Philippines Shelter Cluster
ShelterCluster.org
Coordinating Humanitarian Shelter

WASH Cluster
Water Sanitation Hygiene

SHELTER AND WASH RAPID ASSESSMENT

TYPHOON HAIYAN, PHILIPPINES, 2013

FINAL Report

15 January 2014

Table of contents

GEOGRAPHIC CLASSIFICATIONS

Region:	Highest form of governance below the national level
Municipality:	A collection of barangays that comprise a broader 'city'
Barangay:	An area formed of 10,000 voters; the lowest administrative boundary
Sitio / Purok:	Neighbourhood or area that is informal and not classified for administrative purposes

ACRONYMS AND ABBREVIATIONS

4Ps	Pantawid Pamilyang Pilipino Program
CBOs	Community Based Organisations
CCCM	Camp Coordination and Camp Management
CCT	Conditional Cash Transfer
CFW	Cash for Work
CGI	Corrugated Galvanised Iron
DENR	Department of Environment and Natural Resources
DILG	The Department of Interior and Local Government
DOH	Department of Health
DPWH	The Department of Public Works and Highways
DROMIC	Disaster Response Operations Monitoring and Information Centre
DRR	Disaster Risk Reduction
DSWD	Department for Social Welfare and Development
EC	Evacuation Centre
FDG	Focus Group Discussion
FRC	Free Residual Chlorine
GSC	Global Shelter Cluster
IFRC	International Federation of Red Cross and Red Crescent Societies
HLP	Housing Land and Property Rights
KII	Key Informant Interview
LWUA	Local Water Utilities Administration
NDRRMC	National Disaster Risk Reduction and Management Council
NEDA	National Economic Development Authority
NWRB	National Water Resources Board
ODK	Open Data Kit
PDO	The provincial/city/municipal Planning and Development Office
PRC	Philippines Red Cross
RAT	WASH Rapid Assessment Team
WASH	Water, Sanitation and Hygiene
WSS	Water Supply System

FIGURES AND TABLES

Executive Summary

Context

At 10:00 on 6th November Typhoon Haiyan (named Yolanda locally) entered the Philippines Area of Responsibility (PAR). The typhoon intensified as it entered the Eastern Visayas region, first making landfall over Guiuan on 8th November at 04:40. By 08:00 on 8 November the typhoon had made landfall six times across the Central Philippines. Continuing to weaken over the West Philippine Sea, Typhoon Haiyan left the PAR on 9 November at 15:30.

On 5 December, the Government of the Philippines (GoP) through its Disaster Response Operations Monitoring and Information Centre (DROMIC) reported that a total of 13,067,342 individuals across 10,701 Barangays in the Central Philippines were affected by Typhoon Haiyan. Of the affected population, a total of 4,000,965 individuals were displaced by Haiyan; with 94,310 displaced to formal evacuation centres, and 3,906,654 displaced in other locations (26/11/2013). DROMIC currently reports 1,127,041 houses as having been damaged, of which 548,793 were totally destroyed by the typhoon. (DSWD 17/12/13)

Through standing partnerships within the Global Shelter and WASH clusters, REACH and the WASH Rapid Assessment Team[i] (RAT) jointly supported the inter agency rapid assessments process by collecting and mapping data across Haiyan affected areas. In particular, the results from the joint shelter and WASH assessment complement the Multi-sector Initial Rapid Assessment (MIRA) and will inform strategic response planning. The present report will provide a quick overview of the shelter sector findings.

Key findings

SHELTER

Damage to housing

- Housing damage rates are high across the affected area, with only 21% of households reporting no damage. 13% of all houses/homes were classified as totally destroyed while an additional 29% had major damage and 37% partial damaged.
- In terms of destruction trends, the differences between coastland and inland municipalities are marginal: in both situations, there are large numbers of destroyed housing, due to storm surge or winds. However, in terms of damage rates, coastal municipalities have suffered from relatively more damaged housing (especially major damage) than inland areas. Finally, Haiyan brought more destruction and damage to houses in rural areas rather than those located in urban areas.
- Nipa huts were the least resilient type of housing, with 69% either totally destroyed or having sustained major damage. Timber houses have been highly affected as well with 12% of them destroyed by the typhoon and 32% majorly damaged. Concrete and masonry structures proved by far the most resilient, especially two-storey concrete and masonry structures, which reported by far the highest rates of no damage, 52%.

Housing Recovery

- 85% of households plan to repair their houses. 13% will rebuild it completely and only 2% are looking to relocate elsewhere. The overall majority of the population foresees returning to the same location where they lived before the typhoon.
- Household income coverage and type of housing are related: 62% of households living in nipa huts and 50% of households living in timber houses were unable or partially able to cover their basic needs before Haiyan. Only 17% of surveyed households living in nipa huts have been able to complete - or will be able to complete - rehabilitation and repairs. The analysis suggests that households living in nipa huts are likely to a) be the most vulnerable in terms of livelihood or resources and b) have experienced higher rates of destruction and major damage.
- Over 30% have little to no formal security of tenure. 54% of surveyed households own their house and plot with 8% owning their house and renting the plot. 27% of households are allowed by the landlords to occupy the plot for free with a further 6% occupying a plot without the consent of the landlords at all.
- Eight households out of ten have started to rebuild or repair their houses but only three out of ten have completed or will be able to complete the rehabilitation without any further assistance. In total, 70% of households need shelter support in order to complete their housing recovery process. It should, however, be noted that perception of what 'further assistance' may be required are highly objective and may not reflect the knowledge required to interpret resource requirements for 'building back safer'.

Shelter Assistance

- In terms of shelter assistance, very little had been received by households in the entire affected area at the time of the assessment; only 9% of affected households had received shelter assistance. However, this figure is taking into consideration all affected households with destroyed or damage houses, even beyond the distance of 50km from the storm track. Disaggregating by distance classes shows that the majority of shelter assistance had been provided to households living close to the storm track (less than 25km), in coastland areas and among houses with major damage or those that were totally destroyed. There are significant gaps in terms of shelter assistance when taking into account affected households living further then 25km from the storm track and/or had their house majorly damaged but not destroyed and/or living in inland municipalities.
- 37% of households reported to have received shelter assistance by International non-governmental organisations (INGOs) and 27% reported to have been assisted by the Philippines Red Cross, the International Federation of Red Cross and Red Crescent Societies (IFRC) and the International Committee of the Red Cross (ICRC). At the time of the assessment, the local community was the third most important actor in terms of shelter assistance, providing assistance to nearly 14% of households. LNGOs (13%), Government (10%) and UN agencies (8.5%) are also reported among the sources of shelter assistance. 23% of households have received adequate shelter without external support from community resources.

WASH

- Before Haiyan, the population had limited access to WASH services in terms of quality and coverage: outbreaks which have occurred in the past years have been ascribed to the poor quality of the water utilized by the households as well as the chronic and historical lack of adequate sanitation facilities in both urban and rural areas;
- Pre Haiyan, improved (protected) water sources did not provide reliable quality of water according for the Department of Health (DOH);
- Post Haiyan, 82.01% of households reported using improved water sources (piped water from Level III and II Water Supply System (WSS), protected springs, dug wells and tube wells equipped with hand pumps); 15.68% reported using unimproved water sources (1.73% reported to use surface water and 5.03% unprotected wells and springs). These figures are similar to the pre Haiyan situation in both urban and rural areas;
- 91.84% of surveyed households did not change water source as a consequence of the damages caused by Haiyan; a limited number of families (8.16%) changed water source type from piped water to spring and shallow well water. Piped water (Level III and II WSS) is less utilized by the 7.25% of the population in coastal areas and by the 15.63% in inland areas.
- 63.6% of households have access to less than 15 L/d/p of water for drinking purposes, domestic uses and personal hygiene; 31.9% and 4.48% are respectively the percentages of households with access to 15-20 L/d/p and more than 20 L/d/p. If these figures are consolidated, 95.5% of households have access to less than 15L/d/p or maximum between 15 and 20 L/d/p.
- Repair work on Level III WSS increased the water access to almost pre Haiyan levels in urban areas. Leakages, pressure drops and cross contamination are still concerns; most Level II WSS are still in need of rehabilitation work on storage facilities, power supply lines and pumps. Cross contamination is a concern; Level I WSS are in pre Haiyan conditions. Water quality is still a public health concern for all types of WSS.
- Protected and unprotected wells are fed by shallow aquifers, which are prone to pollution;
- Pre Haiyan, urban and rural areas lack sewerage management systems as well as adequate investments to overcome gaps in sanitation services;
- The National Sewerage and Septic Management Program (NSSMP) which aims to decrease the organic pollutant load discharged into the environment is far from being accomplished;
- Less than 1% of the septic tanks are regularly maintained;
- Pour-flush toilets are utilized by 84.98% of the interviewed households; open defecation is practiced by 5.76% of the households (figure pre Haiyan: 5.15%);
- In high storm surge areas, 11.33% of the septic tanks are heavily damaged while inland this figure amounts to 10.06%. Moreover, within a 25 km distance path this percentage increases to 14.25% and decreases to 10.11% and 3.68% respectively for the 50 km and 50+ km distance paths.

Recommendations

SHELTER

1. The shelter sector should ensure equity of shelter assistance – for instance, amongst the different storm track distance classes, storm surge and type of damage classes. Currently the shelter response is unbalanced toward specific coastal "hotspots" and destroyed or totally damaged houses only.
2. When possible and appropriate, emergency shelter interventions should be replaced as soon as possible by rehabilitation and recovery interventions aimed at durable housing solutions.
3. Aside from housing damage level, household livelihood, age and gender should be among the key factors informing the targeting of beneficiaries of shelter assistance. These may include households from the fishery or agriculture sectors that have lost their productive assets or low-income female single-headed households.
4. By assisting reconstruction and repairs of damaged houses, aid actors should avoid recreating housing solutions that have been proven to be highly vulnerable to climate hazards. Good practices in Disaster Risk Reduction (DRR) should be mainstreamed in all targeted housing support that will be provided in the following months.
5. Any type of support aiming at providing construction materials should take in to serious consideration environmental impact, especially in rural areas.
6. The strength of tenure among typhoon-affected populations is a key factor in their resilience and recovery capacity. Households that did not own a house and/or land prior to the typhoon, as well as those households who wish to relocate, will need specialized support to ensure they access tenure security and thus are able to achieve a durable solution to their shelter needs.

WASH

1. Emergency WASH assistance has been provided to the affected population since the beginning of the emergency. The architecture of the recovery phase and/or reconstruction activities needs to consider the existing pre Haiyan WASH gaps in the Philippines as well as in the affected areas, the limited capacity of the national and local authorities to provide reliable and durable WASH services and the public health risks that the population is exposed to. Outbreaks that have occurred in the past (not only as a consequence of natural disasters) are water borne.
2. Where possible and sustainable and within the humanitarian mandate, the humanitarian response could take the opportunity to fill up part of the historical WASH gaps related to public health concerns: DOH, water districts and local water utilities and barangay authorities should be supported with hardware and software inputs;
3. At the household level, WASH and Shelter partners need to plan and coordinate their activities in order to guarantee an integrated humanitarian approach aiming to improve household living conditions and decrease public health risk exposure: sanitation facilities need to be an integral component of the shelter intervention, household water treatment needs to be promoted and supported by the provision of adequate hardware as well as hygiene promotion campaigns;
4. Gravity system chlorinators should be provided for Level II Water Supply Systems (WSS) and floating chlorinators for Level I WSS. These treatment devices could be locally made and maintained by small local enterprises which have been previously trained on their construction, operations and maintenance[1].
5. Level I WSS (spring catchments and shallow wells) should be rehabilitated or upgraded to minimize surface water contamination. Level III and II WSS should be investigated for leakages with dedicated instruments (manual and electronic listening sticks) to define a basic leakage control strategy aimed to decrease WSS contaminations.
6. Prior prioritization, health facilities and schools in rural areas should be included in the WASH-Shelter intervention also if not directly damaged by Haiyan: improvement of WASH facilities and hygiene promotion should be planned in agreement with DOH and Ministry of Education as a preventive measure to decrease public health risks;
7. Where possible and within the humanitarian mandate, Local Government Units (LGUs) should be supported at the local level in the achievement of the objectives of the National Sewerage and Septage Management Program (NSSMP), specifically to define and support Local Initiatives for Affordable Wastewater Treatment (LINAW) like sedimentation ponds, waste water reuse, and operations and maintenance of septic tanks.
8. Rehabilitation and reconstruction work should be designed considering wind and flood resistant techniques, material and technologies. Risk of waste water intrusion into water facilities or dispersion from sanitation facilities should be minimized.
9. At the barangay level, especially in rural areas, local personnel (community health works and WASH para-technicians) should be empowered through training courses and tools;
10. There is a need to increase the capacity of the communities to participate in WASH, and creating stronger linkages between the education/training sectors and public and private sector employers. This process should take into consideration the number of human resources and skills and competencies needed.

[1] Useful links: https://www.engineeringforchange.org/news/files/CTI8%20InformationManual11.1-pdf.pdf, http://web.mit.edu/watsan/Docs/Student%20Theses/Ghana/2008/Thesis_Cash-Fitzpatrick_5-16-08.pdf

11. Monitoring and surveillance capacity of DOH should be improved at the local level (water quality versus public health risk).
12. In agreement with the relevant National WASH counterparts, clear exit strategies need to be defined.

In case of a second round of the REACH Shelter-WASH assessment, some actions should be taken into consideration:

1. Better involvement of DOH, Water Districts and Rural Water Authorities for secondary data collection and future plans.
2. At the field level, define strategies and activities to support the National Sewerage and Septage Management Program (NSSMP).
3. Carry out quick water sample analyses for bacteriological contamination and FRC measurements.
4. Define specific WASH needs and sustainable solutions of health care facilities and schools in rural and urban areas.
5. Better involvement of community based organizations in data collection and needs analysis.
6. Improve training programs (topics and duration) for enumerators.
7. Assess or verify mid and long term plans of WASH and shelter NGOs for the Haiyan response.
8. Improve involvement of clusters in secondary and primary data collection.

1. Introduction

ASSESSMENT OBJECTIVES

The overall objective of the assessment is:

To conduct an inter-sector rapid assessment of municipalities affected by Typhoon Haiyan in order to inform response planning and the allocation of resources.

The specific objectives are:

1. The completion of an assessment that provides information for shelter, WASH, early recovery and other relevant sector coordination on the situation in the Central Philippines in the aftermath of Typhoon Haiyan;
2. Mapping and sharing of shelter, WASH and early recovery related data at the field and international level to support a planned and coordinated humanitarian aid response in the Central Philippines.

2. Assessment Methodology

This section describes the methodology that was developed and implemented during the rapid shelter and WASH sector assessment. The assessment methodology below outlines (a) the multi-stage sampling strategy designed specifically and used for the assessment, including final sample size by municipality; (b) the data collection process, including an overview of data collection methods and tools; (c) the representativeness and limitations of the data collected; and (d) a demographic overview of the assessed population.

2.1 MULTI-STAGE SAMPLING STRATEGY

In order to give a complete picture of the situation in the Philippines affected regions in the aftermath of the typhoon Haiyan, REACH utilised a multi-stage cluster sampling methodology, which is briefly outlined below. This sampling methodology was chosen in order to avoid sampling bias and to provide the helter and WASH Clusters, and other humanitarian actors responding to the crisis, with a complete and representative picture of the situation rather than focusing solely on areas that have sustained the most damage according to initial assessments.

2.1.1 Selection of Municipalities for Assessment

A secondary data review was used to better understand the overall situation in the affected areas before the typhoon, as well as a way to incorporate government findings on household damage and displaced population. The secondary data review informed the sampling strategy to be used by the assessment.

A representative sample of target municipalities was selected using multi-stage cluster sampling. Municipalities were clustered based on their geographic distance to the path of Typhoon Haiyan, and then, within each of the geographical clusters, were classified into another four groupings based on level of the storm surge, with the lowest stratum being inland areas (no storm surge). Sixteen (16) municipalities were selected in total.

2.1.2. Selection of Barangays within Municipalities

In selected municipalities with fewer than 20 Barangays, all Barangays were assessed. In municipalities with greater than 20 Barangays, a maximum of 20 Barangays were selected at random, with equal distribution across three population classes for the municipality. The representative household sample for each municipality was distributed across Barangays based on stratified sampling using population, with a higher number of households targeted for assessment in Barangays with larger populations. A total of 320 Barangays were assessed at the household level.

2.1.3. Selection of Households within Barangays

In each of the targeted Barangays, enumerators randomly selected households for assessment. Households were assessed in each Barangay until the target sample size for the municipality had been reached. Households were selected by enumerators through a randomised field walk, assessing one household out of every three in urban areas, and every household in rural areas in the geographical location they were assigned. Due to the assumption that approximately 20% of households may not be present at the time of assessment, field teams were instructed to oversample from each Barangay to ensure that a representative sample size of present households was reached at the municipal level. The maximum target number for this assessment was 7133 households, based on a maximum sample of 454 households in each municipality (378 households with a buffer of 76 additional households).

Table 3 below provides a list of the 16 municipalities selected for assessment and the representative sample size. All municipalities initially targeted for assessment were assessed. Additionally, through the random household selection, 945 shelters were assessed where no household members were present at the time of assessment.

Map 1: Municipalities targeted by the Shelter and Wash Cluster Assessment

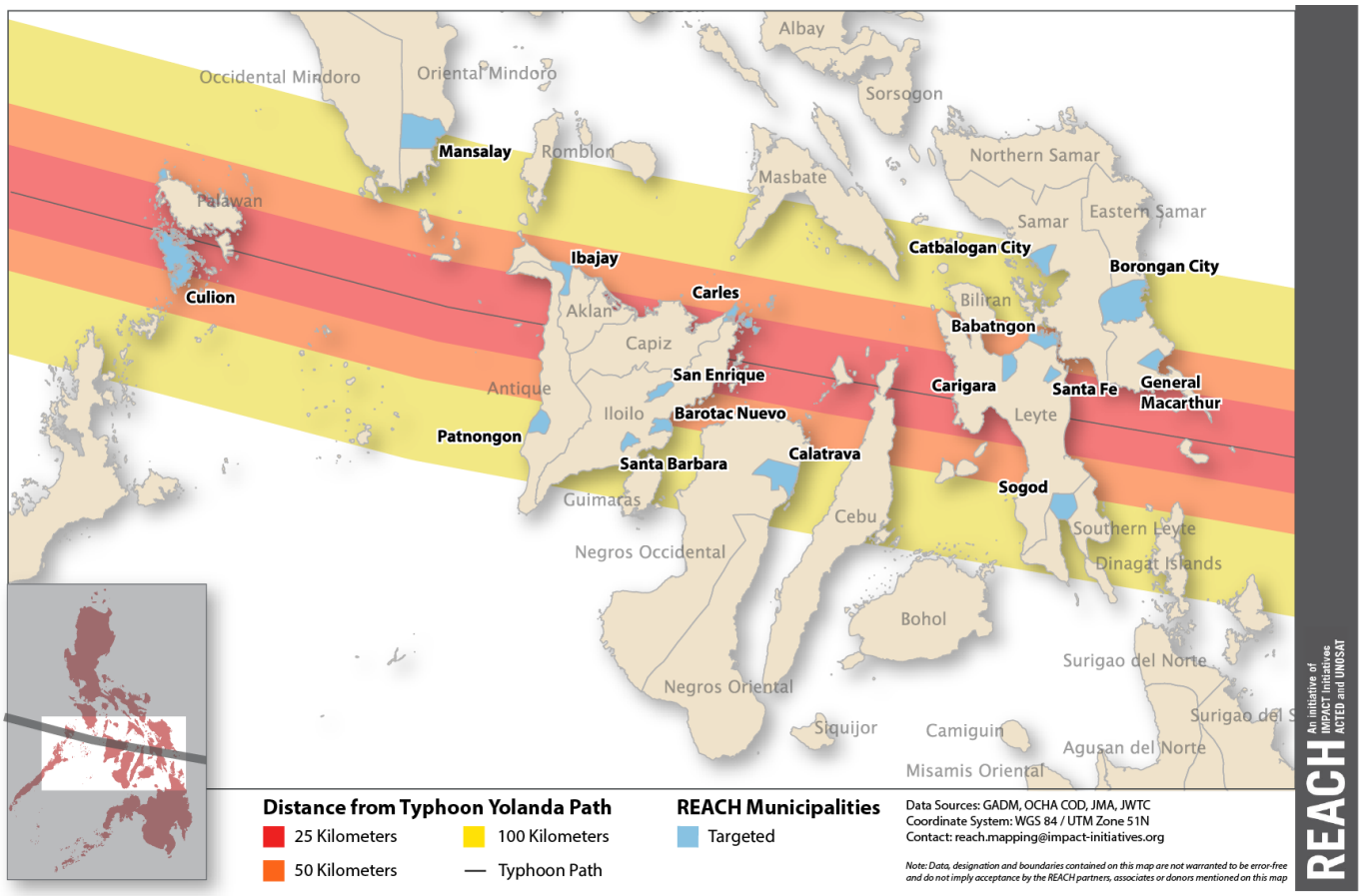


Table 1: Sampled locations (target municipality, target small size, assessed households and shelters)

Municipality	Target sample size	Assessed Households	Assessed shelters with no household present
Patnongon	366	435	33
Ibajay	370	384	42
Mansalay	372	392	4
Borongan City	374	457	72
General Macarthur	334	378	54
Baruotac Nuevo	372	403	37
Carles	374	401	57
San Enrique	364	375	73
Santa Barbara	373	374	83
Babatngon	359	367	129
Carigara	371	378	149
Santa Fe	348	384	16
Calatrava	376	380	4
Culion	352	448	22
Catbalogan City	378	488	118
Sogod	369	472	52
Total	**5852**	**6483**	**945**

2.1.4. Data Representativeness, Extrapolation and Limitations

The combination of stratified, cluster, and random sampling methods ensures equal representation of relevant categories of administrative units and households while avoiding sampling bias at each level. Thus, the dataset provides the Shelter Cluster, WASH Cluster and other humanitarian actors responding to the crisis with a complete and representative picture of the situation. The methodology used in this assessment is representative at the municipal level with a 95% confidence interval and 5% margin of error.

The methodology was designed for the extrapolation of findings based on municipal categories. Therefore, findings for the municipalities in a given category can be considered indicative of the situation in municipalities that are also members of that category. For instance, the level and types of damage recorded across Carigara, Culion, Carles and Santa Fe give a good indication as to the range of level and types of damage to be expected in other municipalities of the 0-25 km distance from the storm track category.

2.1.5. Geographic Information Systems and Mapping

Maps were critical in training the enumerators and conducting the field assessments. Each team was given a set of maps for the targeted municipality for each day's data collection with target areas and sample sizes highlighted as guidance.

2.2 Mixed-method Data Collection

The rapid shelter assessment included three components of data collection and analysis: (a) review of secondary data made available by national and regional government bodies and humanitarian agencies; (b) household level assessments; (c) Geographic Information Systems (GIS) and mapping of all collected and analysed data.

2.2.1 Secondary Data Review

The assessment team reviewed data on the impact of the earthquake made available by DSWD, NDRRMC and a range of other national and international sources. The Secondary Data Review (SDR) informed the design of the data collection tools presented below. The SDR was also used during the data analysis phase to triangulate and contextualize data collected by enumerators in the field.

2.2.2. Household Assessments

The primary method of data collection was a representative random sample of individual households. The assessment tool, designed by REACH in close collaboration with the Global Shelter Cluster and WASH RAT teams, was built to contain a combination of enumerator observations (particularly regarding shelter damage in order to ensure standardisation of categorisations) and responses from the households themselves. In cases where the household was not present at the time of the assessment, the household's shelter itself was assessed based only on enumerator observations regarding the extent of the damage sustained.

While the household assessment tool was designed primarily to collect detailed shelter data, core indicators covering early recovery, protection / housing land and property, and water sanitation and hygiene were integrated following consultation with the inter-cluster coordination forum.

Household assessments were conducted using an assessment tool built on the Android smartphone based Open Data Kit (ODK) platform which significantly improves data quality as a result of: (a) reducing human error as a result of loss of forms, data collection mistakes, and data entry mistakes thus improving the accuracy of collected data; (b) increasing the speed at which mapping products and analytical reports can be produced through reducing data cleaning time and removing the time for data entry; and (c) ensuring the protection of data as a result of completed forms being removed from the data collection tool upon upload to the centralised database.

Data collected by enumerators was subsequently validated by the team leader before being uploaded to the central database, after which a final data quality check was conducted by the GIS/Database Manager.

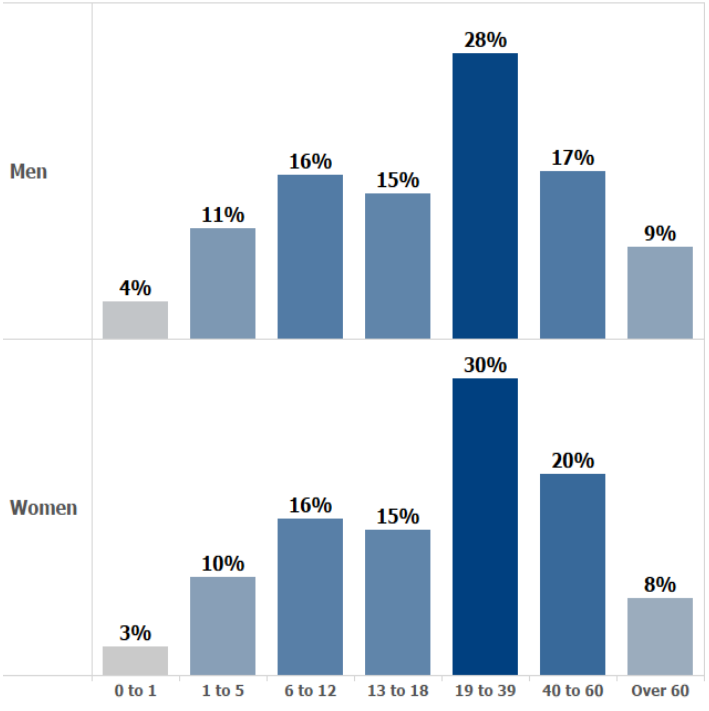
3. Demographic and livelihood overview of the assessed population

3.1 Sex and age disaggregated household data

Field assessment teams assessed a total number of 7428 houses (6483 of them the household was present) across the 16 targeted municipalities. The average household size was 6.4 individuals, with 51 % male and 49% female. On average, each household included 1.5 families. The 19-30 age-group was the largest population cohort, making up 29% of the total assessed population.

The combined cohorts for individuals under 19 years old bring the proportion of children to 39% of the assessed population. The dependency ratio across the twelve municipalities is roughly the same, approximately 66%; considerably higher than the national average of 62%[2].

Figure 1: Age groups within assessed population



3.2 CATEGORIES OF VULNERABLE HOUSEHOLDS

The Shelter Cluster in the Philippines has identified categories of households particularly vulnerable during emergencies and which should be prioritised in the shelter sector response as they may face particular difficulties accessing relief and recovery assistance, notably when rebuilding their homes.

The Shelter Cluster applies these categories of vulnerable households in all its strategies for responding to disasters in the Philippines with the aim to ensure to ensure they have an equal, safe and dignified access to assistance, and to provide specialist support as required.

The following two categories of vulnerable households have been used:

1. Single headed households, and in particular women-headed households; and
2. Households including member(s) with specific needs: pregnant and/or lactating women; persons living with a physically disability; seriously ill, or members with special needs; persons living with a chronic illness; and separated children.

Across all municipalities, **11.4% of the households were identified as female single-headed households** with over 7% in high-priority municipalities (as per DSWD classification). Across the sixteen assessed communities, **36% of households included one or several persons with specific needs**. Across the twelve assessed municipalities, 4% of households reported having a household member that was injured during the Typhoon.

[2] http://data.worldbank.org/indicator/SP.POP.DPND/countries/JP-PT-DE-US-BR-CN-PH?display=graph, retrieved 03/11/13

3.3 LIVELIHOODS AND INCOME SOURCES

Key Facts:

63% are not at all or partially able to cover their basic needs after Typhoon Haiyan

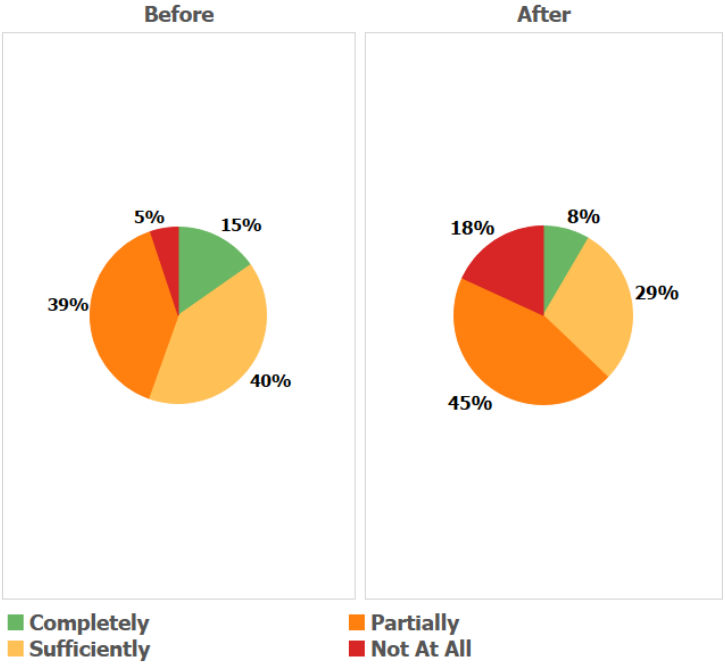
46% have disrupted jobs or livelihoods after Typhoon Haiyan

10% have no primary source of income after the typhoon

Typhoon Haiyan had a marked impact on the livelihoods and income sources of the affected households. The main income sources before Haiyan were agriculture (both worker and landowner) (14%), private sector (inclusive of transportation, small business, etc.) (15%), daily labourers (8%) and fisheries (5%). **Only 1% of households declared having no income sources at all before the typhoon; this figure rose to 10% after Haiyan**. Of those who declared to not have any source of income after the typhoon, 37% were formerly involved in the agricultural sector, 20% in the private sector and 13% from the fishery sector. Amongst the female single-headed households, 25% had their primary source of income affected: 50% from the private sector and 40% from the agriculture sector.

Amongst the 46% of affected households that declared to have their livelihood disrupted by the typhoon, 85% of them reported to have lost their productive assets; 37% of the total surveyed population. The main sectors affected by the loss of productive assets are agriculture (41%) and fisheries (15%). Only 11% reported that dysfunctional markets were the main cause for their disrupted livelihood. In that case, the private sector was the main livelihood category affected by dysfunctional markets. **25% of surveyed households have already restarted their livelihood activities. However, 45% of them were unable to foresee when their livelihood would reach pre-typhoon levels.**

Figure 2: Households' capacity to cover their basic needs, before and after Haiyan



Before the typhoon, 5% of the affected households were not at all able to cover their basic needs while 39% were partially able to cover them. After the disaster, 18% are currently not at all able to cover their basic needs and 45% just partially.

If combined together, **63%, or six households out of ten, are unable to sufficiently cover their basic needs.** 26% of them are women single-headed households.

3. 3. 1. Coping mechanisms

Typhoon affected households rely mainly on two coping mechanisms: borrowing resources from family and relatives (38%) and seeking new employment in the same/current location where they are living (29%). If formal and informal sources are aggregated[3], borrowing is by far the most prominent coping mechanism with an overall figure of 56%. Only 4% of the surveyed households are selling assets as a coping strategy; this figure is consistent with the assessment finding that most of the assets have been lost during the storm.

Figure 3: Households' livelihood coping mechanisms

	Urban	Rural
Borrowing from family	24%	41%
Borrowing from formal sources	7%	10%
Borrowing from informal sources	6%	10%
Seeking new employment in the same location	47%	25%
Seeking new employment in a new location	12%	5%
Selling assets	3%	5%
other	2%	5%

3. 3. 2. Quick overview on the agriculture and fisheries sectors

Agriculture and fisheries have been amongst the most affected livelihood sectors. A quick overview on some additional key facts will highlight some key recovery challenges that an integrated humanitarian and rehabilitation response may have to address.

Only 17% of the surveyed households reported to own agricultural lands or crop fields. Ownership figures increase to only 18% in rural areas. The figure varies from the 16% in the coastal areas to 21% in the inland ones. However, amongst those households who declared crop agriculture as a first income source, 76% of them are also land owners. On the contrary, amongst agricultural workers (skilled and unskilled labourers), only 14% own a plot of land.

66% of agricultural land owners reported that their livelihood has been significantly affected by the typhoon. **Eight landowners out of ten have suffered from crop destruction** due to the wind: these figures are mostly correlated to a) plantations (mainly coconut, banana and fruit trees) and b) rain fed rice fields that have been lost or severely damaged. According to the NDRRMC update of the 18th of November, the amount of losses in rice crops was evaluated at 2109 million PHP.

Two landowners out of eight (20%) reported to have suffered from floods: this figure is mostly linked to irrigated rice farmers. The maize harvest was indeed almost completed by the end of September[4] while 80% of the first season rice production had been harvested by the end of October[5]. Irrigated rice fields, especially in the coastal areas[6], suffered the most from salted waters and floods. According to the NDRRMC update of the 18th of November, the cost of damage to irrigation facilities amounted to 212,700,000 PHP.

[3] Formal sources: borrowing from formal sources, seeking new employment in the same location, seeking new employment in a different location; Informal sources: borrowing from family, borrowing from informal sources, selling assets.
[4] WFP, GEWS update, 19 November 2013
[5] FAO, Typhoon Haiyan fact finding mission, 17 November 2013
[6] ACF, Food Security Assessment in Iloilo and Capiz, 11 November 2013

In the fishery sector, 21% were not at all able to cover their basic needs while 56% were only partially able to do so after Haiyan. **The cumulative figure of 77% is 15 points above the average figure of this survey (62%). If compared to the pre-Haiyan situation (60%, with only 11% not able at all to cover their basic needs), the current figure shows an increase of 29%.**

61% of households from the fishery sector declared that Haiyan disrupted their livelihood source, against an assessment average of 46%. Unsurprisingly, 91% of these households claimed that the loss of assets (mainly boats and gear) was the main cause for such disruption[7]. However, boat ownership remains a sensitive issue in the fishermen communities. Not all affected household from the fishery sector were boat owners but were instead employed as crew members. For instance, Save the Children reported[8] that only 15% to 25% of households in Panay Island (Capiz and Iloilo) own small boats (less than 15ft) while 20% to 40% own medium and larger boats (where 20% seems to be the most likely figure).

3.4 Overview of Displacement Situation

Key Facts:

92% are currently sleeping inside their damaged houses

3.5% are currently living in evacuation centers

7% are hosting IDP households in their house or plot

According to IOM DTM figures of the 18th and 20th of December, a total of 5,853 households were identified in 115 displacement sites in Region VI, VII and VIII[9]. The trends collected by the DTMs are that most of the displacement sites are closing down and most of the families are returning to their homes. While this trend seems to be fast paced in Region VI and VII, Region VIII still remains the most affected by the displacement and the region with the highest number of displacement sites.

Amongst the surveyed shelters and houses, **87% of the households were present at the time of the survey**. **92% of the surveyed households were currently living inside their houses**. For those households who had their house totally destroyed by the typhoon, 66% of them were still sleeping within the remains of their house while 12% had moved to evacuation centres (DSWD or others), 11% were currently hosted by other households and 9% had not left their plots and were sleeping in tents or makeshift shelters. These figures are consistent with those related to the hosting of IDPs: only 7% were hosting IDPs inside their houses or within their plot of land. Almost all of them were hosting relatives or family members who lost their houses because of the impact of Haiyan.

Overall, internal displacement issues will be limited to the evacuation period and could be quickly absorbed, at least in Region VI and VII, in the coming months, if not weeks. Therefore in terms of shelter and WASH assistance, the focus should quickly shift to rehabilitation and recovery interventions once the emergency needs in the evacuation centres are met. However, the remaining displaced households in the evacuation centres may face specific issues (notably HLP rights) which may prevent them from returning to their usual place of residence. For those households, specific and ad hoc interventions will be required.

[7] This is also confirmed by ACF report: Food Security Assessment in Iloilo and Capiz, 11 November 2013
[8] Save the Children; Typhoon Haiyan: Panay Island Markets Assessment for Boat Building Inputs, 29 November 2013
[9] IOM, DTM Region VI, VII and VII, 18 and 20 December 2013

4. Shelter Assessment Findings

This section of the report presents the main findings from the rapid shelter assessment and is comprised of:

- a series of shelter specific findings, including shelter types, level of shelter damage, emergency shelter options and needs of households, as well as their intentions and needs in terms of shelter recovery; and
- a series of findings that cut across shelter and other sectors of humanitarian assistance, notably with regard to tenure security and access to land (Protection/Housing Land and Property – HLP).

4.1. Global Shelter Cluster Indicators

SHELTER SECTOR INDICATORS

Code	Indicator Type	Description	Value %	Source
S-G-1	Needs	% of HHs indicating different types of shelter support as priority needs	**23%**	REACH
S-NF-2	Output	% of HHs having received NFI assistance	**13%**	REACH
S-S-1	Needs	Nb of HHs for shelter recovery solutions	**500,000**	SAG
S-S-2	Needs	% of damaged houses / dwellings	**78%**	REACH
S-S-3	Output	% of HHs having received shelter assistance	**9%**	REACH
S-S-4	Output	% of HHs having received adequate shelter without external support	**23%**	REACH

CROSS-SECTOR INDICATORS

Code	Indicator Type	Description	Value %	Source
R3	Early Recovery	% of HHs in need of income support	**63%**	REACH
R6-1	Early Recovery	% of population directly affected by problematic rubble/debris	**3%**	REACH
F4	Food Security	% change in main source of income	**25%**	REACH

4.2 Damage to Housing

4. 2. 1. Housing Damage Categories

This assessment uses the Shelter Cluster's definition and categorization of shelter damage, which are compatible with and can be compared to the categories used by government agencies in the Philippines.

Table 2: Housing damage category according to the Shelter Cluster and the Government

Damage category (Shelter Cluster)	Damage category (Government)
No Damage	***No Damage***
Minor Damage	***Partially Damaged***
Major Damage	
Collapsed or totally damaged	***Totally Damaged***

4.2.2. Type of Housing

24% of households in the affected area are living in nipa huts while almost 60% are living in timber houses or timber and concrete houses. Only 16% of households are living in more resistant and solid buildings such as two-storey houses or concrete and masonry houses. Across the assessed area, at least 54% of households were living in dwellings, such as nipa huts and timber houses, which could offer limited, if any, protection from the typhoon. **One household out of two was vulnerable to climate hazards such as tropical storms and typhoons and was unable to cope with an event of the magnitude of Haiyan**.

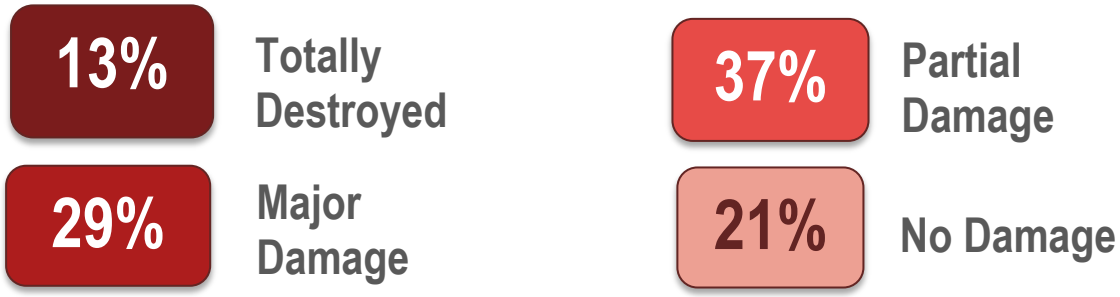
Dashboard 1: Type of Housing

As the Dashboard 1 below shows, **there are significant differences in terms of type of housing comparing storm surge categories; distance from storm track categories and rural versus urban households**. If we look at storm surge category and especially at the "high" and "medium" categories, 61% of households are living in nipa huts and timber houses, while only 49% in the inland category. Coastal municipalities were and are likely to be more vulnerable to a typhoon due to the housing type profile of their population. Similar conclusions could be drawn by looking at rural and urban settings, with rural populations being more vulnerable than urban: 57% of the rural population lives in nipa huts and timber houses while 45% live in the same housing type in urban areas.

4. 2. 3. LEVEL OF HOUSING DAMAGE

Shelter damage rates are high across the affected area, with only 21% of households reporting no damage. 13% of all houses/homes were classified as totally destroyed while an additional 29% had major damage and 37% were partially damaged. DSWD reported 1,127,041 damaged houses within 489 municipalities; however, if compared with the assessment figures, it is likely that a significant number of damaged houses had not been reported yet or had been classified as totally destroyed rather than damaged.

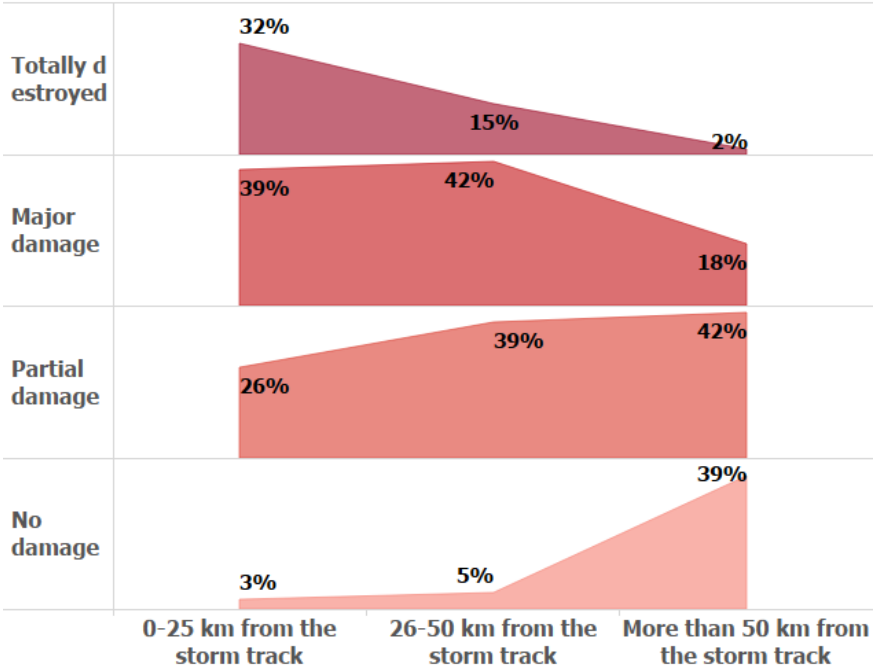
Figure 4: Damage to Housing



Housing Damage and Distance from storm track

When disaggregating the results by distance classification, however, the damage differentials become much starker. 32% of households in the 0-25km distance class were classified as being totally destroyed, compared with only 15% and 2% for the 26-50km and more than 50km distance classes, respectively. This is due to the fact that houses in the first distance class were exposed to winds at their maximum speed while such speed decreased consistently by moving further from the storm track.

Figure 5: House damage by distance from storm track



Municipalities in the 0-25km class have experienced higher rates of destruction and damage if compared to those belonging to the other classes. However, destruction and damage figures are considerable in both 0-25km and 26-50km classes: between five and seven surveyed households out of ten were destroyed or had majorly damaged houses. Therefore both classes should be prioritized in the humanitarian and recovery response:

Finally, **destruction figures almost disappear and damage figures decrease significantly in the "more than 50km" class where eight households out of ten had minor or no damage**.

Housing damaged data collected by Department of Social Welfare and Development

If we compare the assessment data with the Department of Social Welfare and Development (DSWD)[10] , there are notable differences between DSWD and the Shelter Cluster assessment. DSWD data reports more total damage (destruction) than the Shelter Cluster assessment: 49% compared to 16%. The main reasons for these differences are:

- DSWD figures are reported by the Barangay administration, DSWD and municipality officers. Definitions of destroyed and damaged categories may have been interpreted differently from area to area. Some Barangays may not have reported at all. Moreover, it is almost impossible for DSWD officials to verify all barangay data through direct observation because of time and resources.
- The Shelter Cluster categorization is based on specific and conservative technical criteria that have been finalized before data collection. If applied to DSWD data, such technical criteria would most probably re-shuffle such figures and percentages by having less totally damage houses and more partially damaged houses.
- DSWD data does not provide information about "no damage" houses. Therefore analysis and comparisons options are limited.

Table 3: Housing Damage Figures per distance from the storm track category

Data Source:	Shelter Cluster				DSWD	
	Minor Damage	Major Damage	Partially Damaged	Totally Damaged	Partially Damaged	Totally Damaged
Global Figures	47%	37%	**84%**	**16%**	**51%**	**49%**
0 to 50 km	38%	42%	**80%**	**20%**	**45%**	**55%**
0 to 25 km	27%	40%	67%	33%	40%	60%
26 to 50 km	41%	44%	85%	15%	65%	35%
More than 50 km	68%	29%	**92%**	**3%**	**68%**	**32%**

However there are some key trends that both Shelter Cluster assessment and DSWD figures show:

- The highest percentages of 'Totally Damaged' houses are located in the 0-25km class
- The percentages of 'Totally Damaged' houses decrease by 50% from the 0-25km class to the 26-50km class.

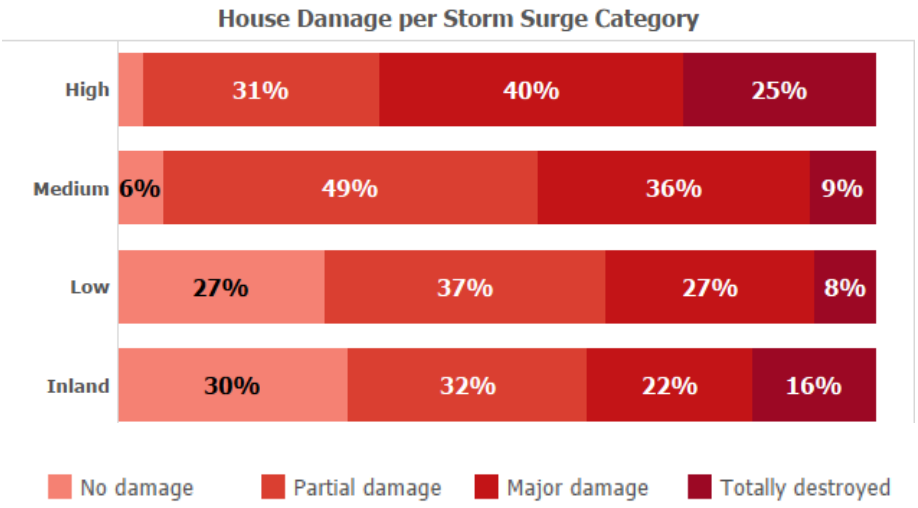
DSWD reports 1,127,041 damaged houses by the typhoon. By using the Shelter Cluster assessment findings[11] that would result in 529,710 minor damaged houses, 416,994 major damaged houses and 180,322 totally destroyed houses.

[10] DROMIC data available at https://philippines.humanitarianresponse.info/figures-excel
[11] And assuming that DSWD reported 1 damaged house = 1 household

Housing damage and Storm Surge

When disaggregated by storm surge classes, damage figures provide additional findings. Each surveyed municipality has been classified according to a storm surge category. Four storm surge categories have been identified: High, Medium, Low and Inland (zero). Municipalities in the "High" storm surge class have been more exposed to its impact due to their geographical locations (for instance Culion being an island right in the middle of the storm track is categorized as "High") while those in the "inland" class do not have coastal areas within their boundaries. Storm surge categories are a strong proxy indicator to identify damage trends related to coastland and inland environment.

Figure 6a: Housing damage per storm surge category



In the "High" storm surge class, one house out of four has been completely destroyed; less than one in ten in the "Medium" and "low" storm surge class.

Destruction figures rise again in the "Inland" class with 16% of destroyed houses.

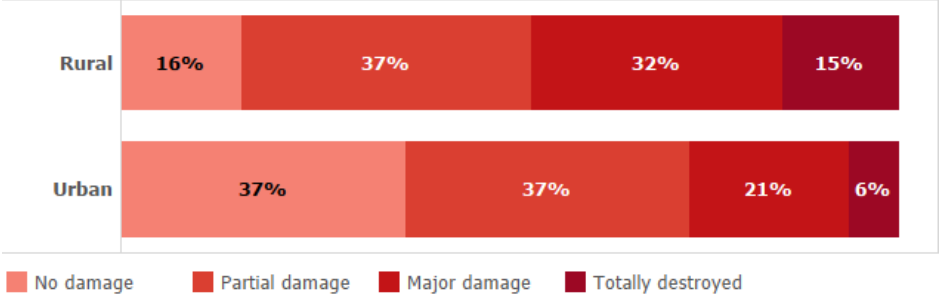
If we consolidate all three storm surge categories into one generic and broad "coastland" class and we compare them to the "Inland" class, almost 60% of destroyed houses are accounted in the generic "coastland" class and 40% are accounted in the "Inland". Therefore, the most significant differences are related to damage figures with only 4% to 6% of houses not reporting any damage in the "High" and "Medium" classes and almost 30% in the "Inland" classes.

In terms of destruction trends, the differences between coastland and inland municipalities are marginal: in both situation, the amount of destroyed houses is huge, due to floods/storm surge and winds. **However, in terms of damage rates, coastland municipalities are reporting more damaged houses (especially within the major damage category) than inland areas.**

Housing damage in Rural and Urban

An additional layer of analysis can be provided by disaggregating damage figures between rural and urban settings.

Figure 6b: Housing damage in rural and urban



As anticipated in the Type of Housing section (above), rural areas have suffered more from the impact of the typhoon when compared with urban areas. In rural areas, 15% of surveyed households had their houses completely destroyed by Haiyan and 32% reported major damaged. In the urban areas, only 6% reported the full destruction of their house and only 21% major damage. Almost four households out of ten have reported no damage from the typhoon in urban settings.

Haiyan brought more destruction and damage to houses in rural areas than those located in urban areas.

It can be partially explained by the type of housing (see Type of Housing section above) used by rural and urban populations. Construction materials are also part of the explanation: urban households generally have better access to construction materials in terms of quality and quantity. Finally, rural households are often more exposed to climate hazards by being more isolated and less likely to be protected by other construction or infrastructure.

Housing Damage per Type of Housing

As briefly introduced above, nipa huts and timber-only houses are usually more vulnerable to climate events due to the type of materials that are used to build them. Figure 8 clearly shows how damage figures change considerably if disaggregated by type of dwelling (see Annex B for the complete description of dwelling types).

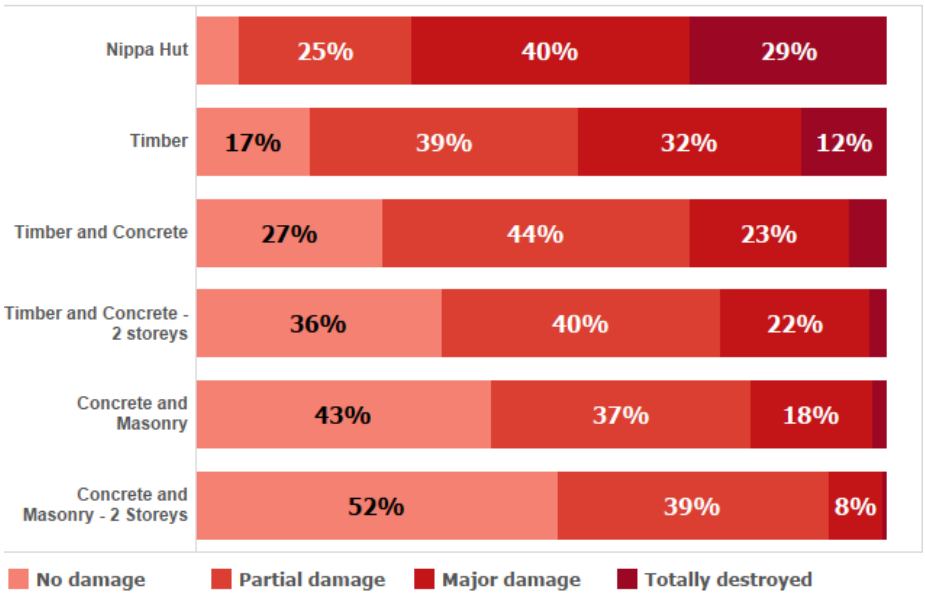


Figure 7: Housing Damage per type of dwelling

Nipa huts were the least resilient type of housing, with 69% either totally destroyed or having sustained major damage. **94% of households living in a nipa huts have been damaged or destroyed by Haiyan.**

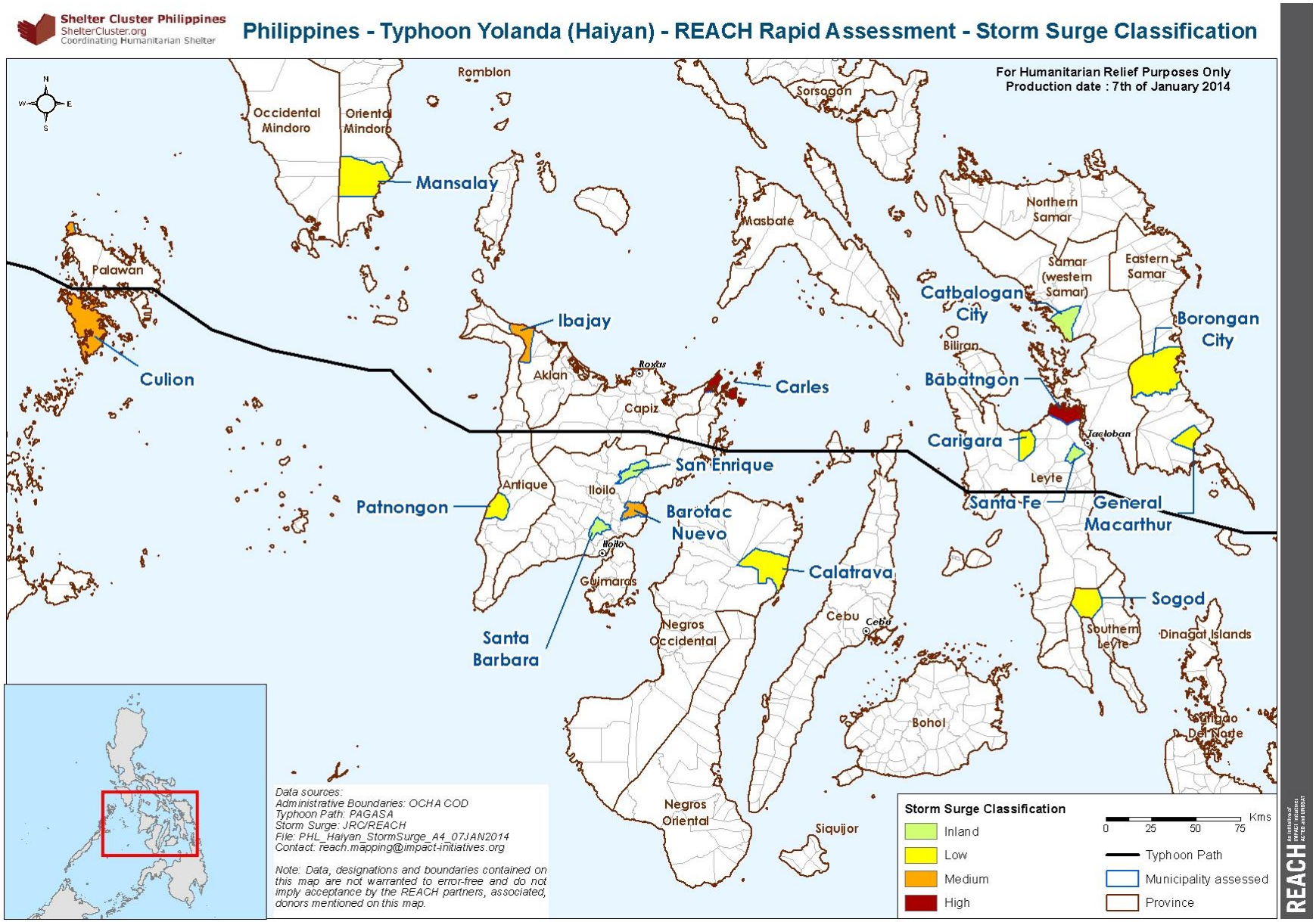
Timber houses have been highly affected as well with 12% destroyed by the Typhoon and 32% majorly damaged. **83% of households living in timber houses have been damaged or destroyed by Haiyan.**

Concrete and masonry structures proved by far the most resilient, especially two-storey concrete and masonry structures, which reported by far the highest rates of no damage, 52%.

4. 2. 4. Causes of Housing Damage

97% of households reported that wind was one of the main causes of housing damage. 24% of them reported flying debris as other main causes of damage and only 8% reported damage from floods and/or storm surge.

Map 2: Storm surge classification – assessed municipalities



4.3 Housing Recovery

Key Facts:

13% plan to rebuild and 85% plan to repair

31% are able to rebuild or repair with their own resources

4. 3.1. Tenure Security

Over 30% of households assessed have little to no formal security of tenure. 54% of surveyed households own their house and plot with 8% owning their house and renting the plot. 27% of households are allowed by the landlords to occupy the plot for free[12] with a further 6% occupying a plot without the consent of the landlords at all. Land tenure in rural and urban settings record very few differences: 53% in rural areas own their house and plot; 56% in urban contexts. 30% of households in rural settings have the consent from the landlord to occupy their plot for free; this figure decreases to 19% in urban settings. On the contrary, in urban settings, households are more likely to pay a rent for their plot: 11% against 7% in rural settings.

Table 4: Land Tenure per storm surge class

	High	Medium	Low	Inland
Own house and plot	38%	58%	57%	48%
Own house but rent the plot	9%	3%	9%	10%
Own house and occupy the plot for free with the consent of th..	43%	27%	25%	28%
Own house and occupy the plot for free WITHOUT the consent..	3%	2%	3%	4%
Rent the house for free with the consent of the landlord	3%	4%	2%	2%
Rent the house for free WITHOUT the consent of the landlord	1%	0%	0%	1%
Ancestral Domain	3%	3%	3%	4%
Other	0%	2%	2%	2%

There is however a significant difference if we disaggregate land tenure data by storm surge classes. Municipalities in the “high” class recorded fewer households owning house and plot (38%) and significantly more households occupying their plot for free with the consent of the landlord (43%).

HLP rights should be monitored closely in municipalities belonging to this class (mainly coastal areas with significant destruction and damage figures as seen above) because landlords’ consents should not be taken for granted, especially after the typhoon. Indeed, some municipalities could take the opportunity to revise their urban plans, especially for informal settlements, and that revision could lead to a rise in property values. In these ad-hoc situations, landlords may be willing to relocate or in some case simply evict households that were previously occupying their lands.

[12] It is worth noting that consent by the landlord does not necessarily mean protection from eviction, and thus does not always provide security of tenure

Outside of proposed no build zones, land tenure does not generally seem to be a major issue that could limit housing repairs and recovery processes. It is worth mentioning that aid actors should encourage households to renew title deeds if they were lost during the typhoon and assist, where possible, in obtaining title deeds if their ownership was not formally registered before Haiyan.

4. 3. 2. HOUSING RECOVERY INTENTIONS

85% of affected households are aiming to repair their houses. Only 13% will rebuild it and only 2% are looking to relocate elsewhere. These results are consistent with the reported damage figures. The overall majority of households that are planning to rebuild their houses or are relocating, are those that had their shelter totally damaged or destroyed by the storm. These households are located mainly in the 0-25km distance class and in the "high" and "inland" storm surge classes[13]; both classes have reported the bulk of totally damaged and/or destroyed houses.

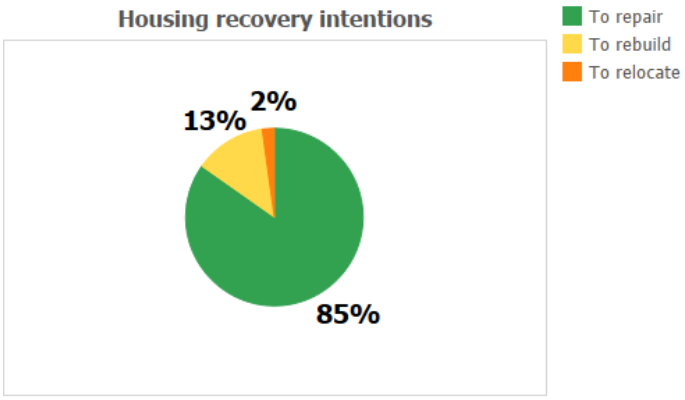


Figure 8: Housing recovery intentions

Low numbers of households willing to relocate are also consistent with displacement figures: few households are confronted with long or permanent displacement issues. **The overall majority of the population foresees returning to settle in the exact location where they used to live before the typhoon.** This might create tensions between affected population recovery intentions and municipalities or government policies that would like to extend or enforce "no build" zones as part of a broader DRR strategy.

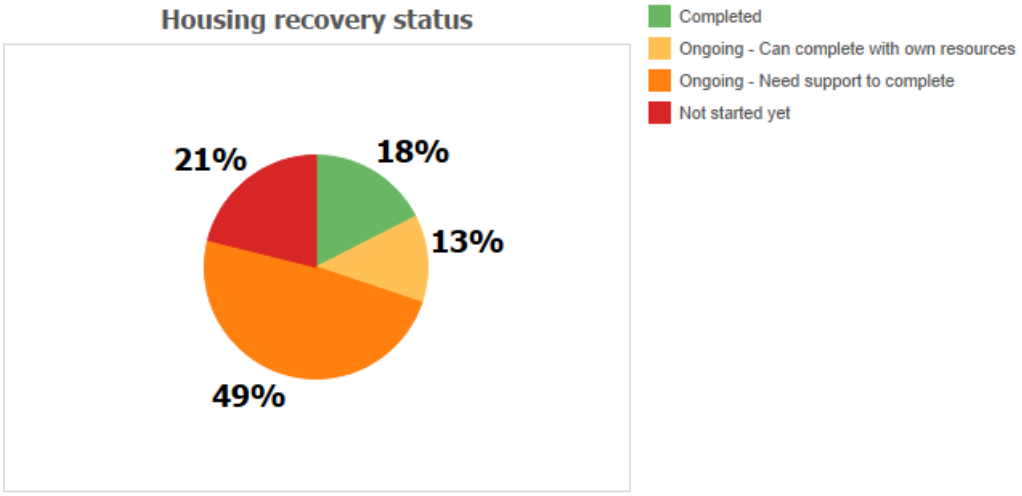
4. 3. 3. HOUSING RECOVERY STATUS AND REQUIREMENTS

Eight households out of ten have started to rebuild or repair their houses but only three out of ten have completed or will be able to complete the rehabilitation without any further assistance. In total, **70% of households need shelter support in order to complete their housing recovery process.**

It should, however, be noted that perception of what 'further assistance' may be required are highly objective and may not reflect the knowledge required to interpret resource requirements for 'building back safer'.

[13] It's worth mentioning that "coastal" areas are largely more urban than "inland" areas

Figure 9: Housing recovery status



These figures vary considerably if disaggregated by income capacity and sources, type of shelter, distance from storm track and storm surge classes.

Amongst the surveyed households that are currently able to completely meet their basic needs, 61% have completed or will be able to complete their rehabilitation or repairs without any further support.

Amongst the households that are currently able to sufficiently meet their basic needs, 43% have completed or will be able to complete their rehabilitation or repairs without any further support while 45% will need housing support; only 12% have not started the recovery process yet.

Amongst the households that are currently able to partially meet their basic needs, only 26% have completed or will be able to complete their rehabilitation or repairs without any further support while 52% will need housing support; only 22% have not started the recovery process yet.

Finally, amongst households that are currently not able to meet their basic needs at all, only 19% have completed or will be able to complete their rehabilitation or repairs without any further support while 49% will need housing support; 32% have not started yet the recovery process.

Households that have their primary source of income linked to the private and public sectors, remittances and agriculture are more likely to have already completed their housing recovery process. On the contrary, households that have no primary source of income or whose primary source of income is linked to fisheries (86%), agriculture (daily worker)(68%) or generic unskilled labour (79%) need housing support to complete or start their recovery process.

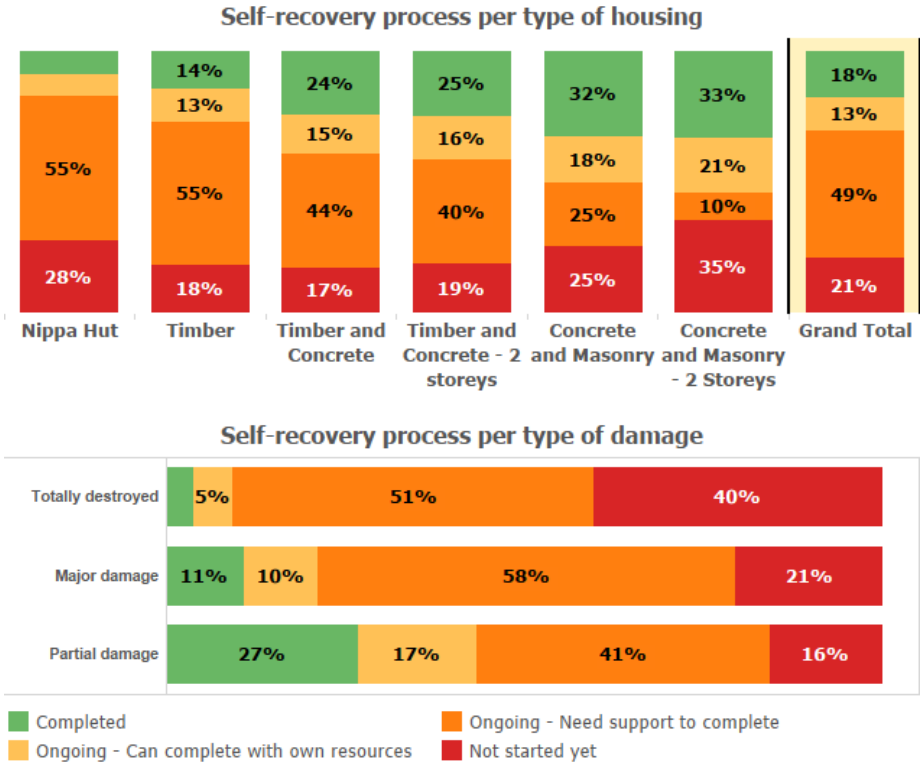
These figures suggest that income source and income level to meet basic needs have a significant impact on the households' ability to complete or even just start the reconstruction and repairs of their houses. Therefore housing support should target the above vulnerable groups and shelter assistance targeting should take into consideration livelihood characteristics.

Household income level and type of housing are related as well: 62% of households living in nipa huts and 50% of households living in timber houses were unable or partially able to cover their basic needs before Haiyan. Only 20% of these same two categories were living in concrete and masonry houses, or two-storey houses, which are more resilient to climate events. Therefore, by disaggregating self-recovery status per type of housing, figures are consistent with those related to income sources and income level.

Only 17% of surveyed households living in nipa huts have been able to complete, or will be able to complete, rehabilitation and repairs; despite the fact that nipa huts are easier to rehabilitate because they require less skilled labour, less technical competency and/or material. The analysis suggests that households living in nipa huts are likely to a) be the most vulnerable in terms of livelihood or resources and b) have probably experienced higher rates of destruction and major damage.

By using the same analysis lens, it is possible to explain the **higher figures (50% and 54%, respectively) for households being able to complete, or who will be able to complete rehabilitation, and are living in concrete and masonry houses (single or two-storeys).** These households are usually amongst the wealthier and thus, have more resources available. On a side note, 35% of two-storey concrete and masonry houses have not yet begun repair work. This is mainly due to the fact that higher technical and material inputs are required to kick off the recovery process and these are rarely available in the immediate aftermath of a natural disaster.

Figure 10a and 10b: Housing recovery status



Finally, housing recovery status is linked to damage type as well. Housing recovery is more likely to have started and been completed without any additional external support if the dwelling has been partially damaged only. 91% of households living in destroyed houses are likely to depend on external aid to rebuild or fix their dwellings. This figure decreases to 57% if the house has been partially damaged only.

Housing recovery requirements

63% of surveyed households reported that they have used or will be able to use salvaged materials from their previous or existing house. This is particularly the case for roofs, for which 69% of households that plan to salvage materials are thinking that they will be able to recover some roofing materials such as CGI sheets. Households plan to use timber (43% except those who live in concrete and masonry houses) and fixings (37%) as well. Households planning to repair or rebuild their houses reported an intention to salvage materials at 64% and 60%, respectively.

Households in the minor to major damage classifications similarly planned to salvage materials at a rate of around 64%. Totally destroyed and those households planning to relocate were less likely to plan to salvage materials. Note that these findings are based on perceptions from local communities: the actual conditions of such salvage materials were not assessed. From observation, it is likely that some of these materials should not be reused but replaced in order to avoid weak or unstable construction.

However**, more than one household out of two requested the provision of additional construction materials in order to complete the rebuild or rehabilitation of their houses**. Labor support was requested by less than three households out of ten while very few reported the needs for hand tools, technical or design support.

4.4 Shelter assistance

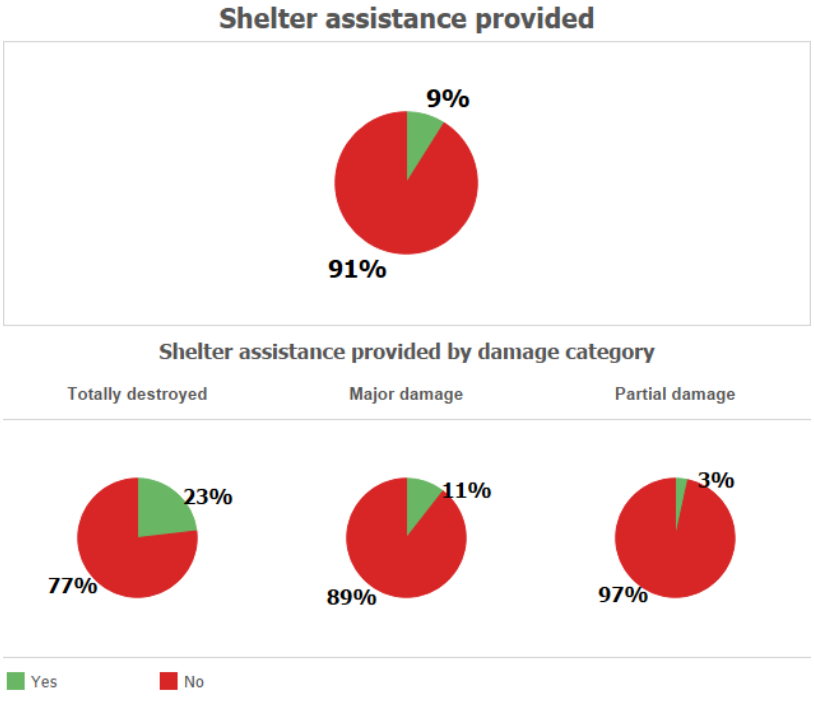
Key Facts:

64% of households have received humanitarian assistance

9% of households have received **shelter** assistance

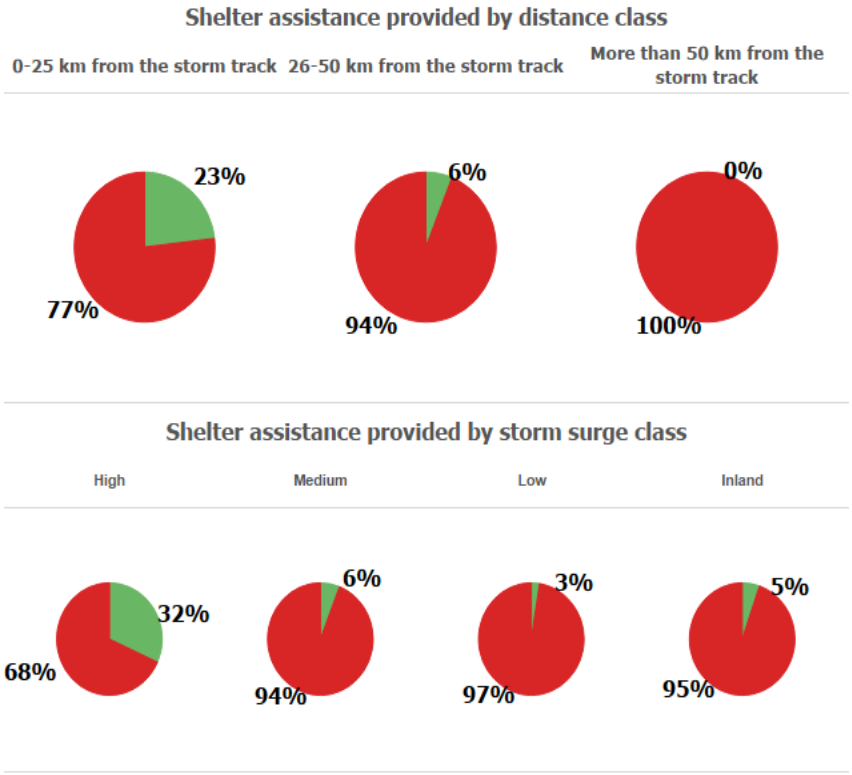
4. 4. 1. SHELTER ASSISTANCE RECEIVED

Very little shelter assistance had been received at the time of the assessment**. Only 9% of affected households have received shelter assistance.** However, this figure is taking into consideration **all affected households with destroyed or damage houses, even beyond the distance of 50km from the storm track.**



When disaggregated by damage type, distance and storm surge capacity, assessment data provides a more refined and detailed picture of the shelter response allowing for a better gap analysis in terms of shelter assistance. **For instance, most of the shelter assistance targeted households within the 0-25km distance class; 23% or one household out of four has been assisted through shelter interventions.** However, only 6% of households living in the 26-50km class have been assisted, despite considerable damage figures.

Almost no households beyond 50km distance from the storm track have been assisted - less than 1%.



The figures above are consistent when disaggregating assistance data by damage category and comparing it with damage to housing figures reported earlier in this document. **Households with totally destroyed shelters have been primarily targeted by aid actors (23%) as most of them are indeed located in the 0-25km class.** Households with major damage (11%) and partial damage (3%) still remain in acute need of shelter support.

Finally, shelter assistance has been directed mainly to municipalities belonging to the "high" storm surge class (coastal areas mainly). 32% of households in the "high" storm surge class municipalities have been assisted with shelter support while only 6% of them in the "medium" and "inland" classes.

The majority of shelter assistance has been provided to households living close to the storm track (less than 25km), in coastal areas and among those that had their houses totally damaged/destroyed. Significant gaps in terms of shelter assistance are present as soon as attention is paid to those affected households living further than 25km from the storm track and/or those that had their house majorly damaged but not destroyed and/or living in inland municipalities.

As previously analysed, housing damage category should not be considered as the unique targeting criteria for shelter assistance. Other vulnerability criteria should be taken into account. For instance, only 7% of female single-headed households who have damaged or destroyed shelters have received shelter assistance despite being amongst the potentially most vulnerable households.

In addition, from the households that have not yet started their repairs or reconstruction process, 86% are still awaiting shelter support. Of those households that are not able to complete repairs or reconstruction without support, 91% have not been assisted. What has been given has been primarily emergency support (tarps and tents - 87%), with 64% of this being reported as provided by international NGOs and by the International Red Cross and Red Crescent movement.

37% of households reported to have received shelter assistance by International NGOs and 27% reported to have been assisted by the Philippines Red Cross (PRC), the International Federation of Red Cross and Red Crescent Societies (IFRC) and the International Committee of the Red Cross (ICRC). The local community has been the third most important actor in terms of shelter assistance, providing assistance to nearly 14% of households. LNGOs (13%), Government (10%) and UN agencies (8.5%) are also reported amongst the source of shelter assistance.

Table 5: Source of shelter assistance per distance from storm track class

	Government	PRC/ IFRC/ ICRC	UN agencies	INGOs	LNGOs	Local Charity	Local Community
0 to 25 km	9%	34%	9%	38%	9%	6%	12%
26 to 50 km	12%	3%	6%	29%	21%	3%	20%
More than 50 km	25%	0%	0%	50%	0%	0%	25%

However, the PRC/IFRC mainly focused their interventions in the 0-25km distance from storm track class. On the contrary, the majority of shelter support coming from local NGOs and Government targeted households living within 26 to 50 km from the storm track. Local communities as well as UN agencies and INGOs evenly targeted their assistance across both distance classes. Very little assistance (below 1%) has been provided beyond the 50km distance class; the small amount of delivered aid was provided by one international NGO, the Government and local communities.

5. WASH Assessment Findings

5.1 Secondary Data Review

WASH GOVERNANCE IN THE PHILIPPINES – OVERVIEW

The Philippines has 42,028 barangays (villages), 1,491 municipalities, 80 provinces and 17 regions. Construction, operations and maintenance, supply and delivery of WASH services in different parts of the country are the responsibility of various government agencies and water utilities, and community-based management systems. More than 30 national government agencies or departments play a role in WASH provision. The most relevant are:

1. **National Economic Development Authority (NEDA)** is the central planning and policy coordinating body , coordinating preparation of national development plans and investment programs, formulating sector policies and strategies, monitoring implementation of sector policies, programs, and projects;

2. **Department of Environment and Natural Resources (DENR)** establishes policies and implements programs for the equitable distribution of natural resources and serves as the lead agency in promulgating the (1) rules and regulations for the control of water, air and land pollution and (2) ambient and effluent standards for water and air quality;

3. **National Water Resources Board (NWRB)** is the primary regulatory and coordinating body for water resources management and development and regulates operations of water utilities outside the jurisdiction of LWUA and MWSS;

4. **The Department of Public Works and Highways (DPWH)** functions as the engineering and construction arm of the government and is responsible for the planning, design, construction and maintenance of infrastructure;

5. **The Department of Interior and Local Government (DILG)** provides technical assistance to LGUs to help them effectively manage their water supply, sewerage and sanitation services;

6. **Department of Health (DoH)** sets water quality regulations and standards for testing, treatment and surveillance, and oversees the implementation and enforcement of the sanitation code. The provincial, city and municipal health offices provide assistance to ensure enforcement and compliance;

7. **Metropolitan Waterworks and Sewerage System** has jurisdiction, supervision and control over all waterworks and sewerage systems in Metro Manila as well as the province of Rizal and some municipalities in the neighbouring provinces of Bulacan and Cavite;

8. **The Local Government (LG)** mandate includes full responsibility for the provision and management of basic services and infrastructure facilities including WASH supply. Water supply provision is usually implemented through LGU-owned water service providers that function as private sector organisations;

9. **The provincial/city/municipal Planning and Development Office (PDO)** serves as the technical arm of the local Chief Executive (i.e. governor or mayor). It provides assistance in the development of project proposals, feasibility studies as well as in sourcing and engaging potential funders or partners;

10. **Local Water Utilities Administration (LWUA)** is a government-owned and controlled corporation with a specialised function to promote and support the development of water supply systems in provincial cities and municipalities outside of Metropolitan Manila;

11. **Water Districts** are government owned and controlled corporations that provide water supply services usually to aggregations of local government areas;

12. **Community Based Organisations (CBOs)**: the RWASAs, BWASAs and cooperatives are CBOs which establish and operate water systems in barangays and other localities. They act as service providers in the place of LGU-managed water utilities;

13. **Non-Government Organisations (NGOs)**: there is no recent data on quantitative contributions of NGOs in delivering potable drinking water services to households and communities.

Water supply system – Overview

In the Philippines there are three levels of water supply, and each of them is regulated by the municipal code or the local water district law. Level 1 - water supplied by wells or springs in the villages – serving rural areas; Level 2 - water supplied by public water faucets – serving rural and peri-urban areas; and Level 3 - water supplied through water faucets in individual households – serving urban areas. Levels 1 and 2 are under the jurisdiction of municipalities, whereas Level 3 water supply is under the jurisdiction of either Water Districts or municipalities.

In specific, the National Economic and Development Agency (NEDA) with the Board Resolution No. 12 (s. 1995) categorises existing water infrastructure as follows:

- **Level I** (point source) systems include a protected well (with or without hand pump), a developed spring or rain water catchment system with an outlet but without a distribution system. These systems are generally adaptable for rural areas where the houses are thinly scattered. Level I infrastructure provides for least 20 L/p/d, it serves around 15 to 25 households and its outreach must not be more than 250 meters from the farthest user. The Philippine National Standards for Drinking Water –PD 856, mentions that the yield or discharge is generally from 40 to 140 liters per minute. Water fees are not collected.

- **Level II** (communal faucet system or stand posts) systems are composed of a source (well, borehole or spring), a reservoir, a piped distribution network and two or more communal faucets located at not more than 25 meters from the farthest house, with each faucet serving from four to six households. These systems are generally suitable for rural and urban fringe areas where houses are clustered densely to justify a simple piped system. Level II infrastructure provides for at least 60 litres per person per day (40-80 L/p/d following the National Standards for Drinking Water –PD 856). Water fees are not collected.

- **Level III** (waterworks systems or individual household connections) are systems with a source, a reservoir, a piped distribution network and household taps. It is generally suited for populated areas. Level III infrastructure provides for at least 100 litres per person per day. This level of facility requires a minimum treatment of disinfection. Water metering policy allows water fees collection.

The access and coverage of water supply services in the country before the Haiyan emergency is difficult to measure due to the lack of a common tool, timeframe and strategy for Monitoring & Evaluation (M&E) as well as the uncoordinated statistical approach between the large number of national and local agencies responsible for data collection (Table 6).

Table 6: Water supply coverage (estimated) for year 2010 as result of the Joint Monitoring Programme (source: WHO-UNICEF, JMP)

Year: 2010	Total Improved	Piped onto premises (Level 3)	Other improved	Other unimproved	Surface water
Urban	93%	61%	32%	7%	0%
Rural	92%	25%	67%	7%	1%
Total	92%	43%	49%	7% / 6.5 million	1% / 0.9 million

The proportion of households in the Philippines in 2004-2010 with access to water was estimated at 92%. It is important to point out that the JMP doesn't provide information on service quality or coverage. Consequently, service coverage, service interruptions, water quality and other quality indicators are not provided by this initiative. In term of water quality, underground water sampling shows that up to 58% of the ground water is contaminated with coliforms. Among 421 major rivers in the country, 50 are heavily polluted and 40 have been declared dead due to a combination of industrial waste water inputs and untreated household waste water (only 4% of the population is connected to sewerage system with a basic waste water treatment). In addition, 12-25% of wells yield iron-laden water. Only Level III water supply systems are provided by water treatment plants while Level I and II provide untreated water.

As for service coverage, even in serviced areas saturated by water district pipe networks, coverage is low (an average of about 40%) and it is increasing by only a couple of percentage points a year. Considering extensions of Level III water supply systems, the data shows that only about 20% of households have taken up connections, due to the high cost of connection itself (PHP 4,000).

SANITATION - OVERVIEW

Philippine sanitation coverage is said to be about 74%; this means that 20 million Filipinos have no access to improved sanitation facilities, resulting in about 8% still defecating in open areas (Table 7).

Table 7: Sanitation coverage (estimated) for year 2010 as result of the Joint Monitoring Programme (source: WHO-UNICEF, JMP)

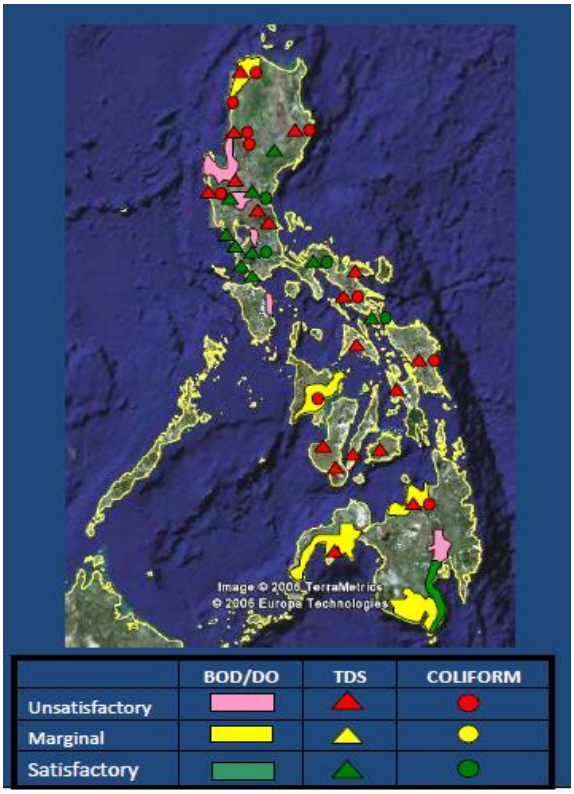
Year: 2010	Improved	Shared	Other improved	Open defecation
Urban	79%	17%	1%	3%
Rural	69%	16%	3%	12%
Total	74%	16%	2%	8% / 7.4 million

The typical sanitation facility is a pour-flush bowl connected to a wet pit or, in the urban areas, a two-chambered septic tank. In the latter, the effluent flows into the nearest drainage canal or watercourse (only 4% of the population have their effluent undergo further treatment).

In urban areas, many drainage systems are usually open earth canals with few concrete lined walls. All drainage canals discharge into rivers and creeks that traverse the towns. During the wet season, overflows and flooding with pollutant dispersion into the surrounding environment are quite common. This results in more than 90% of the sewerage generated in the Philippines not being disposed or treated in an environmentally acceptable manner (Map 3).

Statistics from Philippine Department of Health (DOH) show that there are approximately 38 million diarrhoea cases/year and 11,338 deaths/year due to acute watery diarrhoea.

Map 3: Water quality in the Philippines (source: UN-Habitat)



Sanitation facilities in Philippine public schools are also critical: the toilet-pupil ratio is 1:55 in the elementary level and 1:93 in high school, based on statistics from the Department of Education's Basic Education Information System. The numbers are lower than the global standards set by the World Health Organization (WHO) and United Nations Children's Fund (Unicef) of 1:50 for males (if urinals are present) and 1:25 for females, and even lower than the norm set by the Philippine Sanitation Code, which is also 1:50 for boys and 1:30 for girls. The figures are so much worse in some areas of Mindanao—1:300. Although the Department of Education has managed to reduce the toilet shortage of 135,847 in 2009-2010 to 117,480 in 2011 by adding 60,109 seats in the elementary level and 57,371 in high school, the problem remains acute.

The present sanitation situation in the Philippines reflects the historical lack of governance in the sanitation sector as well as the lack of investment aimed to manage the entire waste water cycle: the WASH sector doesn't foresee a separate and distinct sanitation program, as it is always considered an adjunct to water programs resulting in sanitation receiving merely 3% of total investment for water infrastructure. Pilot projects on Barangay Environmental Sanitation Planning have also been initiated but did not take off at a large scale.

There are many institutions with sanitation related mandates but the leadership required to push efficient, effective and sustainable sanitation programs is lacking. Sanitation regulation is one of the major issues that need to be addressed. There are many laws and standards relating to sanitation and wastewater management but mandates on implementing and monitoring policy implementation remain vague. To date, under the National Sewerage and Septage Management Program (NSSMP) there are only 15 LGUs who have initiated sanitation plans and programs and the private sector investments are limited because sanitation is perceived to be a nonrevenue services.

The recent calamities that affected the country also highlighted the need to address the sanitation crisis in emergency situations. Since the typhoons Ondoy, Pepeng and Santi, one of the most problematic issues that confronted the government was the management of the sanitation in emergency situations. Sanitation and hygiene promotion were identified as critical both during relief and rehabilitation phases due to increasing cases of water borne diseases, health risks due to open defecation, ground water contamination and the generally unsanitary condition in evacuations centres and resettlement areas. In some evacuation centres, the toilet to population ratio is 1: 116 whereas the ideal is 1:20.

OUTBREAK RISK –OVERVIEW

In the past years the Philippines experienced outbreaks of epidemic-prone communicable diseases such as AWD, dengue, cholera, typhoid and leptospirosis. The most common disease outbreaks are food-borne and water-borne diseases like cholera, salmonellosis and shigellosis. Water pollution and poor sanitation conditions account for almost 17% of reported disease cases and 1.5% of the reported deaths in the Philippines.

The National Centre for Disease Prevention and Control (NCDPC) highlighted that among adults, 90% have said that they wash their hands before eating but less than 50% of children below 12 years old adhere to the practice. Moreover, only 20% of children below five years old, 37% among adolescents, 44% of adults, and 50% of older people wash their hands after they use the toilet.

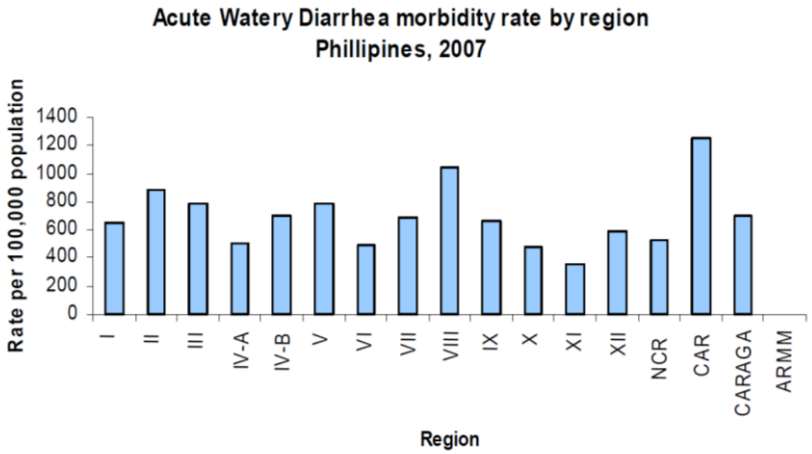
In the country, diarrhea is the 3rd leading cause of child illness and the 4th leading cause of deaths among children less than 5 years. It is estimated to cause 12% or almost 10,000 deaths a year. The diarrheal disease disproportionately affects young children in low- and middle-income regions who have higher incidence rates due to inadequate water and sanitation and nutritional risk factors, such as suboptimal breastfeeding and zinc and vitamin A deficiency. Children living in impoverished areas also have higher case-fatality rates compared to children living in high-income regions due to lack of access to quality health care and timely and effective treatment with oral rehydration solution (ORS) and zinc.

Last 2012, the Philippines became the first country in Southeast Asia to implement the World Health Organization's (WHO) recommendation to introduce life-saving rotavirus vaccines through its national immunization program. An estimated 3,500 children under age five die from rotavirus diarrhea annually (12% of all diarrheal deaths) while 77% of children are infected with severe rotavirus before their second birthday, 31% of young child diarrhea-related hospitalizations are due to rotavirus and 30% of young child diarrhea-related emergency room visits are due to rotavirus.

Outbreak risk in the areas hit by the cyclone was present before the Haiyan emergency. Records on morbidity of AWD and water borne diseases are kept by the Regional Emergency Surveillance Unit (RESU) and the Department of Health (DOH). Historical data for Region VIII, VII, VI and IV are summarized in Figure 11. The main reason for AWD cases has been identified by the RESU in water contamination and poor sanitation conditions in the barangays where the AWD cases have been identified.

Similar causes are mentioned to explain the outbreaks which involved Samar (2009), Danao – North Cebu (2010), Cavite (2011), Catmon – North Cebu (2011), Easter Visayas (April 2013). The contamination of shallow wells (with and without hand pumps) and piped water supplied by the Water Districts has been identified by the DOH as main reason for the AWD outbreaks. In specific, contamination of shallow wells occurred mainly during the wet season by infiltration of contaminated rain water, while broken pipes and negative pressure facilitate the entrance of pollutants in the pipe network.

Figure 11: AWD morbidity rate for Philippines (source: DOH)



Also after typhoon Pablo (2012), AWD outbreaks involved at different magnitude all the area at that time affected by the natural disaster. At that time, DOH carried out massive chlorination campaigns of shallow wells and pipe networks but without a defined disinfection schedule. This kind of approach has a very limited impact on the water quality: the chlorine reaction with bacteria last just from minutes to few hours and the volume of fetched water allow the entrance of new polluted water into the well. Similar considerations are valid for disinfection of piped water. In Tacloban, Tanauan and Guiuan, it has been reported that DOH chlorinates the water points every 4-8 months.

Cholera outbreaks have been declared in Maguindanao (2013), Sultan Kudarat (2008), Bicol (2012), Zamboanga (2010), and Caloocan (2010), while typhoid fever outbreaks have been declared in Albay (2013), Cebu (2012), Abra (2011), Calamba (2008). Contaminated water sources have been confirmed as the root cause of the infection, regardless of the level of technology involved: in urban areas (Level III water supplies) broken pipes allowed waste water and sewage to contaminate the town water supply systems, while in peri-urban and rural areas protected and unprotected shallow wells and springs appeared contaminated by waste water after heavy rains.

Leptospirosis in flood-affected areas is another historical flood-born disease which occurs in the Philippines. Natural disasters like the Bohol earthquake (2013), Sendong cyclone (2012), tropical Storm Washi (2011) and cyclones Ketsana and Parma (2009) showed an increased morbidity of this deadly disease mainly due to contaminated stagnant water. Surges in leptospirosis are registered also during the rainy season in urban and rural areas both.

5.2. WASH - General Overview post Haiyan in the affected areas

High speed wind and flying objects, storm surge and related marine dynamics like battering waves, coastal erosion and rip currents are responsible for the destruction provoked by the Haiyan typhoon along the coastal areas of the central Philippines. Inlands areas were affected mainly by strong wind and flying objects. Minor damage was due to heavy rains, soil erosion and landslides in rural and urban areas located at the foot of hilly areas. Consequently, WASH facilities in coastal areas have been damaged in their substructure (water power) and superstructure (wind power). Inland WASH facilities suffered damages mainly by wind power in their superstructure.

Along the coastal areas, the storm surge – combined with rains and channels/rivers over flooding – contributed to the flooding of septic tanks and cesspools with the consequent dispersion into the environment of organic pollutants. It is estimated that before Haiyan, less than 1% of septic tanks are known to have undergone regular desludging. Most of them are flooded and silted. Structural damages were limited.

The superstructure of household sanitation facilities (off set or flush toilets) were washed away or irreparably damaged by the collapse of the buildings. Ponds and other water bodies were contaminated by the onrush of saline water as well as organic matter. Lined and unlined drainage networks, utilized also as sewerage networks, were obstructed by debris and garbage generating areas of stagnant waste water, an ideal environment for mosquito breeding and flood-borne diseases like leptospirosis. Light damage to channel walls were limited to small caving and embankment collapse localized along the banks and in proximity of small bridges.

Level III and II water supply systems were damaged in all their elements: raw water pumping stations, transmission and distribution mains, reservoirs, piezometric tanks as well as house connections. Power supply lines providing electricity to pumps and water treatment units were damaged by flying objects and collapsed trees. Standby generators were buried by debris and/or flooded (Figure 12). Water pipes alongside small rivers and along the coast were washed away.

House connections were damaged by debris from collapsed buildings as well as water erosion. Where pipes are still present, loose joints and cracks on PVC pipes allow cross contamination by waste water. Despite this dramatic scenario, in urban areas access to drinking water and water supply for domestic purpose is improving day by day thanks to the coordinated rehabilitation efforts between humanitarian agencies, municipalities, water districts and DOH.

Figure 12: Level II WSS not working due to interrupted power supply

Water supplies located in inland areas show transmission and distribution mains damaged by water erosion along river crossings and water storage facilities damaged by flying objects and collapsed trees. Cross contamination is still a serious concern due to loose pipe joints and cracks on PVC pipes. In general, for level III water supply systems fetching water from rivers, the regular provision of chlorine for water disinfection is a concern (Figure 13)

Level I water supply systems in coastal areas are heavily contaminated by sea water and waste water (protected/unprotected shallow well with hand pumps and protected/unprotected springs- direct observations). Inland level I water supply systems are not affected and the quality of water collected is similar to the one before the Haiyan emergency: spring water and shallow wells are widely utilised for drinking purposes. The water is not treated at the source and the population showed trust on its quality.

Figure 13: Level I and III water supply systems in poor sanitary conditions increase public health risk

5. 3. Water access

5.3.1 Water access - Water source in use

Before Haiyan, 83.05% of the households reported using protected water sources for drinking water, while 14.78% reported fetching drinking water from unprotected water sources, with 1.73% of the households using surface water and 4.58% using unprotected springs and wells. After Haiyan, these figures did not change much: 82.01% of the households still use protected water sources and 15.68% still rely on unimproved water source for their daily water needs. Surface water is still utilized by 1.73% of the households while 5.03% utilize unprotected water sources.

Applying in a rigorous way the definition of protected and unprotected water sources, these figures could change in favor of a bigger percentage of households using unimproved water sources: direct observations highlighted about 64% of the protected wells have the cover/lid missing or stored in an unsanitary manner (at ground level accessible by domestic animals and pests); where present, the aprons show deep cracks and the spillways and soakways are usually not present or clogged. Buckets to fetch water from protected wells are dirty and stored in poor sanitation conditions. Hand pumps have missing gaskets and O rings which facilitate the entrance of pollutants.

For urban water supplies, leakages and pressure control represent routes and management elements of public health concern. The International Water Association (IWA) reports that for pipe leakages in urban areas, only 20% of leakages are visible or can be identified only by direct observation. The remaining 80% can be located only by dedicated technologies. Consequently, contamination routes could be higher in number than the one that can be identified by visual surveys (Tables 8, 9).

Table 8: Protection of water sources for drinking purposes before Haiyan

Protected water sources for drinking purpose before Yolanda (%)							Unprotected water sources for drinking purpose before Yolanda (%)					
Municipal WSS	Gravity WWS (spring)	Mini WSS (well)	Public funtain (LevelIII or LevelII WSS)	Protected spring	Protected shallow well	Tubewell with handpump	Unprotected spring	Unprotected well	Water trucking	Bottled water	Small water vendors	Surface water
24.09	9.51	2.4	13.38	3.41	3.62	26.64	1.36	3.22	0.19	9.35	0.66	1.73
Cumulated % of population using protected water sources for drinking water = 83.05%							Cumulated % of population using unimproved water sources for drinking water = 16.51 %					

Table 9: Protection of water sources for drinking purposes after Haiyan

Protected water sources for drinking purpose after Yolanda (%)							Unprotected water sources for drinking purpose after Yolanda (%)					
Municipal WSS	Gravity WWS (spring)	Mini WSS (well)	Public funtain (LevelIII or LevelII WSS)	Protected spring	Protected shallow well	Tubewell with handpump	Unprotected spring	Unprotected well	Water trucking	Bottled water	Small water vendors	Surface water
22.14	9.59	2.26	13.17	3.49	4.27	27.09	1.41	3.62	0.72	9.27	0.66	1.73
Cumulated % of population using protected water sources for drinking water = 82.01%							Cumulated % of population using unimproved water sources for drinking water = 17.41%					

Overall, 91.84% of the population is still using the same drinking water source (piped water, Level III and II WSS) and only 8.16 % have changed into existing shallow wells, springs and gravity systems. Piped water (Level III and II WSS) is less utilized by the 7.25% of the population in coastal areas and by the 15.63% in inland areas.

Households have been forced by the emergency to utilize lower technology water supply systems more intensively; this is due to the lack of electricity from extensive damage to the power lines as well as to the water mains. Similar figures are obtained considering the changes in drinking water sources vs km from the cyclone path (Table 10).

Table 10: Change in drinking water source after Haiyan

	% of HHs who has changed drinking water source after Haiyan	% of HH who has NOT changed drinking water source after Haiyan
Overall figure	8.16	91.84
Coastal areas affected by the storm surge	7.25	92.75
Inland	15.63	84.37
Distance path 25 Km	15.45	84.55
Distance path 50 Km	7.91	92.09
Distance path 50+ Km	4.69	95.31

Table 11 indicates the variation in water source use before and after Haiyan. Level III WSS are 1.95% less utilized (overall figure) while in storm surge affected areas WSS are 1.56% less utilized; inland areas show a decreased utilization of Level III WSS by 6.87%. An increased utilization of tubewells with hand pumps and protected shallow wells is present in inland areas (+1.59%, common value for both sources), while storm surge areas show respectively -0.13% and +1.27% variations in use. Unprotected wells are less utilized in coastal areas (-0.93%) but more utilized in inland regions (+2.53%).

Only 0.29% of the households utilised bottled water for drinking purposes; this figure is slightly decreased to 0.21% after Haiyan; to satisfy the daily needs of drinking water, the average daily cost per household amounted to 14.68 – 15.88 PHP (28.58 PHP within 25 Km cyclone path, 6.24 PHP within 50 Km cyclone path and 9.21 PHP above 50 Km cyclone path).

Table 11: Variation in water sources use before and after Haiyan

		Level II and III water supply					Level I water supply					
		Municipal WSS	Gravity WWS (spring)	Mini WSS (well)	Public funtain (LevelIII or LevelII WSS)	Protected spring	Protected shallow well	Tubewell with handpump	Unprotected spring	Unprotected well	Water trucking	Bottled water
Variation in water sources use after Haiyan (%)	Overall	-1.95	0.08	-0.14	-0.21	0.08	0.65	0.45	0.05	0.40	0.53	-0.08
	Storm surge areas (high magnitude)	-0.39	0.26	-0.78	-0.52	0	0.26	-0.39	0.39	-0.65	0.26	1.17
	Storm surge areas (high + medium magnitudes)	-0.96	0.01	-0.95	-0.44	0	0.99	-0.48	0.39	-0.82	0.26	1.49
	Storm surge areas (high + medium+low magnitudes)	-1.56	0.19	-1.02	-0.65	0.17	1.27	-0.13	0.35	-0.93	0.37	1.21
	Inland	-6.87	0.07	0.08	-0.29	0	1.59	1.59	0.07	2.53	2.03	-0.73

Table 12: Drinking water sources disaggregated between rural and urban areas

		Protected water sources in use for drinking pupose (%)							Unprotected water sources in use for drinking pupose (%)					
		Municipal WSS	Gravity WSS (spring)	Mini WSS (well)	Public funtain (Level IIII or Level III WSS)	Protected Spring	Protected shallow well	Tubewell with handpump	Unprotected spring	Unprotected well	Water trucking	Bottled water	Small water vendors	Surface water
Before	Rural	17.21	12.3	3	12.08	3.93	4.02	29.75	1.85	4.04	0.13	8.48	0.46	2.2
	Urban	43.32	1.7	0.73	17.01	1.94	2.49	17.92	0	0.91	0.36	11.79	1.22	0.43
After	Rural	15.04	12.41	2.8	11.54	3.93	4.85	30.21	1.91	4.63	0.8	8.59	0.37	2.22
	Urban	41.98	1.7	0.73	17.74	2.25	2.67	18.35	0	0.79	0.49	11.18	1.46	0.36
Variation is use	Rural	-2.17	0.11	-0.2	-0.54	0	0.83	0.46	0.06	0.59	0.67	0.11	-0.09	0.02
	Urban	-1.34	0	0	0.73	0.31	0.18	0.43	0	-0.12	0.13	-0.61	0.24	-0.07
Before	Rural	Cumulated % of population using protected water sources for drinking water = 82.29% (% unprotected = 17.16%)												
	Urban	Cumulated % of population using protected water sources for drinking water = 85.11% (% unprotected = 14.71%)												
After	Rural	Cumulated % of population using protected water sources for drinking water = 80.78% (% unprotected = 18.52%)												
	Urban	Cumulated % of population using protected water sources for drinking water = 85.42% (% unprotected = 14.28%)												

Figure 14: Slow sand filtration water system in rural areas

Few barangays in Leyte and Eastern Samar are still utilizing slow sand filters: shallow wells (protected and unprotected) are pumped to deliver raw water to an elevated water tower – usually 3,000 L capacity – which feeds water by gravity to slow sand filters; operations and maintenance are up to the community and the treated water is sold for about 2 PHP/5 gallon.

At present, these systems are not working due to damage to power lines providing electricity to centrifugal pumps. Moreover, some pumps and water towers have been irreparably damaged by the storm surge and flying objects during the cyclone (Figure 14).

Data on drinking water sources disaggregated between rural and urban areas confirm the overall figures (Table 12): in rural areas 17.16% of the population was using unprotected water sources before Haiyan; this percentage increased to 18.52% after the cyclone. In urban areas, these percentages are respectively 14.71% and 14.28%. Overall, in rural areas, 8.61% of the households have changed their water source due to the impact that the typhoon had on their water supply. This figure amounts to 6.93% for urban settlements (Table 12 and 13).

Table 13: Change in drinking water source in rural and urban areas

	% of HHs who has changed drinking water source after Haiyan	% of HHs who has NOT changed drinking water source after Haiyan
Rural	8.61	91.39
Urban	6.93	93.07

Considering the water sources utilized for domestic purposes before Haiyan, 85.56% of the population was using protected water sources for domestic purposes (mainly piped water and tubewells with hand pumps), while unprotected water sources accounted for 14.28%. After Haiyan, the overall picture is not significantly different: 86% and 13.82% of households, respectively, utilize protected and unprotected water sources for domestic purpose (Table 14, 15).

Overall figures highlight that 94.64% of the households are still using the same water sources (pipe water) while the 5.36% changed its water supply from piped water to tubewells equipped with hand pumps (Table 16).

Table 14: Protection of water sources for domestic purpose before Haiyan

Protected water sources for domestic purpose before Yolanda (%)							Unprotected water sources for domestic purpose before Yolanda (%)					
Municipal WSS	Gravity WWS (spring)	Mini WSS (well)	Public funtain (LevelIII or LevelII WSS)	Protected spring	Protected shallow well	Tubewell with handpump	Unprotected spring	Unprotected well	Water trucking	Bottled water	Small water vendors	Surface water
24.11	8.24	2.85	10.93	2.5	5.55	31.38	1.7	7.33	0.05	0.29	0.06	4.85
Cumulated % of population using protected water sources for domestic water = 85.56%							Cumulated % of population using unimproved water sources for domestic water = 14.28 %					

Table 15: Protection of water sources for domestic purpose after Haiyan

Protected water sources for domestic purpose after Yolanda (%)							Unprotected water sources for domestic purpose after Yolanda (%)					
Municipal WSS	Gravity WWS (spring)	Mini WSS (well)	Public funtain (LevelIII or LevelII WSS)	Protected spring	Protected shallow well	Tubewell with handpump	Unprotected spring	Unprotected well	Water trucking	Bottled water	Small water vendors	Surface water
24.68	8.26	2.64	10.69	2.51	5.6	31.62	1.63	7.22	0.03	0.21	0.06	4.67
Cumulated % of population using protected water sources for domestic water = 86%							Cumulated % of population using unimproved water sources for domestic water = 13.82 %					

Table 16: Change in domestic water source after Haiyan

	% of HHs who has changed domestic water source after Haiyan	% of HH who has NOT changed domestic water source after Haiyan
Overall figure	5.36	94.64
Coastal areas affected by the storm surge	5.55	94.45
Inland	7.38	92.62
Distance path 25 Km	8.67	91.33
Distance path 50 Km	5.71	94.29
Distance path 50+ Km	3.62	96.38

5. 3. 2. WATER ACCESS - AESTHETIC CHARACTERISTIC

Time and technical constrains didn't allow an investigation on microbiological contaminants present in water stored at the household level. Considering that Level II and I WSS do not provide chlorinated water, the measuring of the FRC wasn't relevant in the settlements serviced by these types of WSS. To have a very general idea of the water quality, the questionnaire included questions related to secondary water indicators like aesthetic characteristics such as water colour, odour and taste. Water that is aesthetically unsatisfactory may discourage the users from using an otherwise good water supply. On the other hand, taste, odour, and colour may be the first indication of potential health hazards. Aesthetic characteristics are in any case subject to individual preference as well as social, economic, and cultural considerations.

Sources of aesthetic contaminants include: the chemical and microbial content of the raw water, which is most influenced by geology, ecology and environment, chemicals added or removed during treatment and inputs and reactions that occur during distribution and storage. Odour and taste are useful indicators of water quality even though odour-free water is not necessarily drinkable. Colour may be indicative of dissolved organic material, inadequate treatment, high disinfectant demand and the potential for the production of excess amounts of disinfectant by-products.

Overall, before Haiyan 78.95% of the households declared that they never experienced aesthetic water issues, 21.93% reported to have faced them "just sometimes"; the remaining 2.98% reported to often have problems with aesthetic water issues. The 23.38% of households living in coastal areas often or sometimes experienced aesthetic water issues during the year; this figure decreased to about 19.39% for populations living inland. This difference could be explained considering that inland, the main sources of water are springs located in hilly areas (gravity systems level III and II) which are more stable in water quantity and quality.

Table 17: Water quality trend

Water quality trend (aesthetics characteristics) before and after Haiyan (%)		
	Same	Worst
Overall figure	75.75	24.25
Coastal areas affected by the storm surge	71.15	28.85
Inland	78.73	21.27
Distance path 25 Km	58.79	41.21
Distance path 50 Km	75.53	24.47
Distance path 50+ Km	84.13	15.87

After Haiyan, 24.25% of the households considered the water they were using worse in quality while 75.75% reported to use water with the same quality as before the cyclone. Within the 25 Km from the cyclone path, 41.21% of the households declared that the water they were using had worse quality than before Haiyan; this figure decreased to 24.47% and 15.87%, respectively, for 50 Km and 50+ Km from the cyclone path (Table 17). Worse water quality is perceived by 8.85% and 21.27 % of the population in coastal and inland areas, respectively (overall rural areas = 25.17%, overall urban areas = 21.69%)

Households mainly use the same water source for drinking and domestic purposes regardless of the technology involved (Level I, II, III WSS) and the effectiveness of the water treatment in case of Level III water supplies. The population trusts the quality of the water fetched from springs (Level II WSS) and piped water by urban water systems (Level III).

There is a diffused feeling that the raw water doesn't need treatment before drinking and treating water (boiling water) is adopted for a limited period of time only when family members or close relatives living in the same barangay are sick (mainly children affected by AWD). In case of suspected outbreaks or increased AWD morbidity, the recommendations on boiling water diffused through the media by DOH are quite often ignored by the majority of the population. The element which is increasing the public health risk is the sewage dispersed by the storm surge in coastal areas and by the rain in inland regions which has affected the water quality utilized for drinking and domestic uses.

After Haiyan, when looking at the households using the same water source for drinking and domestic use together with the limited percentage of households treating water before drinking (27.77%), the data clearly show that during emergency periods, households don't have the choice or the means to utilize an alternative or better quality water source and they don't have the knowledge, capacity or the means to treat water before drinking. The increased use of unprotected water sources shows also that sensitization campaigns on water treatment in emergencies should be better tuned and targeted and supported with the means to treat the water at the household level.

5. 3. 3 WATER ACCESS - DAILY WATER CONSUMPTION

At present time, overall figures about daily water consumption show 63.6% of households having access to less than 15 L/d/p of water for drinking purposes, domestic uses and personal hygiene; 31.9% and 4.48% are respectively the percentages of households with access to 15-20 L/d/p and more than 20 L/d/p. If these figures are combined, 95.5% of households have access to less than 15L/d/p or a maximum of between 15 and 20 L/d/p.

Storm surge areas seem the most affected in term of water access with 63.25% of the population having access to less than 15 L/d/p; inland, 29.09% of the population has less than 15 L/d/p. The combined figures between the percentage of the population having access to less than 15 L/d/p and between 15-20 L/d/p for storm surge areas and inland are respectively 92.45% and 95.52%. Similar trends are identified along the cyclone path (Table 18, 19) as well as in rural and urban areas.

Table 18: Percentage of the population with access to water after Haiyan

	Access to water after Haiyan (% of population)			
	Cumulated <15 L/d/p + 15 - 20 L/d/p	< 15 L/d/p	15 - 20 L/d/p	> 20 L/d/p
Overall	95.5	63.6	31.9	4.48
Storm surge areas	92.45	63.25	29.2	7.55
Inland	95.52	29.09	66.43	4.49
25 Km distance path	94.91	37.94	56.97	5.09
50 Km distance path	94.62	34.83	59.79	5.38
50+ distance path	96.11	27.88	68.23	3.86

Table 19: Access to water after Haiyan in rural and urban areas

	Access to water after Haiyan (% of the population)		
	< 15L/d/p	15 - 20 L/d/p	>20 L/d/p
Rural	64.23	31.62	4.15
Urban	61.85	32.75	5.41

The average water quantity unlikely exceeding 20 l/d/p (basic needs) is considered by the WHO as high level health concern. This issue is strengthened also considering that the 72.23% of households declared do not treat the water before drinking and the same water source is utilised for drinking, domestic purpose and personal hygiene with limited concern about its quality.

5. 4 Water Quality - Water treatment at HH level

Overall, among the 6,247 households interviewed, 72.23 % reported to not treat water before drinking it. This percentage decreased to 57.7 % within the 25 km radius and increased to 72.9% and 79.1%, respectively, in correspondence with the 50 km radius and 50+ Km radius (overall rural areas = 69.03%, overall urban areas = 81.17%).

Humanitarian agencies are providing water treatment products at the household level as part of the strategy to increase the access to treated water for the affected population. Moreover, DOH is conducting sensitization campaigns to promote household water treatment within the affected population. Despite these efforts, only 30-40% of the population is using preventive measures to improve the water quality and protect the health status of the family in the affected areas.

In storm surge areas heavily affected by Haiyan, 69.22% of the population is not treating the water before drinking it. This data is quite impressive considering that coastal areas have very shallow aquifers (Level I water supply) - mainly exploited by hand pumps and centrifugal pumps - susceptible to surface, sub-surface and underground organic contamination. Historical lack of maintenance and quality performances coupled with possible cross contamination due to over flooded sanitation facilities makes the piped water easy to be contaminated before the final user (Level II and III WSS).

Considering inland areas, only 30% of the population reported treating water before drinking it. Level II and III water supply systems show better water quality because the source of water is from springs located in hilly areas far away from possible pollution sources (direct observation). Despite this aspect, cross contamination is still possible within the populated areas before the final user. Level I water supplies are mainly utilized for domestic purposes.

During the assessment, randomized interviews were conducted among the affected population to better understand water treatment dynamics at the household level: almost all the family heads reported treating water due to the occurrence of diarrhea among the family members (usually children). This is limited in time until recovery.

In rural areas, the adopted treatment method is boiling the water utilizing firewood which is free. This implies they do not have any additional cost affecting the domestic economy. In urban areas, free firewood is not available and charcoal is utilized for boiling water.

Bottled water is mainly utilized by a limited portion of the population and only in urban areas. This is an expensive approach and families limited this practice only to the period in which one young family member has diarrhea. Households also reported that they start to treat water only when a family member has diarrhea and not when other members of the community are sick.

This is also confirmed by the findings of the following assessment: “Household treatment of drinking water and child diarrhea: Estimating the effect of each one on the other in the Philippines” by Joseph J. Capuno, Carlos Antonio R. Tan, Jr (2011).

One important study which is also helping to contextualize the importance of water treatment at the household level comes from the study, "Bacterial indicators of risk of diarrhoeal disease from drinking-water in the Philippines" (WHO bulletin, 1991): this field epidemiological study attempted to relate water supply and diarrhoeal diseases assessing the organic pollutant load of different water sources. Organic pollutants considered are faecal coliforms, Escherichia Coli, enterococci, faecal streptococci: 65% of water samples from open dug wells showed faecal coliform, enterococci, and faecal streptococci of >100 colonies per 100 ml of water sample; boreholes, which ranged in depth from about 12 m to 37 m, provided water of relatively good quality with <1 colonies per 100 ml (38-77% of the total sampling population); more than 50% of water samples from springs have >100 colonies per 100 ml. 100% of the water samples collected in small, untreated, water supply systems (Level II) were contaminated with contaminant concentrations ranging between 11-100 colonies to above 1000 per 100 ml. Urban water systems (Level III) did not deliver water of consistently high quality: the majority of samples had <1 colonies per 100 ml for faecal coliforms, E.coli, and enterococci; however, depending on the microorganism, 4-13% of the samples had >100 colonies per 100 ml.

During the present assessment, randomized free residual chlorine measurements for collected water from Level III WSS and stored and at the household level showed 0 mg/L FRC (Tacloban and Guiuan towns) despite 0.3-0.8 mg/L FRC measured in some spots along Level III WSS and water trucks managed by the Pilipino Red Cross. Containers utilized to collect water from Level II and I WSS were not clean and not properly stored. FRC chlorine measured on water stored and utilized in rural and peri-urban health facilities showed 0 mg/L FRC (Figure 15).

Household water treatment during previous emergencies was supported by DOH and Pilipino Red Cross (international and national donations) with the provision of chemical products for water disinfection under different commercial names: aqua drops, aqua chlorine tabs, waterine solution, Aqua tabs, PUR etc. This approach is limited in time and geographic distribution and the main household water treatment method recommended by DOH and Pilipino Medical Association remains boiling water before drinking. This recommendation doesn't consider constrains related to the local availability of firewood and charcoal and neither the additional cost a family should face on a daily basis. These are the main reasons boiling water as water treatment is not widely or regularly adopted.

Figure 15: Jerry cans for water collection stored in unsanitary conditions

5. 5. Sanitation

Pour flush toilets are the most common sanitation facilities in use in the area hit by the typhoon: overall, before Haiyan, these toilets were used by 85.22% and 84.98% of the households after Haiyan (similar figures are also for rural and urban areas). Open defecation was practiced by 5.15% and 5.76% of the population, respectively, before and after the emergency. Flush toilets account only for 4.95% before and 4.66% after Haiyan. Overall, the cyclone doesn't seem to have had an impact on the use of toilets or drastically changed the habits of the population: the variation of the use of different types of toilets is widely less than 1% except in the coastal areas with high storm surge impact: the use of the pour flush toilet decreased by 1.57% while open defecation increased by 1.7% (Tables 20, 21 and 22).

Table 20: Typology of toilets in use before Haiyan

	Type of toilets in use before Haiyan (% of population)				
	Flush toilet	Pour flush toilet	Pit latrine	VIP latrine	Open defecation
Overall	4.95	85.22	3.86	0.8	5.15
High	3.12	79.69	8.07	0.26	8.85
Low	3.07	89.52	2.45	0.45	4.47
Medium	7.37	79.76	4.78	1.46	6.64
Inland	7.67	84.3	3.62	1.23	3.18
25 Km distance path	4.79	79.64	5.7	1.03	8.85
50 Km distance path	3.43	86.7	3.51	1.06	5.3
50+ Km distance path	5.58	87.42	3.09	0.59	3.29

Table 21: Typology of toilets in use after Haiyan

	Type of toilets in use after Haiyan (% of population)				
	Flush toilet	Pour flush toilet	Pit latrine	VIP latrine	Open defecation
Overall	4.66	84.98	3.79	0.78	5.76
High	3.12	78.12	7.68	0.52	10.55
Low	2.9	88.89	2.48	0.38	5.31
Medium	6.88	80.57	4.45	1.38	6.72
Inland	7.16	84.66	3.76	1.23	3.18
25 Km distance path	3.94	79.7	5.82	1.09	9.45
50 Km distance path	3.18	85.97	3.26	1.06	6.53
50+ Km distance path	5.55	87.21	3	0.53	3.68

Table 22: Variation is use of different type of toilets after Haiyan

	Variation in use of different type of toilets after Haiyan (%)				
	Flush toilet	Pour flush toilet	Pit latrine	VIP latrine	Open defecation
Overall	-0.29	-0.24	-0.07	-0.02	0.61
High	0	-1.57	-0.39	0.26	1.7
Low	-0.17	-0.63	0.03	-0.07	0.84
Medium	-0.49	0.81	-0.33	-0.08	0.08
Inland	-0.51	0.36	0.14	0	0
25 Km distance path	-0.85	0.06	0.12	0.06	0.6
50 Km distance path	-0.25	-0.73	-0.25	0	1.23
50+ Km distance path	-0.03	-0.21	-0.09	-0.06	0.39

Pour flush toilets are connected to a reinforced concrete or brick wall septic tank (some of them bottomless). The outlet usually discharges into water bodies and natural drainage network in rural areas or lined or unlined channels in urban settlements. Informal interviews with key informants highlighted that less than 1% of the septic tanks are regularly maintained. Usually, in rural areas the emptying is done manually by buckets and sewage is dumped into the closest water bodies. Vacuum trucks are utilized in urban areas but the high cost discourages the households to desludge the septic tanks until they are filled and overflowing.

The sanitation facilities are located inside the house for 75.32% of the households while 18.34% have the toilet within 30 meters of their plot. Most of the protected or unprotected water sources (shallow aquifers) are within the same distance from the septic tank. In densely populated barangays along the coast, tube wells with hand pumps were observed at not more than 5-10 meters far away from the sanitation facilities.

Table 23: Toilet shared before and after Haiyan

Most of the households weren't accustomed to sharing the sanitation facility with other families: before Haiyan, 82.9% of the population didn't share the family toilet and this figure is confirmed also after the cyclone with 81.17% of households not sharing it (rural areas = 81.33%, overall urban areas = 87.3%): overall, 1.73% of the affected population was forced to share its toilets with neighbours because of Haiyan with 3.47% and 3.88% of households inland and within 25 km distance from the cyclone path (Tables 23, 24), respectively reporting as such.

Toilet shared -overall (%)		
	No	Yes
Before Haiyan	82.9	17.06
After Haiyan	81.17	18.79
Variation	-1.73	1.73

Table 24: Percentage of the population forced to share toilets

% of population forced to share toilet facilities after Haiyan	
Overall	1.73
High	0.65
Low	1.5
Medium	0.97
Inland	3.47
25 Km distance path	3.88
50 Km distance path	2.04
50+ Km distance path	0.56

During the assessment, the question related to the impact Haiyan had on the substructure of the sanitation facilities was misunderstood: the original question was aiming to quantify which percentage the sewage has been dispersed in the environment.

Considering the damages provoked by the storm surge in coastal areas, the term "flooded" has been translated into "washed away"; consequently, the collected information is not related to a still existing facility which has been flooded but to sanitation facilities which have been heavily damaged by the cyclone. The collected data are still consistent with the scope of the present assessment: before Haiyan, 93.4% of the households declared that they never experienced heavy damages to their septic tanks due to flood, flash floods or land slips.

Table 25: Percentage of washed away septic tanks after Haiyan

After Haiyan, 92.24% declared their septic tank was not irreparably damaged or in need of repair while 7.73% of the HHs defined the substructure of the sanitation facility not functioning due to wall collapses and in need to be partially repaired. In high storm surge areas, 11.33% are heavily damaged while inland this figure amounts to 10.06%. Moreover, within the 25 km distance path, this percentage increases to 14.25% and decreases to 10.11% and 3.68% respectively for the 50 Km and 50+ Km distance paths (Table 25).

Washed away septic tanks after Haiyan (%)	No	Yes
Overall	92.24	7.73
High	88.67	11.33
Low	94.97	4.96
Medium	90.69	9.31
25 Km distance path	85.76	14.24
50 Km distance path	89.89	10.11
50+ Km distance path	96.26	3.68

Waste disposal was investigated as per distance between HHs and disposal sites and frequency of garbage collection. At present, 87.85% of the HHs declared to dispose their garbage within 100 m distance from their home with a daily garbage collection services covering 21.75% of the population and a weekly service available for the 20.75% of the HHs. 58.38% of the affected population doesn't benefit of a scheduled service.

Regional Disaster and Risk Reduction Management Council (RDRRMC) reported that "vectors of different diseases such as mosquitoes, flies, cockroaches and rats have significantly increased" while UNDP declared that only 5% of the debris and garbage have been cleared up to date (4th January) in Tacloban, Ormoc, Roxas and Guiuan.

It is important to underline that rural areas in coastal and inland locations, were historically underserved or un-served at all in terms of WASH services: most households are left to deal with sanitation on their own and the water supply is guarantee by local private initiatives which don't guarantee continuity and quality of the service. Moreover, in the Philippines the most vulnerable population comes from rural areas: indigenous people, small-scale farmers who cultivate land received through agrarian reform, landless workers, fishers, people in uplands. Migrant women and children from rural areas often find themselves in the lowest and marginalized jobs both in domestic and international market.

Rural population needs for health programs, aiming to improve access to care and routine monitoring of chronic illness and first health care and first level referral services. Disparities in maternal health services are clear: the recommended minimum of four antenatal care follow-up visits were received by 78% of births to mothers living in urban areas, but for only 62% of births to mothers living in rural areas. Similarly, 55% of deliveries in urban areas, only 23% of deliveries in rural areas, took place in health care facilities (Utilization of Maternal Care Services in Rural Philippines, 2003 National Demographic Health Survey (NDHS).

Twenty-four babies die for every thousand infants born in the urban areas, while the infant-mortality rate in rural areas is higher by 50 percent: 36 babies die for every thousand live births (Press Release May 27, 2009 Senate of Philippines) The underlying causes of maternal deaths are delays in taking critical actions: delay in seeking care, delay in making referral and delay in providing of appropriate medical management.

Skilled human resources (water technicians, teachers, nurses, doctors etc) are reluctant to move in rural areas due to the scarce job opportunities or the limited chances to improve their professional careers. On the other hand, community based organizations are present almost on all barangays. Together with health and education workers and WASH technicians already present in some communities could be trained through short courses or vocational initiatives in order to improve their skills and to become community development workers. Related equipment should be provided at community or barangay level.

ANNEXES

Annex A – Assessment FAQs

Annex B – Damage level classification guide for enumerators

Annex C – Household Interview Questionnaire

Annex D – Basic Training inputs for enumerators

Annex E – WASH Assessment Tool (available upon request)

Annex F – Indicators Table

Picture on the cover page: UN Photo. 21 December 2013. Tacloban City, Philippines. Photo # 575655

A product of:

Global WASH Cluster Rapid Assessment Team (RAT)

The global WASH Cluster Rapid Assessment Team (RAT) is a consortium of active WASH agencies (CARE, IFRC and OXFAM) which deploys in the early stages of major emergencies or crises, to provide a rapid assessment of WASH needs to all stakeholders - See more at: http://www.washcluster.info

REACH Informing more effective humanitarian action

REACH is an interagency program of IMPACT Initiatives, ACTED and UNOSAT. Since 2011 REACH has formalized a partnership with the Global Shelter Cluster (GSC) to support the strengthening of its coordination and planning capacity. Dedicated REACH teams (including assessment, database and mapping experts) are available to be rapidly deployed to the field in the emergencies in order to facilitate interagency assessments and mapping activities on behalf of the shelter cluster. Resulting information products are used to enable better planning and coordination by the cluster, and are widely disseminated. For more information, see: www.reach-initiative.org / @REACH-info