THE DISASTER
RESILIENCE LAB

A JOURNEY INTO THE INFORMATION TYPHOON

TYPHOON HAIYAN DRL FIELD REPORT

FINDINGS AND RESEARCH INSIGHTS

This transdisciplinary fieldwork was carried out from November 2013 to September 2014 to understand the information needs of humanitarian responders. We focused on decision support and sensemaking, i.e., the process by which people give meaning to what is happening, during the response to Typhoon Haiyan.

Our findings and recommendations are derived from field observations, meetings, and 39 interviews conducted in the Philippines with individuals affiliated with United Nations (UN) agencies, local and international non-governmental organizations (NGOs), as well as governmental agencies. MapAction and digital humanitarian volunteers carried out additional analyses.

The insights and recommendations shared in this document are aimed to contribute to ongoing and evolving discussions on information management and decision-making in humanitarian and disaster settings. We hope that our communications do not only support pre-existing knowledge and perspectives but also that our findings will provide new insights and help us all move ahead.

The authors sincerely thank all humanitarian responders who were willing to be interviewed. They took time from their busy schedules to share their experiences and perspectives. This work would not have been possible without their contributions. We are not only inspired by their dedication but also continue to learn from their expertise.

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EXECUTIVE SUMMARY

CONTEXT AND PURPOSE

In the aftermath of Typhoon Haiyan, as a group of researchers and practitioners from the fields of computer science, information systems, fire response, and health we observed an abundance of information Trying to understand and make sense of the dynamic and evolving response environment from our individual standpoints posed a challenge. While initially we remotely explored how information management, sensemaking, decision-making and humanitarian technologies were playing a role in the response activities we realised quickly that our complementary questions could best be addressed by moving into the field. Our central objective was to understand decision-makers' information and communication needs in the field.

This report summarizes and discusses our insights on the role and use of information during the response to Typhoon Haiyan. These findings result from transdisciplinary field research combined with research approaches in information management, decision support, sensemaking, supply chain management and organizational behaviour and coordination.

FIGURE 1: SUNSET OVER GUIUAN

RESEARCH QUESTIONS

Our primary research objective is to understand decision-makers' information needs in the humanitarian response system during the aftermath of Typhoon Haiyan.

By exploring and beginning to find answers to this primary research objective, better information products and communication platforms can be designed that are tailored for the specific needs of a decision-maker and collaborative groups responding to Typhoon Haiyan.

The number of actors involved in the Typhoon disaster response was overwhelming but not unique for sudden onset disasters of this size. From local NGOs and charities to the UN; from affected communities to digital volunteers, they all make decisions and undertake actions that impact the course of response and reshape preparedness activities for the future. The decisions they make over time are even very diverse, ranging from seeking shelter, to implementing programs and funding projects. To support this diverse range of decisions, a diverse set of information is required.

FIGURE 2: DRL FIELD TEAM IN GUIUAN, WITH ANDREW MARTIN (UN OCHA)

To provide a meaningful framework for our research, we structured our transdisciplinary research to address the following research questions:

1. **The Role of Information Management:** what is the role of traditional information management officers and other actors who focus on information products and flow of information to various decision-makers? How is information management embedded in their respective operations?

2. **Information Sharing and Coordination:** how is information shared between actors and organizations? How is it filtered, processed, and transformed into actionable insights? What are the success stories, and what are challenges?

3. **Understanding and Monitoring Risks:** how are risks assessed and monitored? How is information from various partners analysed to efficiently recognize gaps between aid provided and needs in a post disaster dynamic environment? How are emerging risks and new threats understood by various actors and how does this translate into monitoring?

4. **Information Products Impact Evaluation:** how are crisis mapping information products impacting humanitarian operations? Which technologies, information product types, and modalities are being recognized, valued and used for decision-making at various levels? What are the barriers to perceived value and successful use?

5. **Logistics and Supply Chain Management:** how is information about logistics needs translated into goods distributed, and what is the impact of aid on markets, and infrastructures?

KEY INSIGHTS AND RECOMMENDATIONS

1.THE ROLE OF INFORMATION MANAGEMENT

Thirty-nine interviews included discussions with information managers and humanitarian staff whose primary role was organizing information exchange. These interviews and our observations revealed that the post disaster information environment continues to expand at a rapid pace. A United Nations Disaster Assessment and Coordination (UNDAC) member described the post-Haiyan context as the "*information disaster*".

INGO's, UN staff and others interviewed echoed similar sentiments regarding the challenges they faced fulfilling the information needs of multiple actors either within their own organization or across coordinating structures. Often interviewees described their struggle to fulfil the requests of leadership and staff with existing products as current tools and systems did not provide the level of detail, elucidate patterns of change or provide stylized visualizations for funders and donors.

Additionally, the local population has been recognised by NGOs and the UN as (increasingly) important in their role as both a provider and user of data information products, due to both technological advances and a community-centred recovery approach. Yet, it is still often unclear how to make the local communication structures and data accessible to the responding organizations.

Recommendation: given an abundance of requests and products provided by different organizations, the role of information management needs to shift: from collecting and producing information products to further incorporate **processing, analysing and filtering** as core functions. Humanitarian information management roles thus need to transform as well in novel ways.

Information management officers need to be **trained and empowered** to create new ways to fulfil this evolving role. This change will help information managers better target decision-makers' needs and answer specific problems within and across clusters and organizations. Particularly, the operational and strategic functions of information need to be distinguished; Information Management Officers (IMOs) should be able to identify the *needs* of the different organizations and decision-makers to identify and provide the most suitable products. Technologies and innovations can facilitate this **brokering process** between information needs and the increasing volume of data and information products available.

ROLE OF INFORMATION MANAGEMENT

Information is widely recognised as key to managing disasters.

To leverage the potential of an abundance of information that can be collected and evaluated, the focus of traditional IM needs to shift towards **processing, analysing** and **filtering.**

Information managers need to be **trained and empowered** for their new role as **information broker**.

FIGURE 3: DAILY COORDINATION MEETING AT OSOCC IN GUIUAN

2. INFORMATION SHARING AND COORDINATION

Skype chat groups or Dropbox folders are among newer tools that fit the needs of field operations. These tools support tracking and logging users' interactions, enabling users to 'catch up' when connectivity improves. Nevertheless, observations and interviews reflected the continued reliance on **direct and bilateral exchange** in trusted networks that often bypassed official channels.

Low technology options, such as radio/satellite phones, dominated the communication landscape in Tacloban, and Guiuan. This is particularly true for communication with the affected communities, as shown around Guiuan by the Internews project Radyo Bakdaw. Whiteboards and paper-based solutions were dominant in all meetings from Manila to Guiuan. Operational information sharing varied greatly across geographical contexts and organizational hierarchy, ranging from shared Dropbox folders and reliefweb, where connectivity was good, to a village map painted on a wall.

Challenges with information sharing and coordination were ascribed partly to the lack of inter-organizational information sharing policies and a lack of familiarity with the Philippines disaster response structures. Often, NGO-specific granular datasets for dedicated operational aims took priority over aggregated information products and standardized data sharing.

INFORMATION SHARING AND COORDIATION

Despite the potential of technology, communication relies heavily on direct and bilateral information exchange, which follow the decreasing complexity and rigidity of coordination structures in the (deep) field.

Communication lines and technology should reflect and support these operational workflows and prioritise operational decision making with respect to both coordination mechanisms and organizational aims.

Our findings further show a **decreasing complexity and rigidity of coordination structures from headquarters to the field**.

Recommendations: in order to facilitate information sharing to address the specific decision-makers' needs and constraints, a common understanding is necessary of the diverse requirements and workflows. This is not (merely) a technological issue; rather it requires a combination of tools, individual and organizational decisions to strengthen coordination and to align operations. Future efforts in information sharing and coordination should continue to:

- establish **transparent communication** lines and workflows, for advocacy, reporting/monitoring and field operations;
- make the **purpose** of data collections or information requests clear;
- follow a transparent communication and **coordination strategy** that respects workflows deep in the field;
- **prioritise** operational decision-making.

3. UNDERSTANDING AND MONITORING RISKS

The response phase to a disaster is highly dynamic. Risks not only arise from external natural hazards that continue to threaten the Philippines, but also stem from political, social, and environmental issues. These often intertwined issues can also be understood from the perspective of the affected communities, taking into account the local organizations, structures, and cultures.

In the Philippines, the widespread use of English and the functioning governance structures facilitated the response activities. However, according to our interviews and observations, the interaction of responders with the population, government entities and their respective decision-makers remained challenging. Interviewees described the expectations towards international actors as *"filling gaps"* that could not be met by regional or national efforts. How to measure these gaps and by whom they should be filled remains difficult to answer, and in part leads to inefficiencies or a multiplication of efforts.

Understanding the needs, trends and risks as they emerge is often entangled with monitoring and reporting to donors or the general public. Interviewees, mostly at UN organizations, referred to these reporting obligations as "*feeding the beast*", indicating their frustration. The precise role and contribution of remote support is still unclear, in particular, how the worldwide Volunteer and Technical Communities (V&TCs) support traditional monitoring systems or help create situational awareness.

UNDERSTAND RISKS

Along with the dynamic nature of the response phase go a plethora of uncertainties and risks.

Understanding these risks as they emerge requires transparent prioritisation of needs and gaps as well as efficient monitoring tools that are tailored to support operational decision-making.

Standard approaches should not only rely on lagging indicators that refer to past data, but need to include leading information that allows to anticipate important upcoming issues.

Recommendation: **monitoring** needs, capacities and risks should serve the purpose of steering and **managing field operations.** Current indicator-based systems are not sufficient, since they focus on high-level and lagging indicators, which only track past developments on an abstract scale.

A shift is required that **prioritises the future,** including emergent social, political or technical risks. These risks need to be detected and understood as they emerge. We need to combine monitoring and forecasting to better understand the impact of response. Trends and patterns, for instance reflecting the concerns of the population, should be integrated. Filtering and processing should focus not only on what can be predicted in a reliable way - but also point out different possible courses of action and thus help revise strategies whenever necessary.

4. INFORMATION PRODUCT IMPACT EVALUATION

As part of our information product impact evaluation objective, we explored different evaluation methodologies to assess which products were recognized and valued, and began to establish how they were used for operational decision-making. Our research focused on geographical information products and digital humanitarian efforts.

Some NGO-based interviewees expressed interest in online information products produced by digital humanitarians. More frequently, however, interviewees were unaware of the digital humanitarian groups, their aims, and novel capacities. One interviewee recognized a World Food Programme (WFP) map but did not recognize that some of the geographic contributions came from the digital humanitarian group, Humanitarian OpenStreetMap.

The decision to use certain information products seemed to be based mainly on referral through trusted networks rather than on a thorough review of available products. From our interviews and observations it appeared that decision-makers often used a single map intensely if it was aligned with their information needs. Other times it appeared that they quickly browse products to build a quick situational overview from combined products.

The three main driving factors for information product access and use were found to be (1) the dynamic and heterogeneous post-disaster digital environment; (2) information product explosion; and (3) trusted networks as channels for information exchange.

IMPACT EVALUATION

The way information is presented has major implications for its uptake and impact.

Access to information products is depends and technology and ease of retrieving it in the given context.

The question of use and value also depends on the ease of extracting relevant information from a product.

Both aspects can only be addressed if a deep understanding of context and decision-makers' information needs is essential in the design of products.

FIGURE 4: MEETING WITH ANDREJ VERITY, UN OCHA, MANILA

Recommendations: information explosion affects the **accessibility** of information products and presents an ongoing technical and non-technical challenge to retrieve relevant information in the right format and in due time. Even in resource rich environments, information overload, which is well documented in other reports, persists and acts as a disincentive to find necessary products in a sea of documents.

Diffusion of information is certainly a condition for impact, but not sufficient. Whether an information product can trigger an action, inform a discussion or influence a decision relates to the **purpose** for which a product is designed, as well as the needs and skills of the decision-maker who is viewing or using the product. Tailoring products for a specific use to answer requests at real-time will be the challenge for operational and strategic decision support in the future.

5. LOGISTICS AND SUPPLY CHAIN MANAGEMENT

From an information and decision-making perspective, humanitarian logistics comprises all information flows and decisions that facilitate providing aid to those in need, from sourcing to distribution. Information is a vital part of supply chain management activities.

FIGURE 5: USAID FOOD PACKAGES OUTSIDE GUIUAN

Distribution of aid in the response to Haiyan varied with access and information on needs, which were highly variable owing to the fragmented structure of the Philippines, and the difference of damage patterns. According to UNDAC Guiuan, the logistics were an "*amazing challenge: in remote areas still days after the storm the basic supplies were not available*". Goods were pre-deployed before Haiyan hit, but were mostly routed via Manila, making distribution to remote areas difficult.

In our interviews, the logistics discussions were centred around distribution and partially monitoring. Issues of competition around access points such as harbours or airports were reported in interviews with MsF and ICRC for Guiuan and Tacloban.

An ICRC logistician reported on the difficulty of capturing logistics re-lated information in dedicated reporting tools. This confirmed findings from other interviews about the difficulty to obtain information if the data collection is not part of the operational work. Along similar lines, some interviewees also asked for more specialised training for logisticians.

The debate on sourcing (local or global) was emphasised in Guiuan, by the OCHA Head of Office. Sticking to the official UN sourcing policies lead to higher cost and longer waiting times, even for simple office material. In interviews in Tacloban and Cebu, where markets were functioning, Cash for Work programs were advocated.

In coordination meetings, the impact of aid on local markets and livelihoods were discussed. Yet, these potential impacts are not part of the official logistics cluster reports, and therefore it is unclear how this information is integrated into the planning.

LOGISTICS

Supply Chain Management goes beyond mere distribution of goods.

Logistics related information systems and planning tools need to reflect the realities in the field and should support workflows of responders instead of adding to them.

Specific domain knowledge and tools for planning and executing operations may support field work at remote levels while ensuring that the requirements are met with respect to flexibility and agility in sudden onset disasters.

Recommendations: the difficulty of quickly delivering aid to remote areas is in part owing to the ad-hoc set up of the response. Pre-disaster deployments should focus not only on major hubs, but also take into account potential access *after* the disaster and rely on **robust planning methods.**

Since efficient logistics processes rely on information on gaps, capacities, resources, or access, there is a strong **link between information management and logistics** that needs to be further exploited, particularly when it comes to analyses and planning. *Patterns* that drive logistics and disaster response include for instance needs that are induced by the aid. By forecasting and tracking changes of needs over time, more efficient logistics can be provided.

Naturally, uncertainties in disaster-struck areas are of a greater magnitude than elsewhere. Therefore, planning needs to focus on agile and flexible supply chains that can be adapted as the situation evolves, and as we obtain a better understanding of the needs.

FIGURE 6: THE FACULTY OF ENGINEERING, GUIUAN