Shelter Cluster Philippines
ShelterCluster.org
Coordinating Humanitarian Shelter

Shelter and Environment – An Overview

Typhoon Yolanda Response, Philippines




Haiyan Shelter Cluster

12 January 2014

1. The Environment and Typhoon Yolanda

The Philippines - a historically threatened environment

The Philippines is a country with many environmental challenges, - deforestation, marine degradation, soil erosion, destruction of watersheds, poor solid waste management and water pollution. Less than one fourth of the country has forest cover, more than 70% of the coral reefs are threatened and the country produces well in excess of 10 million tons of solid waste annually, most of which goes into open or partially controlled dumps.

Yolanda hits

The high winds and storm surges of Typhoon Yolanda undoubtedly caused considerable direct damage to ecosystem. However the biggest environmental threat came in the aftermath due to the massive quantity of debris left behind by the typhoon that has to be cleared, repurposed and/or disposed of. This debris is already overwhelming the limited number of open or partially controlled dumpsites in the affected areas. A considerable quantity of debris, with a potential component of hazardous material (medical waste, electronic wastes, industrial chemicals) still remains on the ground waiting to be cleared.

a) Open dumps filling up fast.

b) Debris waiting to be cleared.

Destroyed livelihoods

In addition to the direct environmental impacts of Yolanda, secondary impacts will emerge in the disaster recovery stage. The typhoon has destroyed livelihoods (e.g., fishing, coconut cultivation) of many communities living in ecologically and economically marginal conditions. In the disaster aftermath, these communities are compelled to exploit natural resources further exasperating risk and vulnerability from potential hazards such as landslides and floods.

Re-building – and do no harm principle

The rebuilding process also inevitably exerts additional pressure on natural resources. Around 500,000 families are in need of substantial shelter assistance. The construction material needs for rehabilitation of roads, schools, hospitals and eventual rebuilding of permanent houses will coincide with the current construction boom experienced in major cities such as Metro Manila. Most construction material such as sand and gravel is currently

extracted from sensitive ecological systems such as rivers and streams already in a highly degraded state.


c) Timber sand and gravel entering market to meet the swelling demand.

Most impoverished communities in the typhoon-affected areas are living in the fringes of ecological systems such wetlands, lagoons and streams that provide vital services to local communities. Further encroachment into these ecosystems is a daily reality. When planning new shelter projects, especially for community relocation, care should be taken not to extend the pressures on such ecosystems and current pressure/damage should be mitigated.


(d) (e)

d) Marginalized community in a lagoon fringe- Tacloban. e) Excessive gravel mining and river band erosion - Barauen-Layte.

Working within the National Environmental Governance Framework

Complying with the local environmental regulatory framework is not optional for humanitarian agencies. It is mandatory under the law of the Philippines and also stipulated by the Sphere Guidelines. The Philippines has a comprehensive environmental governance framework, with strong legal provisions and capacity for enforcement at the ground level. Department of Environment and Natural Resources – DENR (www.denr.gov.ph) is the foremost agency that carries the mandate for environmental management nationally. It coordinates six separate bureaus with different environmental mandates. DENR has directorates in each region and most of the bureaus also have regional offices. The Philippine Coconut Authority – PCA - regulates the coconut industry in the Philippines and is under the Department of Agriculture. Municipalities also bear certain environmental management responsibilities. Most municipalities are solely responsible for solid waste management within their jurisdiction and also issue building permits for construction.

Shelter agencies will need to get both guidance and mandatory permission for their projects and activities from state environment agencies. The Philippines Shelter Cluster recommends that all shelter agencies establish contact with the relevant DENR regional directorate and municipalities from the inception stage of projects.

The following are some of the mandatory legal requirements for shelter projects:

1. Environmental Compliance Certificate – Mandatory for shelter relocation projects. Issue by the Environmental Management Bureau (www.emb.gov.ph)
2. Permitting chain saws, saw mills and transportation of timber products – Issue by DENR regional office.
3. Approval for all permanent construction – Issued by the Municipality.
4. Permits for felling coconut trees – Issue by the Philippines Coconut Authority (www.pca.da.gov.ph)
5. Sand and gravel mining permits– Contact DENR or Mines and Geosciences Bureau (www.mgb.gov.ph)
6. Land subdivisions, drainage plans, excavations – Contact the Municipality

2. Let's build back safer

It is imperative that government agencies and the aid community involved in the Yolanda response be internally responsible and accountable for current better management practices and standards, including avoiding, reducing or mitigating negative environmental impacts. The Sphere Standards, the NGO Code of Conduct, the Hyogo Framework, Millenium Developemnt Goals, and most local and national government disaster management policy include environmental management elements. Reducing risk and vulnerability is a key tenant of the principle of "build back safer". Apart from complying with

national environmental regulations, proactive measures are needed for better management of waste, reduce pressures on natural recourses/ ecosystems and build back livelihoods.

Debris: menace or resource?

Debris is often treated as a menace in post disaster situations. However it has many recoverable resources in scrambled form. The conventional solution of trucking the debris to a dumpsite is often the most expensive and time-consuming option. Moreover, the swelling dumpsites are impending environmental, social, health disasters. Debris encountered in the typhoon-affected areas includes materials that can be easily separated and reused, repurposed or recycled.

Following table gives a simplified categorization of the debris, examples and how to reuse or recycle. More details about the recovery methods are provided in the Section 3.

Category	Examples	Howe to reuse or recycle
Timber	fallen trees , timber from destroyed houses	As timber, firewood, charcoal
Metal and iron	CGI sheets, steel trusses, cables	Send for recycling
Organic matter	leaves, twigs, food items	Compost
Rubble	cement blocks, concrete blocks, floor tiles	Crush and reuse as aggregate in construction
Plastics	Plastic sheeting, PET bottles, polythene bags, plastic chairs	Send for recycling (some plastics are non-recyclable)
E- waste	electronic equipment, batteries, fluorescent lamps	Not recommended due to toxicity
Glass	glass bottles, window panes	Send bottles for recycling. Plate glass is difficult to recycle
Other	clothing, cardboard and paper	Very difficult due to poor quality

Separating the debris may involve hazards (sharps, exposure to chemicals, inflammables, medically contaminated waste). Health and safety comes before reuse and recycling. Any waste that cannot be separated without considerable risk, should not considered for reuse of recycling and should be treated as 'hazardous waste'.

A guideline document for safe handling of debris in a disaster aftermath has been prepared by UNOCHA and UNEP (http://www.who.int/hac/techguidance/pht/7561EmergencyWasteManagementGuidelines.pdf). In the Yolanda response UNDP and the Early Recovery and Livelihoods Cluster are mainly handling the coordination of the debris clearance.

Build back lighter: managing the material demand

Managing the demand for construction material is an important concern in the disaster recovery and rehabilitation stage. Soaring demands for locally sourced building material such as timber, sand, gravel and clay can have serious and immediate environmental impacts. A few specific steps can be taken to ensure efficient and environmentally responsible material use in the reconstruction process:

1. Use optimized designs for both intermediate shelter and permanent housing. Material inputs can be significantly reduced by careful design.
2. Procure material from trusted and sustainable sources. Always check and verify where the material comes from when purchasing in the market. For sustainable timber sourcing in humanitarian response refer (https://www.sheltercluster.org/Asia/Philippines/Typhoon%20Haiyan%202013/Pages/Technical-Resources.aspx).
3. Recover material from the typhoon debris for reconstruction: e.g. coco timber recovery[1], using rubble as aggregate.
4. Use alternative environmentally responsible material where possible: e.g. rammed earth construction
5. Always adhere to national standards and Sphere standards in material selection

Unfortunately there are only few guidelines or IEC material currently available at present for environmentally responsible material selection or material efficient design for humanitarian response (refer to http://green-recovery.org/) . The Shelter Cluster is prepared to help the agencies in need of technical guidance for optimizing the material inputs. Please contact the technical coordinator – tech2.phil@sheltercluster.org – for support. You can also use the Material Sourcing section of the "Environmental Self-assessment Checklist" available in the Shelter Cluster Website (https://www.sheltercluster.org/Asia/Philippines/Typhoon%20Haiyan%202013/Documents/Shelter_Environmental_Self-assesments_v1.pdf) as guidance.

shelter, environment and livelihoods

Livelihoods and shelter are closely connected. While those who are in need of shelter have also lost their livelihoods, rebuilding shelter and shelter projects will provide many temporary or long-term livelihoods for communities in the months to come. However, neither providing shelter nor building back livelihoods will necessarily ensure environmental sustainability. In fact most traditional livelihoods in a given area may have many environmentally damaging practices. A degrading environment will eventually erode the livelihoods and cause more risk and vulnerability. The challenge is to integrate shelter, livelihoods, environment and climate considerations together in a sustainable way. In the

[1] See https://philippines.humanitarianresponse.info/system/files/documents/files/PHL_FAO_and_Gov_Philippines_TechnicalGuidelines_for_Utilization_of_Downed_Coconuts_and_Trees_January2014.pdf)

case of Typhoon Yolanda response, building environmentally responsible shelter can provide many livelihood options in timber recovery, waste recycling, composting and home gardening and rubble reuse. Some possible options to integrate shelter, livelihoods and the environment are discussed in detail Section 3.

Site selection, management and construction

Selecting new sites for construction (in relocation projects) is one of the most significant environmental concerns in providing new safe shelter. Moreover, environmental sustainability should be ensured once the shelters are handed over to beneficiaries in relocation sites or on their own land. Agencies providing shelter should consider the following in planning the shelter projects:

1. Do not select environmentally risky areas for relocation sites, for instance, near the high water mark near the coast.

2. Consider traditional livelihoods of the people when selecting sites, for instance, assuring that fishing folk are located near the coast.

3. Consider the environmental impacts of construction in the selected area, for instance, where will sand, wood, and gravel come from for construction.

4. Have proper plans to support the community to manage wastewater and solid waste after the handover of the shelters, for instance, assuring that latrines are constructed so that they will not flood and are adequately above the ground water level.


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Environmental Self-assessment and Action Checklist for Shelter Interventions

”The Environmental Self-assessment Checklist” developed by the Philippines Shelter Cluster helps the agencies to cope with these issues and make environmentally informed decisions with regard to above concerns. The Checklist can be found at https://www.sheltercluster.org/Asia/Philippines/Typhoon%20Haiyan%202013/Documents/Shelter_Environmental_Self-assesments_v1.pdf.

3. Some Ideas for Environmentally Responsible Rebuilding

Collecting the recyclables

The best way to manage the recyclable material in debris is to hand it over to recyclable collectors. There are well established networks for collecting recyclables in many urban areas affected by the typhoon. Mostly these are simple operations where metal or plastic bottles are collected, stacked and transported to Manila for recycling or export. Some municipalities also have recovery programs and facilities. Overall, there are 2,428 material recovery facilities (MRFs) in the Philippines.

The Environmental Management Bureau – EMB (www.emb.gov.ph) is the state agency responsible waste management. EMB has offices in every region and can provide more information on the recycling networks and MRFs in each region. Supporting these existing networks to expand will not only help waste management but also offer more livelihood opportunities. In addition to collecting and transporting high value recyclables, such as PET bottles and iron scrap, to Manila, small scale local industries can be initiated to recycle Low Density Poly Ethylene (LDPE) products (plastic sheets, plastic bags) or paper and cardboard with little investment.


h) Plastic bottles and metal collected and stacked for shipment (Tacloban city).

Salvaging timber and wood

The large quantity of timber found in the debris can be salvaged for many useful purposes. Currently many agencies are looking at recovering the fallen coconut trees for timber. PCA estimates that 16.6 Million coconut trees are fallen in the typhoon; at a 50% recovery rate that will provide 800 Million board feet of coconut lumber for reconstruction work. There is a lesser quantity of other hard wood trees fallen that may also have a timber value.

In terms of environment, salvaging these trees has the double benefit of clearing the habitat for regrowth as well as reducing the demand for virgin timber. Recovering timber also provides extensive livelihood opportunities (e.g., chainsaw operators, truck drivers, unskilled labour).

However it should be noted that a timber recovery operation of this scale will produce much more wood than the actual immediate need. Currently in the Philippines, coconut lumber is mostly used without any preservation or seasoning and usually lasts less than 5 years. Providing the communities with skills and knowhow in basic timber seasoning and preservation will enhance the longevity and quality of the product and help curb the soaring timber demand. In the Yolanda response coconut lumber recovery mainly comes under the purview of the Early Recovery and Livelihoods Cluster (deguzman.reynaldo@undp.org). The Philippines Shelter Cluster can also offer guidance on timber recovery issues: contact debris.phil@sheltercluster.org.

Apart from recovering structural timber, there are many other uses for wood-based debris. Low grade timber or soft woods can be used in making items such as vegetable craters, temporary furniture, temporary fencing, etc.

Wood is also the most popular fuel in poor and rural communities. A large quantity of fuel wood can be salvaged from the typhoon debris. If properly dried, stored and used, this resource can ease the pressure of fuel wood consumption on the environment for a considerable time.

Charcoal production is another potential use for wood-based debris. Charcoal, is sparsely used for cooking in the Philippines at present, creating an opportunity to introduce efficient wood/charcoal stoves to low income communities, which are more fuel efficient and emit less smoke than open hearth stoves. However, the Safe Access to Firewood and alternative Energy in Humanitarian Settings (SAFE)[2] guidance should be adhered to when utilizing fuel efficient stoves.

(i)

i) Fire wood and coconut shell charcoal for sale in Palo – Leyte.

j) Efficient wood stove from Sri Lanka.

Composting and home gardening

Organic matter constitutes more than 50% of the domestic solid waste in the Philippines. Currently most of this material is directly disposed in municipal solid waste dumps. Popularizing composting at household level or through Municipal material recovery facilities can significantly reduce the waste load going into the dumpsites already overwhelmed by the typhoon debris.

Composting is a simple process that converts the organic matter in household wastes into a useful material ("compost") which can be used as a soil conditioner and an organic fertilizer in gardening. Integrating composting and home gardening in shelter design for low income communities not only improves the efficiency of waste management and also provide multiple benefits for uplifting household assets, nutrition and women's empowerment. It is particularly effective to introduce composting and home gardening practices to a community along the intermediate rebuilding stage, because many community members will see it as a new beginning and will be in a mind -set conducive to behavioural change.

[2] See http://www.womensrefugeecommission.org/programs/fuel-and-firewood.

Composting and home gardening have been introduced very successfully in disaster rebuilding, especially in the rebuilding process of the 2004 Asian Tsunami.

k) Household composting unit and a lush home garden - Tsunami rehabilitation Sri Lanka.

Rubble (concrete and masonry) reuse

Rubble from collapsed buildings is difficult to handle and costly to transport. However, if crushed into suitable sizes, rubble can be reused in many ways. Good quality rubble can be crushed and used as fine or coarse aggregate in non-structural concreting and masonry work. Coarsely crushed rubble (3/4"-2" diameter) can be packed in steel mesh cubes (gabions) and used as blocks in construction. Even very poor quality rubble (weak mortar, lime plaster, clay bricks) can be crushed and used as road base or to build-up land for construction. There is a range of manual and motored crushers available in different sizes that can be used in rubble crushing. There were many successful examples of rubble reuse in construction in the rebuilding following the 2010 Haiti Earthquake and elsewhere.

(l) (m)

l) Crushing rubble using hand crushers. m) Coloured pavers made of crushed rubble – Haiti earthquake reconstruction .