

– ‘earthquakes don’t kills people, buildings do’, ‘earthquakes don’t destroy buildings, political will does?’, destruction of buildings is proportionate to environmental impact

“Preparing for post disaster shelter also needs to address why higher initial costs are justified and how subsidies or other mechanisms can be used to address the cost factor”

Post Disaster Shelter and Energy Efficiency: A Review of Information and Issues
Adele Billups, Margaret Ledyard-Marks and C. Kelly (undated and unpublished)

2.2 Emergency

What is the most appropriate, not effective, energy activity?

The humanitarian imperative

Preparedness and stockpiling

The selection of materials considered with recycling and disposal

Rubble removal, debris management

Difficult to do development activities in emergencies – developmental approach must have funding present in country to achieve sustainability

http://sheltercentre.org/library/plastic-sheeting-guide-specification-and-use-plastic-sheeting-humanitarian-relief
http://humanitarianlibrary.org/channel/debris-management

2.3 Transition and recovery

What is the most appropriate, not effective, energy activity? Cost-benefit analysis, from local and international perspectives

Relocation or reconstruction away from hazards is an opportunity to improve environmental performance

Building design and orientation, materials selection– embodied energy, Life Cycle Analysis

Quantifying Sustainability in the Aftermath of Natural Disasters (QSAND) - a kind of “BREEAM” certification by IFRC

Transitional shelter – recycle, reuse, resell, relocate

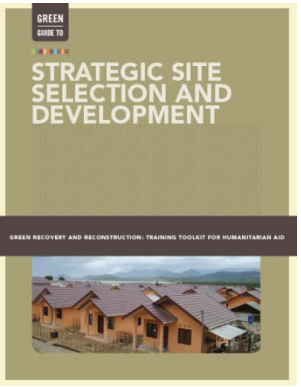
Stoves and cooking

http://sheltercentre.org/transitional shelter guidelines
http://sheltercentre.org/library/smoke - killer in the kitchen

2. Energy efficiency

"KEY PRINCIPLES OF ENVIRONMENTALLY SUSTAINABLE CONSTRUCTION

- Actively consider the full life cycle of building materials, including the economic and environmental cost.
- Use existing materials and resources where possible.
- Sourcing and procurement decisions must consider the local appropriateness of the material, legality, cost, transport distance, and impact on the environment.
- The life span of the building, its various uses, and its flexibility should be actively considered in building design.
- Building designs should address local climatic variability and energy efficiency.
- The use of buildings typically produces solid waste, and this should be factored into building design and maintenance.
- Site selection should take into account the availability of freshwater resources. Designs should consider ways to reduce building waste and minimize water pollution.
- Community participation and analysis of existing building practices are essential for successful building construction and the minimizing of environmental impact and wastage."



http://green-recovery.org/

2. Energy efficiency

"Ideal practices in providing shelter after disaster include:

- All shelter-related resources are obtained from near where they are used to reduce the energy needed for transportation.
- All structures are designed to resources in an energy efficient way to reduce the energy needed to construct the shelter and develop ancillary sites and services.
- All structures to be designed in such a way that the energy needed for heating or cooling is minimize, if not eliminated."

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http://sheltercentre.org/post-disaster-shelter-and-energy-efficiency

2.4 Tools

Involving communities, understanding their priorities and VFM

Training builders

Training humanitarian aid workers and on-site advisors

Environmental Impact Assessments and EMMA

Zoning and building codes

Building political will, locally, nationally and internationally, to bridge to development, especially in coordinating funding

PreventionWeb
Serving the information needs of the disaster reduction community

preventionweb.net/english/
http://emma-toolkit.org/
http://green-recovery.org/
http://sheltercentre.org/library/guidelines-rapid-environmental-impact-disasters-version-44
http://sheltercentre.org/library/passa-participatory-approach-safe-shelter-awareness-manual
http://sheltercentre.org/library/safer-homes-stronger-communities-handbook-reconstructing-after-natural-disasters

3. Climate neutrality

3.1 Preparedness and emergency

3.2 Transition and recovery

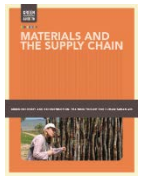
Transition and recovery *Pakistan case study*

3.1 Preparedness and emergency

What is the most appropriate, not effective, climate activity?

Minimising logistics impacts through national and regional stockpiling

Following the 2005 Haiti earthquake, during emergency phase alone, two to three million timber poles were used (40 to 60 km2 of plantation forest) for shelters and most timber was imported from the USA with some imported from Canada and Dominican Republic (Navaratne, 2010)



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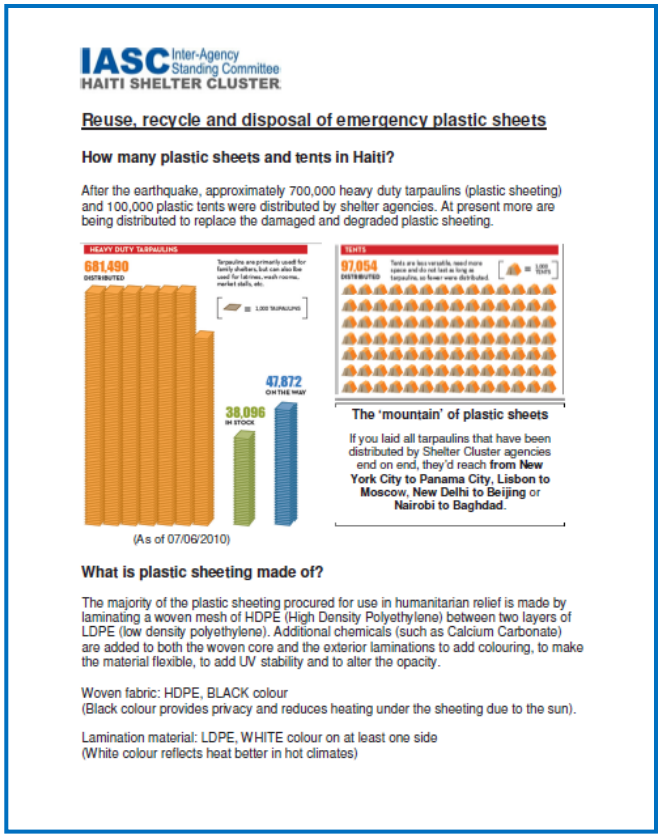


IASC Inter-Agency Standing Committee
HAITI SHELTER CLUSTER

Reuse, recycle and disposal of emergency plastic sheets

How many plastic sheets and tents in Haiti?

After the earthquake, approximately 700,000 heavy duty tarpaulins (plastic sheeting) and 100,000 plastic tents were distributed by shelter agencies. At present more are being distributed to replace the damaged and degraded plastic sheeting.

(As of 07/06/2010)

The 'mountain' of plastic sheets

If you laid all tarpaulins that have been distributed by Shelter Cluster agencies end on end, they'd reach **from New York City to Panama City, Lisbon to Moscow, New Delhi to Beijing** or **Nairobi to Baghdad**.

What is plastic sheeting made of?

The majority of the plastic sheeting procured for use in humanitarian relief is made by laminating a woven mesh of HDPE (High Density Polyethylene) between two layers of LDPE (low density polyethylene). Additional chemicals (such as Calcium Carbonate) are added to both the woven core and the exterior laminations to add colouring, to make the material flexible, to add UV stability and to alter the opacity.

Woven fabric: HDPE, BLACK colour
(Black colour provides privacy and reduces heating under the sheeting due to the sun).

Lamination material: LDPE, WHITE colour on at least one side
(White colour reflects heat better in hot climates)

3.3 Transition and recovery

Trying to build in a two years what took hundreds of years to build, involving the all of the material inputs over that period in addition to the disposal of the waste caused by the destruction

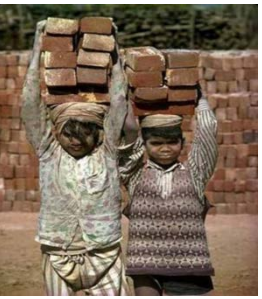
Is carbon offsetting relevant? The lignite-fired power stations in Kosovo impact the environment negatively, however carbon offsetting by planting trees elsewhere does not help Kosovo

The energy lens has other benefits and is a useful yardstick for outcomes across humanitarian response

3.3 Transition and recovery *Pakistan case study*

For 100,000 One Room Shelters – post 2010 flooding

Bricks Needed for One House:	5,500
Total Bricks Required:	550 million
Total Kilns Required:	106 kilns for one year
Deforestation:	50,770 Acres w/o trees for 10 yrs
CO2 Emissions:	316,470 tons of CO2
Carbon Credits Admissible:	USD $ 4.75 million
Dioxins:	234 gms



Magnus Wolf-Murray, DFID Technical Advisor Pakistan,
http://sheltercentre.org/meeting/material/environment-and-shelter-post-disaster

3.3 Transition and recovery *Pakistan case study*

Local and Global Emissions – total brick production in Pakistan

CO2 Emissions : 37.4 million Tonnes

Dioxins : 425.88 nanogrammes

Equal to:

- 40m Pakistanis CO2 / year
- 9 million cars CO2 / year

Value for Money for DFID includes triple bottom line accounting:

economics, social, environment

Magnus Wolf-Murray, DFID Technical Advisor Pakistan,
http://sheltercentre.org/meeting/material/environment-and-shelter-post-disaster

3.3 Transition and recovery *Pakistan case study*

The blocks in the shade are lime-stabilised compressed earth blocks, which will stay in the shade for 28 days to cure properly

Magnus Wolf-Murray, DFID Technical Advisor Pakistan,
http://sheltercentre.org/meeting/material/environment-and-shelter-post-disaster

Conclusions

Disasters are an environmental opportunity, if preparedness is undertaken and if a longer-term approach can be sustained, however the trend before the disaster often continues after

Prioritisation must be included in the humanitarian imperative, where this is the case, or balanced against it

Improving energy efficiency can cost more initially, raising the question of who pays, with limited household or external funding

There may be resistance to new energy efficient methods and materials by disaster survivors because they are new, and most disaster survivors want to return to the familiarity of life before

"Cost is also a critical issue when asking for external funding to cover part or the whole cost of energy efficient post disaster shelter. Solid information on the benefits of the energy efficiency need to available immediately after a disaster."

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