

Mekong Basin Organization Network Survey: Exploratory Study



Research Overview

Why: Recent Mekong River Basin workshops have highlighted the need for increased research collaboration and data sharing for the effective use of scientific information to manage the Mekong River system. Improved information regarding the existing networks in the region should help us to better understand opportunities and challenges to strengthen Mekong Basin research collaboration at the national, regional and international levels.

What: The Mekong Fish Network is carrying out a network analysis to map the connections between organizations that conduct or use Mekong Basin research. The organizations are from different countries and regions, mainly Vietnam, Cambodia, Lao PDR, Thailand, the rest of Asia, the U.S. and Europe. Organizations in the analysis include: universities and research institutions; local, national and international government agencies; national, regional and international NGOs; and private firms.

Benefits: We believe that with a better understanding of interactions among institutions, programs, and agencies, we will be able to identify opportunities to improve connectivity between Mekong Basin researchers and managers so that they can more efficiently work on science projects of mutual interest and improve the availability of research in support of policy and management.

Methodology

Network Participants: Key informant interviews, organizational contacts, workshop proceedings and Internet research were used to compile a list of Mekong region organizations and contacts.

| Country/Type | Breakdown of Organizations Included in Network Survey | | | | | Total |
|----------------------|---|-------------------------------|------------------|-------------------------------------|----------------|-------|
| | Government Agency | University/Research Institute | NGO ¹ | International Agencies ² | Private Sector | |
| Myanmar ³ | 2 | 0 | 0 | 0 | 0 | 2 |
| Lao PDR | 5 | 3 | 6 | 5 | 3 | 22 |
| Thailand | 4 | 7 | 6 | 6 | 0 | 24 |
| Cambodia | 8 | 6 | 13 | 2 | 1 | 30 |
| Vietnam | 13 | 18 | 10 | 3 | 2 | 46 |
| Asia (regional) | 0 | 1 | 3 | 5 | 0 | 8 |
| Australia | 2 | 2 | 0 | 0 | 1 | 5 |
| USA | 4 | 4 | 1 | 5 | 0 | 13 |
| Europe | 3 | 6 | 2 | 0 | 1 | 10 |
| USA | 6 | 22 | 4 | 5 | 1 | 30 |
| Total | 43 | 63 | 41 | 26 | 8 | 180 |

¹Myanmar was not explicitly included as part of this study which is why only 2 organizations were included.
²North and International Organizations with country offices were treated as separate organizations affiliated with that country.
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Network Survey: The network participant list was used to develop an online organizational network survey that was sent by e-mail to one or more key representatives from each of the organizations on the list. The survey asked participants to identify their organization's contacts and weigh the importance of each to their mission.

Mekong Basin Organization Network Survey

Mekong Basin Organization Network Survey: Part 1

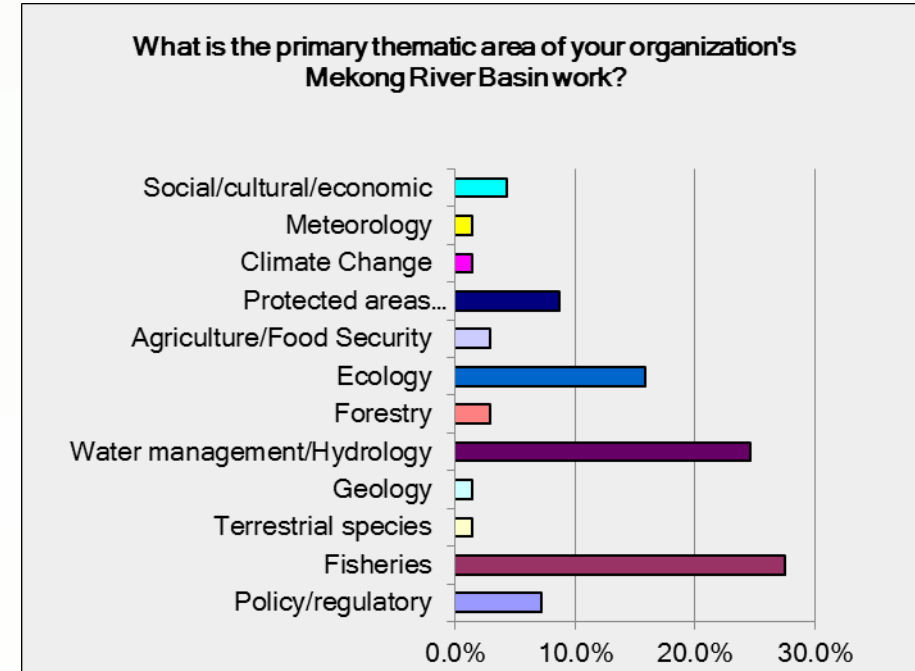
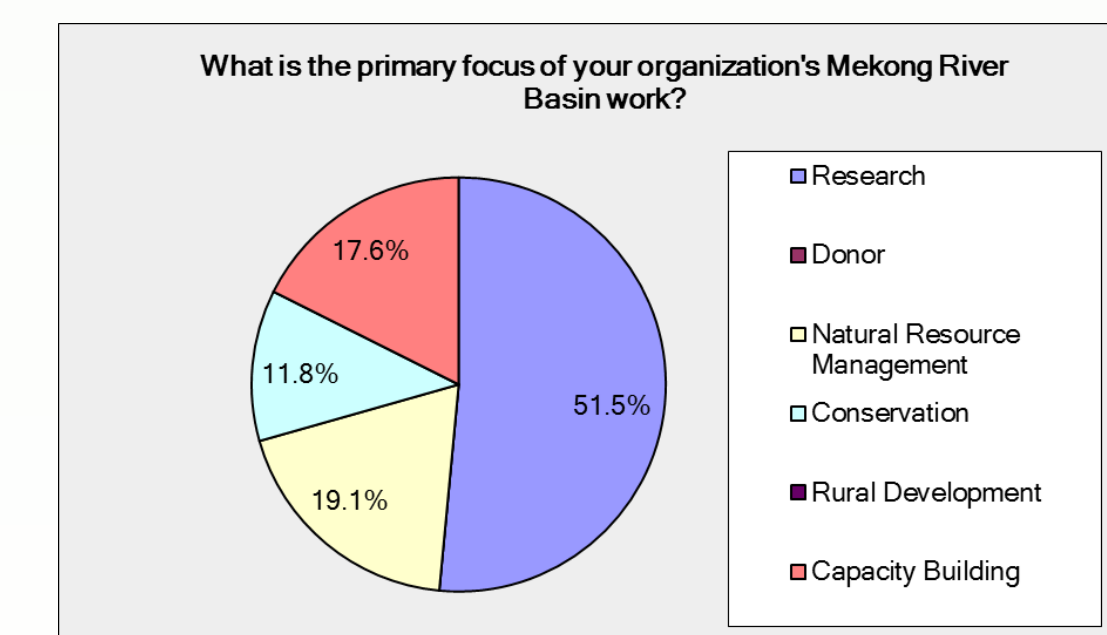
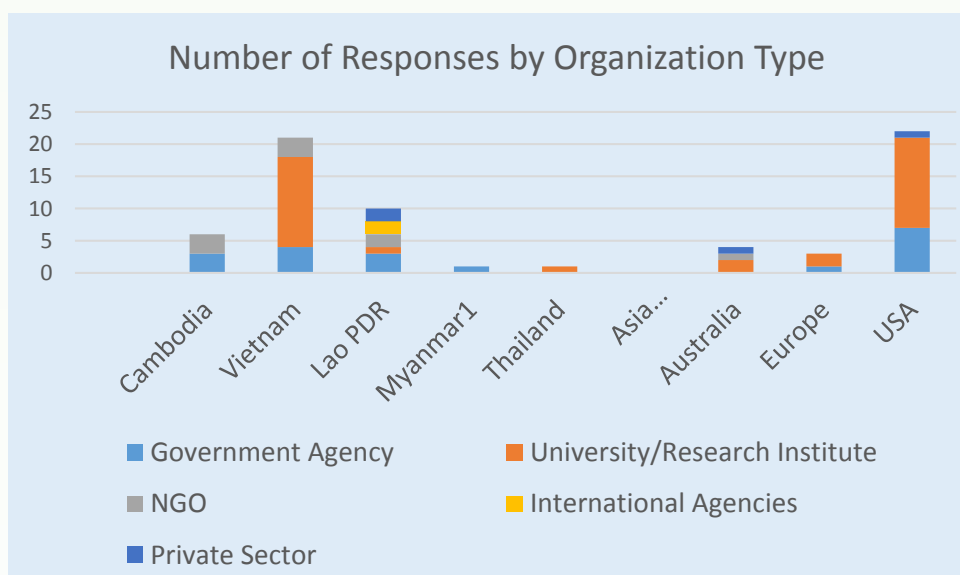
4. Please review the list below and mark (by clicking on circles) all of the INTERNATIONAL AGENCIES that you have worked with in the past year (tick all that apply). I have worked with this organization in the past year (tick all that apply)

| | |
|--|--------------------------|
| ASEAN (Association of Southeast Asian Nations) - Asia | <input type="checkbox"/> |
| Asian Development Bank - Asia | <input type="checkbox"/> |
| Food and Agriculture Organization (FAO) - Asia | <input type="checkbox"/> |
| World Bank - Asia | <input type="checkbox"/> |
| JICA (Japan International Cooperation Agency) - Japan | <input type="checkbox"/> |
| Belgian Development Agency - Belgium | <input type="checkbox"/> |
| VLR - ICG (Flanders) - Belgium | <input type="checkbox"/> |
| DANIDA (Danish International Development Agency) - Denmark | <input type="checkbox"/> |
| SCA (Swedish Agency for Development and Cooperation) - Sweden | <input type="checkbox"/> |
| DFID (Department for International Development) - United Kingdom | <input type="checkbox"/> |

Results

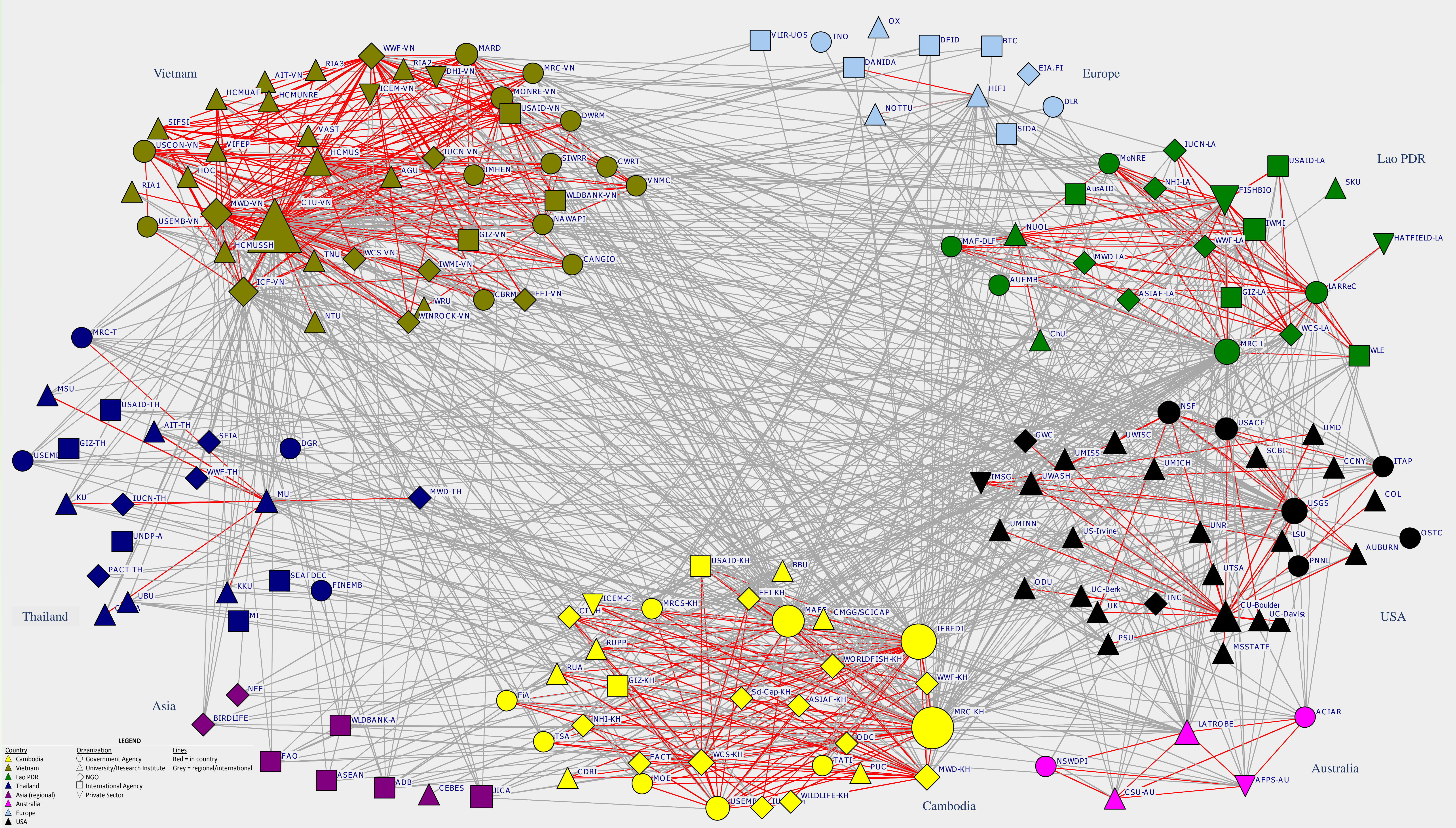
Survey Response Statistics:

- Total Sent Survey: 207
- Total Recipients: 191 (16 undeliverable)
- Average time to take: 11 min.
- Total Responses: 69 (includes 6 incomplete)
- Response Rate: 33%



Imputing Missing Data

Some 60% of the organizations identified in the network did not complete the survey. To address this data gap, the network connections for those organizations were imputed from the lists of the respondents that did complete the survey using the procedure described by Borgatti et. al. (2013).



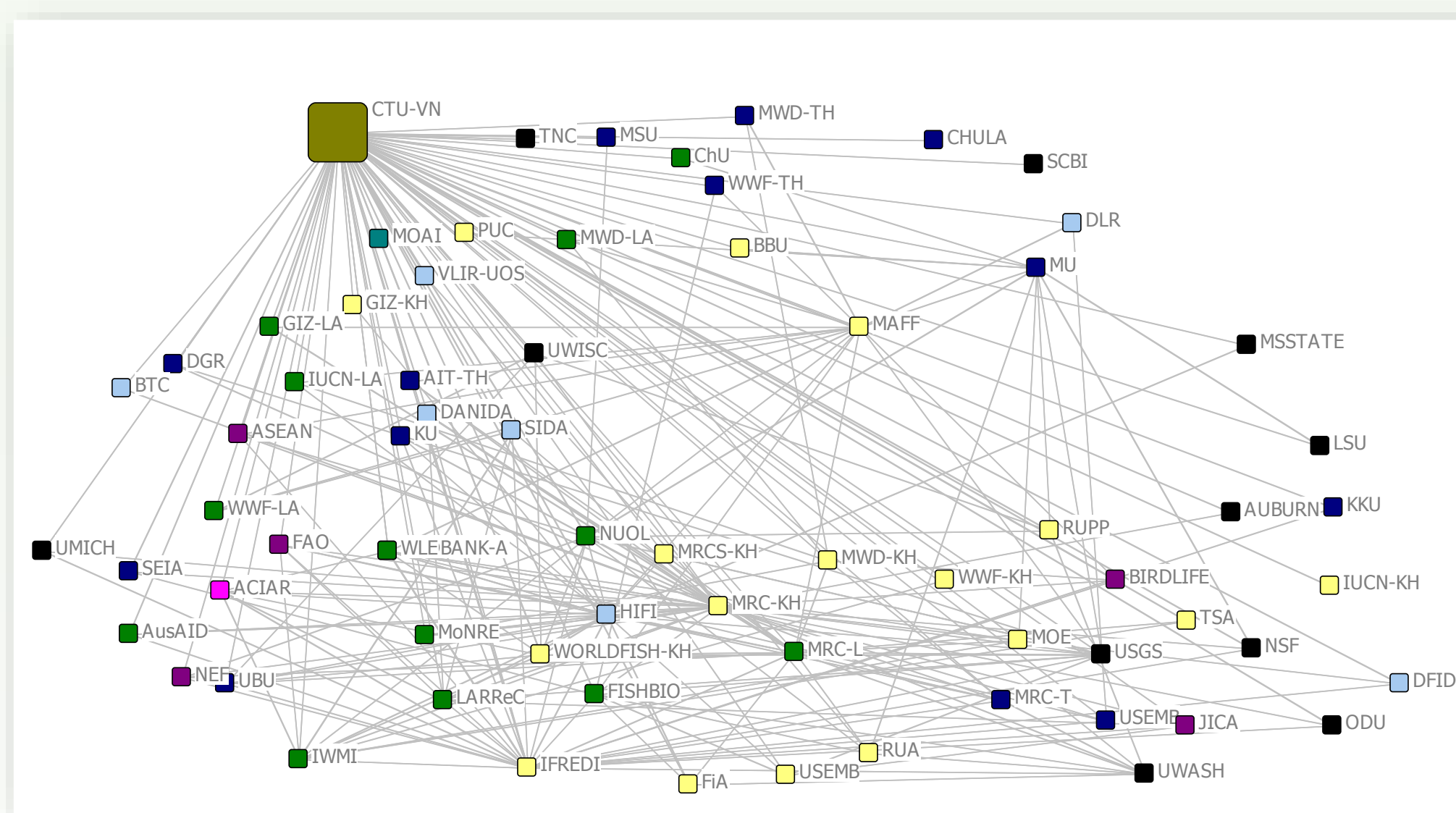
Mekong Basin Organization Map. In this network map, individual shapes (referred to as nodes) represent organizations. The lines represent connections between organizations, but the distance between nodes is not significant. A visual inspection of the map indicates that the network appears to have a high degree of overall connectedness. At the national level, some countries demonstrate greater internal connectedness than others. The level of centrality of a node is represented by the size of the node. Larger nodes occupy a more central place within the overall network.

Network Centrality

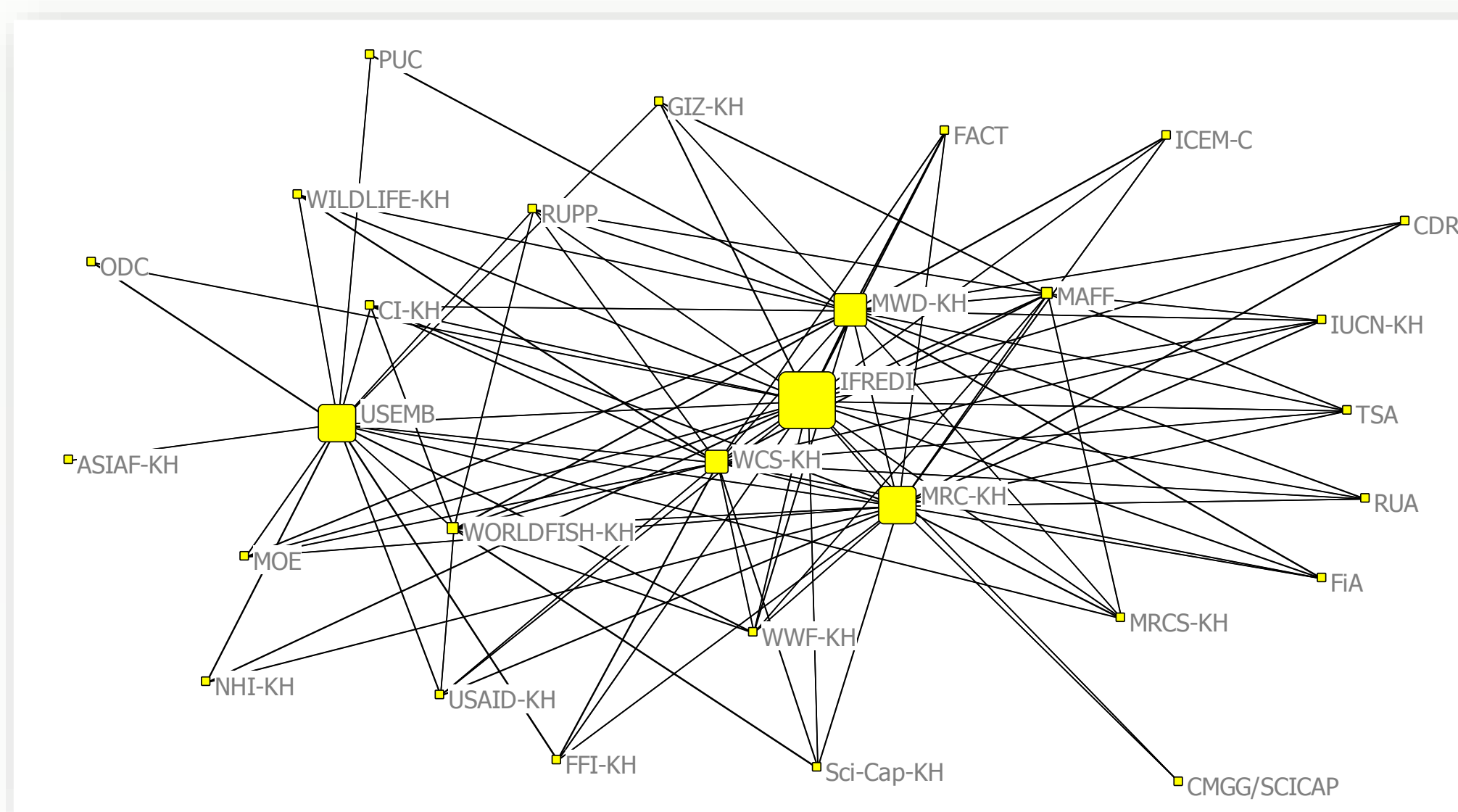
Network centrality involves a set of concepts that are used to describe a node's position in a network. In the above map, we use a measure called *Betweenness Centrality*. Organizations with high betweenness centrality are closely connected to a large number of other nodes in the network. They therefore display the potential to play a gatekeeping function in the network – that is, they can control flows of information through the network. These organizations can facilitate the rapid flow of information through the network. However, they are also “in a position to threaten the network with disruption of operations...[and to] filter information and to color or distort it as they pass it along (Borgatti et. al. 2013).”

In the full network, the same three organizations have highest centrality scores across all measures. These are: 1) Can Tho University (Vietnam); 2) Mekong River Commission Cambodia; 3) Inland Fisheries Research and Development Institute (Cambodia). The relative level of centrality for the other organizations in the network may vary somewhat depending on the centrality measure that is used.

| Sample of Organizations Ranked by Level of Betweenness Centrality | | |
|---|-------------------|-----------------|
| High Centrality | Medium Centrality | Low Centrality |
| CTU-VN 3408.0 | MWD-VN 818.1 | FFI-KH 0.7 |
| MRC-KH 2271.7 | FISHBIO 772.0 | VIFEP 0.5 |
| IFREDI 1561.1 | ICF-VN 759.6 | CBR 0.4 |
| MAFF 1116.7 | HCMUS 714.1 | DGR 0.4 |
| CU-Boulder 1029.4 | USGS 591.1 | NHI-KH 0.3 |
| | MRC-L 508.0 | SCBI 0.3 |
| | WCS-KH 357.7 | PNNL 0.3 |
| | WWF-VN 349.1 | FACT 0.3 |
| | LATROBE 332.5 | CDRI 0.2 |
| | USEMB 324.9 | IUCN-T 0.2 |
| | MWD-KH 321.0 | MWD-TH 0.2 |
| | MONRE-VN 255.3 | PACT-TH 0.2 |
| | LARReC 228.6 | WILDLIFE-KH 0.1 |
| | HIFI 218.5 | WCS-VN 0.1 |
| | NUOL 188.7 | WINROCK-VN 0.1 |
| | UWISC 178.1 | WR 0.1 |
| | NSF 156.6 | HCMUNR 0.1 |
| | MU 142.0 | AUEMB 0.1 |



This “ego network” for Can Tho University shows the extensive connections at the international and regional level that, in part, explain its high centrality scores in the network.



Centrality can vary by sub-network. The above network map of Cambodia organizations shows that, at the national level, IFREDI is more central than MRC Cambodia, which has higher centrality scores in the full network.

Conclusions

Connectedness: The network displays a high level of connectedness (.903), which is a condition that could favor increased collaboration and information exchange in the network.

Centrality: Notably, two of the organizations with the highest betweenness centrality scores are Can Tho University and the Mekong River Commission in Cambodia.

- Can Tho University's strong centrality suggests that it is well positioned in the network to sponsor a regional Mekong River Natural History Museum as has been proposed.
- In light of the strong centrality of the Mekong River Commission's Cambodia office in the current network, it will be important to monitor the impact that the decentralization of the MRC has on connectedness and the flows of information within the network.

Limitations of study:

- Missing Data:** Many organizations did not respond to the survey and network analysis may be sensitive to missing data. Imputing missing values is preferable to deleting actors from a network (Borgatti et. al. 2013). However, it also may introduce error by underestimating the number of network connections for organizations that did not respond.
- Multiple responses:** In a few cases we received survey responses from multiple individuals from the same organization. These organizations may display a higher centrality than organizations that only had one response.
- Missing organizations:** Many organizations working in the Mekong Basin region were not included in our initial list. We received the names of over 121 additional organizations to add to the network. As a result, this iteration of the network map excludes many institutions that are very active in the Mekong. A follow up study should be done using the larger list of organizations.

Further analysis: To date, only a preliminary analysis of the data has been conducted. Future analyses will yield more insights regarding the overall structure and position of actors in the network as well as cliques and sub-networks.

References
 Borgatti, Stephen P., Everett, M.G. and Johnson, J.C. 2013. *Analyzing Social Networks*. Sage Publications.
 Borgatti, S.P. 2002. *NetDraw: Graph Visualization Software*. Harvard: Analytic Technologies.
 Borgatti, S.P., Everett, M.G. and Freeman, L.C. 2002. *Ucinet 6 for Windows: Software for Social Network Analysis*. Harvard, MA: Analytic Technologies.