

# Disaster Recovery User Needs Survey



Children in Bedadi, Mansera Northern Pakistan November 2005

15 September 2008

# Disaster recovery user needs survey

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# 1 SUMMARY

The following are the main points from the study

- 1 The users needs study started with our attendance at a World Bank sponsored two-day conference that provided the initial survey contacts and insights into devising the questionnaire.
- 2 The survey was emailed to 50 people. A total of 26 people responded. This gives a notional response rate of over 50% A wide spread of agencies responded, giving a fairly representative view of the relief and recovery sector. A note of caution needs to be sounded, however. Given the small sample size, the findings need to be treated with caution.
- 3 Six responses were received from people in Thailand working on various aspects of tsunami recovery. Although this group differs markedly from the rest of the sample of people from International agencies their responses were not markedly different.
- 4 Over half of the respondents (57%) use all three forms of information: published statistics, field survey and satellite imagery. And 69% of respondents say that their organisation already uses satellite imagery to assess needs.
- 5 The information people feel is currently lacking falls into three categories: base line data, damage assessment mapping and recovery monitoring.
- 6 Over three-quarters (77%) of respondents chose the Comprehensive Approach using multiple indicators to monitor recovery. Only 18% chose the Simple Approach and one person chose both.
- 7 Consistent with this choice, all 24 of the indicators offered were given a medium to high priority.
- 8 However, some indicators are given higher priority than others.
- 9 In brief the indicators that people would like to see mapped fall into the following major categories:
  - 1 Livelihoods, including agriculture and fisheries
  - 2 Housing
  - 3 Drinking water supply
  - 4 Environmental factors: Removal of floodwater sand and debris; Vegetation growth
  - 5 Road access and Reconstruction
  - 6 Services: schools, health
- 10 Nevertheless it is clear that, in terms of what people say they need, it would make sense for any future system to measure all of the indicators that it possible to map, apart from Transition housing and Relief schools, that Ian Davis recommend we remove from the list.
- 11 In addition, a number of other additional indicators were suggested. These fall into three main groups: Population Movement, Contamination and Risk, and Other (that include, changes inland ownership, changes in topography and presence of groups assisting recovery).
- 12 Decisions about what indicators we need to include in our study as examples of the approach and methodology should be made on the basis of practicality rather than an attempt to map all the indicators suggested. However, it might be useful to try to map one indicator in each of the six groups listed in Point 8 above.

## 2 Post Disaster Needs Assessment (PDNA)

This report begins with a summary of a two-day conference on Post Disaster Needs Assessment (PDNA) in Brussels 19-20 May 2008 organised by the World Bank and the European Commission.

In part this is because the user needs study began with this conference. We were invited to attend and two people went from Cambridge – Steve Platt and Beverley Adams. The organisers provided us with a database of attendees and this provided the initial contacts for this user needs survey. The conference was highly relevant initiative and we were privileged to be invited to attend. It is significant for the Recovery Project for two reasons: the conference discussion generated important questions that we used, in part, to frame our survey and because the people involved in the PDNA process provide a reference group with whom we can test our conclusions.

Nearly forty people attended the conference. They were fairly senior people working in the relief and recovery sectors for the European Commission, ILO, FAO, OCHA, UN, UNDP, WFP, WHO and the World Bank. They had been working together for two years had met a couple of times before. Currently they are in Phase 2 that involves developing a guide to Post Disaster Recovery. Monitoring recovery, the subject of our study, is seen as part of a Phase 3.

The overall aim of the World Bank initiative is to develop a way of coordinating agencies in post disaster needs analysis (PDNA). The approach is to build on current post conflict needs analysis, in particular a World Bank method of calculating damage and loss called ECLAC and humanitarian assessment of livelihoods and social issues by aid agencies like WFP, ILO.

The main drivers for the initiative are: to fill the gap between relief aid and development funding, to restore the foundations for development as early as possible and to identify opportunities for positive change that will increase resilience to future disaster, in other words, to build back better. The main expected outputs of the process are: protocols for cooperation between main donors and a Guide to multi-stakeholder needs assessment.

The conference discussion raised the following key questions:

- 1 Should post disaster needs analysis include generic recovery planning, or is each situation too specific, and should include prioritisation, or should this be the responsibility of the national government affected? In other words, how prescriptive should it be and how specific to particular countries and particular disasters?
- 2 How detailed or complex does needs analysis need to be? In other words how many factors or indicators should be included in the analysis and in how much detail should they be measured?
- 3 How can the current World Bank damage and loss assessment (DaLA) be reconciled or merged with less quantitative criteria such as livelihoods?

There are also a number of lessons or conclusions that we can infer from the conference:

No one, either donors, aid agencies or national governments seems to be doing systematic monitoring of recovery.

Monitoring and evaluation might usefully adopt the same framework and use the same indicators as the needs analysis. These indicators are likely to be sector based plus some cross cutting issues

A matrix of needs and indicators by sector has two additional dimensions: **Phases**: relief (days); early recovery (8 weeks); recovery (18 months) development (>18 months) and **Levels**: infrastructure; services; households.

The Recovery Framework in the form of a matrix of classes of indicators was presented at the conference. (See Appendix 4.6)

## 3 SURVEY

### 3.1 Introduction

This is a summary of the findings of the Disaster Recovery User Needs Survey conducted in June/July 2008. Users are defined as personnel working in international and national relief agencies who need information to assess and monitor the recovery process after major natural disasters.

The survey is part of a wider study by the University of Cambridge aimed at developing indicators of recovery that can exploit the wealth of data now available, including that from satellite imagery, internet-based statistics and advanced field survey techniques. The work will develop a standard, independent and replicable approach to measure, monitor and evaluate the relief and recovery processes.

### 3.2 Response

The survey was emailed to 44 people. This contact list was devised from various sources:

- People attending a conference organised by the World Bank and the EC in Brussels in May 2008 to discuss 'Post-Crisis Needs Assessment and Recovery Planning' with whom the researcher had had personal contact during the conference. (32 people)
- UNDP Emergency Shelter Cluster Work Plan list of contacts (7 people)
- Contacts provided by Sarah Moss at Christian Aid

An additional 6 people were contacted by Ratana Chuenpagdee, our research associate in Thailand.

A total of 26 people responded. This gives a notional response rate of over 50%, which is good for an email survey. These people work for the following organisations:

- DIFD, Department of International Development
- EuropeAid
- European Commission
- European Commission, Joint Research Centre
- FAO
- ILO, International Labour Organisation
- IRP, International Recovery Platform
- OCHA
- UNDG, United Nations Development Group
- UNDP, United Nations Development Programme
- UNEP
- UNFPA
- University of Memphis
- UNOSAT
- WFP
- World Bank – Head Office
- World Bank – Indonesia

This is a wide spread of agencies and, accepting the small sample size, gives a fairly representative view of the relief and recovery sector. The majority of respondents were senior field personnel, most of whom need good information on which to base decision-making and all of whom are concerned with recovery.

The results are presented as percentages. A note of caution needs to be sounded. Given the small sample size, these percentages need to be taken with a "pinch of salt".

## 3.3 Information

### 3.3.1 Information used

People were asked: *What type of information does your agency use when assessing the need on the ground? They were offered: published statistics, field survey, satellite imagery, and other.*

Over half of the respondents (57%) use all three main forms of information. Two-thirds of respondents (69%) say that their organisation already uses satellite imagery to assess needs.

### 3.3.2 Additional sources of information used

People were asked: *Specify what other sources of information do you use?* Their answers fall into four categories.

#### 1 Mapping and GIS data

Mapping available from OCHA ILO

Available spatial datasets over affected areas (e.g. GIS data, GPS points, photos, videos, etc.) UNOSAT

Vector data (e.g. shelter locations), type of construction material used, harvesting cycle, World Bank

Observations, aerial surveys WFP

#### 2 Local knowledge

Local assessments, including qualitative interviews with key informants, focus groups, and with community UNFPA

Local expert knowledge. University of Memphis

Focus groups Project for Participatory Restoration of Natural Resource

#### 3 Non-published reports, networking

Regional ECHO Correspondents and delegation staff EuropeAid

ECLAC Damage and Loss calculations World Bank - Indonesia

In the Community Civil Protection Mechanism (immediate disaster response phase) we use needs assessment provided by the governments. We also compare them with DG ECHO's, UN's or IFRC's needs assessments. European Commission

From time-to-time we may also rely on non-published surveys/reports from within HMG and also from NGOs, the UN and international agencies to develop an understanding of needs on the ground. DIFD

Aid and Government situation reports University of Memphis

Networking with colleagues Cranfield, Oxford Brookes and Kyoto Universities

Work with local development/response partners, typically with three-year aid programmes. Christian Aid

Monitoring visits to check if programme meets proposal targets. Most NGOs find this a difficult area. Currently improving monitoring and auditing. Christian Aid

Contacts with agencies with a field presence DFID

#### 4 Media

Press articles *UNEP*

Media information *Cranfield, Oxford Brookes and Kyoto Universities*

### 3.3.3 Information lacking

People were asked: *Thinking about a particular disaster, what information did you lack?*  
Their answers fall into four categories.

#### 1 Base Line Data

Cadastral data with spatial information included (e.g. coordinates of housing/ building corners) GIS LAYER on housing and building comprising heights and number of floors. *European Commission, Joint Research Centre*

Good population data as denominator for extrapolation of survey findings. *WFP*

Up to date large and small-scale information (spatial and non spatial) on: population, housing, local economy, infrastructure and critical facilities, community resilience, existing information and/or local institutions to share information. *UNOSAT*

Reliable data and quality assessments; data disaggregated by sex and age. *UNFPA*

Myanmar lacked easy access to reliable (Govt. Approved) pre-disaster baseline data. Lacked information on vulnerable groups, and livelihoods (particularly non-agricultural livelihoods). *UNDP*

Good baseline data on pre-disaster livelihood patterns. This is a common problem. *FAO*

Precise and detailed maps, detailing town and village names and also showing roads, ports, airports and other infrastructure can be hard to come by in the initial stages. *DIFD*

When looking at rubble, being able to identify what the building was, i.e. hospital, school, factory, etc. *ILO*

We lack knowledge on satellite imagery and also the base map or information. *Andaman Sea Fisheries Research and Development Centre*

Knowledge; management after disaster; warning system. *Department of Marine and Coastal Resources*

Up-to-date satellite images and risk area maps. *SNim Limited Part*

Tsunami baseline data or resource used (GIS show what who use resource and where). *Department of Marine and Coastal Resources*

#### 2 Damage assessment and mapping

Damage to housing and infrastructure; impact on access; land cover change. *World Bank*

High-resolution satellite imagery before and after, ideally loaded into Google Earth so that it can be compared by means of a transparency slider. *World Bank*

Change in the area. *Project for Participatory Restoration of Natural Resource*

Time sequence satellite imagery. *FAO*

#### 3 Needs assessment

Field surveys and needs assessment of the industrial hotspots /environmentally sensitive or vulnerable sites. *UNEP*

What the national government plans to do. *EuropeAid*

#### *4 Monitoring recovery*

Timing of achieving benchmarks that restore community functioning. Community needs / requirements to restore functions - decision making. *University of Memphis*

IRP is working towards becoming an international source of knowledge on good recovery practice. For each disaster, while not getting involved directly in the recovery processes, IRP tries to gather information relating to the gaps and constraints and provides information about the good practice from global experiences. *IRP*

## 3.4 Indicators

### 3.4.1 Approach to monitoring recovery

People were asked: *Which of the two approaches to monitoring recovery do you prefer; A SIMPLE APPROACH eg Sphere Guidelines or B COMPREHENSIVE APPROACH eg PDNA Recovery Framework?*

Over three-quarters (77%) of respondents chose the Comprehensive Approach using multiple indicators to monitor recovery. Only 18% chose the Simple Approach and one person chose both.

In some ways offering both a simple and comprehensive set of indicators might make sense. One person said that they, 'Prefer simple approach, (but needs to be more comprehensive than you have outlined here.' *FAO*

### 3.4.2 Indicators to map

People were asked: *If up-to-date information was available as overlays to satellite imagery of the disaster area. What indicators of recovery would it be useful to see mapped?* Using the classification adopted in the survey, people mentioned the following indicators:

#### 1 Habitation

Demographic details with patterns of habitation, housing and dwellings. *IRP*

Damage to housing and infrastructure. *World Bank*

Rebuilding of damaged housing stock, distribution of assistance grants. *World Bank*

Geo-referenced GIS layer of new urban developments and reconstructed housing, buildings (public, residential, governmental), *EC, Joint Research Centre*

Housing: Number of re-built and/or repaired houses; Relocation from temporary to permanent housing; Housing market (average sale or rental prices in the affected areas) *UNOSAT*

Population Recovery: Population estimates and distribution; School enrollment. *UNOSAT*

Would be useful to know where displaced populations (those not in camps) had gone, and more importantly, where they had begun to return to, particularly if not areas of origin. *UNDP*

Population movements; Rehabilitation of homes. *DIFD*

Settlement patterns including quality of reconstructed housing, population numbers and densities. *FAO*

#### 2 Infrastructure

Transportation, infrastructure including roads with focus on accessibility and other communication networks. *IRP*

Impact on access. *World Bank*

Restored transport lines. *World Bank*

Transport and energy infrastructure. *EC, Joint Research Centre*

Infrastructure functioning: cars on roads, lights in houses, etc. *ILO*

Infrastructure and critical facilities and public services (Re-building and repairing):

Transportation network; Health facilities; Educational facilities; Water and sanitation; Irrigation; etc. *UNOSAT*

Percent of infrastructure and housing rebuilt. *OCHA*

Would be good to map damage to community level infrastructure (schools, medical centers, religious buildings, paths, etc). *UNDP*

Road reconstruction. *FAO*

Utilities - required to bring people home. *University of Memphis*

Rehabilitation of infrastructure including roads, camps / transitional settlements and medical centers. *DIFD*

### 3 Health and education

Total population estimates (returns), % school enrollment, and no. of restored health facilities/schools, *World Bank*

For the field of gender: education (schools; infrastructure; attendance (m/f), literacy level; health (including reproductive health): health services available (different levels); contraceptive use/availability/other commodities; GBV reporting/services. *UNFPA*

### 4 Economic

Livelihoods. *IRP*

No. of jobs by sectors, net change in total employers, labor force size, food aid. *World Bank*

On the basis of assumed differences in livelihood, determine impact of the disaster on specific geographic zones. These zones would provide the frame for all further analysis: Pre crises vulnerability including food security and nutritional status, assets ownership, current coping and food consumption, livelihood impact. *WFP*

Visual confirmation of economic activity. *ILO*

Local Economy: Labor force (total size); Unemployment rates and claim; N. of non-farm jobs by type of employment; Access to local markets; Crop production; Industry sector; Tourist sector. *UNOSAT*

Cultivable land, it shows if the population is back "to business". *EuropeAid*

Damage to small to medium-scale enterprises (eg. small factories); damage to agricultural areas, livestock, fishing boats, etc; damage to access points (roads, ports, bridges, etc) and damage to housing. *UNDP*

Cropping patterns *FAO*

New businesses. *FAO*

Uptake of agricultural activities and other livelihoods. *DIFD*

Evidence of household vegetable garden planting, subsistence-level fishing activities, informal markets, road use, repairs & reconstruction, schools (temporary or permanent) in use, crop planting or harvesting activities. *DFID*

### 5 Environment

Resources, vegetation and forests, land-use patterns etc. *IRP*

Landcover change. *World Bank*

Security, environment and cross cutting issues indicators... *UNOSAT*

Agricultural damages, crop loss, forest loss, map out industrial and environmental sites where are displaced people, where the rubble/waste is being transported. *UNEP*

Debris and environmental / ecological health indicators. *University of Memphis*

### 6 Other

Indicators of safety as function for economic and human recovery. *University of Memphis*

Changed hazard patterns/ social displacement/ signs of early recovery actions. *Cranfield, Oxford Brookes and Kyoto Universities*

### 3.4.4 Indicators to be mapped

People were asked to score on a five point priority scale: *Which of the following possible indicators would you find interesting and useful if mapped using satellite images?*

Consistent with the Comprehensive Approach to monitoring recovery chosen by all but one of the respondents, all 24 of the indicators offered were given a medium to high priority. The results are presented below.

Criteria	Indicator	Average Score	Rank Order
Housing	Relief shelter	4.0	14=
	Transitional housing	3.8	20=
	Housing reconstruction	4.5	2=
	New urban development	4.1	12=
Infrastructure	Temporary road access	4.0	14=
	Road reconstruction	4.3	6=
	Power supply	3.9	19
	Drinking water	4.4	5
	Waste water disposal	4.0	14=
	Debris removal	4.0	14=
Health	Health – relief services	4.2	10=
	Health – recovery	4.3	6=
Education	Schools – relief	3.6	23=
	Schools – recovery	4.0	14=
Agriculture	Crops / livestock / fisheries	4.5	2=
	Food supply	4.1	12=
	Administration	3.8	20=
Economic	Livelihoods	4.7	1
	Tourism	3.6	23=
	Business/Manufacturing	3.7	22
Environment	Floodwater removal	4.3	6=
	Sand/debris removal	4.3	6=
	Vegetation	4.2	10=
	Water quality	4.5	2=

In brief the indicators that people would like to see mapped fall into the following major categories:

- Livelihoods, including agriculture and fisheries
- Housing
- Drinking water supply
- Environmental factors: Removal of floodwater sand and debris; Vegetation growth
- Road access and Reconstruction

It is possible to reorder this list of indicators in terms in descending order of priority.

<b>Criteria</b>	<b>Indicator</b>	<b>Average Score</b>	<b>Rank</b>
Economic	Livelihoods	4.7	1
Agriculture	Crops / livestock / fisheries	4.5	2=
Environment	Water quality	4.5	2=
Housing	Housing reconstruction	4.5	2=
Infrastructure	Drinking water	4.4	5
Infrastructure	Road reconstruction	4.3	6=
Health	Health – recovery	4.3	6=
Environment	Floodwater removal	4.3	6=
Environment	Sand/debris removal	4.3	6=
Health	Health – relief services	4.2	10=
Environment	Vegetation	4.2	10=
Agriculture	Food supply	4.1	12=
Housing	New urban development	4.1	12=
Education	Schools – recovery	4.0	14=
Housing	Relief shelter	4.0	14=
Infrastructure	Temporary road access	4.0	14=
Infrastructure	Waste water disposal	4.0	14=
Infrastructure	Debris removal	4.0	14=
Infrastructure	Power supply	3.9	19
Agriculture	Administration	3.8	20=
Housing	Transitional housing	3.8	20=
Economic	Business/Manufacturing	3.7	22
Economic	Tourism	3.6	23=
Education	Schools – relief	3.6	23=

There are some anomalies in the way people scored these indicators. For example, Livelihoods was scored highest, yet two aspects of economic activity, Tourism and Business/manufacturing scored much lower.

Ian Davis made a number of points that are worth detailing:

We need simple quick monitoring and, in parallel, a comprehensive approach.

Two indicators, Transitional housing and Schools – relief, might be removed from the list. Including Transitional housing gives it an unwarranted official status and the distinction between relief and recovery schools makes little sense.

Apart from this it is clear that, in terms of what people say they need, it would make sense to for any future system to try to measure all of the other indicators.

### 3.4.5 Additional suggested indicators

People were asked to: *To add any other indicators they would you find interesting and useful if mapped using satellite images?*

The following indicators were suggested:

1 *Population movement*

Population movements *UNFPA*

Internally displaced persons *UNFPA*

Population return to impact area *University of Memphis*

Day and night population, Deceased victims locations, sanitation *World Bank*

Land degradation (landslides, deforestation) *UNEP*

Buildings other than residential reconstruction or new developments *EC, Joint Research Centre*

2 *Contamination and Risk*

Map industrial hotspots with risks of chemical contamination *UNEP*

Oil spills, Hazardous Material *World Bank*

Map out dams *UNEP*

Flood depths, dam breaks, damage estimates, points of dispensing, logistics *World Bank*

Data on vulnerability (poverty, malnutrition, borrowing and debt) *World Bank*

3 *Other*

Land ownership (m/f) *UNFPA*

Changes in topography *Cranfield*

Presence of groups assisting recovery *Cranfield.*

## 4 CONCLUSIONS

- 1 The World Bank Post Disaster Needs Analysis group provides a useful reference group against which we can test our proposals.
- 2 Two-thirds of survey respondents already use satellite images to analyse needs. But none of the organizations represented seems to be monitoring recovery in a long-term systematic way.
- 3 Four out of five respondents prefer a comprehensive approach using multiple indicators.
- 4 All of the 24 indicators we presented were given a fairly high priority by respondents. This suggests that, apart from Transitional housing and Relief schools that we might exclude, a future system should include all the indicators we are able to map.
- 5 In addition respondents suggested a number of additional indicators we might consider adding to our list.
- 6 Therefore any decision about which indicators our study should include could be driven by what is practical and expedient for us to demonstrate the approach, rather by user needs.

## 5 APPENDIX

## 5.1 Other information used to monitor recovery

*People mentioned the following other sources of information they use to monitor recovery:*

ECLAC Damage and Loss calculations *World Bank - Indonesia*

Vector data (e.g. shelter locations), type of construction material used, harvesting cycle, etc. *World Bank*

Observations, aerial surveys *WFP*

Mapping available from OCHA *ILO*

Available spatial datasets over affected areas (e.g. GIS data, GPS points, photos, videos, etc.) *UNOSAT*

Local assessments, including qualitative interviews with key informants, focus groups, and with community *UNFPA*

Press articles *UNEP*

Regional ECHO Correspondents and delegation staff *EuropeAid*

In the Community Civil Protection Mechanism (immediate disaster response phase) we use needs assessment provided by the governments. We also compare them with DG ECHO's, UN's or IFRC's needs assessments. *European Commission*

From time-to-time we may also rely on non-published surveys/reports from within HMG and also from NGOs, the UN and international agencies to develop an understanding of needs on the ground. *DIFD*

Local expert knowledge. *University of Memphis*

Aid and Government situation reports *University of Memphis*

Media information *Cranfield, Oxford Brookes and Kyoto Universities*

Networking with colleagues *Cranfield, Oxford Brookes and Kyoto Universities*

Work with local development/response partners, typically with three year aid programmes. *Christian Aid*

Monitoring visits to check if programme meets proposal targets. Most NGOs find this a difficult area. Currently improving monitoring and auditing. *Christian Aid*

Contacts with agencies with a field presence *DFID*

Research vessel survey *Andaman Sea Fisheries Research and Development Centre*

Focus groups *Project for Participatory Restoration of Natural Resource*

## 5.2 Information lacking

*People mentioned that they lacked the following information in managing relief and recovery:*

IRP is working towards becoming an international source of knowledge on good recovery practice. For each disaster, while not getting involved directly into the recovery processes, IRP tries to gather information relating to the gaps and constraints and processes, IRP tries to gather information relating to the gaps and constraints and provides information about the good practice from global experiences. *International Recovery Platform (IRP)*

Damage to housing and infrastructure; impact on access; land cover change. *World Bank - Indonesia*

Depends on how much time passed after the disaster. In general, high res satellite imagery before and after, ideally loaded into Google Earth so that it can be accessed by a wide audience and compared by means of a transparency slider is extremely helpful but is rarely available. *World Bank*

Cadastral data with spatial information included (e.g. coordinates of housing/ building corners). GIS LAYER on housing and building comprising heights and number of floors. *European Commission, Joint Research Centre*

Good population data as denominator for extrapolation of survey findings. *WFP*

When looking at rubble, being able to identify what the building was, i.e. hospital, school, factory, etc. *ILO*

Up to date large and small scale information (spatial and non spatial) on: Population, Housing, Local Economy, Infrastructure and critical facilities, Community s resilience, Existing information and/or local institutions to share information with. *UNOSAT*

Reliable data and quality assessments; data disaggregated by sex and age. *UNFPA*

Field surveys and needs assessment, where are the industrial hotspots /environmentally sensitive or vulnerable sites. *UNEP*

What the national government plans to do. *EuropeAid*

Myanmar: lacked easy access to reliable (Govt. Approved) pre-disaster baseline data. Lacked information on vulnerable groups, and livelihoods (particularly non-agricultural livelihoods). *UNDP*

Good baseline data on pre-disaster livelihood patterns. This is a common problem. *FAO*

Precise and detailed maps, detailing town and village names and also showing roads, ports, airports and other infrastructure can be hard to come by in the initial stages of a rapid onset disaster. *DIFD*

Timing of achieving benchmarks that restore community functioning. Community needs / requirements to restore functions - decision making. *University of Memphis*

Accurate Information. *Cranfield, Oxford Brookes and Kyoto Universities*

Population movements, status of drinking water sources & health facilities, crop damage, road useability, water access constraints (e.g. new sandbanks, damaged ports), vulnerable groups/isolated communities, new risks e.g. from damaged flood protection works, crop damage, access to fishing areas (sandbanks again). *DFID*

We lack knowledge on satellite imagery and also the base map or information. *Andaman Sea Fisheries Research and Development Centre*

Knowledge; management after disaster; warning system. *Department of Marine and Coastal Resources*

Up-to-date satellite images and risk area maps. *SNim Limited Part*

Change in the area. *Project for Participatory Restoration of Natural Resource*

Time sequence satellite imagery. *FAO*

Tsunami baseline data or resource used (GIS show what who use resource and where).  
*Department of Marine and Coastal Resources*

### 5.3 Other indicators suggested by respondents

*People suggested the following additional indicators:*

Demographic details with patterns of habitation, housing and dwellings, transportation, infrastructure including roads with focus on accessibility and other communication networks, livelihood resource, vegetation and forests, land-use patterns etc. *International Recovery Platform (IRP)*

Damage to housing and infrastructure; impact on access; land cover change. *World Bank - Indonesia*

Total population estimates (returns), % school enrollment, no. of restored health facilities/schools, rebuilding of damaged housing stock, distribution of assistance grants, no. of jobs by sectors, net change in total employers, restored transport lines, labor force size, food aid. *World Bank*

Geo-referenced GIS layer of new urban developments and reconstructed housing, buildings (public, residential, governmental), transport and energy infra-structure. *European Commission, Joint Research Centre*

We would determine on the basis of assumed differences in livelihood impact of the disaster certain geographic zones. These zones would provide the frame for all further analysis: Pre crises vulnerability including food security and nutritional status, assets ownership, current coping and food consumption, livelihood impact. *WFP*

Infrastructure functioning: cars on roads, lights in houses, etc. Visual confirmation of economic activity. *ILO*

1. Population Recovery: Population estimates and distribution, School enrollment *UNOSAT*

2. Housing: Number of re-built and/or repaired houses,,Relocation from temporary to permanent housing, Housing market (average sale or rental prices in the affected areas)

3. Infrastructure and critical facilities and public services (Re-building and repairing): Transportation network, Health facilities, Educational facilities, Water and sanitation, Irrigation

4. Local Economy: Labor force (total size), Unemployment rates and claim, N. of non-farm jobs by type of employment, Access to local markets, Crop production, Industry sector, Tourist sector

5 security, environment and cross cutting issues indicators.

For the field of gender: education (schools; infrastructure; attendance (m/f), literacy level; health (including reproductive health): health services available (different levels); contraceptive use/availability/other commodities; GBV reporting/services available; emergency obstetric care/maternal health services; HIV/AIDS prevention; livelihood; ownership of land/assets; housing, etc. *UNFPA*

Agricultural damages, crop losts, forest losts, map out industrial and environmental sites. Where are displaced people, where the rubble/waste is being transported to. *UNEP*

Cultivable land, it shows if the population is back "to business". *EuropeAid*

Percent of infrastructure and housing rebuilt. *OCHA*

Would be useful to know where displaced populations (those not in camps) had gone, and more importantly, where they had begun to return to, particularly if not areas of origin. Would be good to map damage to community level infrastructure (schools, medical centres, religious buildings, paths, etc); damage to small to medium-scale enterprises (eg. small factories); damage to agricultural areas, livestock, fishing boats, etc; damage to access points (roads, ports, bridges, etc) and damage to housing. *UNDP*

Cropping patterns, settlement patterns including quality of reconstructed housing, population numbers and densities, road reconstruction, new businesses. Prefer simple approach, (but needs to be more comprehensive than you have outlined here. *FAO*

Population movements; Rehabilitation of homes; Rehabilitation of infrastructure including roads, camps / transitional settlements and medical centres; Uptake of agricultural activities and other livelihoods. *DIFD*

Utilities - required to bring people home. Debris and environmental / ecological health indicators. Indicators of safety as function for economic and human recovery. *University of Memphis*

Changed hazard patterns/ social displacement/ signs of early recovery actions. *Cranfield, Oxford Brookes and Kyoto Universities*

Evidence of household vegetable garden planting, subsistence-level fishing activities, informal markets, road use, repairs & reconstruction, schools (temporary or permanent) in use, crop planting or harvesting activities changed patterns before vs after as on examples below. *DFID*

The comparative area show damage from disaster, such as housing, information, health and other building in the disaster area. *Andaman Sea Fisheries Research and Development Centre*

Housing reconstruction; road reconstruction. *Department of Marine and Coastal Resources*

Level of risk from each disaster; Population; Human activity; Natural resources. *SNim Limited Part*

Livelihood, economic; Green area, roads, canals; Season. *Project for Participatory Restoration of Natural Resource*

Habitat; Livelihoods; Coastal resources. *FAO*

Sanitary; Income. *Department of Marine and Coastal Resources*

## 5.4 People contacted

No.	SURNAME	FIRST NAME	ORGANISATION	EMAIL
1	Almgren	Ola	UNDP	ola.almgren@undp.org
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20	Leon	Esteban	UNHABITAT, UN	leon.unhabitat@unog.ch
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23	Siebert	Michael	Germany (GTZ)	Michael.Siebert@gtz.de
24	Suprayoga	Hadi	Indonesia	suprayoga@bappenas.go.id
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29	Vivo	Gaetano	World Bank, Brussels	gvivo@worldbank.org
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42	Dutton	Alistair	Christian Aid	adutton@christian-aid.org
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## 5.5 People responding

NAME	POST	ORGANISATION
Yoshihiro Imai	Senior Expert	International Recovery Platform (IRP)
Josef Leitmann	Disaster Management Coordinator	World Bank - Indonesia
Henrike Brecht	Disaster Risk Management Analyst	World Bank
Delilah Al Khudhairy	Head of Unit	EC, Joint Research Centre
Anette Haller	Programme adviser	WFP
Mukul Bhola	Economic Recovery Specialist	ILO
Luca Dell'Oro	Disaster Management Expert	UNOSAT
Riet Groenen	Gender Adviser	UNFPA
Anne-Cécile Vialle	Associate Programme Officer	UNEP
Anastase Zacharias	Head of the Urban development sector	EuropeAid
Saso Borko	DG ENV-Civil Protection Unit/A3	European Commission
Alexis Hoskins	Assessment and Classification of Emergencies	OCHA
Charlotte Latimer	Knowledge Manager, Early Recovery Team	UNDP
Bradley Foerster	Policy Advisor	UNDG
Neil Marsland	Food security and livelihood adviser	FAO
Dan Ayliffe	Response Officer	DIFD
Arleen A Hill	Assistant Professor	University of Memphis
Ian Davis	Visiting Professor	Cranfield, Oxford Brookes and Kyoto Universities
Sarah Moss	Christian Aid	Disaster Risk Reduction Unit Manager
Fred Roberts	Humanitarian Specialist	DFID
Ms Praurai Nootmorn		Andaman Sea Fisheries Research and Development Centre
Ruamsub Chumnantana		Department of Marine and Coastal Resources
Sompoch Nimsantijaroen		SNim Limited Part
Tanu Nabnian		Project for Participatory Restoration of Natural Resource
Kungwan Juntarashote	Consultant on tsunami recovery	FAO
Pinsak Suraswadi	Director of Marine Conservation Division	Department of Marine and Coastal Resources

## 5.6 Survey Form

**Cambridge University EPSRC Project**

**INDICATORS FOR MEASURING, MONITORING AND EVALUATING POST-DISASTER RECOVERY – USER NEEDS SURVEY**

Introduction

The aim of this project is to develop indicators of recovery that can exploit the wealth of data now available, including that from satellite imagery, internet-based statistics and advanced field survey techniques. The work will develop a standard, independent and replicable approach to measure, monitor and evaluate the relief and recovery processes.

Your Name:.....

Organisation:

Post: .....

1. What type of information does your agency use when assessing the need on the ground?

Please tick

published statistics  field survey  satellite imagery

other (please specify)

2. Thinking about a particular disaster, what information did you lack?

3. If up-to-date information was available as overlays to satellite imagery of the disaster area. What indicators of recovery would it be useful to see mapped?

4. Which of the two approaches to monitoring recovery do you prefer? Please tick one

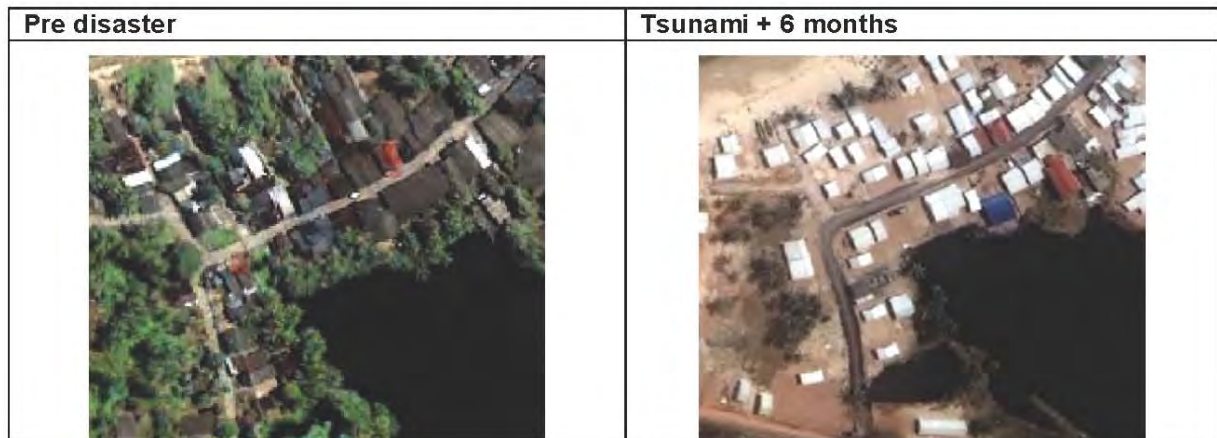
<p>A SIMPLE APPROACH eg Sphere Guidelines</p>		<p>B COMPREHENSIVE APPROACH eg PDNA Recovery Framework</p>
<p>Monitor 3 key issues: Habitat Livelihoods Communications</p>		<p>6-8 Sectors Cross cutting issues Phasing: relief; early recovery; recovery Level: infrastructure; service delivery; households</p>
<p>YES <input type="checkbox"/></p>		<p>YES <input type="checkbox"/></p>

Which of the following possible indicators would you find interesting and useful if mapped using satellite images? *Tick one box on each line to indicate what priority or importance you attach to each indicator. SEE ATTACHED EXAMPLES SHEET*

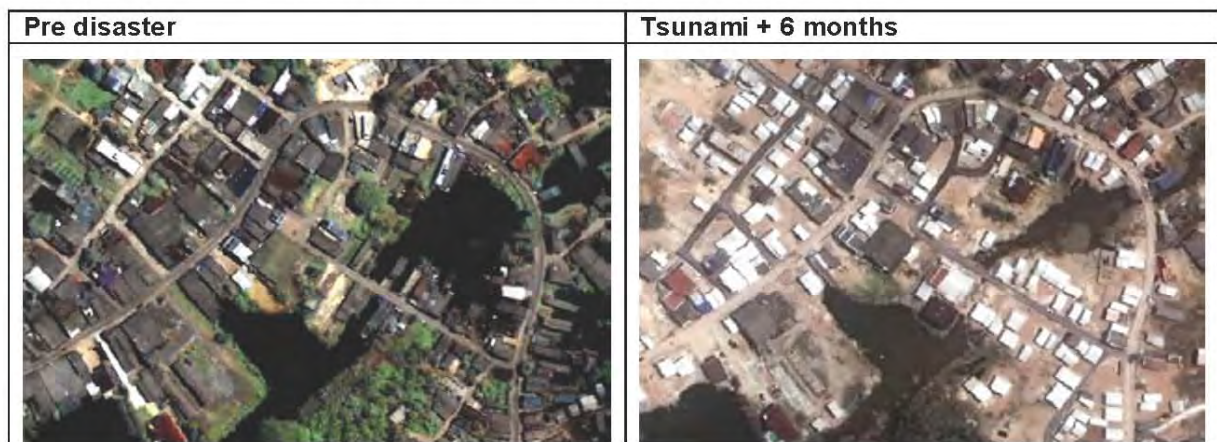
Criteria	Indicator	low priority			high priority	
Housing	Relief shelter	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
	Transitional housing	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
	Housing reconstruction <b>(Example 1)</b>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
	New urban development	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Infrastructure	Temporary road access	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
	Road reconstruction <b>(Example 2)</b>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
	Power supply	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
	Drinking water	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
	Waste water disposal	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
	Debris removal	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
	Health	Health – relief services	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
	Health – recovery	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Education	Schools – relief	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
	Schools – recovery	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Agriculture	Crops / livestock / fisheries <b>(Example 3)</b>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
	Food supply	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
	Administration	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Economic	Livelihoods	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
	Tourism	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
	Business/Manufacturing	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Environment	Floodwater removal	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
	Sand/debris removal	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
	Vegetation	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
	Water quality	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Other		<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
(Please add)		<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
		<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
		<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

**RECOVERY INDICATORS: EXAMPLES FROM BAN NAM KHEM, THAILAND.**

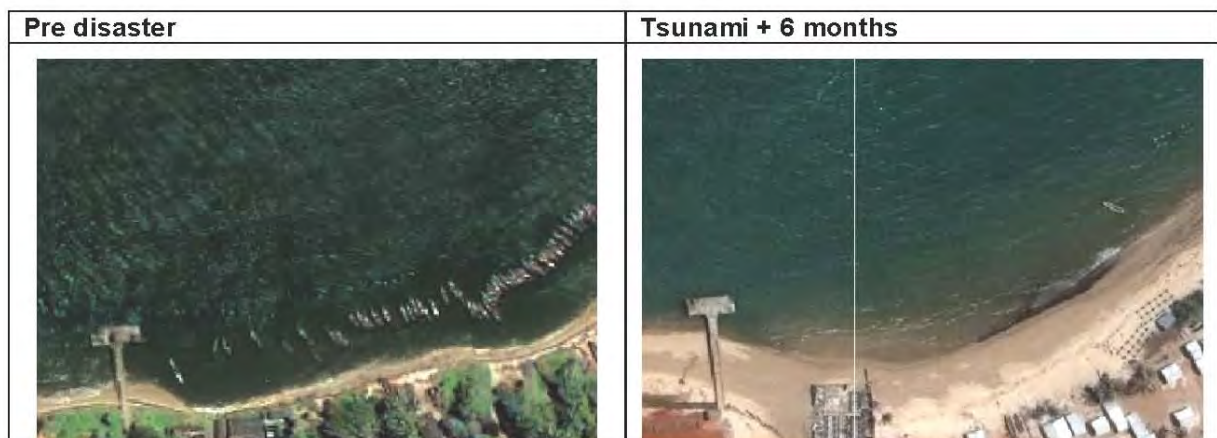
**Example 1: Return of inhabitants to land and dwellings.**



**Example 2: Transport access to the affected areas**



**Example 3: Restoration of economic activity**



## 5.7 Recovery framework proposed by World Bank/EC PDNA conference

