

**NETWORK ANALYSIS
OF ACTORS WORKING
TO SUPPORT
DISASTER PREPAREDNESS
AND RESILIENCE
IN THE PHILIPPINES**

HARVARD HUMANITARIAN INITIATIVE | OCTOBER 2020



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Network Analysis of Actors Working to Support Disaster Preparedness and Resilience in the Philippines.

Harvard Humanitarian Initiative. 2020.

This study was conducted as part of the Harvard Humanitarian Initiative's Program on Resilient Communities. The program partnered with Root Change to analyze network data.

The **Harvard Humanitarian Initiative (HHI)** is a university-wide initiative with a mission to advance the science and practice of humanitarian response worldwide through research and education. HHI serves as the humanitarian arm of Harvard University and brings an interdisciplinary approach to building the evidence base of humanitarian studies and professionalizing the field of humanitarian aid. Through its research programs and educational offerings, HHI is an influential forum for humanitarian innovation, effectiveness, and leadership.

HHI's **Program on Resilient Communities** uses evidence-based approaches to interpret how communities mitigate the impact of disasters. The program's starting point is the central role local communities play in both disaster preparedness and response. Communities are the front line and locus for interactions with local civil society organizations, the private sector, national disaster management agencies, and the international humanitarian community.

Root Change aims to bring people together to question assumptions, think deeply, test ideas, and lead the way to a world built on social justice principles. Root Change designs products, technologies, and interactive experiences that help people, organizations, and communities build better futures for themselves.

ABOUT THE AUTHORS

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ACRONYMS

CBO – Community-based Organization

DEPP – Disasters and Emergency Preparedness Program

DRRM – Disaster Risk Reduction and Management

DFID – Department for International Development

HHI – Harvard Humanitarian Initiative

INGO – International Non-governmental Organization

LGU – Local Government Unit

MHPSS – Mental Health and Psychosocial Support

NDRRMC – National Disaster Risk Reduction and Management Council

NGO – Non-governmental Organization

NPA – Net Promoter Analysis

SNA – Social Network Analysis

UN – United Nations

UNOCHA – United Nations Office for the Coordination of Humanitarian Affairs

STUDY OVERVIEW

The Harvard Humanitarian Initiative (HHI) partnered with Root Change to conduct a network analysis of actors working to support disaster preparedness and resilience in the Philippines.

The study design is modeled after a summative phase external evaluation that HHI conducted in 2016-2017 on the START Network's Disasters and Emergency Preparedness Program (DEPP).¹ Network analysis techniques applied in this evaluation have been adapted from the DEPP work to analyze the disaster resilience network in coastal Bangladesh under the Resilient Communities Program.

In this report, we present the network analysis and methods used. We also detail findings and recommendations for HHI and other in-country partners about how these results can inform programs to strengthen disaster resilience and climate change in the Philippines.

STUDY PURPOSE

The purpose of this network analysis research had two goals:

- 1) To understand the relationships among actors supporting disaster preparedness and resilience work in the Philippines; and
- 2) To develop a representation of the disaster preparedness and resilience system in the Philippines through a depiction of the structure and characteristics of the relationships among the actors that make up the system.

HHI worked with Root Change to develop an analysis plan to inform these research goals.

STUDY SCOPE

In the Philippines, management of disaster risk reduction is governed by the National Disaster Risk Reduction and Management Council (NDRRMC). Its responsibilities are replicated at the series of hierarchy of administrative levels, from the regions, provinces, municipalities or cities, and barangays. The NDRRMC is composed of national government agencies and offices. Humanitarian actors engage with NDRRMC members across various levels in the implementation of their disaster-related activities.

Recruitment of participants for this study target humanitarian actors as well as members of NDRRMC across levels, which include among others, agencies working on social welfare, health, environment, climate change, education, agriculture, planning and development, civil defense, safety and security, local government, business, and finance.

The recruitment of participants was also based on NDRRMC's areas of DRRM implementation such as a) disaster prevention and mitigation; b) disaster preparedness; c) disaster response; and d) disaster rehabilitation and recovery.

In order to capture the involvement of communities as locus of resilience, local government units (LGUs) were also recruited for participation.

Not included in the survey are other sectoral organizations like those involved in human rights, peacebuilding, management-related NGOs among others.

¹ Pham et al. DEPP Evaluation Summative Phase Report. Harvard Humanitarian Initiative, Jan 2019. <https://hhi.harvard.edu/publications/depp-evaluation-summative-phase-report>.

DATA COLLECTION

Criterion sampling was used to select organizations organizations engaged in disaster preparedness and resilience work in the Philippines. We also included national, provincial, city and municipal agencies of and offices of the NDRRMC. The survey period took place between 2017 to 2019.

Surveys were collected either online, using KoboToolBox, or in person. In person interviews allowed for the identification of additional participants not identified through criterion sampling.

Invitations to participate in the survey were extended through social media and directly through our team members' presentations in INGO and NGO consortia meetings and in various disaster conferences and workshops in Manila.

In 2019, survey was administered face-to-face by the HHI Philippines team, acting as enumerators. The enumerators filled out printed hard copy versions of the questionnaires. In some instances, when the respondents could not immediately accommodate the enumerators, the printed questionnaires were left in the respondents' offices to be filled out at their convenience then retrieved by the enumerators at a pre-arranged later date. Face-to-face surveys were conducted in Tagalog and community guides were brought in to translate into other local languages when needed.

It is important to note that during courtesy visits especially for LGUs, endorsement or approval letter coming from the local chief executive, (Mayor for cities or municipalities and Governor for province) would have to be shown to the

respective offices working on DRRM, health, social welfare, environment, and agriculture among others.

This process of conducting courtesy visits, meetings, short presentations was repeated in each of the regions we worked in. Once back from fieldwork, the gathered data was encoded into the online Kobo Toolbox format by the enumerators and uploaded for submission.

LIMITATIONS

QUESTIONNAIRE

The length of the survey was a barrier for some respondents. For those taking the survey online, poor internet connectivity may have limited the number of people able to access and ultimately complete the survey form.

ONLINE SURVEY

Invitation to participate in the online survey was sent via email to the purposely selected actors starting 2017. There was however a low response to the online survey despite constant follow ups. In some instances, the very slow connectivity posed a challenge to some respondents. Isolated LGUs and community-based organizations in the Philippines with no internet connection were also not able to participate. In some instances, respondents with no email address could not move on with answering the online survey since the procedure required the provision of an email.

Invitations to participate in the survey were sent to the humanitarian network via email and also posted to the social media page of HHI in the Philippines. Followers and members of this network seldom include the business groups and sectoral groups like women, LGBTQ, PWDs and other vulnerable groups which might had been under-sampled in the survey. On the other hand, followers of the social media or LGUs with high internet connectivity might have been over-sampled. Other social media groups related to DRRM wherein the HHI page in the Philippines is a member could have also been over-sampled.

FACE-TO-FACE SURVEY

In-person surveys took an average of two hours. Respondents often felt a need to explain their responses, which added to the amount of time needed to conduct the survey. In some instances, the respondents requested for the survey instrument to be left for them to answer during their free time and the enumerators came back to gather the filled-out survey. At times, the team would have to visit several times to set a schedule for the survey to some LGUs and municipal government offices.

Face-to-face surveys were done in Luzon and Visayas. It was not possible to survey in Mindanao due safety issues and to the limited number of enumerators. Respondents were, for the most part, from cities or municipalities with a smaller number of respondents included from coastal communities.

CRITERION PURPOSEFUL SAMPLING

Organizations involved in disaster management, disaster preparedness, disaster risk reduction and/or climate change adaptation were considered for inclusion. Organizations working on development, peacebuilding and human rights were excluded, even though these actors occupy many of the same geographic spaces. This is a further limitation for the study as a number of these types of actors undertake activities that impact disaster preparedness and resilience.

SNOWBALL SAMPLING

Some of the respondents expressed concerns about how the data from the study might be used and were reluctant to refer other organizations. Other respondents expressed fears about competition with other organizations. These respondents were particularly sensitive about mentioning anything about financial resources. In both cases, the number of actors in the system were underrepresented and some connections between organizations may have been missed for those actors expressing reservations about making their partners known.

LENGTH OF DATA COLLECTION

Although data gathering extended from 2017 to 2019, some humanitarian actors were not able to participate in this study since their operations ended by the time the survey was administered face-to-face. This was particularly experienced in the Western Visayas area where several local and international NGOs which were very active after Typhoon Haiyan struck had completed their projects by the time we started the face-to-face survey. In this case, these organizations opted not to participate in the survey and might result to loss of vital collaborations not being documented.

SUMMARY OF KEY FINDINGS AND RECOMMENDATIONS

The following is a summary of findings from the network analysis. We have included additional questions that these findings raise and have embedded recommendations for strengthening disaster preparedness and resilience in the Philippines.

NETWORK OF MANY LOCAL ACTORS, WORKING INDEPENDENTLY

- There is a vibrant local system of actors in the Philippines working on disaster preparedness and resilience; however, many local actors were found to be working in distinct groups, isolated from the larger system. Of the organizations we surveyed, 64% were sub-national and 21% national humanitarian actors. Sub-national actors, particularly smaller sized organizations, were commonly found on the periphery of the network or working in isolated groups, typically 2 to 6 organizations working together but disconnected from the larger ecosystem. Over 35 isolated groups were found working in the disaster preparedness and resilience network in the Philippines.
- As a result of these isolated groups, while 61% of the relationships identified in this study were local-to-local actor ties, reciprocity (bidirectional ties), density, and reach (the spread of information, ideas or support, among local actors) among local actors were found to be very low. In other words, while local-to-local ties are prevalent in the system, many local actors are not working cohesively on common issues. Further research is needed to understand why so many isolated

groups exist. Geography may be a factor, with smaller sub-national organizations potentially focusing their efforts on a specific locality or working in more isolated regions in the country.

- In addition to isolated groups, we also found many isolates in the Philippines disaster preparedness and resilience system. Isolates are individual actors that were surveyed but reported no connections to others and were not identified by other survey respondents as a contact. Out of a total of 501 actors identified, 114 were isolates. Many of these actors were also small, sub-national organizations, particularly schools or universities. Further research is needed to understand why schools and universities are not engaging much with others on disaster preparedness and resilience topics, and why they are not sought after by others in the larger ecosystem.
- Increasing connections to and collaboration with isolated groups and isolates in the Philippines would allow for greater flow of information, ideas and resources within the disaster preparedness and resilience network in the Philippines. Since many of the isolated groups are primarily sub-national actors (approximately 80% of isolated groups), this would also help to increase the local system's ability to respond to shocks and implement a coordinated strategy.

PREFERENTIAL ATTACHMENT TOWARDS INGOS AND GOVERNMENT

- International actors along with the government were found to be helping to connect local organizations within the larger disaster preparedness and resilience system that otherwise would be disconnected. Mid-Sized INGO A, Small INGO C and Government were consistently cited as the top collaboration hubs (having the greatest number of relationships) and top resource hubs (those to whom others go most often). Top influencers and brokers in the system were also found to be predominately international actors.
- These findings suggest there is preferential attachment within the system toward international actors. Preferential attachment is a common phenomenon that can occur in humanitarian aid systems, where existing system actors are more likely to associate with organizations that have the most links and connections (and opportunities for funding). Not surprisingly, when international agencies set up operations, they quickly become the target of preferential attachment by local actors. This can initially have positive system effects with international actors, like those seen in the Philippines network, helping to connect up actors that otherwise would be disconnected. Over time, however, if this behavior continues it can pose threats to local system sustainability.
- The potential risks of preferential attachment toward international actors is present in the Philippines system. Out of 387 total actors identified in the Philippines system, 59 were international actors. When removed, the network lost 39% of its relationships. The loss of these international actors also made 41 local actors isolates. This demonstrates a weakness in the resilience of the local system and local actors' ability to maintain coordination and collaboration when international actors withdraw their support.
- Over time, we would expect international actors to shift the role they play within the system, transferring their roles of fostering local system connectivity to a range of emerging local leaders at both the sub-national and national levels. Relevant national and international agencies might consider how they can support emerging local actors to take on greater leadership roles and how the program can play a brokering role within the system, helping to increase collaboration between local actors. Multi-stakeholder platforms, like social labs or collective impact models, are powerful approaches that bring together diverse local actors to work towards a common agenda on issues related to climate change and disaster resilience. These platforms are proven methods for fostering locally led solutions, as they emphasize co-creation between local actors, helping to support local system self-reliance.

ONE-WAY, TOP-DOWN STRUCTURE

- The disaster preparedness and resilience system in the Philippines was found to have primarily one-way relationships, with less than 1% of relationships being reciprocal, or bidirectional between two organizations. With such low reciprocity, actors are displaying more seeking behavior—seeking information or support rather than cross-collaborating and working jointly on initiatives.
- Analysis of collaboration patterns revealed that often actors surveyed indicated they go to others who work at a higher level. For example, Local NGOs tend to go to National or International NGOs. Community-based or people’s organizations tend to go to National NGOs. 50% of relationships were reported to be formal partnerships, which indicates that relationships are primarily transactional, in addition to being top-down.
- Collaboration was also found not to be structured in a way that facilitates the spread of information, ideas or resources. Increasing connectivity, both through creating new connections and through encouraging bi-directional relationships would help to improve the flow of information and ideas to more actors in the system and coordination on specific issue areas. Relevant national and international agencies might look at how they can incentivize groups of organizations to work together through peer networks on a topic and engage informally as well as formally, fostering more mutual exchange among actors at different levels.

NEW AND EMERGING PARTNERSHIPS

- Among existing relationships, survey respondents indicated that they primarily collaborate frequently, and have high trust. Approximately half (55.8%) of collaboration between organizations is often, or more than 5 times in the last 6 months. This suggests that actors have many touch points to meet and engage. Actors were found to be predominately collaborating and exchanging information, ideas and support in the areas of advocacy, community capacity building, community-based risk assessment, and climate change adaptation.
- The disaster preparedness and resilience system in the Philippines was found to be made up of actors with recent or new partnerships. Almost half of all reported relationships (45%) are between organizations who have known each other for 3 years or less. For relationships between sub-national and national relationships, half (51%) were 3 years old or less. International actors, in particular, were found to have many new and emerging partnerships. 74% of relationships between international actors and 46% of relationships between international and sub-national actors were formed within the last 3 years. Further research is needed to determine if changes to political legislation, aid funding, social movements or campaigns, or other factors in the Philippines have contributed to new relationships forming between international, national and sub-national actors in the last 3 years.

LEARNING APPROACH

UNDERSTANDING NETWORKS AND WHY THEY MATTER

One of the most important contributions to our understanding of social change is the idea that individuals and organizations are embedded in thick webs of social relations and interactions, forming complex ecosystems that shape development outcomes. This is particularly true for the humanitarian sector, where social networks exist between organizations, communities, clients and services providers. The exchanges and transactions that take place in this web of humanitarian actors can be viewed much like a natural ecosystem— but where natural ecosystems operate on premises of instinct and survival, humanitarian actors fulfil certain functions according to principal-agent agreements, personal ties, social and cultural affinity and shared goals.

Humanitarian actors and their organizations are influenced by social effects that include the exchange of ideas, information and social pressure. Tracking the flow of ideas is key to understanding the readiness of networked organizations to meet complex challenges, not just because timely information is critical to efficient systems but because individual and organizational behavior is driven by the way people cooperate, learn and coordinate for action. Effective networkers attract people by achieving powerful results and building a community that others want to join. In other words, they build strong social capital. Social capital refers to the leverage an organization gains from its relationships; or, to put it another way, the benefits

derived from having links within a community of peers. These benefits flow from trust, reciprocity, information exchange, and the cooperative norms embedded in these relationships. Root Change has observed that organizational social capital can be a reliable predictor of social impact and programmatic success.²

CHARACTERISTICS OF HUMANITARIAN ECOSYSTEMS

To assess the network of actors working on disaster preparedness and resilience in the Philippines, we have taken into account key characteristics and potential roadblocks that can affect collaboration within humanitarian ecosystems, building off the approach we used in the DEPP evaluation. Below we describe the factors that influenced our system analysis and our recommendations.

² Levinger and Bloom, Fulfilling the Promise: How National Societies Achieve Sustainable Organizational Development, 2011.

LOCALIZATION

Within humanitarian aid there is a growing attention among donors and practitioners on the importance of localization. Localization refers to a shift of power, where stakeholders such as donors, United Nations (UN) agencies and International Non-governmental Organizations (INGOs) are putting local actors, such as civil society, local Non-governmental Organizations (NGOs), community-based organizations (CBOs), and government, in the driver seat and supporting them to play a more central role in leading humanitarian efforts. Trocaire and Groupe URD's 2017 research on how localization efforts within humanitarian aid build community resilience and sustainability provides a succinct definition of localization, seen in the text box.³

Many humanitarian response initiatives are working to improve local collaboration between a range of stakeholders and strengthen local capacity to plan, implement and finance efforts. An example of this is seen with the START Network and DEPP, which acted as a global capacity building program and aimed to strengthen the networks and collaboration among local actors working in humanitarian assistance. In assessing the impact of the DEPP network across four country contexts, Root Change designed an analysis approach to examine dimensions of localization. We have applied some similar techniques to the analysis of network actors in the Philippines in order to assess:

1. The degree to which sub-national and national actors are collaborating with each other;

Localization Definition

“Aid localisation is a collective process involving different stakeholders that aims to return local actors, whether civil society organisations or local public institutions, to the centre of the humanitarian system with a greater role in humanitarian response. It can take a number of forms: more equitable partnerships between international and local actors, increased and ‘as direct as possible’ funding for local organisations, and a more central role in aid coordination. Underpinning this is the question of power. Localisation requires a shift in power relations between actors, both in terms of strategic decision-making and control of resources.”

-Trocaire and Groupe URD, “More than the Money, Localisation in Practice”

2. Whether local actors are in positions of influence; and

3. The role that international actors play in the Philippines and effects on the local system when international actors are removed.

In this report, we present suggestions for how to strengthen this system and improve localization of humanitarian efforts.

³ Trocaire and Groupe URD, “More than the Money, Localisation in Practice”: <https://www.trocaire.org/sites/default/files/resources/policy/more-than-the-money-localisation-in-practice.pdf>

BEHAVIORAL ROADBLOCKS

Many of the international development and humanitarian response networks we have studied previously show predictable patterns. These are based on how international aid programs, funders and organizations engage in a local system. The arrival of foreign assistance can bring much needed resources and support to a country context, but at the same time it can be disruptive to the local ecosystem. In assessing the Philippines network, we looked for examples of two common roadblocks to effective collaboration we commonly find in any international development network.

1. PREFERENTIAL ATTACHMENT AND

DOMINATION: Development ecosystems are complex and adaptive, as new organizations enter and exit a system constantly. A common misconception is that new entrants will naturally choose to associate with a range of local-peer institutions on common development challenges. In reality, new actors are much more likely to associate with organizations with the most links and connections (and of course opportunities for funding). Preferential attachment to centralized actors reinforces the hegemony of a few key actors, with negative consequences for sustainability. Not surprisingly, when international agencies set up operations, they quickly become the target of preferential attachment by local actors, where local actors go primarily to these international agencies. Preferential attachment can lead to positive effects, such as local partners implementing aid programs, but often donor attention on a few local partners can make them “usual suspects.” This reinforcement of their “inner circle” status, can create preferential attachment towards these few local actors as well. As a result, networks can become dependent on a

few dominant actors, who have few incentives to facilitate connections and embrace new brokering roles that might potentially diminish their own influence. We have looked for presence of preferential attachment and dominant actors in the full Philippines network and across collaboration areas in our analysis.

2. **INSULARITY:** Another common feature of systems is homophily: the tendency of individuals and organizations to affiliate with others like themselves. Organizations tend to restrict their relationships to friends, colleagues or peers who often work in the same sector, have similar organization type, or have the same beliefs, attitudes and practices. This creates a “small world” effect where clusters of collaboration are composed of organizations with common characteristics. This insularity can complicate efforts to spread new knowledge and ideas. Government actors, NGOs, and donors are also susceptible to the small-world syndrome. We have observed how central actors with influence increasingly limit ties to an “inner circle,” further isolating themselves from new connections and alternative viewpoints. In our analysis, we have looked for signs of insularity especially among organization types such as government, INGOs, local NGOs and CBOs. We also look for other drivers of homophily, including the age of an organization and history of collaboration.

STUDY METHODS

DESIGN

This study utilized quantitative and network analysis surveys, following a similar survey design and process used for the DEPP evaluation. The surveys asked questions about traits of the organization answering the survey, as well as questions about the nature of their collaboration with other organizations. Data was collected between October 2017 and October 2019 in person using enumerators as well as online using KoboToolBox.

They also were asked to name additional actors who were not on this list but work on disaster preparedness and resilience in the Philippines. Additional actors named are considered to be 1st degree actors. They are one degree of separation away from the survey informant. The 1st degree actors identified were then invited to also take the network survey. The actors they identified are 2nd degree actors, as they are two degrees of separation from the initial survey informant.

DEGREES OF SEPARATION

Actors were eligible to participate in the survey if they work on disaster preparedness and resilience in the Philippines. The initial list of respondents was based on a list of humanitarian-related actors registered with the government.

Figure 1. Example of Degrees of Separation



In this example, Small National NGO F took the first phase survey and named Small INGO R. Small INGO R then took the survey in the second phase and named Small INGO S. Small INGO S is two degrees of separation away from Small National NGO F.

RELATIONSHIP TYPES

As part of the network survey, participants identified who they collaborated with over the last 6 months. They picked from a list of 38 collaboration areas, representing a menu of topics in which humanitarian actors are likely to engage. Collaboration areas are the functional or thematic areas in which organizations work together. Participants could also nominate or name their own areas of collaboration. Participants wrote in about 40 additional collaboration areas, but many of these were similar enough to the collaboration areas offered on the survey to be added to those or were similar enough to other write-in collaboration areas to form a new collaboration area. For example, many of the write-in collaboration areas fell under a common theme of Urban Planning/Infrastructure Development, so this became a new collaboration area. The final count of collaboration areas in the network is therefore 45. This report concentrates analysis on the full network and the top 4 most frequently referenced collaboration areas: Advocacy, Community Capacity Building, Community-based Risk Assessment, and Climate Change Adaptation. For a complete list of collaboration areas, see Annex A.

In addition, participants were also asked to describe how formal they defined the relationship and if it was based on mutual interest or a funding requirement. Table 1 provides an overview of the information that was collected on relationship type.

STRENGTH OF RELATIONSHIP

Survey participants were also asked to describe attributes related to the strength of the relationship. The first of these attributes describes how frequently they collaborate with the actors they identified. Frequency of communication or interaction is a common proxy for quality of relationship. The following frequency scale was used:

- Rarely (1-2 times in the last 6 months)
- Occasionally (3-4 times in the last 6 months)
- Often (more than 6 times in the last 6 months)

When an actor indicates frequent collaboration, we hypothesize that there is high trust and perceived value in continued engagement.

In addition to frequency, respondents were also asked about how long they had collaborated with an actor based on year increments, and the likelihood they would recommend the organization to another actor, which is a common proxy for trust in a relationship. See Table 1 for definitions of the attributes collected on relationship strength.

Table 1. Attributes collected on Relationship Type and Strength

Relationship Type Measures	Description
Collaboration Area	Organizations listed who they collaborate with and selected the collaboration areas that described their connection to each actor they nominated. Collaboration areas were chosen from a list or were written in, examples include advocacy, community planning, funding, climate mitigation, etc. For a full list of collaboration areas identified see Annex A.
Collaboration Type	Selected if it is (1) formal contract, (2) information sharing, (3) informal partnership and (4) created during project
Collaboration Reason	Selected if the reason is (1) mutual interest or (2) a funding requirement
Relationship Strength Measures	Description
Frequency of Interaction	How frequently you have engaged, with choices (1) often, (2) occasionally or (3) rarely; based on a 6-month period
Length of Collaboration	Selected incremental choices, such as less than 1 year, 5-10 years, more than 15 years, etc.
Likelihood to Recommend the Organization	Based on a 1-10 Likert scale with 1 being not likely at all to recommend and 10 being very likely to recommend

ORGANIZATION ATTRIBUTES

For the actors surveyed, we captured a range of attributes on each of organization. See Table 2 for details on the actor attributes collected.

ANALYSIS AND REPORTING

HHI undertook data cleaning and formatting, and then Root Change performed the analysis described in this report.

ATTRIBUTE SUMMARIES

Summary counts and percentages of organization and relationship attributes allow us to get a better sense of who is in the network and what types of relationships are present. For example, we can answer questions such as: How many INGOs are in the network vs CBOs? How many relationships were reported for each collaboration area? How frequently are actors collaborating? In the findings section, we have separated these by organizational attributes, or information about the survey respondent, and relationship attributes, or information collected about the nature of a given relationship between two actors.

Table 2. Organization Attributes Identified in Survey

Attribute	Description
Organization Type	Respondents selected from 9 options: National NGO (has projects throughout the country); Local NGO (has projects in a specific locality or region within country); Community-Based Organization/ People's Organization; International NGO or Organization; LGU; Government Agency; University, College, or Research Institution; Primary or Secondary School; Faith-Based Organization; Private Sector; or Red Cross and Red Crescent
Organization Size	Respondents selected from choices of the number of employees. We then combined them into the following categories: small (less than 100 employees), medium (100-1000 employees), or large (more than 1000 employees).
Local versus International	Whether an actor is local (based in the Philippines) or international (based in another country)
Sub-national, National versus International	Further breakdown of the above by splitting choices into sub-national (works only within a specific locality or region within the Philippines), national (works throughout the Philippines) or international
Pandemics	A question on the survey asked on which types of disasters organizations focus. Due to the current global pandemic caused by COVID-19, we also included data on whether the organizations worked on pandemics. A spotlight on this analysis is included on page 34.

NETWORK STATISTICS

Using social network analysis, we can learn about a full system and its sub-systems. For the full network and each sub-network, we prepared a visualization and calculated social network analysis statistics.

Network statistics include:

Table 3. Social Network Analysis Measures Used

Network Measures	Description
Number of Organizations (in the Map)	While there were 501 total organizations surveyed, not all of them have relationships. This measure indicates the number of organizations who have at least one relationship in the network.
Number of Relationships (Total and Unique)	The network survey allowed and encouraged respondents to indicate all collaboration areas in which they worked with another actor. This caused redundancy in the number of relationships between actors. Total number of relationships is the number of relationships in the network, counting different collaboration areas separately. Number of unique relationships only includes the number of relationships from one organization to another but does not count redundancy due to collaboration areas. This latter does preserve directionality of relationships, so a relationship from actor A to actor B is counted separately from a relationship from actor B to actor A.
Average Number of Collaboration Areas per Relationship	This calculation takes the number of total relationships and divides by the number of unique relationships. In other words, in how many collaboration areas the average two actors work together.
Average Number of Relationships	This looks at how many total relationships each actor has and divides by the number of actors in the map. This is a measure of how many connections each actor has.
Average Number of Actors Each Actor is Connected to	This looks at how many other actors each actor is connected to. First, we create a network that does not have redundancy of collaboration areas or relationship directions. Then it looks at how many relationships each actor has and divides by the number of actors in the map. This is another measure of how many others each actor knows.
Density	This SNA metric uses the number of actors in the network to determine the total number of possible relationships. It then takes the number of actual relationships and divides by the total number of possible relationships. This calculation does take into account relationship direction, but not redundancy of collaboration areas.
Reciprocity	This metric divides the number of relationships that are reciprocal, or bidirectional between two actors, by the number of actual relationships in the network to determine the percent of relationships that are reciprocal. This calculation does take into account relationship direction, but not redundancy of collaboration areas.
Average Reach	This calculation uses the NetworkX algorithm <code>local_reaching_centrality</code> , which calculates the percentage of actors in the network that can be reached by a single actor, using limitless degrees of separation. The algorithm provides a score for each individual actor, so we then calculate an average based on the individual scores and total number of actors in the network.

IDENTIFYING KEY ACTORS

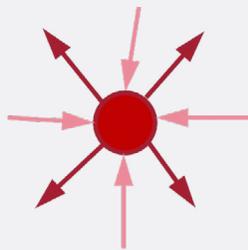
There are four key actor types that form the basis of this network analysis— collaboration hubs, resource hubs, brokers, and influencers. Each of these actor types play different but equally valued roles within the network. The aggregate impact these four actor types strongly affects the viability of the ecosystem. Figure 2 defines each actor types.

Collaboration ecosystems are dynamic and often involve diverse sets of actors who learn,

adapt, self-organize, and co-evolve over time. Culture, values, beliefs, and one’s peers all work to influence relationships and interactions. Seemingly small independent decisions –grant money distributions, choice of program partners, the selection of an international versus a local NGO as an implementing partner–, can each have macro-level impacts on the ecosystem. Therefore, roles are continuously changing, as they are based on the collaborations between and among all actors in the network.

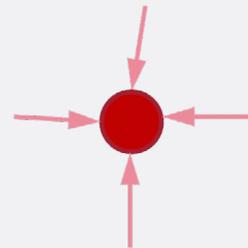
Figure 2. Types of Key Actors

Collaboration Hubs



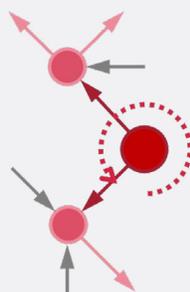
Collaboration Hubs are sources and distributors of subject matter expertise. As intense gatherers and spreaders of information, Collaboration Hubs are often the first to pick up on new trends. The SNA metric to calculate this role is total-degree centrality.

Resource Hubs



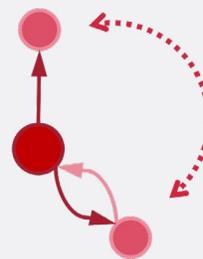
Resource Hubs are opinion leaders and sources of subject matter expertise. As those most sought after by others in the system, they can passively spread information, ideas or resources throughout the network. The SNA metric to calculate this role is in-degree centrality.

Influencers



Influencers are connected to other well-connected actors, and therefore spread information quickly through the system. Influencers are often “in the know” and can help to get the message out when rapid communication is needed. The SNA metric to calculate this role is eigenvector centrality.

Brokers



Brokers can introduce people and institutions across professional, economic, social, and cultural circles. They often have exclusive ties to unique actors and smaller sub-groups, as well as direct ties to central core actors, such as funders and government. The SNA metric to calculate this role is betweenness centrality.

IDENTIFYING COLLABORATION PATTERNS

Attributes allow us to dive deeper into specific groups of actors, or specific types of collaboration. We have done analysis based on key attributes of interest for HHI, agreed upon in pre-analysis planning. In the findings section, analysis is separated by whether it is based on relationship attributes, organizational attributes, or both.

Most collaboration pattern analysis in this report relies on a SNA metric called E-I Index, which stands for external-internal index. By first defining a group of interest, whether it be NGOs, CBOs, local actors, district actors, etc., this metric uses relationship counts to see whether actors within that group are collaborating with actors in their same group or actors in other groups. This is of particular interest when looking for insularity in a network. For more information on this measure see Annex B.

We ran a correlation on scaled attributes such as likelihood to recommend another actor, or how long actors have been collaborating.

ANALYSIS TOOLS

Most analysis was carried out using Python coding language, including packages such as NetworkX and DataFrames, to run social network analysis algorithms and summary statistics respectively. As with the DEPP evaluation, we used ORA, a tool developed by CASOS at Carnegie Mellon for network analysis, to create the network images. In addition, the statistical software package R was used for statistical significance tests. Excel pivot tables provided additional breakdowns of the data using multiple variables and was used to create the pie charts found throughout this report. The outputs of all of the tools can be found in the annexes of this report, organized in the same fashion as the findings section.

FINDINGS

NETWORK OVERVIEW

The enumeration process in the Philippines identified a total of 501 actors working to support disaster preparedness and resilience in the country. Of these organizations, 114 did not have connections to any other organizations. We call these organizations isolates, as they are working in isolation from others in the network. We explore who these organizations are in the last section of the Findings, titled Isolates. They are not included in the other Findings sections, which focus on the 387 organizations who reported 3146 total relationships with one another.

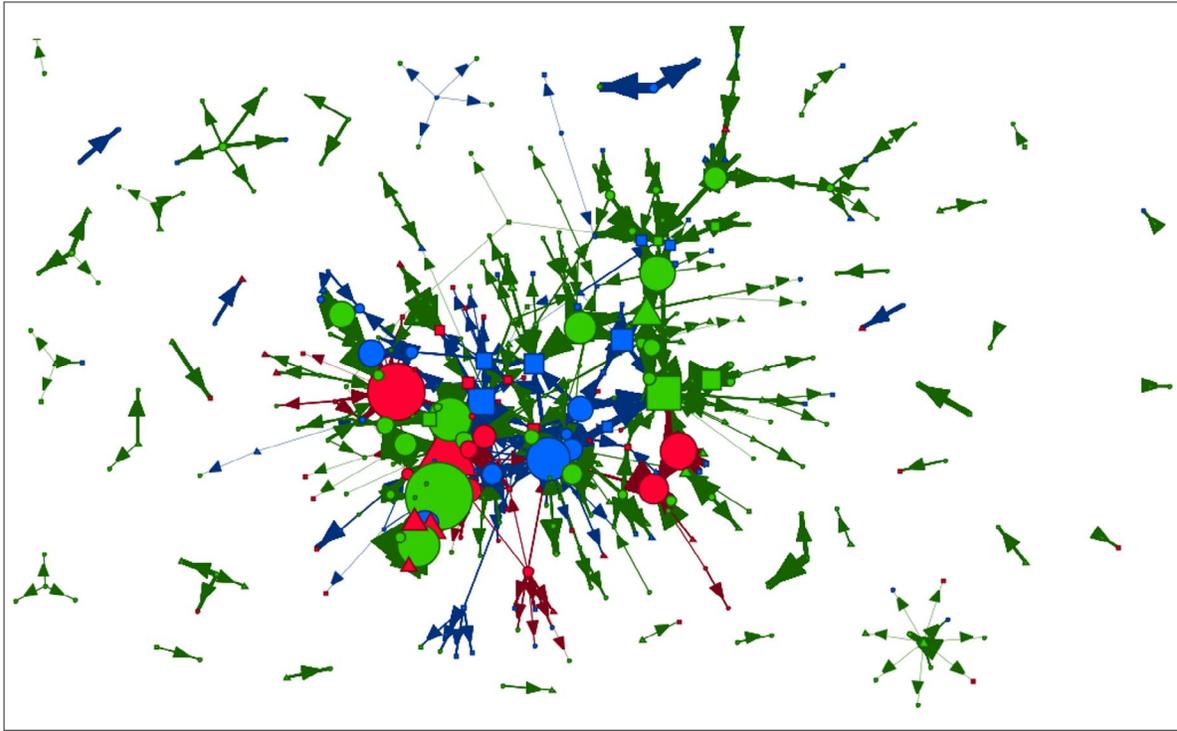
Figure 3 shows a visualization of the full network. Actors in green represent sub-national actors, actors in blue are national actors and actors in red are international actors. Those shaped as a square represent large-sized organizations (more than 1000 employees), those that are triangles are medium (100-1000 employees), and those that are circles are small organizations (less than 100 employees). We have sized actors by total-degree centrality, which highlights which actors in the system are collaboration hubs, or the most well-connected actors in the network. We explore these actors more in the Key Actor section of this report.

The full network is comprised of 45 collaboration areas. In collecting relationship data for a range of collaboration areas, we were able to account for both the presence of a relationship between one organization to another, as well as the number of different areas or topics these two actors are collaborating around to exchange information, ideas, and support. We found there were 446 unique relationships, meaning a relationship

from one organization to another disregarding redundancy caused by collaboration areas. This means that on average, each organization went to another organization for seven different collaboration areas. For more on the top collaboration areas see the Sub-Network Analysis section of this report.

In the full network, shown in Figure 3, you can see many green actors and arrows, meaning there are many sub-national actors working in the Philippines. There are also over 35 isolated groups, or small groups of about 2 to 6 actors that are working together but not connected to the larger network and therefore are cut off from information, ideas and resources flowing through the main network. See Annex C for a zoomed in image of the main network.

Figure 3. Full Network



On average, each organization has about 16 relationships (including redundancy in collaboration areas) and knows about 2 other organizations.⁴ These numbers help us better understand how well-connected someone in this system is likely to be. The average can also serve as a benchmark for the system, meaning that those who don't have at least 16 relationships and know 2 other organizations might aim to do more networking. For example, 268 actors in the network have less than 16 relationships, which is about 69% of actors. Knowing an average of 2 others in the network is very low (only 0.05% of actors). Even the Small National NGO F, who knows the greatest number of other actors in the network, knows less than 6% of actors.

We use two measures to assess how well-

connected the network is: density and reach. First, the network density of the full network is 0.003, or in other words, 0.3% of all possible ties between organizations have been realized. Second, looking at relationship directionality and flow through the entire network based on degrees of separation, we can see that on average each organization's contributions to the network (whether they be resources, ideas, or support) have the potential to reach 1.5% of other organizations. This second measure of network connectivity allows us to see not only if relationships exist, but if they form structures that foster information or resource exchange.

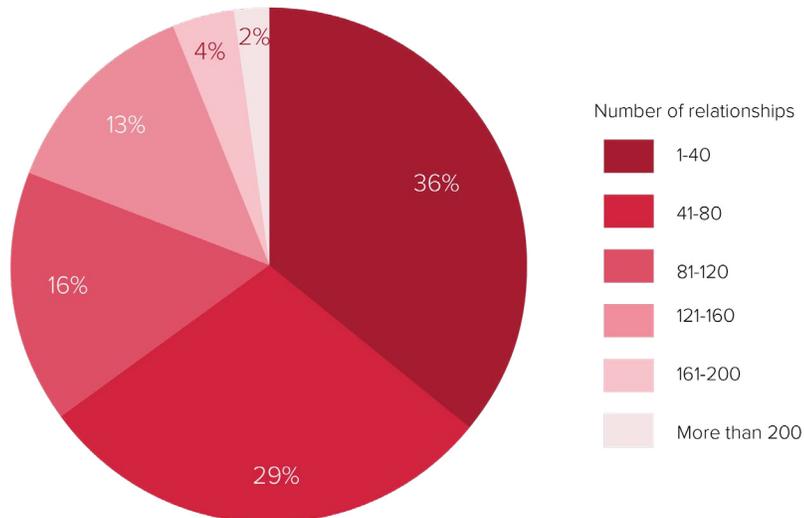
In Root Change's experience conducting network analysis using these two measures, the scores for the Philippines are quite low. In our experience,

⁴ The median number of relationships (including redundancy in collaboration areas) per organization is 7, and the median number of other organizations each knows is 1. The median for number of others an actor knows is so small because over half of actors only know one other actor.

networks that contain 3 times as many actors have densities around 0.01. Because density is skewed by more actors, a smaller network should have a higher density score. For reach, networks we have analyzed typically have an average reach of 10-15% of actors in the network. The large number of isolated groups, or small groups of actors collaborating apart from others in the network, in the Philippines network is likely contributing to its low scores on these metrics. Further research is needed to determine why there are so many of these isolated groups. For example, do they represent geography and the physical islands that make up the Philippines, where sub-national actors are based? In such a nation, geographical distance could be a natural barrier for collaboration. Groups of actors alternatively may have formed based on sector focus or partnerships around a specific program or common source of funds.

OVERVIEW OF RELATIONSHIPS

Figure 4. Percent of Collaboration Areas by Number of Relationships Identified in Each



SUMMARY OF FINDINGS FOR COLLABORATION AREAS

In the Philippines, 45 total collaboration areas were identified by HHI and responding organizations. Among those, the greatest collaboration was found within two areas: Advocacy (268 relationships) and Community Capacity Building (242 relationships). Other top collaboration areas with 150-161 relationships each included Community-Based Risk Analysis, Climate Change Adaptation, Community Planning, and Education. These six collaboration areas account for 36.1% of all relationships in the Philippines network.

Figure 4 shows number of collaboration areas cited by organizations and what range of total relationships was reported in each. We see that many collaboration areas (36%) have less than 40 relationships reported in them. Often, the

number of relationships was less than 20 for these collaboration areas.

Some of the very small collaboration areas were write-ins from respondents, where the person answering the survey chose to create a new category for them. We did clean some of the write-in collaboration areas that were similar to the existing collaboration areas or combined them to form a new category. An example of this includes including relationships for “Fisheries” and “Seaweed Farming” in the “Agricultural Expertise” collaboration area. Before a next round of survey, we recommend exploring why respondents felt like those categories were not captured in the other choices, and why other respondents did not also report relationships in these areas.

SUMMARY OF FINDINGS FOR COLLABORATION TYPE AND REASON

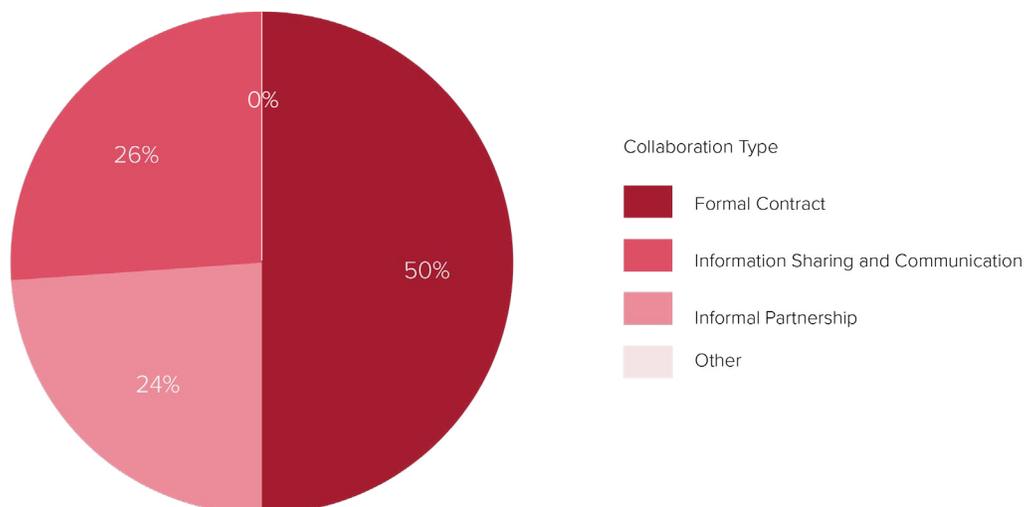
In addition to collaboration areas, the network survey asked about collaboration type (formal, informal, or information sharing) and collaboration reason (contractual or mutual interests) to learn more about why organizations are collaborating. Collaborations that are informal or informational are by choice and often do not have explicit financial benefits, which indicate that an actor values the work of the other organization. In the case of formal contracts, they could also be by choice but have an additional motivating factor of financial benefits. Finally, funding requirements indicate that the collaboration is not by choice. For this network, collaboration is fairly evenly split into formal and informal (including information sharing) and is also most often by choice rather than a requirement imposed by a funder or donor.

When looking at the reason for collaboration, organizations cited that the majority of their relationships were based on mutual interests, accounting for 87.7% of all relationships. 12.2% of relationships were based on funding requirements, and one relationship was reported as “Other,” but no further reason was given.

When looking at the type collaboration, formal contracts were the most commonly cited relationship type, representing 50.0% of relationships. This was followed by information sharing, at 25.9%, and informal partnerships at 23.9% (see Figure 5). Six relationships were reported as “Other,” but no further information was given. Because mutual interest was a very common reason for collaboration (87.7% of all relationships), most of the relationships in each collaboration type (ie. formal contract, informal partnership, information sharing) were due to mutual interests. This system seems to be less donor-driven than other systems where funding requirements are often the reason for collaboration. More research could look into which mutual interests those in the Philippines are collaborating around most and benefits to collaborations due to mutual interests.

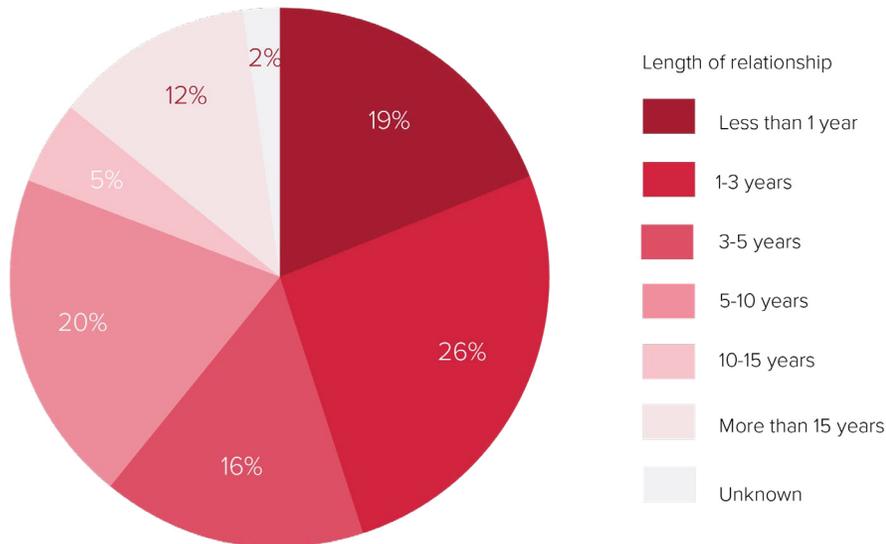
Of the few relationships that were due to funding requirements (385 out of 3146 total relationships in the system), most of them correspond with formal contracts (71.2%), as opposed to informal partnerships (23.1%) or information sharing (5.7%). This indicates that funding requirements in this system typically lead to a formal partnership.

Figure 5. Percent of Relationships by Collaboration Type



SUMMARY OF FINDINGS FOR RELATIONSHIP STRENGTH

Figure 6. Percent of Relationships by How Long Organizations Have Been Collaborating



Relationships in the Philippines are new, but fairly strong. Approximately half (55.8%) of collaboration between organizations is often, or more than 5 times in the last 6 months. This suggests that actors have many touch points to meet and engage. This may also be driven by high presence of formal partnerships and mutual interests. Approximately a quarter of collaborations occurred occasionally (3-4 times in the past 6 months) and the last quarter of collaborations occurred rarely (1-2 times in the past 6 months).

Almost half of reported relationships (45%) are between organizations who have known each other for 3 years or less, whereas only 17% of relationships are between organizations that have known each other for over 10 years. About one-third (36%) of organizations have known each other for between 3 and 10 years (see Figure 6). This suggests that in the disaster preparedness

and resilience systems in the Philippines, there is a high proportion of new relationships. More investigation is needed to understand why. For example, are there new and emerging local organizations working in disaster preparedness, or are there new programs or funding that are incentivizing new forms of collaboration between organizations who have not previously worked together?

Trust among the actors in the system was also found to be fairly high. In the survey, participants were asked how likely they are to recommend their contacts to others on scale of 1-5 with 5 being extremely likely. This question is commonly used as proxy for trust or strength of relationship. We applied Net Promoter Analysis (NPA) to assess these relationships scores.⁵ NPA divides up scores in the following way: Organizations that give a score 5 are called “promoters,” they are

⁵ <https://www.netpromotersystem.com>. NPA is typically calculated on 0-10 scales for the question how likely would you recommend this organization. Detractors are calculated as a score of 6 or less. We have adapted this approach for this question, which was asked of participants in the survey on a 1-5 scale. Therefore, we have adjusted the scale by dividing by two, considering promoters to be a score of 5, passives to be a score of 4, and detractors to be scores of 3 or less.

very pleased with the relationships and would highly recommend those actors. Within the network 54% of relationships received a score of 5. Organizations that give a score of 4 are considered to be “passives,” they believe the relationship is okay, but may have a few reservations. Within the network, 32% of relationships received a score of 4. Organizations that give a score of 3 or less are considered to be “detractors,” they have more serious reservations about the relationship, which indicates low levels of trust. Within the network, 14% of relationships received a score of 3 or less. Further analysis is needed to understand the reasons that passives and detractors have in giving their scores, including how to address any reservations they may have about their partners.

When we ran a correlation between variables representing how long actors have been collaborating, how often they have been collaborating, and how likely they are to recommend the other actor, we found that there were significant ($p < 0.001$) weak positive correlations among all three variables. This means that as frequency of interaction increases, so does the likelihood to recommend the other actor ($r = 0.135$) and as the length of collaboration increases, so does the likelihood to recommend the other actor ($r = 0.120$). The strongest correlation, though still fairly weak, was between the length of collaboration and frequency of interaction ($r = 0.270$), meaning that the longer organizations have been collaborating, the more frequently they tend to interact.

While relationships appear to be fairly strong in Philippines, less than 1% of relationships were found to be reciprocal, or bidirectional between two organizations. This suggests very little joint collaboration between actors. With a high number

of formal relationships within the network, we might expect to see higher reciprocity. It may be that within these formal partnerships there is more of a one-way flow of information and resource exchange as opposed to two-way exchange. With such low reciprocity, actors are displaying more seeking behavior—seeking information or support rather than co-creating and co-collaborating.

See Annex A for full tables of relationship attributes in the network as well as results from the correlation test.

OVERVIEW OF ACTORS

There are 328 local actors and 59 international actors in the network. Of the 328 local actors, 247 work at the sub-national level and 81 work at the national level. In reviewing the types of actors working in the Philippines, the group identified the most was LGUs, or Local Government Units, with 94 actors (24.3%), followed by other Government Agencies at 16.0% of actors, and International NGOs at 12.9%. Figure 7 provides a breakdown of the actor types.

Primary or secondary schools, faith-based organizations, and the private sector were the least identified actor types found engaging on disaster preparedness and resilience in the system. This survey did distinguish Red Cross and Red Crescent organizations from other INGOs. There were 9 total organizations that fell into this category (2% of organizations in the network).

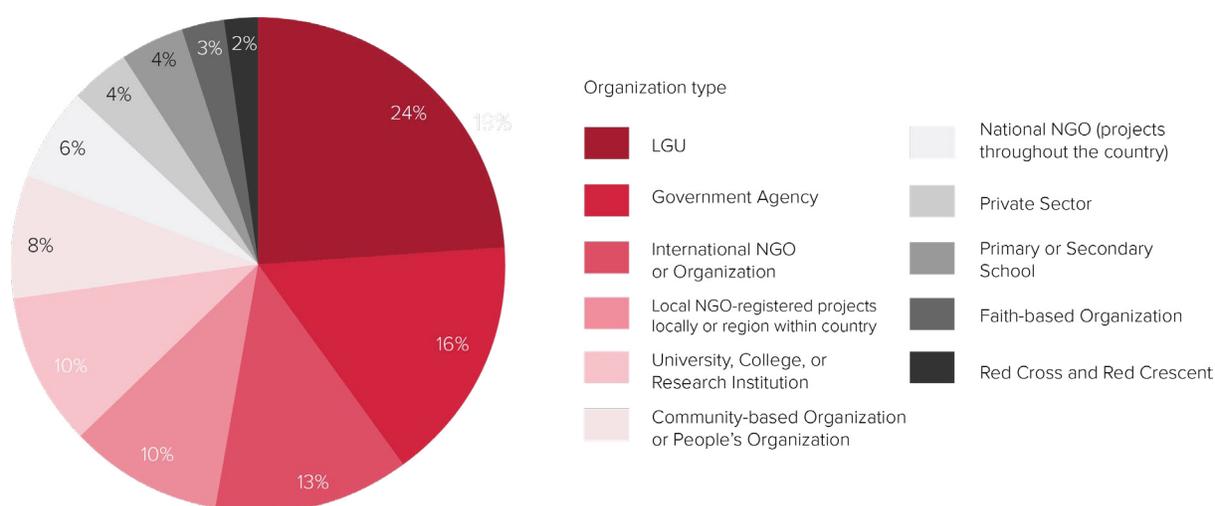
When comparing the geographic focus of actors, we found that 247 were sub-national actors working in only a region or community within the

Philippines (63.8%), 81 were national actors working throughout the country but only in the Philippines (20.9%), and 59 were international actors (15.2%). This suggests that many disaster preparedness and resilience efforts in the Philippines are locally focused. The large presence of sub-national actors, or those who work only in a specific region or locality within the Philippines, might also help to explain the low density, reach, and reciprocity observed in this network, as many actors are focusing only on their immediate region or community.

There were about three times as many small organizations found in the network, 237 organizations or 61.2%, as either large organizations (83) or as medium organizations (67). This makes sense given the geographic focus of many of the organizations in the network is sub-national.

See Annex B for a full breakdown of organizational attributes in the network.

Figure 7. Percentage of Actors in the Network by Organization Type



COLLABORATION PATTERNS BETWEEN ACTOR GROUPS

Using organization attributes, we can look at collaboration more closely, answering questions around who is collaborating. For example, to what degree does collaboration exist between local and international actors, between district and national actors? Is there cross-collaboration happening between different organization types, or actors with the same focus? Cross-collaboration is important to a network to prevent insularity, or homophily, where actors only collaborate with those like them. Using attributes around whether actors are local or not also allows us to explore localization, or whether cross-collaboration is occurring among international actors and local actors.

Combining organization and relationship attributes, we can further examine collaboration to answer questions around how those specific actors are collaborating. For example, do different types of organizations collaborate in different ways? This analysis dives deeper into collaboration between key groups of actors, including local and international and the various organization types. Below is a summary of findings across a range of questions. See Annex B for tables with data for each question.

Are local⁶ and international actors collaborating?

In assessing the levels of collaboration between local and international actors, we can begin to see whether localization is emerging in the network. Important to note is that localization does not mean that international actors are only going to local actors, as they also need to coordinate with one another. Instead, we are looking for a healthy balance of relationships.

Of the 3146 relationships in the network, 3046 of these (96.8%) involve at least one local actor. Approximately one-third of all relationships (36.2%) are between one local and one international actor, and roughly two-thirds of all relationships (60.5%) are between two local actors. The remaining relationships account for 98 total relationships that the 59 international actors have with one another. This last figure shows that international actors are not collaborating much with one another.

There are over five times as many local actors with relationships in the Philippines disaster preparedness and resilience network than international actors (328 versus only 59), so it is especially important that local actors are also involved in most of the collaboration happening in the network, which they are. However, looking at the network structure, many of the isolates and isolated groups are made up of local actors. It is important that local actors have a diverse range of connections to others working a sub-national and national level, to ensure they are able to access information, ideas and resources. There is a need for more local conveners, or actors who can help to bridge connections between groups, and for others working at the national level on key issues.

Are actors collaborating across geographic focus?

Localization also applies at a more micro level, inside a country for example. By analyzing collaboration patterns among international, national and sub-national actors, we can begin to see if localization is happening within the Philippines.

⁶ Here, local actors include both sub-national and national organizations.

Table 4. Number of Relationships between Actors with Different Geographic Focus

Collaboration Between	No. of Relationships
Sub-national & Sub-national	926
Sub-national & National	818
Sub-national & International	738
National & National	163
National & International	403
International & International	98
Total	3146

International actors have very few relationships with one another, only 98 relationships between 59 international actors in the network. Increased collaboration among international actors can limit duplication of humanitarian efforts, which often happens in fast-paced environments such as a disaster.

International actors have more relationships with sub-national actors (a total of 738 relationships) than with national actors (a total of 403 relationships), which is an indication that they have the potential to reach local levels. However, most of the relationships between international and sub-national actors (87%) are from sub-national actors to international actors rather than the other way around. This suggests that the flow of information, technical assistance, and resources is top-down. This kind of network behavior can create a dependency on international actors and can be a potential risk for local systems. Over time we would want to see more local to local ties fostered between sub-national and national actors, government, and other local institutions.

Greater reciprocity, bi-directional ties, between international and sub-national actors would also be an indication that local actors are being sought after for their expertise, leadership, and input, demonstrating a shift in decision making toward local actors for humanitarian projects, a key dimension of localization.

Sub-national actors have the closest balance of relationships between groups (E-I index of 0.254).⁷ Their collaborations are split almost evenly between other sub-national actors (926 total relationships), national actors (818 total relationships), and international actors (738 total relationships). This suggests that sub-national actors seem to be tapping into all levels of collaboration in the Philippines disaster preparedness and resilience system, which is aligned to the role they are playing within the larger ecosystem. They serve as a bridge between the local communities they represent and the larger national support system.

⁷ An E-I index score of 0 represents a perfect balance between relationships within a group and with others outside that group.

How long have sub-national, national and international actors been collaborating?

We have discovered that relationships in this network are predominately new (less than 3 years old). We have also discovered that many of the relationships involve sub-national actors. We can now look at how long these groups have been collaborating.

Relationships between international actors seem to be the newest. Over half of the relationships between international actors are less than 1 year old (54 out of 98 or 55%). Further analysis, including change over time, would reveal whether international actors are beginning to collaborate more with one another.

Sub-national and national relationships are also quite new, with half of their relationships (51%) being 3 years old or less. Further research could reveal if changes to political legislation, social movements or campaigns, aid funding, or other factors in the Philippines have contributed to an increase in collaboration among sub-national and national actors who have not worked together previously in the last 3 years. Further research could also reveal the age of these organizations, and if there has been a surge in newly formed sub-national or national actors working in disaster preparedness and resilience in the Philippines.

International and national actors seem to have been collaborating for the longest relative to others. About a quarter of their relationships have been for 5-10 years, and 18% of their relationships have been for more than 15 years. However, international actors and sub-national actors have newer relationships. Over one-third of their relationships have been for 1-3 years (38%), but only 8% of relationships were formed in the last

year. This may reflect a larger localization agenda to directly work with and fund local organizations rather than national organizations. Further research is needed to determine if this is the case.

Is there cross-collaboration between different actor types?

For a resilient network we expect to see actors exchanging information, ideas, and support across different actor types. In the disaster preparedness and resilience network in the Philippines, we found this to be the case, with a high amount of cross-collaboration found happening between all actor types.

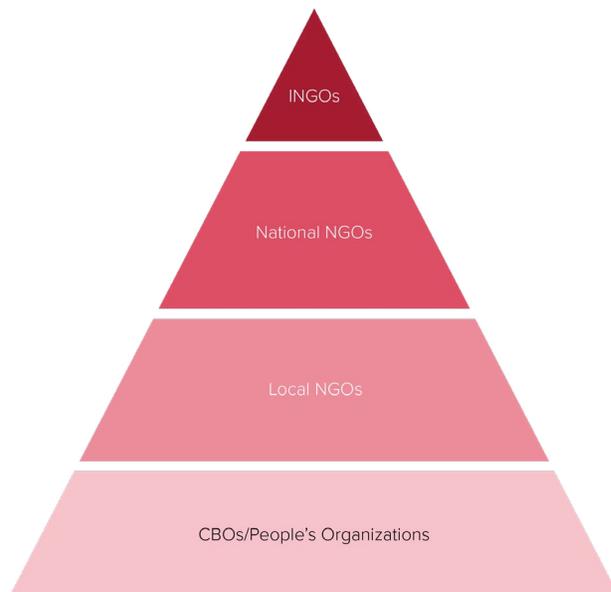
The one exception was faith-based organizations, who were found to predominately go to other faith-based organizations (87.9% of relationships from a faith-based organization was to another faith-based organization). More research is needed to understand why faith-based organizations go primarily to other faith-based organizations, and to understand what role religious organizations are playing in the disaster preparedness and resilience system, and if there is more cross-collaboration that could better leverage the value add they bring.

Government (including both LGUs and other government agencies) and INGOs tend to be the actors that others are going to most. Government agencies, primary and secondary schools, and universities, colleges or research institutions, go most often to government. Primary/secondary schools tend to go to government agencies and not LGUs, with over half (58%) of relationships from primary/secondary schools going to

government agencies. This aligns with education funding structures in the Philippines, where much of the funding for schools comes from the National government and not LGUs.⁸

INGOs, LGUs, National NGOs, private sector and Red Cross/Red Crescent organizations go most often to INGOs. Local NGOs go to both INGOs and National NGOs. CBOs go most often to National NGOs. This suggests that there may be a hierarchical structure forming in the Philippines disaster preparedness and resilience system, at least among NGOs and CBOs. Figure 8 is a diagram of this structure. Further research is needed to understand why CBOs are going mostly to National NGOs rather than Local NGOs. Further research could also assess the effectiveness of a hierarchical structure in supporting disaster preparedness and the degree to which this networking structure supports localization and shifting decision making and capital to local actors to lead humanitarian efforts.

Figure 8. NGO Structure



⁸ Assessing the Role Played by Local Government in Supporting Basic Education in the Philippines, Philippines Education Note, World Bank Group and Australian Aid, June 2016, <http://documents.worldbank.org/curated/en/468611468569289731/pdf/106955-REVISED-PH-PETS-QSDS-Note-7.pdf>

Do different types of organizations collaborate in different ways?

Faith-based organizations and the private sector were the only organization types to report no relationships for information sharing purposes. Additional research is needed to understand why these actors are not collaborating in those ways.

While relationships for the private sector were split between formal and informal contracts, faith-based organizations were found to primarily collaborate on disaster preparedness and resilience in the Philippines through formal contracts. The same was found for LGUs, Local NGOs, and National NGOs. Relationships from these organization types are therefore most likely formal contracts.

University, college, or research institutions are the only organization type who collaborate through informal partnerships more than other types of collaboration like formal contracts or information sharing. This type of collaboration may reflect the way academic and research institutions disseminate and exchange research and expertise rather than through formal programs. Further research is needed to reveal the dynamics of these informal partnerships and why relationships for this actor type is predominately informal partnerships.

Is there cross-collaboration between different organization sizes?

For a resilient network we also expect to see actors exchanging information, ideas, and support across different organization sizes. In the Philippines network, there is a large amount of cross-collaboration between different organization sizes.

Small organizations are the largest organization size group in the network (61.2% of all organizations) and are present in many of the relationships in the network (87.8% of relationships). They also were found to have the highest amount of insularity of the three organization sizes. Small organizations go to other small organizations almost as often as they go to medium and large organizations combined (external-internal ratio of 0.135). Looking at the full network image in Figure 3 on page 22, many of the isolated groups are made up of small organizations, and many of those on the periphery of the main network are also small organizations. Further research is needed to determine ease of access to medium and large organizations for small organizations and what can be done to connect or bridge isolated groups of small organizations to the larger network.

Medium organizations have the least amount of collaboration within their own organization size with an external-internal ratio of 0.967. Further research is needed to determine if they are going primarily to small organizations, which could be further evidence of decentralization, or if they are going primarily to large organizations.

SPOTLIGHT: PANDEMICS IN THE WAKE OF COVID-19

While this study did not specifically focus on pandemics, the survey administered asked participants what types of disasters actors address, with pandemics being one of the options. In light of the COVID-19 global pandemic, we have analyzed this data to see if there are any networking patterns observed for actors working on pandemics.

Within the network data for disaster preparedness and resilience in the Philippines, little collaboration was happening around pandemics. A total of 35 actors reported that they focus on pandemics, accounting for only 7.0% of organizations identified. Of these organizations, 15 were isolates with no connections to others working on disaster preparedness and resilience in the Philippines.

Of the 20 actors that do appear in the network, only 1 actor reported collaborating with another organization who also was focused on pandemics. Small Local Government Agency L2 identified that they collaborate with Small LGU M2 around 4 areas: Health/Public Health Expertise, Logistics, Policy, and Volunteers and Volunteer staff. While the two organizations have been collaborating for 5-10 years and collaborate often (more than 5 times in the last 6 months), the relationship was only rated as a 3 (somewhat likely

to recommend). This actor goes to the other pandemic focused organization for information sharing and communication due to a funding requirement, meaning that there is no formal/informal partnership and that the collaboration is not necessarily by choice.

The 20 actors in the network who focus on pandemics did report a total of 625 relationships with actors not working on pandemics. The most common collaboration areas were advocacy and community capacity building, which are the same two common collaboration areas found for the full network. Further research is needed to determine whether these relationships are for preparedness and resiliency for pandemics specifically, or for another disaster area. Further research could also help to understand the system working to prepare for a global pandemic, such as COVID-19 in the Philippines. Based on this analysis, it appears that there are limited connections and collaboration among actors who have a common focus on pandemics.



KEY ACTORS

In addition to the analysis of relationships, we calculated different centrality measures to identify types of influential actors within the network. See Table 3 on page 18 for a description of the centrality measures used.

In assessing key actors, we looked to see the degree to which district and national actors were influential and central positions in the network versus international actors. This would be an indication of local actors serving as resource and collaboration hubs, which is a sign that within certain areas of disaster preparedness and

resilience local actors are leading and providing expertise.

Tables 5 and 6 list the top collaboration and resource hubs that were found for the full network. Collaboration hubs are actors who have the greatest number of connections in the system. At the core of the network, we find a few organizations that are top collaboration hubs, notably Mid-Sized INGO A, Small INGO C, various LGU Offices, Small National NGO F and the Government.

Table 5. Top Collaboration Hubs in the Full Network

Total Degree Centrality - Collaboration Hubs			
Rank	Name	Local?	Degree
1	Mid-Sized INGO A	International	171
2	Small LGU B	Sub-national	146
3	Small INGO C	International	136
4	Government	Sub-national	135
5	Philippine Red Cross	National	123
6	Small National NGO F	National	123
7	Small LGU G	Sub-national	103
8	Small LGU H	Sub-national	94
9	Small LGU I	Sub-national	90
10	Small LGU J	Sub-national	87

Table 6. Top Resource Hubs in the Full Network

In-Degree Centrality-Resource Hubs			
Rank	Name	Local?	Degree
1	Mid-Sized INGO A	International	162
2	Government	Sub-national	135
3	Small National NGO F	National	71
4	Mid-Sized National NGO K	National	71
5	Mid-Sized Government Agency L	National	71
6	Local governments	Sub-national	67
7	Small National NGO N	National	65
8	Mid-Sized University O	Sub-national	63
9	Large International Organization P	International	62
10	Small International Organization Q	International	60

Mid-Sized INGO A is the actor who both has the most total number of relationships (171) and has the most nominations from other actors in the network (162). Connections with Mid-Sized INGO A are around multiple collaboration areas. The 171 total relationships that this actor has are with only 16 actors, meaning that each actor collaborates with Mid-Sized INGO A around approximately 10 collaboration areas.

Actors who know many others in the ecosystem include Small National NGO F (connections to 22 other actors) and Government (connections to 20 other actors). These actors also appear on lists of top collaboration and resource hubs, for the full network, the local network, and for the top collaboration areas such as Advocacy, Community Capacity Building, Community-based Risk Assessment and Climate Change Adaptation.

Further research would be necessary to determine which departments or localities within government others are going to most often.

For the full disaster preparedness and resilience network in the Philippines, we also explored who is playing key roles as brokers and influencers. The influencers list, shown in Table 7, is revealing. Influencers are those who have connections to other prominent actors in the network.

Table 7. Top Influencers in the Full Network

Eigenvector Centrality - Influencers			
Rank	Name	Local?	Score
1	Large International Organization T	International	0.333
2	Mid-Sized INGO U	International	0.306
3	Small INGO V	International	0.298
4	Small NGO W	National	0.270
5	Mid-Sized INGO X	International	0.256

Many other INGOs, who do not appear on lists of top collaboration and resource hubs, appear as top influencers. Centrality measures for influencers and resource hubs typically overlap. Here we see some new actors emerge, such as Large International Organization T, Mid-Sized INGO U, Small INGO V, and Mid-Sized INGO X. These actors represent others who are influential within the system, given their proximity to other key actors (like the government and other resource hubs). As a result, they may be able to convene or push forward specific agendas around disaster preparedness and resilience. Further research is needed to reveal the programs and issues areas they are focusing on within the system. We have also noted that all of these influencers, with the exception of Small NGO W, are international actors, indicating that they continue to hold prominent positions in the system, as opposed to local actors.

Please refer to Figure 2 on page 19 for definitions and diagrams of each of the key actor roles. See Annex D for tables of the top actors under each key actor measure.

SUB-NETWORK ANALYSIS

Using organization and relationship attributes, we pulled apart the layers of the full network to look at dynamics within specific sub-networks. The sub-network analysis included an analysis of the top four collaboration areas where collaboration was the highest among actors. We also conducted a sub-network analysis of collaboration between just local actors, in order to inform how localized the network is and how the system is impacted when international actors are removed.

COLLABORATION AREA ANALYSIS

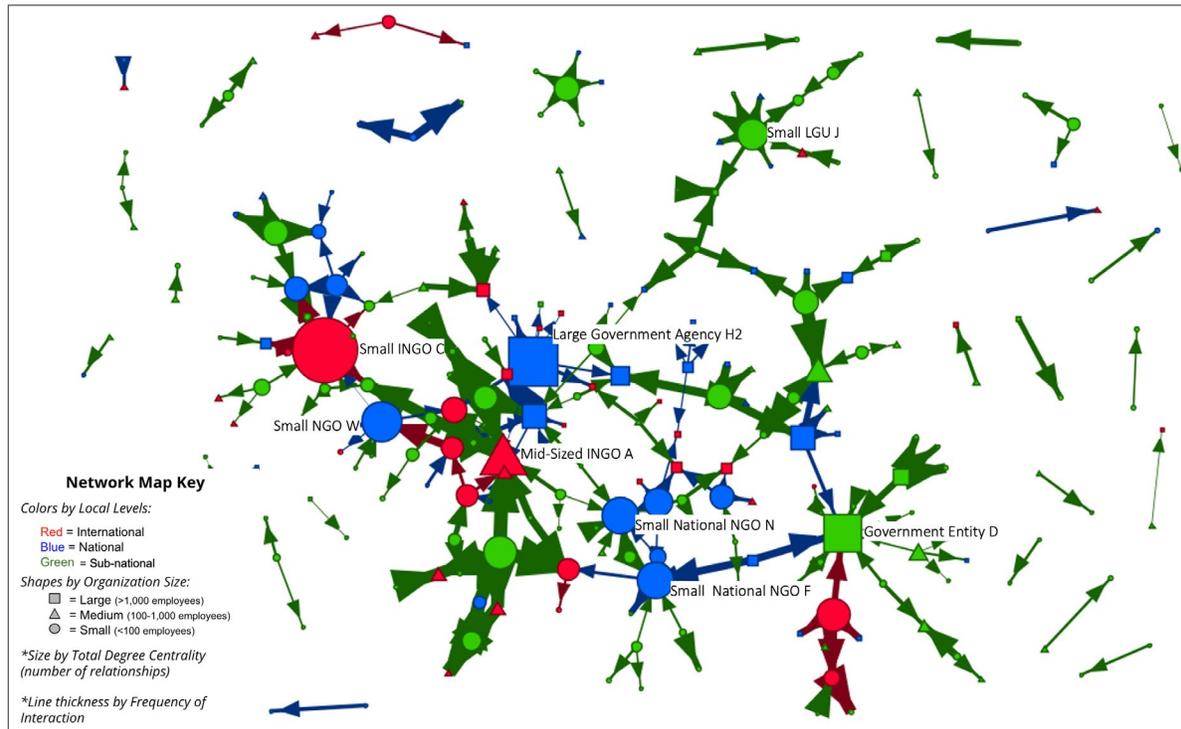
The top four collaboration areas found in the network were Advocacy, Community Capacity Building, Community-Based Risk Analysis, and Climate Change and Adaptation. These represent the areas where district, national and international actors are collaborating the most to exchange information, ideas and support.

Often, the lifespan of networks follows three main network structures: isolated, decentralized and distributed. Isolated networks are made of many isolated groups, or small groups of actors working independently on issues within a system. In decentralized networks, a few key actors start to convene, or link up organizations and isolated groups working on common issues and help to improve information flow and resource exchange. Often, we see this happen in humanitarian ecosystems with the inflow of aid organizations and foreign assistance programs, which can initially act as key conveners, helping to mobilize and align collaboration. There is a risk with decentralized systems that over time these key actors or hubs in the system can end up acting as bottlenecks and control information

flow in negative ways, with peripheral actors becoming dependent upon those central actors. When those actors leave the system, they take with them their relationships, leaving actors once again disconnected. A more resilient system would ideally move towards a more distributed structure, where there is greater cohesion and distribution of links between multiple actors in the network, allowing for a more equal flow of information to all actors in the network. Central actors or hubs help to create distributed networks by creating incentives for joint collaboration, brokering connections among others working on similar issues, and helping to weave the network. Annex E provides an overview of these network structures.

For each of the top four collaboration area sub-networks, we find early signs of a decentralized network structure. We still see presence of over 30 isolated groups (note that not all isolated groups are pictured) and can see evidence of former isolated groups that are now connected to the larger network by only one or two actors. For example, the government seems to be convening isolated groups of international actors (red), national actors (blue) and sub-national actors (green). This makes sense from a policy perspective, as we would expect the government to be helping to coordinate and convene a range of actors working on disaster preparedness and resilience. An example of this is seen with the Community Capacity Building sub-network in Figure 9.

Figure 9. Community Capacity Building Sub-Network, nodes are sized by Total Degree Centrality



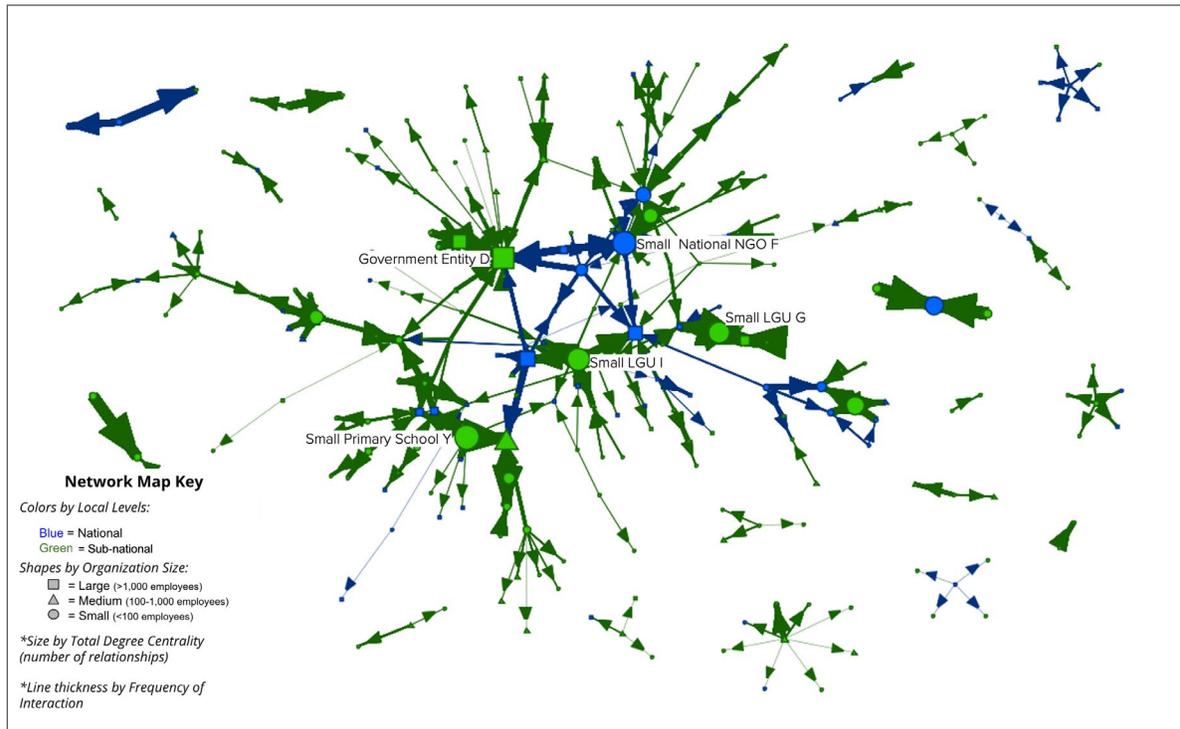
In each of the four sub-networks, the same few key actors tended to be top collaboration and resource hubs, notably the Government, Mid-Sized INGO A, and Small INGO C. Small INGO C was a top collaboration and resource hub for all top collaboration areas except Community-based Risk Analysis network. Further research might explore why Small INGO C is not as prominent in this topic, especially given the large number of relationships that were reported in this area and the prominent role of Small INGO C in the overall disaster preparedness and resilience ecosystem.

See Annex F for visualizations of the top four collaboration areas and a summary of network health, including the top 10 collaboration and resource hubs in each network broken down by whether they are district, national or international.

LOCAL ACTOR SUB-NETWORK ANALYSIS

To further understand the level of localization within disaster preparedness and resilience in the Philippines, we removed international actors from the full network. This allowed us to visualize a network of only local actors. When we did this, the full network was reduced from 387 total actors down to 287 local actors, and from 3146 total relationships to 1905 relationships. This means that by removing the 59 international actors, the network lost 39% of relationships. This is quite high considering international actors only account for 15% of the network actors. The loss of these international actors also made 41 local actors isolates—those 41 local actors only have connections to international actors. This demonstrates a potential weakness in the resilience of this system and local actors' ability to maintain coordination and collaboration when international actors withdraw their support.

Figure 10. Local Actor Sub-Network, With International Actors Removed



The top collaboration areas in the local actor sub-network are: Advocacy, Community Capacity Building, Education, and Community-based Risk Analysis. The biggest difference from the full network was that Education was found to be more prominent among local actors than Climate Change and Adaptation, which came in 5th place. Notable changes were for Data Resources and Vulnerable Groups, which each lost about 30 relationships by removing international actors from the network. This indicates that especially for these two areas, international actors are involved in exchanging information, ideas and support around these topics. This may also represent technical expertise international actors offer or social agendas they are advocating for related to funding or programs they are leading. For a full breakdown of the collaboration areas in the local sub-network, see Annex F.

On average, local organizations have about 13 relationships with one another, and know about 2 other local organizations.⁹ As with those in the full network, organizations in the local network go to one another for about 7 different collaboration areas. The network density is 0.003, meaning that around 0.3% of all possible ties between organizations exist. This is the same as observed for the full network, and also quite low. On average, each organization's resources, ideas, or support has the potential to reach 0.4% of other organizations, which is an extremely low value for this metric. As discussed on page 21, even the full network has a low value for reach, but that score is over three times as high as that of the local network.

⁹ The median number of relationships for the local actor network is 6 and the median number of others an actor knows is 1.

In addition to low density and extremely low reach, the local sub-network has a reciprocity score of 0. The low levels of density, reach, and reciprocal ties between local actors are indications that even though many local actors are working on disaster preparedness and resilience in the Philippines, there does not appear to be much joint collaboration happening among local actors. The low level of reciprocity may be an indication as well that relationships are more transactional, and that there are lower levels of trust or mutual exchange. Local levels of reciprocity may also be a factor of the length of relationships, as many sub-national and national actors indicated having only worked together for less than 3 years.

When assessing key actors, the top collaboration hubs within the local network are quite different than the top local collaboration hubs from the full network, as seen in Table 8. A few different LGU offices appeared on the list of top collaboration hubs in the full network, but only one appears on the list for the local network. In addition, a few of the top local resource hubs in the full network did not appear as top resource hubs in the local network, as seen in Table 9. An example of this is Mid-Sized National NGO . These actors must have many connections to international actors, who do not appear in the local network.

Table 8. Collaboration Hubs for Local Network, Compared to Full Network

Total Degree Centrality - Collaboration Hubs						
Local Network				Full Network		
Rank	Name	Local?	Degree	Name	Local?	Degree
1	Government	Sub-national	121	Mid-Sized INGO A	International	171
2	Small LGU I	Sub-national	90	Small LGU B	Sub-national	146
3	Small National NGO F	National	88	Small INGO C	International	136
4	Small Primary School Y	Sub-national	79	Government	Sub-national	135
5	Small LGU J	Sub-national	78	Philippine Red Cross	National	123
6	Small LGU G	Sub-national	76	Small National NGO F	National	123
7	Mid-Sized Government Agency L	National	71	Small LGU G	Sub-national	103
8	Large CBO Z	Sub-national	69	Small LGU H	Sub-national	94
9	Local governments	Sub-national	67	Small LGU I	Sub-national	90
10	Large Government Agency A1	National	66	Small LGU J	Sub-national	87

Table 9. Resource Hubs for Local Network, Compared to Full Network

In-Degree Centrality - Resource Hubs						
Local Network				Full Network		
Rank	Name	Local?	Degree	Name	Local?	Degree
1	Government	Sub-national	121	Mid-Sized INGO A	International	162
2	Mid-Sized Government Agency L	National	71	Government	Sub-national	135
3	Local governments	Sub-national	67	Small National NGO F	National	71
4	Small National NGO N	National	64	Mid-Sized National NGO K	National	71
5	Mid-Sized University O	Sub-national	62	Mid-Sized Government Agency L	National	71
6	Small National NGO F	National	60	Local governments	Sub-national	67
7	Small NGO B1	National	59	Small National NGO N	National	65
8	Large Government Agency C1	Sub-national	58	Mid-Sized University O	Sub-national	63
9	Mid-Sized Government Agency D1	National	45	Large International Organization P	International	62
10	Philippine Red Cross	National	44	Small International Organization Q	International	60

Government appears at the top of both lists, however many of the actors that were identified as collaboration or resource hubs are different. This means that those who are most well-networked, or collaboration hubs, are not necessarily those to whom others are going most often for information, ideas or resources, or resource hubs. For example, while many local actors go to the Mid-Sized University O, this actor is not among the most well-networked. The top actors on both lists do tend to be government

offices or schools. Additional research is needed to understand why these actors are sought after by other but not necessarily reaching out to others on this topic.

See Annex F for a more comprehensive list of the top collaboration and resource hubs in the local network broken down by whether they are local or national.

ISOLATES

There were 114 actors who were surveyed but who reported no relationships with others working on disaster preparedness and resilience in the Philippines. These same 114 organizations were not identified by others as partners. We refer to these actors as isolates, as they have no connections to the rest of the network. To better understand who these 114 actors are, we looked at their organizational attributes, such as geographic focus, organization size and organization type.

Most of the isolated actors in the disaster preparedness and resilience system in the Philippines are sub-national actors (representing 90% of isolates). Many of the isolated actors were found to be small organizations that have fewer than 100 employees (73%). Of the 83 isolated organizations that are small, about one-third (34%) have fewer than 10 employees. Small organization size with fewer employees means they have less capacity to create and upkeep relationships with other organizations working on similar issues, or

that they are focused exclusively on serving a specific locality. These results may be influenced by where sub-national organizations are physically based in the country. As the Philippines is an island nation, those sub-national organizations working on a small island, may naturally be cut off from the rest of the country. Further research is needed to understand why so many actors were found disconnected from others working on similar topics.

The most common organization type among the isolates is LGUs at 30%. LGUs were also the most common organization type for those who do have connections to others working in disaster preparedness and resilience in the Philippines. Further research might explore why some LGUs are so well connected whereas other are not connected at all. Some hypotheses include geographic location, priorities set by the LGU, or budgetary constraints.

Figure 11. Percentage of Isolates by Geographic Focus and Organization Size

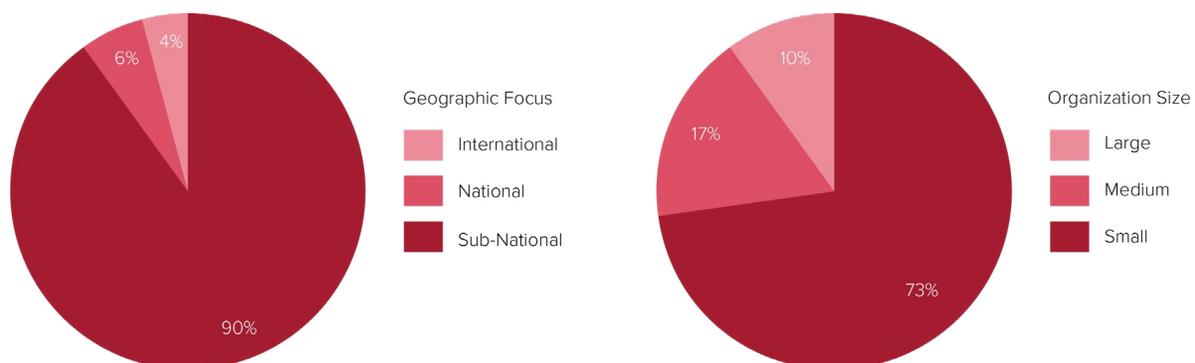


Figure 12. Percentage of Isolates by Organization Type



The other common organization type found among isolates in the Philippines network was academic institutions, amounting to 40% of the isolates when combining both basic education and higher education. Again, location of primary and secondary schools might explain their isolation, particularly if they are based in rural areas of the country. We might expect higher education and research institutions to be better connected, as they typically have greater access to internet and partnerships with government and INGOs. That said, higher education and research institutions made up 14% of the isolates, Further research is needed to determine the barriers for collaboration among academic institutions at both levels.



ANNEXES

ANNEX A: OVERVIEW OF RELATIONSHIPS

COLLABORATION AREA COUNTS

Collaboration Area	Number of Relationships
Advocacy	268
Community Capacity Building	242
Community-Based Risk Analysis	161
Climate Change and Adaptation	158
Community Planning	154
Education	153
Community Connections	131
Early Warning Systems Expertise	127
Data Resources including data sets, collection and analysis	122
Project Implementation	120
Volunteers and Volunteer staff	107
Facilitation	101
Leadership	98
Funding	91
Local Expertise	88
Vulnerable Groups	81
Management	79
Gender-based violence	73
Policy	72
Health/Public Health Expertise	69
In-Kind Resources (e.g., meeting space)	69

TA	69
WaSH	66
Logistics	62
Project Design	61
Research	48
Agriculture Expertise	47
Conflict Mitigation Expertise	47
Proposal Writing	41
MEL Expertise	38
Technology/web resources (e.g. server space, web site development, social media)	32
Journalism/Media	19
Disaster/Emergency Response	8
Child-Centered DRR	7
Disaster/Emergency Preparedness	7
Disaster Risk Reduction and Management (DRRM)	6
Livelihoods	6
Urban Planning/Infrastructure Development	5
Business	4
Nutrition	3
Information Sharing	2
Medical Surge Capacity	1
Mental Health and Psychosocial Support (MHPSS)	1
Other	1
Rehabilitation	1

COLLABORATION TYPE COUNTS

Collaboration Type	Number of Relationships
Formal Contract	1574
Information Sharing	814
Informal Partnership	752
Other	6

COLLABORATION REASON COUNTS

Collaboration Reason	Number of Relationships
Mutual Interests	2760
Funding Requirement	385
Other	1

FOR WHAT REASONS ARE DIFFERENT TYPES OF COLLABORATION HAPPENING?

	Formal Contract	Informal Partnership	Information Sharing	Other	Total
Funding Requirement	274	89	22		385
Mutual Interests	1300	663	791	6	2760
Other			1		1
Total	1574	752	814	6	3146

RELATIONSHIP STRENGTH COUNTS

FREQUENCY COUNTS

Frequency	Number of Relationships
Often (5 or more times in the past 6 months)	1757
Occasionally (3-4 times in the past 6 months)	659
Rarely (1-2 times in the past 6 months)	730

HOW LONG COUNTS

How Long	Number of Relationships
Less than 1 year	591
1-3 years	818
3-5 years	504
5-10 years	648
10-15 years	148
More than 15 years	382
Unknown	55

LIKELIHOOD TO RECOMMEND COUNTS

Likelihood to Recommend	Number of Relationships
5 (Extremely likely)	1698
4	995
3 (Fairly likely)	426
2	25
1 (Not at all likely)	2

CORRELATION OF RELATIONSHIP STRENGTH MEASURES

Pearson's product-moment correlation: Frequency of interaction, How long known the org, Likelihood to recommend

	Frequency	How Long	Likelihood to Recommend
Frequency	1.0000000	0.2700974 p-value < 2.2e-16	0.1347096 p-value = 3.265e-14
How Long	0.2700974 p-value < 2.2e-16	1.0000000	0.1196027 p-value = 2.544e-11
Likelihood to Recommend	0.1347096 p-value = 3.265e-14	0.1196027 p-value = 2.544e-11	1.0000000

ANNEX B: OVERVIEW OF ACTORS IN THE NETWORK

LOCAL VERSUS INTERNATIONAL COUNTS

Local Actor	Actors	Percent
Yes	328	84.8%
No	59	15.2%
Likelihood to Recommend	0.1347096 p-value = 3.265e-14	0.1196027 p-value = 2.544e-11

DISTRICT, NATIONAL AND INTERNATIONAL COUNTS

Local Actor	Actors	Percent
Sub-national	247	63.8%
National	81	20.9%
International	59	15.2%

ORGANIZATION TYPE COUNTS

Organization Type	Actors	Percent
LGU	94	24.3%
Government Agency	62	16.0%
International NGO or Organization	50	12.9%
Local NGO (registered - projects locally or region within country)	38	9.8%
University, College, or Research Institution	37	9.6%
National NGO (projects throughout the country)	24	6.2%
Community-based Organization / People's Organization	30	7.8%
Primary or Secondary School	14	3.6%
Faith-Based Organization	13	3.4%
Private Sector	16	4.1%
Red Cross and Red Crescent	9	2.3%

ORGANIZATION SIZE COUNTS

Organization Size	Actors	Percent
Large	83	21.4%
Medium	67	17.3%
Small	237	61.2%

COLLABORATION PATTERNS BETWEEN AND ACROSS GROUPS OF ACTORS

External-Internal Index (E-I Index)

For tables that include E-I index, each row represents the possible choices for that attribute (ie. District versus National). The internal-external column is the total number of relationships in the network that are between actors of that group and actors of any other group (ie. NGOs and not NGOs). The internal-internal column is the total number of relationships in the network that are between actors of that group (ie. NGOs to NGOs). The total is the total number of relationships that the group has (ie. all NGOs in the network).¹⁰

The E-I index number is a standard SNA calculation that takes the number of external ties, subtracts the number of internal ties and divides by the total number of ties for that group to get a ratio of external to internal ties ranging from -1 to 1, with -1 representing all internal ties, 1 representing all external ties, and 0 representing an even number of external and internal ties.¹¹

Are Local and International Actors Collaborating?

	internal-external	internal-internal	total	ei index
Local	1141	1905	3046	-0.251
International	1141	98	1239	0.842

Are Actors Collaborating Across Geographic Focus?

	internal-external	internal-internal	total	ei index
Sub-national	1556	926	2482	0.254
National	1221	163	1384	0.764
International	1141	98	1239	0.842

¹⁰ Note that these calculations ignore tie directionality, and instead focus on which two actors are connected. Therefore, summing tie counts vertically in these tables can add up to more than the total number of ties in the network, especially when looking at attributes that have more than two choices (ie. organization type, organization size) or where actors could belong to more than one group (ie. organization focus). Therefore, totals are only provided horizontally. These sums can be used to determine ratio of total network relationships that include this actor type by dividing by the total number of relationships in the network (1312).

¹¹ https://faculty.ucr.edu/~hanneman/nettext/C8_Embedding.html#EI

How long have district, national and international actors been collaborating?

Each cell represents relationship counts.

	Less than 1 year	1-3 years	3-5 years	5-10 years	10-15 years	More than 15 years	Unknown	Total
Sub-national & Sub-national	210	169	137	220	45	123	22	926
Sub-national & National	194	223	165	95	13	101	27	818
Sub-national & International	58	279	119	142	63	75	2	738
National & National	15	47	8	70	15	8	0	163
National & International	60	81	59	115	12	72	4	403
International & International	54	19	16	6	0	3	0	98
Total	591	818	504	648	148	382	55	3146

Is there cross-collaboration between different actor types?

Instead of running E-I index for organization type, we looked at raw relationship number for to whom different actor types are going. The table below provides counts of relationships from each actor type (those labeled in the rows) to other actor types (those labeled in the columns). Reading across a row shows the breakdown of relationships from that actor type; reading down a column shows the breakdown of relationships to that actor type.

	LGU	Govt. Agency	INGO	Local NGO	Univ. or Research Inst.	Nat. NGO	CBO	Pri. Or Sec. School	Faith-Based Org.	Priv. Sector	Red Cross and Red Cres.	Total
LGU	130	273	504	88	81	86	99		4	23	61	1349
Govt. Agency	38	70	51		13	6				7	14	199
INGO		35	69	39	18	51			40	24	4	280
Local NGO	9	10	46	13	3	31	5			4		121
Univ. or Research Inst.	45	53	33	8	16	26			13	11		205
Nat. NGO	4	43	115	40	4	42	13		12	11		284
CBO	94	70	25	25	8	127	5				4	358
Pri. or Sec. School	15	87	7	1		2	7	28		3		150
Faith-Based Org.				2		5			51			58
Priv. Sector	6	2	12		9							29
Red Cross and Red Cres.		17	50			17					29	113
Total	341	660	912	216	152	393	129	28	120	83	112	3146

Do different types of organizations collaborate in different ways?

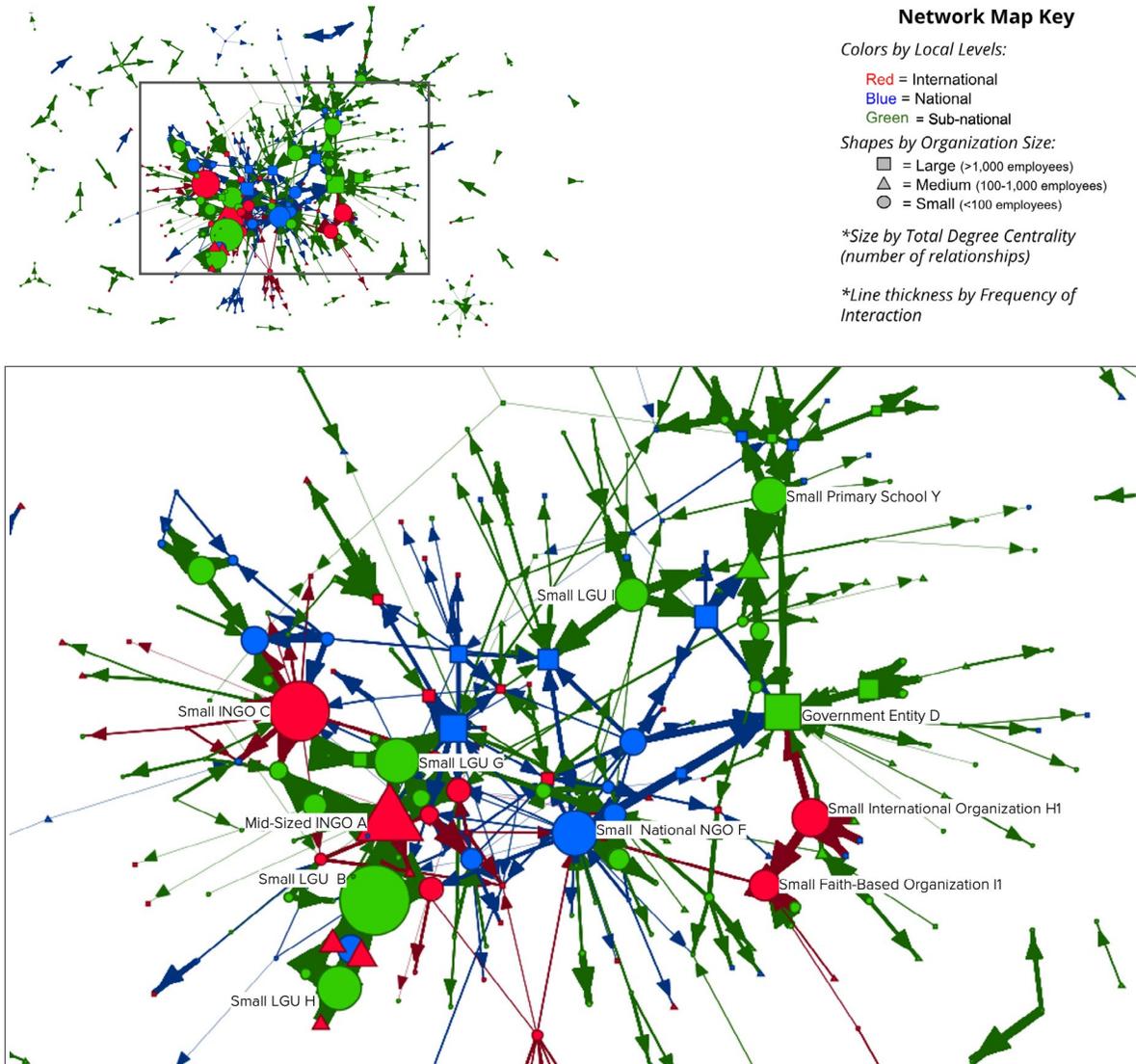
Each cell represents relationship counts. Note this table looks at outgoing relationships, ie. why are these types of actors going to others?

	Formal Contract	Informal Partnership	Information Sharing	Other	Total
LGU	731	356	262		1349
Government Agency	88	35	76		199
International NGO or Organization	160	8	112		280
Local NGO (registered - projects locally or region within country)	75	29	11	6	121
University, College, or Research Institution	74	100	31		205
National NGO (projects throughout the country)	139	61	84		284
Community-based Organization / People's Organization	181	50	127		358
Primary or Secondary School	22	42	86		150
Faith-Based Organization	45	13			58
Private Sector	12	17			29
Red Cross and Red Crescent	47	41	25		113
Total	1574	752	814	6	3146

Is there cross-collaboration between different organization sizes?

	internal-external	internal-internal	total	ei index
Small	1567	1195	2762	0.135
Medium	900	15	915	0.967
Large	1013	194	1207	0.679

ANNEX C: FULL NETWORK ZOOM



ANNEX D: KEY ACTORS

TOP COLLABORATION HUBS – FULL NETWORK

Total Degree Centrality - Collaboration Hubs

Rank	Name	Local?	Degree
1	Mid-Sized INGO A	International	171
2	Small LGU B	Sub-national	146
3	Small INGO C	International	136
4	Government	Sub-national	135
5	Philippine Red Cross	National	123
6	Small National NGO F	National	123
7	Small LGU G	Sub-national	103
8	Small LGU H	Sub-national	94
9	Small LGU I	Sub-national	90
10	Small LGU J	Sub-national	87
11	Small International Organization H1	International	81
12	Small Primary School Y	Sub-national	79
13	Small Faith-Based Organization I1	International	74
14	Mid-Sized National NGO K	National	71
15	Mid-Sized Government Agency L	National	71
16	Large International Organization P	International	69
17	Large CBO Z	Sub-national	69
18	Local governments	Sub-national	67
19	Large Government Agency A1	National	66
20	Small National NGO N	National	65
21	Small CBO E1	Sub-national	65
22	Mid-Sized University O	Sub-national	63
23	Small INGO R	International	62
24	Small Local Government Agency F1	Sub-national	62
25	Small NGO G1	National	62

TOP RESOURCE HUBS – FULL NETWORK

In-Degree Centrality-Resource Hubs

Rank	Name	Local?	Degree
1	Mid-Sized INGO A	International	162
2	Government	Sub-national	135
3	Small National NGO F	National	71
4	Mid-sized National NGO K	National	71
5	Mid-Sized Government Agency L	National	71
6	Local governments	Sub-national	67
7	Small National NGO N	National	65
8	Mid-Sized University O	Sub-national	63
9	Large International Organization P	International	62
10	Small International Organization Q	International	60
11	Small NGO B1	National	59
12	Large Government Agency C1	Sub-national	58
13	Small INGO R	International	57
14	Mid-Sized INGO J1	International	56
15	Small INGO C	International	55
16	Mid-Sized INGO U	International	54
17	Small NGO K1	International	53
18	Small NGO L1	Sub-national	45
19	Mid-Sized Government Agency D1	National	45
20	Philippine Red Cross	National	44
21	Small Faith-Based Organization I1	International	43
22	Large Government Agency M1	National	43
23	Small LGU N1	Sub-national	36
24	IFRC	International	35
25	SMALL INGO V	International	35

TOP UNIQUE DEGREES – FULL NETWORK

Unique Degree Centrality – Know the Most Actors

Rank	Name	Local?	Degree
1	Small National NGO F	National	22
2	Government	Sub-national	20
3	Small INGO C	International	18
4	Mid-Sized INGO A	International	16
5	Philippine Red Cross	National	16
6	Large International Organization P	International	14
7	Small NGO W	National	12
8	Small National NGO N	National	12
9	Small NGO G1	National	11
10	Large Government Agency H2	National	11
11	Mid-Sized Government Agency L	National	10
12	Small INGO A2	International	10
13	Mid-Sized University I2	Sub-national	10
14	Mid-Sized INGO U	International	9
15	Small LGU J	Sub-national	8
16	Large International Organization T	International	8
17	Small Primary School Y	Sub-national	8
18	Mid-Sized International NGO J2	International	7
19	Mid-Sized INGO X	International	7
20	Large Government Agency C1	Sub-national	7
21	Small Local Government Agency L2	Sub-national	7

TOP BROKERS – FULL NETWORK

Betweenness Centrality - Brokers

Rank	Name	Local?	Score
1	Small NGO W	National	0.007
2	Small National NGO F	National	0.005
3	Small INGO V	International	0.004
4	Small INGO C	International	0.004
5	Large International Organization P	International	0.004
6	Mid-Sized International NGO J2	International	0.002
7	Small NGO G1	National	0.002

TOP INFLUENCERS – FULL NETWORK

Eigenvector Centrality - Influencers

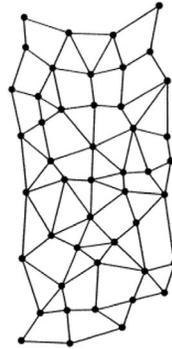
Rank	Name	Local?	Score
1	Large International Organization T	International	0.333
2	Mid-Sized INGO U	International	0.306
3	SMALL INGO V	International	0.298
4	Small NGO W	National	0.270
5	Mid-Sized INGO X	International	0.256
6	Large International Organization P	International	0.238
7	Small INGO C	International	0.238
8	Small National NGO F	National	0.204
9	Small National NGO N	National	0.188
10	Mid-Sized Government Agency L	National	0.171

ANNEX E: NETWORK STRUCTURES

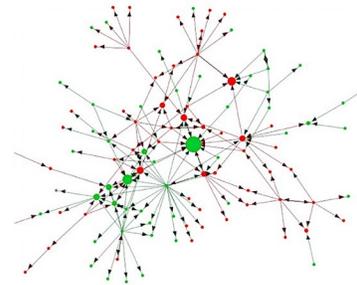
DISTRIBUTED

- Greater cohesion and links between multiple actors in the network
- Allows for more equal flow of information to all actors in the network
- Minimizes bottlenecks and promotes sustainability; information flow is not disrupted if actor leaves network

Model Networks

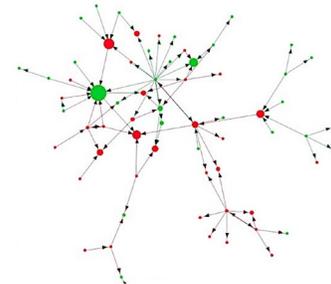


Example Network



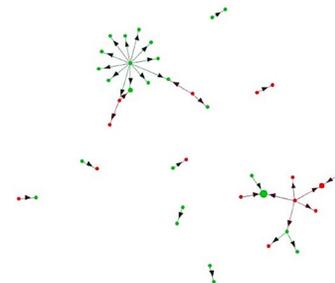
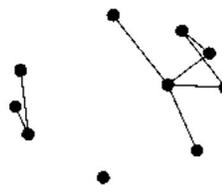
DECENTRALIZED

- Flow of information is controlled/managed by key central actors
- Can lead to bottlenecks
- Peripheral actors are dependent upon those that are more central



ISOLATED

- Network actors disconnected, isolated groups of activity
- Lack of information flow and coordination between actors working in similar areas



ANNEX F: SUB-NETWORKS

LOCAL ACTOR NETWORK | COLLABORATION AREA COUNTS, LOCAL NETWORK

Collaboration Area	Number of Relationships	Collaboration Area	Number of Relationships
Advocacy	168	Policy	39
Community Capacity Building	152	Vulnerable Groups	39
Education	112	Gender-based violence	36
Community-Based Risk Analysis	102	Agriculture Expertise	32
Climate Change and Adaptation	100	Conflict Mitigation Expertise	28
Community Planning	95	Research	28
Early Warning Systems Expertise	88	Project Design	27
Community Connections	81	MEL Expertise	17
Volunteers and Volunteer staff	79	Technology/web resources (e.g. server space, web site development, social media)	14
Project Implementation	73	Proposal Writing	12
Leadership	72	Journalism/Media	9
Facilitation	68	Disaster/Emergency Response	3
Data Resources including data sets, collection and analysis	65	Disaster Risk Reduction and Management (DRRM)	2
Local Expertise	51	Livelihoods	1
Management	49	Business	1
TA	47	Information Sharing	1
WaSH	44	Disaster/Emergency Preparedness	1
Health/Public Health Expertise	42	Nutrition	1
Logistics	42	Urban Planning/Infrastructure Development	1
Funding	41	Mental Health and Psychosocial Support (MHPSS)	1
In-Kind Resources (e.g., meeting space)	40	Other	1

COLLABORATION HUBS, LOCAL NETWORK

Total Degree Centrality - Collaboration Hubs

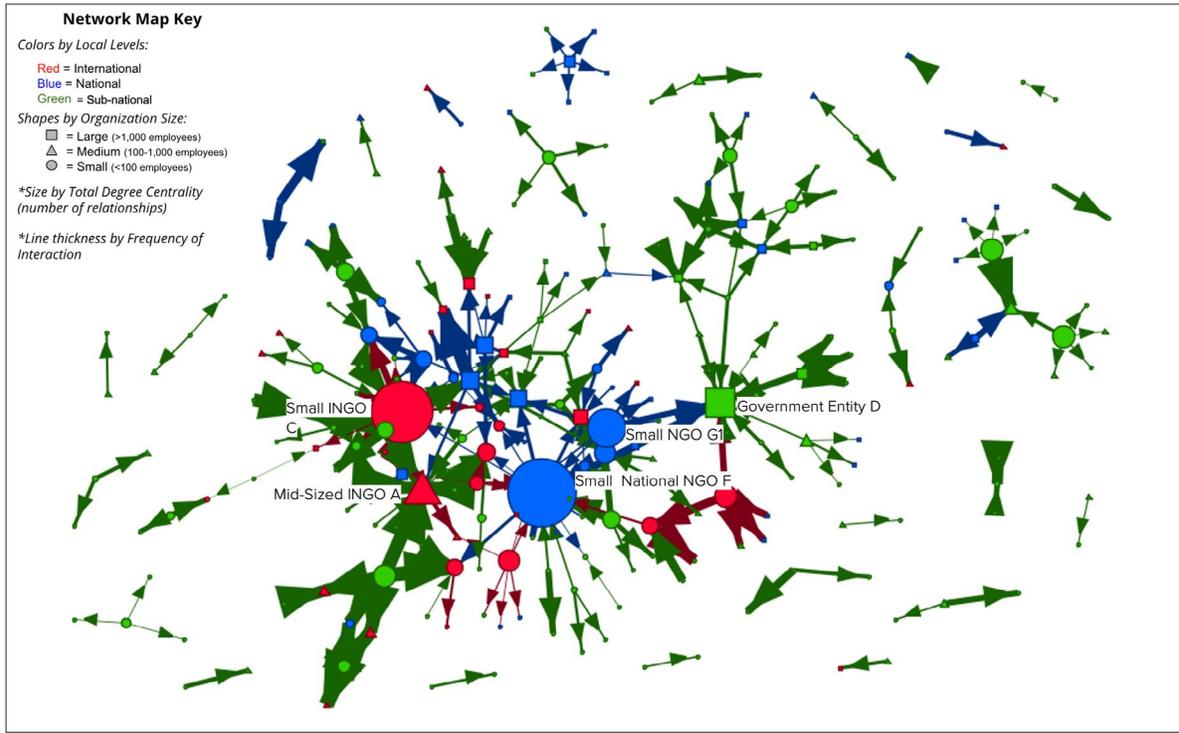
Rank	Name	Local?	Degree
1	Government	Sub-national	121
2	Small LGU I	Sub-national	90
3	Small National NGO F	National	88
4	Small Primary School Y	Sub-national	79
5	Small LGU J	Sub-national	78
6	Small LGU G	Sub-national	76
7	Mid-Sized Government Agency L	National	71
8	Large CBO Z	Sub-national	69
9	Local governments	Sub-national	67
10	Large Government Agency A1	National	66
11	Small CBO E1	Sub-national	65
12	Small National NGO N	National	64
13	Mid-Sized University O	Sub-national	62
14	Community Organizers	Sub-national	60
15	Small NGO B1	National	59
16	Large Government Agency C1	Sub-national	58
17	Small Local Organization E2	Sub-national	48
18	Mid-Sized Government Agency D1	National	45
19	Philippine Red Cross	National	44
20	Mid-sized National NGO K	National	43
21	Large Government Agency M1	National	43
22	Small NGO G1	National	42
23	Small Local Government Agency F2	Sub-national	41
24	Small Local Organization G2	National	36
25	Small LGU N1	Sub-national	36

RESOURCE HUBS, LOCAL NETWORK

In-Degree Centrality - Resource Hubs

Rank	Name	Local?	Nominations
1	Government	Sub-national	121
2	Mid-Sized Government Agency L	National	71
3	Local governments	Sub-national	67
4	Small National NGO N	National	64
5	Mid-Sized University O	Sub-national	62
6	Small National NGO F	National	60
7	Small NGO B1	National	59
8	Large Government Agency C1	Sub-national	58
9	Mid-Sized Government Agency D1	National	45
10	Philippine Red Cross	National	44
11	Mid-Sized National NGO K	National	43
12	Large Government Agency M1	National	43
13	Small LGU N1	Sub-national	36
14	Small NGO L1	Sub-national	32
15	Small Local Government Agency P1	Sub-national	28
16	Small NGO Q1	National	26
17	Small Private Sector R1	National	23
18	Mid-Sized University S1	Sub-national	22
19	Small LGU T1	Sub-national	22
20	Small NGO U1	Sub-national	22
21	Large Government Agency V1	National	22
22	Large Government Agency W1	National	21
23	Small NGO X1	National	20
24	Small Local NGO Y1	Sub-national	20
25	Large Government Agency A1	National	19

ADVOCACY NETWORK



The largest collaboration area was the Advocacy network, which is pictured above. This network has 257 actors that reported and 268 relationships with one another. On average, each organization in the network has about 2 relationships and knows about 2 actors. The network density is 0.004, meaning that around 0.4% of all possible ties between organizations exist. This network has the same density as the full network, which is quite low. Also like the full network, reciprocity and reach in the Advocacy network are very low. Less than 0.01% of ties are reciprocal, and on average, each organization's resources, ideas, or support has the potential to reach only 1% of other organizations.

From the network image, we can see a more distributed structure, with some decentralization and isolated groups. Both according to the popularity of this sub-network and to the network structures of the sub-networks, Advocacy seems

to be the area that is farthest along in forming a strong system. This sub-network would benefit from tasking those in the main network structure to reach out to those in the isolated groups, especially the larger isolated groups like the one on the right-hand side of the image above.

Also seen in the network image above, are the prominent national and international actors in this sub-network. The top actors by total number of relationships for the advocacy network were: Small National NGO F, Small INGO C, Government, and Mid-Sized INGO A. The same four actors are the top collaboration hubs, with the most overall connections, and the top resource hubs, or the most identified by others in the network. See the tables below for lists of the top actors in this network broken down by whether they are sub-national, national or international.

COLLABORATION HUBS, ADVOCACY NETWORK

Total Degree Centrality - Collaboration Hubs

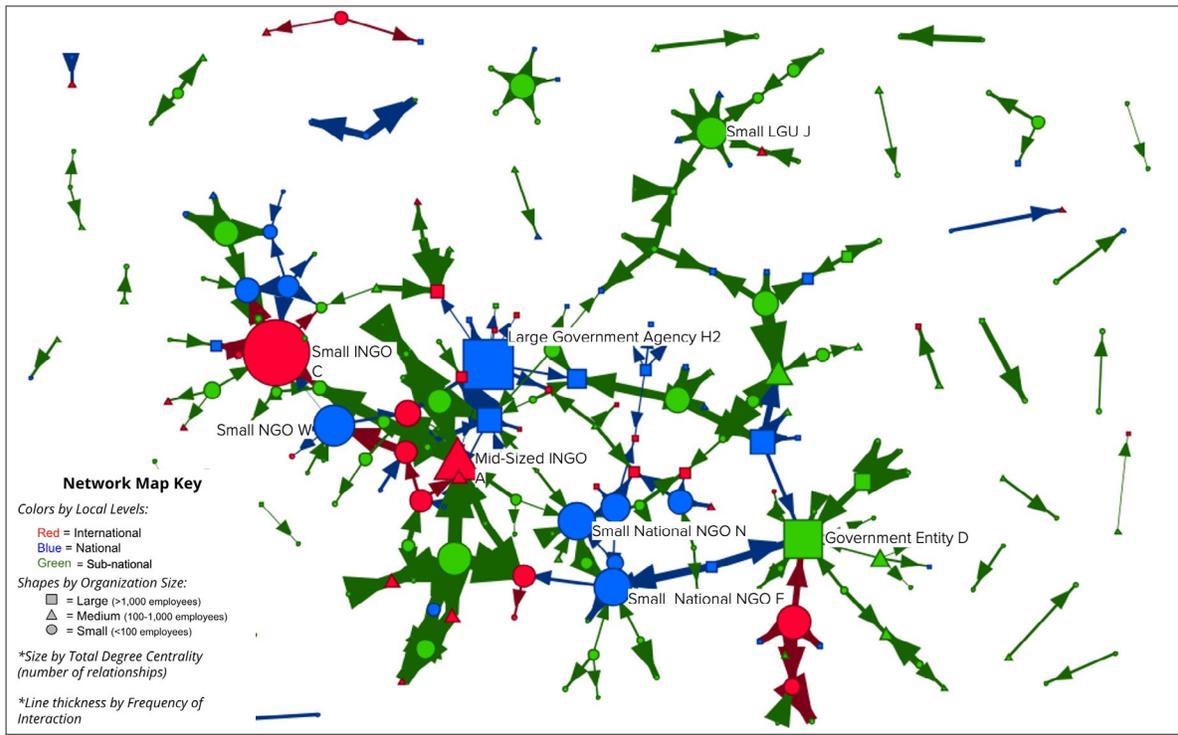
Rank	Name	Local?	Degree
1	Small National NGO F	National	21
2	Small INGO C	International	15
3	Government	Sub-national	13
4	Mid-Sized INGO A	International	12
5	Small NGO G1	National	9
6	Philippine Red Cross	National	9
7	Mid-Sized Government Agency L	National	7
8	Small CBO Z1	National	6
9	Small INGO A2	International	6
10	Large International Organization P	International	6
11	Small National NGO N	National	6
12	Mid-Sized INGO U	International	6

RESOURCE HUBS, ADVOCACY NETWORK

Total Degree Centrality - Collaboration Hubs

Rank	Name	Local?	Nominations
1	Government	Sub-national	13
2	Small National NGO F	National	11
3	Mid-Sized INGO A	International	11
4	Small INGO C	International	7
5	Mid-Sized Government Agency L	National	7
6	Mid-Sized INGO U	International	6
7	Small National NGO N	National	6
8	Large International Organization P	International	6
9	Large Government Agency C1	Sub-national	5
10	Mid-Sized INGO J1	International	5
11	Mid-Sized National NGO K	National	5
12	Small INGO V	International	4
13	Small INGO R	International	4
14	Philippine Red Cross	National	4
15	Large Government Agency M1	National	4
16	Large National Organization B2	National	4
17	Mid-Sized Government Agency D1	National	4
18	Large International Organization C2	International	4

COMMUNITY CAPACITY BUILDING NETWORK



The second largest collaboration area was the Community Capacity Building sub-network, with 242 actors that reported and 249 relationships with one another. On average, each organization in the network has about 2 relationships and knows about 2 actors. As with the full network and other sub-networks, density, reciprocity and reach in the Community Capacity Building network are very low. The network density is 0.004, meaning that around 0.4% of all possible ties between organizations exist. Less than 0.01% of ties are reciprocal, and on average, each organization's resources, ideas, or support has the potential to reach only 0.7% of other organizations.

From the network image, we can see a more decentralized structure, with many isolated groups. This sub-network seems to be entering into a convening stage, where isolated groups of actors are coming together around this issue. Some of the key conveners include Small INGO

C, Government, and Large Government Agency H2. In general, this sub-network would benefit from both introducing key actors to one another and tasking those in the main network structure to reach out to those in the isolated groups. See the tables below for lists of the top actors in this network broken down by whether they are sub-national, national or international.

COLLABORATION HUBS, COMMUNITY CAPACITY BUILDING NETWORK

Total Degree Centrality - Collaboration Hubs

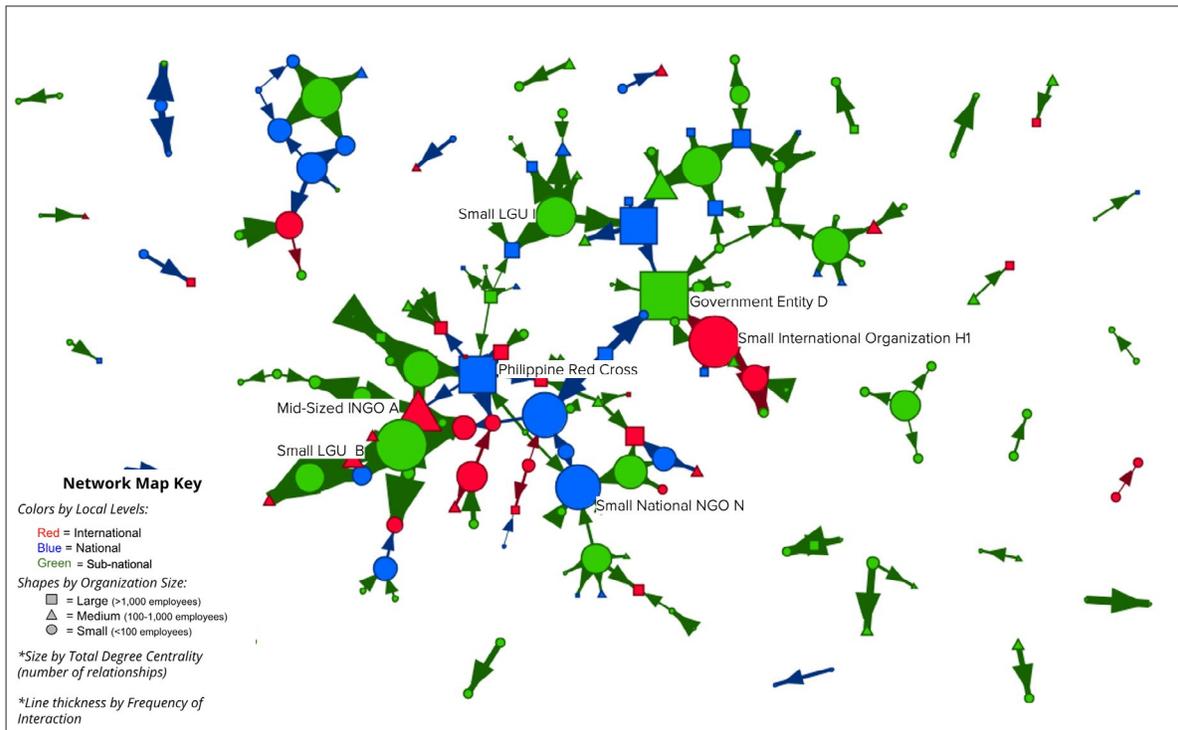
Rank	Name	Local?	Degree
1	Small INGO C	International	11
2	Government	Sub-national	10
3	Large Government Agency H2	National	10
4	Mid-Sized INGO A	International	9
5	Philippine Red Cross	National	9
6	Small National NGO F	National	8
7	Small LGU J	Sub-national	8
8	Small National NGO N	National	8
9	Small NGO W	National	7

RESOURCE HUBS, COMMUNITY CAPACITY BUILDING NETWORK

In-Degree Centrality - Resource Hubs

Rank	Name	Local?	Nominations
1	Government	Sub-national	10
2	Mid-Sized INGO A	International	8
3	Small National NGO N	National	8
4	Small National NGO F	National	6
5	Small INGO C	International	6
6	Philippine Red Cross	National	5
7	Large International Organization P	International	5
8	Mid-Sized National NGO K	National	5

COMMUNITY-BASED RISK ANALYSIS NETWORK



Community-based Risk Analysis was also a popular collaboration area, containing 178 actors that reported and 161 relationships with one another. On average, each organization in the network has about 2 relationships and knows about 2 actors. As with the full network and other sub-networks, density, reciprocity and reach in the Community Capacity Building network are very low. The network density is 0.005, meaning that around 0.5% of all possible ties between organizations exist. Less than 0.01% of ties are reciprocal, and on average, each organization's resources, ideas, or support has the potential to reach only 0.6% of other organizations.

In the network image, we see a decentralized structure, with many isolated groups. One isolated group is quite large with about a dozen actors. This sub-network seems to be in the later stages of the convening phase, where isolated groups of actors are coming together around this issue.

It therefore would benefit from both introducing key actors to one another and tasking those in the main network structure to reach out to those in the isolated groups. Unlike the Community Capacity Building Network, which sees a few very prominent conveners, this sub-network seems to have many conveners. Actors include Philippine Red Cross, Government, and Small LGU J. See the tables below for lists of the top actors in this network broken down by whether they are sub-national, national or international.

COLLABORATION HUBS, COMMUNITY-BASED RISK ANALYSIS NETWORK

Total Degree Centrality - Collaboration Hubs

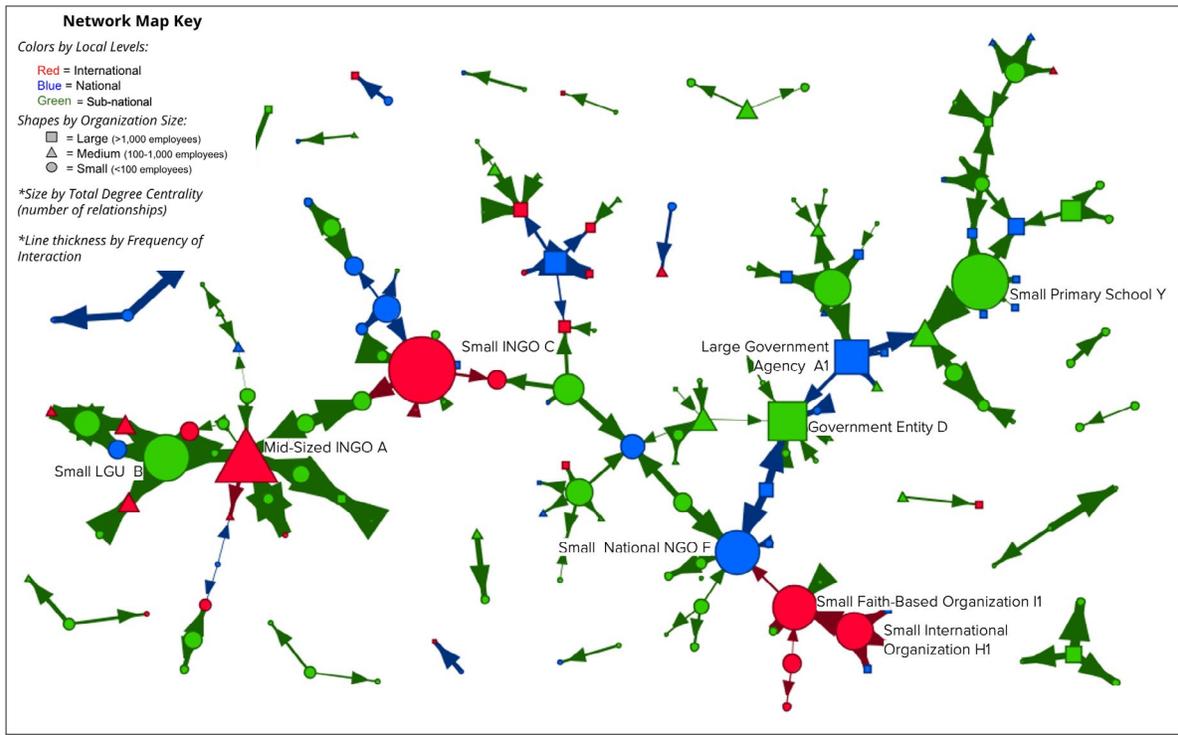
Rank	Name	Local?	Degree
1	Philippine Red Cross	National	9
2	Government	Sub-national	8
3	Small LGU J	Sub-national	6
4	Small LGU D2	Sub-national	6
5	Mid-Sized INGO A	International	6
6	Small National NGO N	National	6

RESOURCE HUBS, COMMUNITY-BASED RISK ANALYSIS NETWORK

In-Degree Centrality - Resource Hubs

Rank	Name	Local?	Nominations
1	Government	Sub-national	8
2	Small National NGO N	National	6
3	Mid-Sized INGO A	International	6
4	Small National NGO F	National	4

CLIMATE CHANGE ADAPTATION NETWORK



The fourth largest collaboration area was Climate Change Adaptation. This sub-network is made up of 173 actors that reported and 158 relationships with one another, meaning that it is almost the same size as the Community-based Risk Analysis sub-network. The two networks scored the same on all of the SNA metrics, but have different shapes. While both sub-networks are decentralized, the Community-based Risk Analysis sub-network is trending towards distributed and contains many isolated groups, whereas the Climate Change Adaptation sub-network is in early stages of decentralization with fewer isolated groups. The benefit of the structure seen in the Climate Change Adaptation sub-network is that though it seems to be behind other sub-networks in maturity, it will take a few relationships to connect many actors due to the snake-like structure seen in the sub-network image above.

Key actors in this sub-network include Small INGO C, Government, and Mid-Sized INGO A. Because of the current structure of this network, we recommend connecting key actors and asking them to also connect their peers. See the tables below for lists of the top actors in this network broken down by whether they are sub-national, national or international.

COLLABORATION HUBS, CLIMATE CHANGE ADAPTATION NETWORK

Total Degree Centrality - Collaboration Hubs

Rank	Name	Local?	Degree
1	Small INGO C	International	8
2	Government	Sub-national	8
3	Mid-Sized INGO A	International	8
4	Small Primary School Y	Sub-national	6
5	Small LGU D2	Sub-national	6
6	Small National NGO F	National	6

RESOURCE HUBS, CLIMATE CHANGE ADAPTATION NETWORK

In-Degree Centrality - Resource Hubs

Rank	Name	Local?	Nominations
1	Government	Sub-national	8
2	Mid-Sized INGO A	International	7
3	Small National NGO F	National	6
4	Small National NGO N	National	4
5	Mid-Sized INGO J1	International	4
6	Small INGO C	International	4



A NEW LIFE BLOOMS IN PARADISE. This coastal community in Tacloban City called *Paraiso* or Paradise was once unrecognizable after Super Typhoon Haiyan ravaged the Visayas region in the Philippines and left over 6,000 casualties in 2013. Several years later, life is finally getting better here. Instrumental to the disaster recovery of the local communities were the people's *bayanihan* or communal unity, and the humanitarian aid and response efforts of many international and local DRR actors.



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