



SCHOOL of INTERNATIONAL SERVICE
AMERICAN UNIVERSITY • WASHINGTON, DC

Drivers of Development and Conflict in the Mekong River Basin

Report of the Mekong Capstone Research Practicum
American University School of International Service
May 2013

Image: Landsat USGS.gov

Brandt Burleson
Matthew Espie
Olivia Gilmore
Amanda Johnson
Weini Li
Roman Manziyenko
Linh Nguyen
Xiaocheng Zang

Dr. Ken Conca, team supervisor

EXECUTIVE SUMMARY

Born in the Tibetan Plateau and emptying some 4,800 kilometers later into the South China Sea, the Mekong River Basin (MRB) is one of the great river systems of the world. It is also undergoing a period of significant change, where rapid, large-scale development of the river and its tributaries are altering the Mekong's flow regime, with major social, economic, and ecological implications. Richly endowed with natural resources, the riparian ecosystems threading through the six countries in the basin – China, Myanmar, Lao PDR, Thailand, Cambodia, and Vietnam – are second only to those of the Amazon in terms of river biodiversity. The Mekong is also the site of the largest inland fishery in the world.¹ Rural livelihoods in the region, including those of the approximately 55 million people living in the Lower Mekong Basin alone, depend on the integrated use of a wide range of natural resources and ecosystem services provided by the river.²

Rapid infrastructure construction, growing populations, climate change, and a host of other trends are threatening the environmental and social stability of the basin.³ Climate change is likely to increase the already high variability of wet and dry seasonal water flows, as well as the frequency and intensity of floods and droughts.⁴ Sea-level rise will increase the threat of saltwater intrusion further inland in the Mekong Delta, with significant impacts to agriculture. National development strategies have largely overlooked trans-boundary implications and impacts to ecosystems and livelihoods at the local scale.⁵ Institutions meant to coordinate natural resource management and river basin development, such as the Mekong River Commission, are arguably not equipped to deal with both current and impending stresses in the region that may lead to ecosystem collapse and social conflict.

The food-water-energy nexus is at the heart of the future prospects for development, social stability, and conflict in the Mekong region.⁶ This research project aims to add to our understanding of the likely drivers of development and conflict around food, water, and energy in the region during the coming decade. A survey of experts both within and outside the region was conducted, to gather information on respondents' perceptions of the most important actors in the region, the issues they prioritize, and the prospects they see for conflict and cooperation. The research also examines the strength of ties and modes of interaction among different types of stakeholders in the region. The survey results are complemented with a series of case studies on Mekong hydropower projects, given the centrality of hydropower development to the region's food, water, and energy future and the contentiousness of current hydropower decision mechanisms.

Among the report's major findings are the following, divided by section categories:

¹ Ziv 2012.

² MWBP 2004.

³ Mekong River Commission 2011.

⁴ ICEM 2010.

⁵ Cronin and Hamlin 2012.

⁶ Ibid.

MOST IMPORTANT ISSUES FACING THE REGION

- **Five issues emerged as particularly important to the future of the Mekong River Basin: hydropower, climate change, equity, biodiversity, and water supply/quality.**
- **Biodiversity was identified by the surveyed experts as the issue most likely to be overlooking in the region in the coming decade.**
- **With the exception of hydropower, the issues ranked as the most important are also viewed as being the most likely to be overlooked.**
- **Hydropower was identified most frequently as a likely source of political instability, followed by equity issues.**
- **Climate change was identified as the leading source of potential cooperation, followed by trade, hydropower, biodiversity, and water supply/water quality.**
- **Hydropower, climate change, and water supply/water quality are characterized by both the potential for instability and the potential for cooperation.**

CONFLICT: PERCEIVED LIKELIHOOD, SCALE, AND FREQUENCY

- **Ninety-seven percent (97%) of experts surveyed expect that social conflict in the Mekong Region is likely to occur.**
- **Nearly half of all respondents expect conflict to be chronic (as opposed to episodic).**
- **Non-governmental organizations see a much higher likelihood of chronic social conflict than other surveyed groups.**
- **Respondents working for governments within the region perceive a very low likelihood for local-level conflict when compared to other surveyed groups.**
- **Sixty-four percent (64%) of experts surveyed think that conflict is more likely to occur within countries rather than between countries.**

REGIONAL NETWORKS: INFLUENTIAL ACTORS, KEY SETTINGS, AND STAKEHOLDER TIES

- **Governments within the Mekong Region and International Financial Institutions (IFIs) were identified as the most influential actors across the food-water-energy nexus.**
- **IFIs and local NGOs have significant engagement with the largest number of other actor types.**

- **IFIs, national governments, and local NGOs stand out as possible conduits for cooperation and conflict resolution.**
- **Local communities and the private sector have the least engagement with other types of actors.**

FINANCIAL FLOWS: HYDROPOWER DEVELOPMENT IN THE MEKONG RIVER BASIN

- **There is no single financial model for dam construction.**
- **The role played by IFIs in dam construction has been reduced compared to previous decades.**
- **State-owned companies are prevalent as funders of hydropower projects.**
- **There is low involvement by the agricultural sector, with dams primarily focused on energy production.**
- **Small investors have little room for involvement.**
- **Smaller dams tend to be funded solely by domestic sources, while larger dams tend to bring in international funders.**
- **There is little regard given to environmental and social impacts, and those who are impacted have no voice.**



Photo credit: Mekong River Commission. Reprinted with permission.

Introduction

1. INTRODUCTION

The Mekong River Basin is a complex and dynamic ecological system facing rapidly changing threats from growing populations, widening development, intensifying pollution and infrastructure development.⁷ Decisions regarding water, food, and energy in the Mekong region are closely linked to human security, livelihoods, regional development and stability. However, current formal institutional arrangements, including the Mekong River Commission (MRC), struggle with a lack of authority and coordination among key players. Collaborative basin management faces strong challenges rooted in the diverging interests of numerous stakeholders across multiple levels of governance. Without an effective institution to coordinate these decisions, the divergent interests of numerous stakeholders drive policy and resist collaborative basin management. The six riparian nations of the Mekong River Basin – Cambodia, China, Laos, Myanmar, Thailand, and Viet Nam – are each characterized by both unique and unifying social, economic, and environmental factors that shape and influence the trans-boundary implications of development in the region.

As the most upstream riparian state along the Mekong, China has sizable influence on regional basin developments. Within its borders, China controls both the headwater of the Mekong and 24 percent the total basin area, including the steepest elevation drop along the river. Exploiting the power generating potential of the river system, China has constructed a series of large and small dams with enough storage capacity to normalize river flows, while inhibiting nutrient-rich sediment transport to downstream neighbors.⁸ Further complicating social and environmental concerns surrounding large-scale dam projects, hydropower regulation is not uniform within China. Control of regulations for hydropower is administered in part by the State Environmental Protection Administration and in part by the Ministry of Water Resources, while provincial governments remain another important stakeholder. This complex decision-making process under multiple authorities can be difficult to navigate internally and opaque externally. Riparian states are not consulted and typically not even informed about construction projects and reservoir release strategy.⁹

Myanmar and China are not members of the Mekong River Commission, although they do hold observer status.¹⁰ Myanmar accounts for only two percent of the Mekong's waters, but like China, lacks transparency in its actions that affect riparian neighbors.¹¹ Both nations have also attracted significant concern regarding human rights issues.¹² Myanmar also suffers from a deficiency in technical expertise and features only a handful of dams along the Mekong¹³ (partially because the Mekong is only one of eight river basins¹⁴ endowing Myanmar with bountiful water resources). Each of these dams is sizable, however, sporting a generating capacity of over 400 MW each.¹⁵ Hydropower projects and groundwater harvesting prop up the nation's agricultural productivity, which claims a food surplus economy despite 20 percent

⁷ Glassman and Sneddon 2003.

⁸ Cronin and Hamlin 2012.

⁹ Backer 2006, 50-55.

¹⁰ Backer 2007.

¹¹ Fabi 2012.

¹² OHCHR 2013.

¹³ Khaing 2012, 531-535.

¹⁴ Nyo Nyo 2012, 554-562.

¹⁵ Moinuddin and Maclean 2012.

undernourishment rates among the population.¹⁶ The country is especially sensitive to climate change-induced ocean acidification, temperature increases, and coastal erosion, all of which endanger agriculture and aquaculture productivity.¹⁷ These environmental concerns may have played a role in the suspension of additional energy generation projects.¹⁸

Environmental protection has been a casualty of the social divisions and political conflict marking the past two decades of Thailand's history, including a military coup in 2006 and ongoing struggles over constitutional revisions.¹⁹ Growing income inequality also marks the country.²⁰ Marginalized groups are often blamed for environmental degradation resulting from government policies that prioritize trade and agriculture. Such policies, despite reducing food insecurity and poverty, have further added to instability in Thailand by increasing the polarization between classes and regions.²¹ As part of its strategy to bring more power to the country and increase economic development, the Thai government plans to increase its renewable energy production.²² Currently, only 3 percent of its energy comes from hydropower sources.²³ However, Thai civil society plays a large role in preventing dam construction²⁴. While dam construction has been controversial in Thailand for decades, in recent years civil society activity has channeled Thai energy companies to seek hydropower from neighboring states such as Laos.²⁵ ²⁶ However, beyond hydropower, Thailand exhibits little regard for water-related issues. Lax environmental regulations have led to both air and water pollution problems throughout the nation. Industrial companies commonly release contaminated wastewater into Mekong River tributaries, contaminating rice fields and fishponds and creating a host of environmental ills.²⁷

Like Thailand, Viet Nam is experiencing rapid socio-economic development. WTO membership and the participation in the Trans-Pacific Partnership provide Viet Nam with access to international markets. The trend of regional economic integration and investments in energy infrastructure does not show signs of abating: Vietnam is seeking middle-income status by 2030, while Lao PDR and Cambodia seek to graduate from least-developed country status.²⁸ Viet Nam's environmental sensitivity results not only from being the riparian state furthest downstream, but also from its significant coastal territory, which harbors densely populated and economically dynamic cities.²⁹ As such, this growing nation must balance industrialization with environmental security.

¹⁶ FAO 2011

¹⁷ Ibid.

¹⁸ One example is the suspension of the Chinese-sponsored Myitsone Dam in November 2011. Also see a comment by Apichai Sunchindah on a delayed Thai coal-fired power plant in Myanmar recorded in "Panel discussion – Day 2: Seizing Opportunities: The Way Forward" in *International Conference on GMS 2020: Balancing Economic Growth and Environmental Sustainability: Focusing on Food – Water – Energy Nexus*, ed. Hasan Moinuddin and Jay Maclean (20 – 21 February 2012, Bangkok, Thailand, Conference Proceedings, 2012), 539-545.

¹⁹ Ortuoste 2009.

²⁰ Glassman and Sneddon 2003.

²¹ Delang 2005.

²² Ministry of Energy 2009.

²³ Energy Policy and Planning Office 2013.

²⁴ International Rivers 2013.

²⁵ International Rivers 2013b.

²⁶ World Bank 2005.

²⁷ Glassman and Sneddon 2003.

²⁸ ICEM 2010.

²⁹ Hayton 2010.

Thus, each riparian nation in the Mekong River Basin is struggling with internal challenges that complicate the coordination of basin governance. The importance of actors other than nation-states, including non-governmental organizations (NGOs), international financial institutions (IFIs), the private sector, and local communities, results in an intricate web of basin actors and interests. Without a credible and effective means for undertaking collaborative basin management and cooperative development, the bounty of the Mekong will continue to be unevenly distributed, contributing to distrust among stakeholders and mismanagement of natural resources.

Interpretative Lens: The food-water-energy nexus

The food-energy-water nexus is the primary framework through which this study analyzes the intricate decision-making process and developmental challenges of the Mekong River Basin (MRB). This is a pragmatic lens; water access is a necessary condition for food and energy production and limited by quality and availability. Assuming water is a limiting factor in these sectors, the economic and ecological systems of the MRB are in danger of collapse. In this framework, regional actors may perceive the water diversion as an existential threat.³⁰

The nexus lens of analysis allows this research to consider tangential factors, such as private enterprise, social equity, conservation, climate change, and disaster mitigation. These underlying issues provide further context to the debate surrounding resource development, dam construction, and riparian cooperation. While decisions in the basin regarding food, energy, and water are well documented, much about decision-making processes and stakeholder relationships remains to be thoroughly investigated. This report contributes to the body of knowledge on governance and the trajectory of development and conflict in the Mekong River Basin by defining key decision-makers, the extent of their influence, and driver such as funding of major infrastructure projects.

Decisions regarding water, food, and energy in the Mekong region are closely linked to regional development and stability. Collaborative basin management faces challenges rooted in the diverging interests of disparate stakeholders, and conflict is all but certain.³¹ This report outlines perceptions regarding the scale and frequency of conflict, identifies key decision makers, maps the relationships between these decision-makers to assess cooperative bottlenecks, and assesses the role of financial institutions in developing hydropower projects.³²

To acquire a better understanding of the probability and form of conflict, powerful players, and notable relationships, a survey was deployed. This provided an opportunity to gather holistic overviews of trends and patterns in the Mekong, from a large existing knowledge base.

³⁰ Poulsen, et al. 2004.

³¹ Newton and Wolf 2007.

³² Ibid.



Photo credit: Mekong River Commission. Reprinted with permission.

The survey

2. THE SURVEY

A primary objective of this study is to determine how various local, national and international stakeholders identify principal challenges in the region and resulting opportunities for and barriers to collaborative basin development. To this end, the research team developed a method of identifying Mekong experts, using a range of media-based and scholarly resources. A survey was developed and administered via electronic mail to 784 identified experts in academia, research institutes, government service inside and outside the region, the non-profit and private sectors, and intergovernmental organizations. Individuals to be surveyed were identified through an extensive search utilizing academic (JSTOR) and media (Lexis Nexis) databases, as well as publicly available attendance lists of major conferences.

Respondents were asked a range of questions about their experience in the region, the type of work performed by themselves and their organization, and their views of the most important issues facing the region, the likelihood of conflict around these issues, and the current state of interactive and collaborative relationships among different actors and types of stakeholders. Specifically, survey questions were divided into three main parts: (i) five questions to collect information on the demographics and experience of respondents, (ii) six questions to determine the perspectives of respondents on pressing issues, potential for conflict and cooperation, and major sources of funding in the region, and (iii) five questions to investigate the role and power of different actors and the relationships among them. Appendix 1 details the survey methodology and procedures, and includes a copy of the survey instrument.

The survey yielded a 21 percent response rate and, with a few noteworthy exceptions, a heterogeneous distribution of respondents by geographic location and type of organization. Respondent demographics confirm that the expert-identification and surveying method yielded a reasonably diverse, experienced, and highly expert survey sample. The credibility of survey responses were strengthened by the fact that 49 percent of expert respondents have been working in the Mekong region for more than ten years, and additional 22 percent for five to ten years. Respondents reflected the diversity among stakeholders in the region, including government ministries of Mekong countries, governments from outside the Mekong region, intergovernmental organizations, international NGOs, local NGOs, private-sector organizations, and research organizations. Survey results also reflected the extensive geographic experience of respondents: 26 percent have experience in all six riparian countries, and 53% in at least four countries.

Nevertheless, survey results should be interpreted with caution. Respondents were guaranteed anonymity, which limited our ability to draw a picture of networked relationships (although as discussed below the results do yield useful results in terms of how well-networked different categories of actors are, in the view of our experts). Also, different types of actors responded at different rates, with researchers arguably over-sampled and governments from outside the Mekong region, under-sampled (see Appendix 1).

Results concerning respondents' demographics confirmed that this method yielded a reasonably diverse, experienced, and highly expert survey sample. The credibility of survey responses were strengthened by the fact that 49% of experts have been working in the Mekong region for more than 10 years and 22% for five to ten years. The significant diversity among stakeholders in the region, including governments within Mekong countries, governments outside the Mekong region, intergovernmental organizations, international NGOs, local NGOs, private sector organizations, and research organizations were represented among the survey

respondents. Survey results also reflected the extensive experience of respondents: 26% have experience in all six riparian countries, 30% in at least five countries, and 53% and 63% have experience in at least four or three countries, respectively.



Photo credit: Mekong River Commission. Reprinted with permission.

Most important issues facing the region

3. MOST IMPORTANT ISSUES FACING THE REGION

Ten issues were identified as being appropriate lenses through which to examine specific networks of actors, perceptions of conflict or cooperation, and financial flows within the Mekong River Basin: climate change or disaster management, commercial-scale agriculture, conservation of biodiversity, conventional energy resources, local-scale agriculture, renewable energy resources, social equity or poverty reduction, water infrastructure or hydropower, and water supply or water quality. Experts surveyed were asked to choose from this list, in rank order, the three most important issues for the MRB region in the coming decade, as well as the three most overlooked, the three most likely to cause political instability, and the three most likely to be a source of cooperation. We developed a weighted scoring system for aggregating responses by number of mentions and ranked order (see Appendix 1). This method allowed us to identify not simply the most important issues but also *why* they are important for development and conflict dynamics in the region.

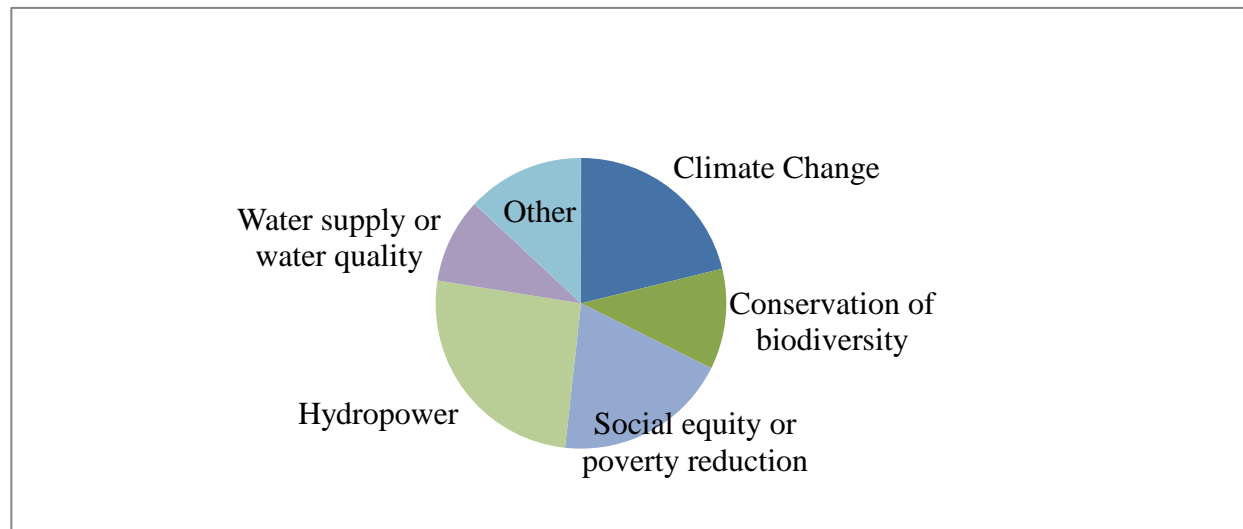
Several patterns are noteworthy in the responses:

Five issues - **hydropower, climate change, equity, biodiversity, and water supply/quality** – emerged as particularly important to the future of the Mekong River Basin (Table 1 and Figure 1). These five issues continued to dominate the responses when experts were prompted to identify the most overlooked issues, the issues most likely to be a source of political instability, and the issues most likely to be a source of cooperation. In contrast, response options related to energy (other than hydropower) and food had noticeably lower levels of response and priority across all questions.

Table 1: Most Important Issues Facing the Mekong Region

Issue	Weighted Score
Hydropower	292
Climate change	240
Equity	220
Biodiversity	127
Water supply/quality	107
Commercial-scale agriculture	51
Local-scale agriculture	41
Trade	25
Renewable energy	23
Conventional energy	8

Figure 1: Most Important Issues Facing the Mekong Region



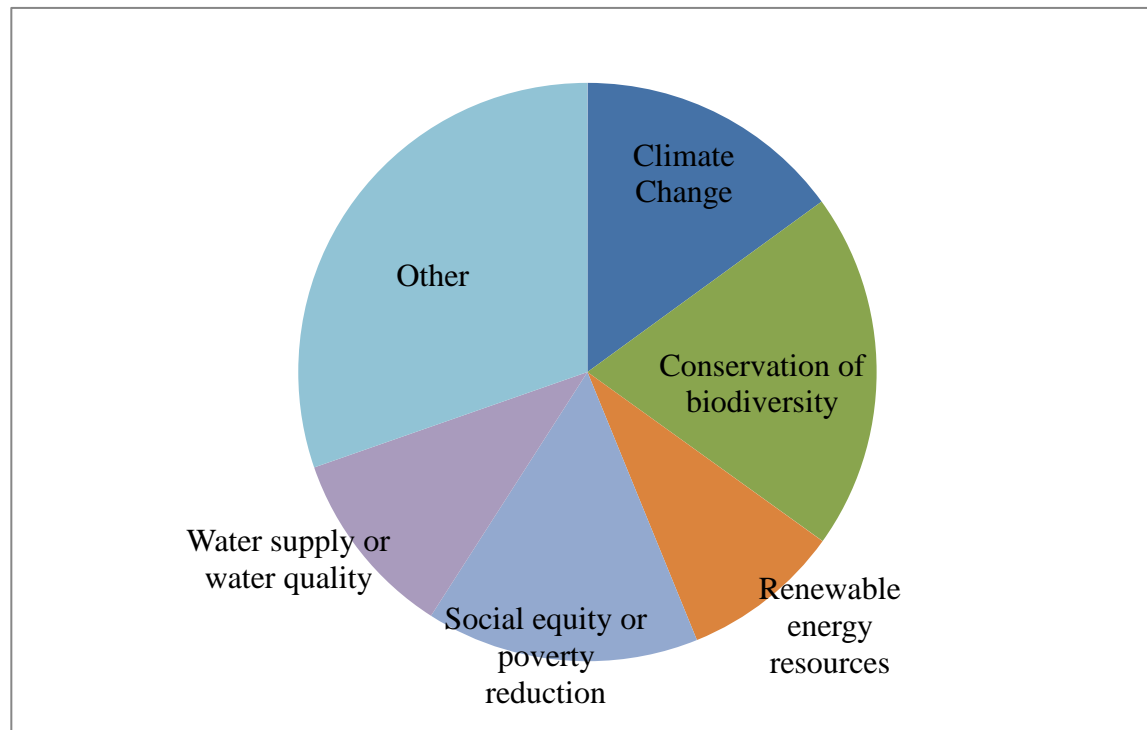
Biodiversity was identified by the surveyed experts as the issue most likely to be overlooked in the region in the coming decade, as indicated by its frequency and prioritization within the responses. Biodiversity was followed in this category by equity, climate change, water supply/quality, and renewable energy (Table 2 and Figure2).

With the exception of hydropower, the issues ranked as the most important are also viewed as being the most likely to be overlooked. Additionally, this question was characterized by a tighter distribution, showing fewer consensuses among experts compared to responses ranking issue importance. Renewable energy saw here its only appearance in the top half of responses. The clear pattern in the data is that experts feel several critical issues are not being given the attention they deserve.

Table 2: Most Overlooked Issues in the Mekong Region

Issue	Weighted Score
Biodiversity	226
Equity	173
Climate change	170
Water supply/quality	120
Renewable energy	101
Hydropower	90
Local-scale agriculture	89
Trade	68
Commercial-scale agriculture	63
Conventional energy	34

Figure 2: Most Overlooked Issues in the Mekong Region

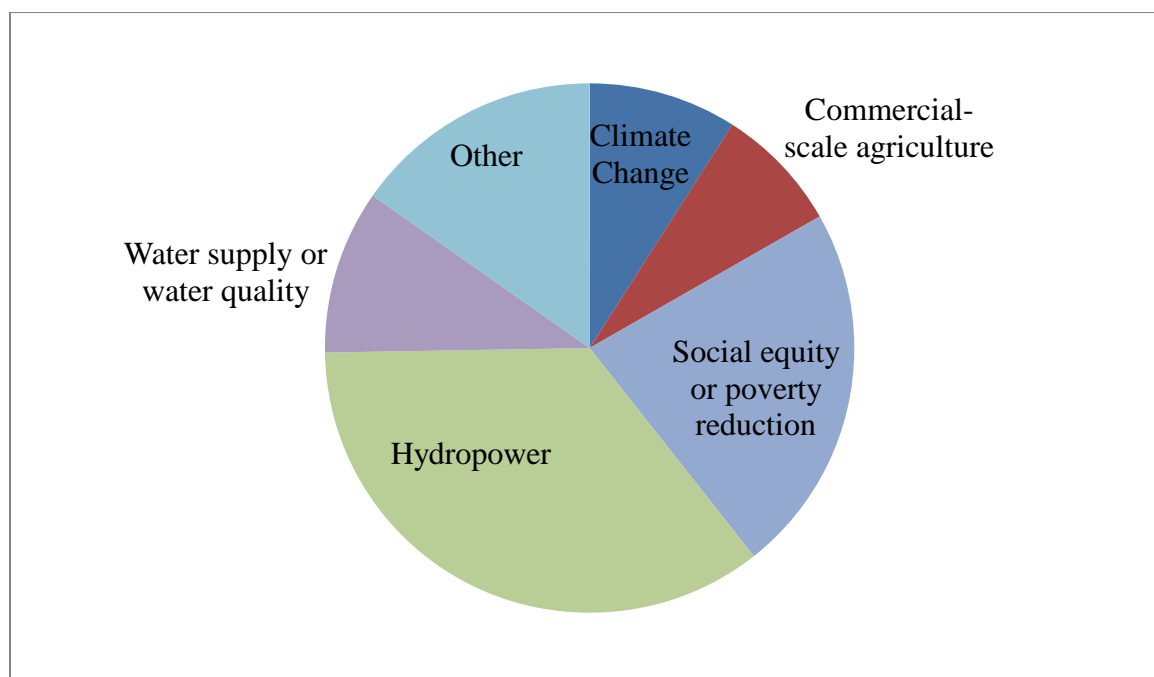


Two forward-looking survey questions were aimed at extracting expectations regarding future political instability and cooperation in the region. Tying these responses to the rankings for the most important and most overlooked issues yielded information explaining how experts foresee the future of instability and cooperation and the context in which they believe it will occur. Noteworthy results include the following:

Hydropower was identified most frequently as a likely source of political instability, followed by equity issues. Together, these two issues account for nearly 60 percent of the total weighted points assigned to responses to this question. This result suggests significant agreement among experts that hydropower and equity, alone or in combination, are likely to characterize political instability in the basin. Water supply/water quality, climate change, and commercial-scale agriculture followed in the list of issues most likely to cause political instability. The instability question was the only instance for which commercial-scale agriculture made an appearance in the top half of the responses.

Table 3: Issues Most Likely to Cause Political Instability in the Mekong Region

Issues	Weighted Score
Hydropower	406
Equity	260
Water supply/water quality	115
Climate change	104
Commercial-scale agriculture	88
Trade	63
Conventional energy	44
Local-scale agriculture	29
Biodiversity	23
Renewable energy	16

Figure 3: Most Likely to Cause Political Instability

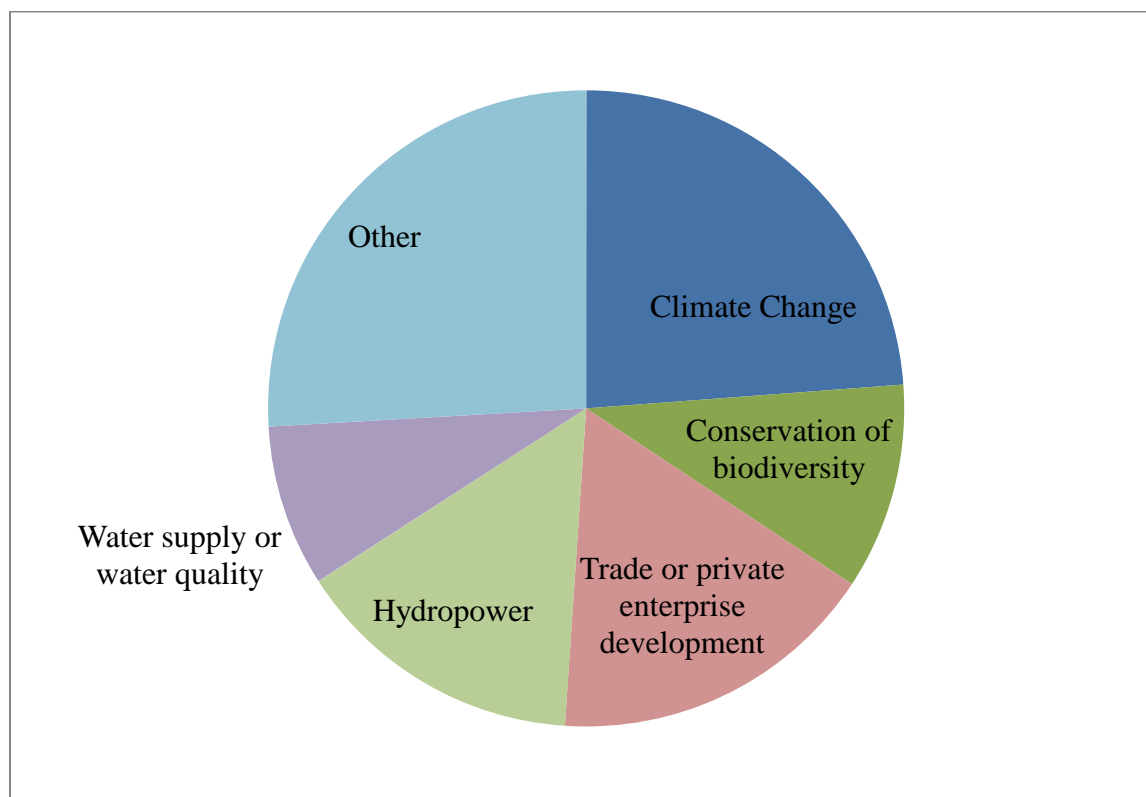
When asked about potential sources of cooperation, survey respondents identified climate change as the leading issue, followed by trade, hydropower, biodiversity, and water supply/water quality. This was the only question for which trade was present as one of the top responses. Expert consensus on sources of instability is less robust than on sources of cooperation. The distribution of responses indicates that there is less agreement as to the issues

around which cooperation can occur than there is about which are likely to trigger instability. This may mean that there is potential for cooperation in more issue-areas, or that the outlook on the potential for cooperation in general is pessimistic.

Table 4: Issues Most Promising for Cooperation in the Mekong Region

Climate Change	270
Trade	190
Hydropower	168
Biodiversity	119
Water Quality	93
Equity	86
Renewable energy	68
Commercial-scale agriculture	67
Local-scale agriculture	50
Conventional energy	23

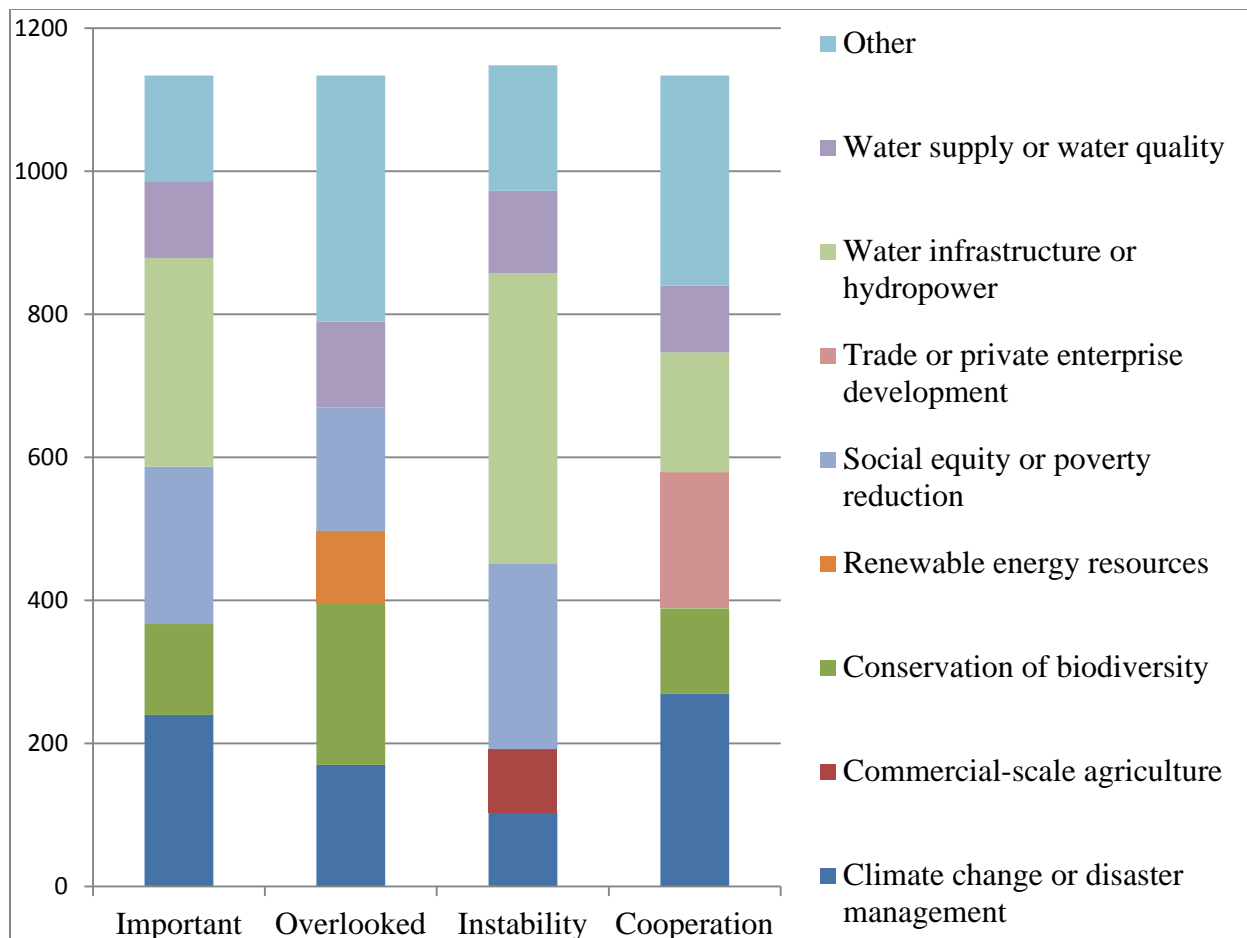
Figure 4: Issues Most Promising for Cooperation in the Mekong Region



Combining results across these four questions – most important, most overlooked, most likely to cause political instability, and most likely to be a source of cooperation – creates a picture of the most critical issues that experts see as driving the future of the basin (Figure 6). In that context, we highlight two findings:

Some of the issues most likely to catalyze instability or cooperation are being overlooked.

Figure 5: Comparison of Responses across Questions about Issue Salience



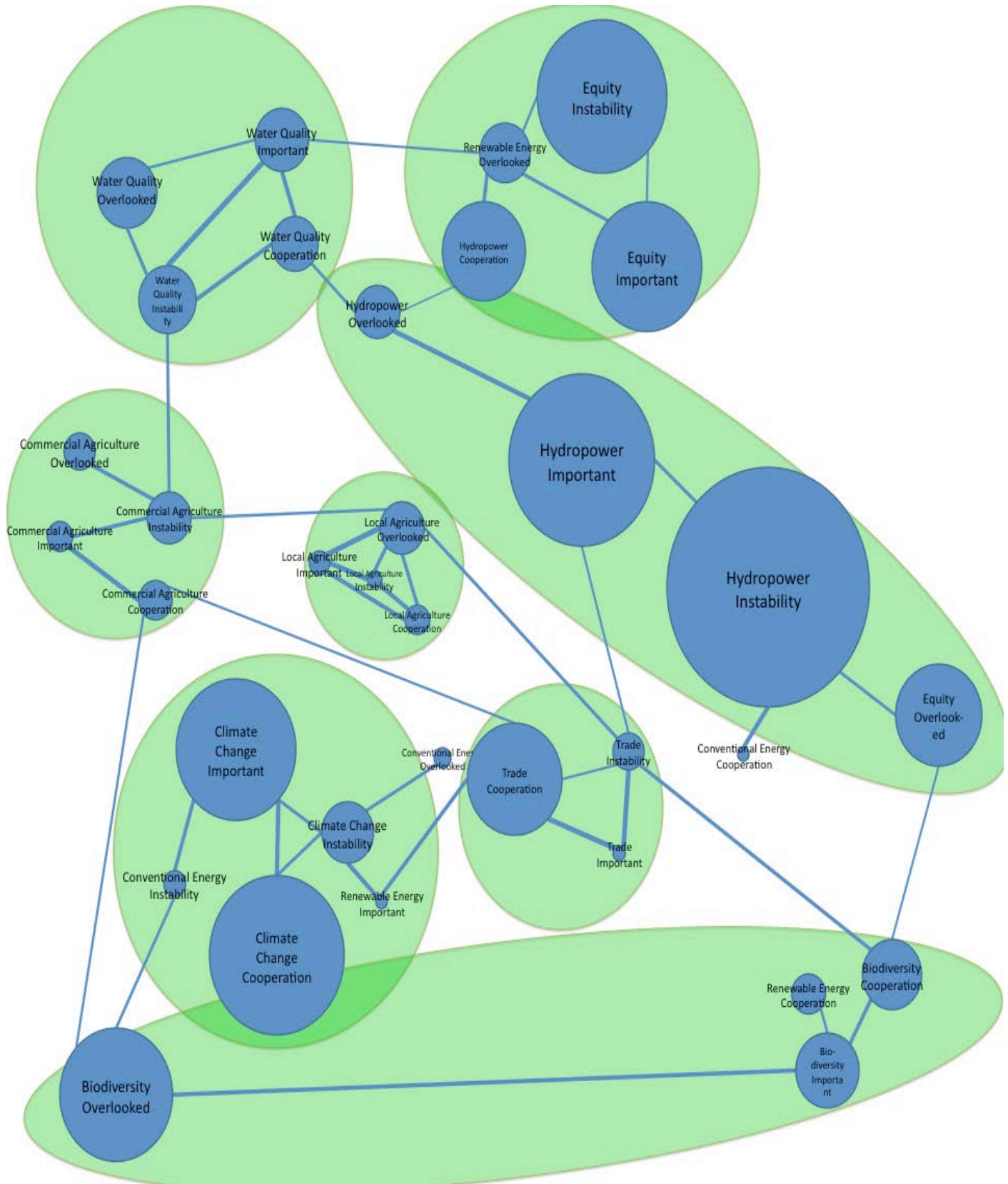
Many issues, including hydropower, climate change, and water supply/water quality, are characterized by both the potential for instability and the potential for cooperation. This finding indicates that a variety of trajectories are possible in the region, and that key decisions may dictate whether an issue follows a cooperative or conflictive path. Experts were more likely to see the potential for building cooperation on climate change than for any other issue. In contrast, hydropower was far more likely to be characterized as a source of instability. Equity was also indicated as issue around which instability might occur, but experts did not see it as a likely platform for building cooperation.

Cluster analysis of responses

The structure of the survey also makes it possible to test whether responses on a particular question correlate with responses on another. Identifying such clusters of responses helps us to see divergent ‘worldviews’ among experts within the survey, and it may also reveal what experts view as the causal mechanisms linking different issues and outcomes. For example, does an expert who prioritized climate change also view renewable energy as a possible source of cooperation? Do those who see hydropower as a source of instability also see local-scale agriculture as overlooked? More generally, are there clusters of survey respondents who consistently choose certain responses, with several separate groups coming to agreement on a single issue?

Figure 6 below provides a visual representation of identified connections among survey responses. Each blue sphere in Figure 6 represents a specific response (e.g., hydropower is a source of instability), with the size of the sphere reflecting the weighted score for a particular response (which accounts for both the number of respondents holding that view and how highly each response was ranked—see Appendix 1). The green spheres gather individual responses among which there was a statistically significant association. Thus each green sphere can be seen as a collected set of views or “worldview.” The line segments in the figure show how these worldviews extend outside of the sphere to bring in associations with other issues (for example, a cluster of views about energy may be linked to a particular view about trade). (See Appendix X for a detailed discussion of the methodology used to identify and construct these associations). This type of visual representation is useful for identifying intervention points and strategies. Within the complete set of associations mapped in Figure 6, several are noteworthy. The following section presents a discussion of several important patterns of association in the data, followed by a summary of the most important underlying messages found in these associations.

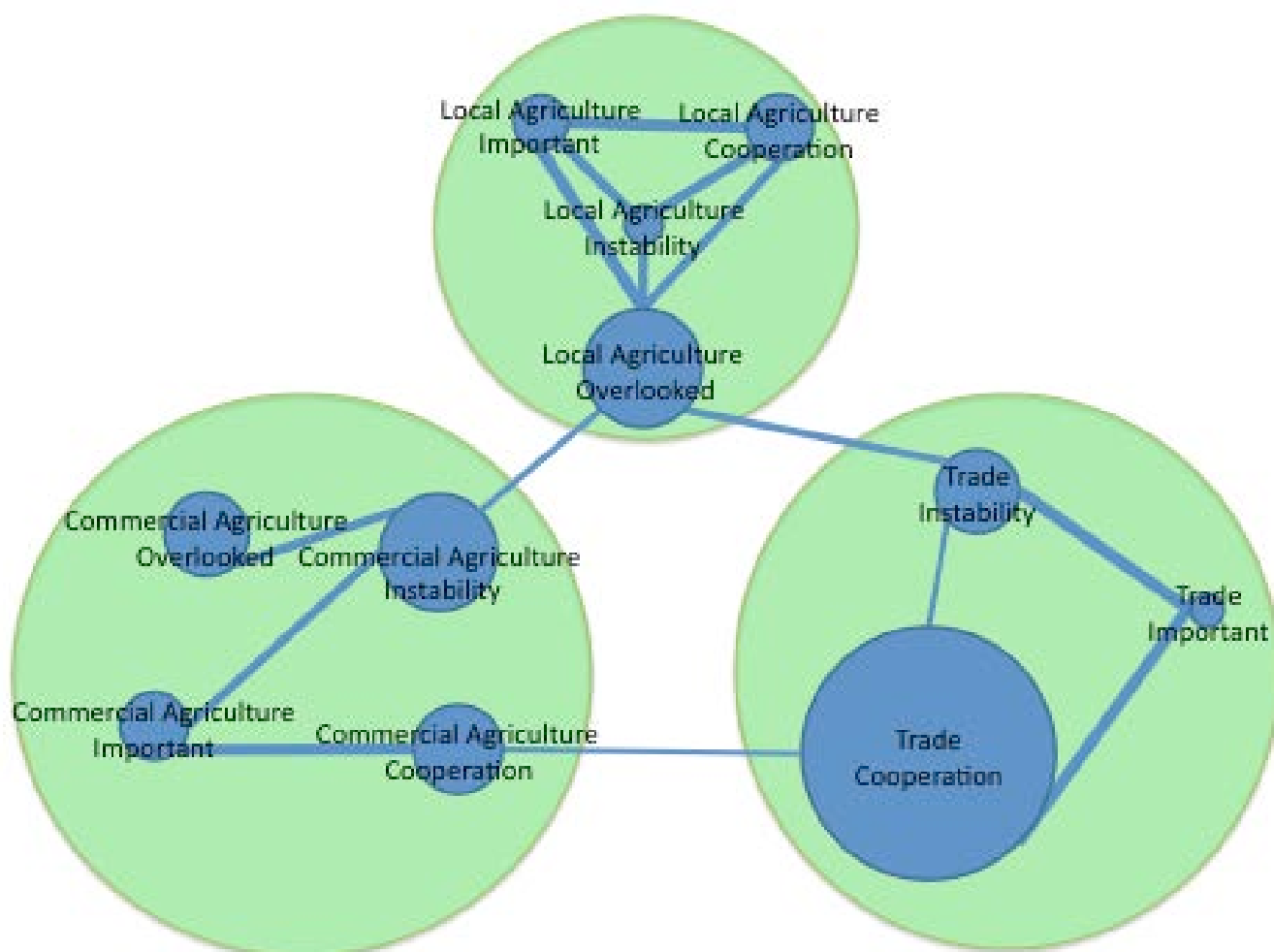
Figure 6: Complete Issue Map



Respondents who ranked local agriculture as important were also likely to see it as an issue that is overlooked, as a source of instability, and as a possible basis for cooperation (Figure 7). A similar pattern can be seen in commercial agriculture and trade, suggesting two distinct worldviews. The distinctiveness of these two views is reinforced when looking at the connections between these two sets of issues. Thus:

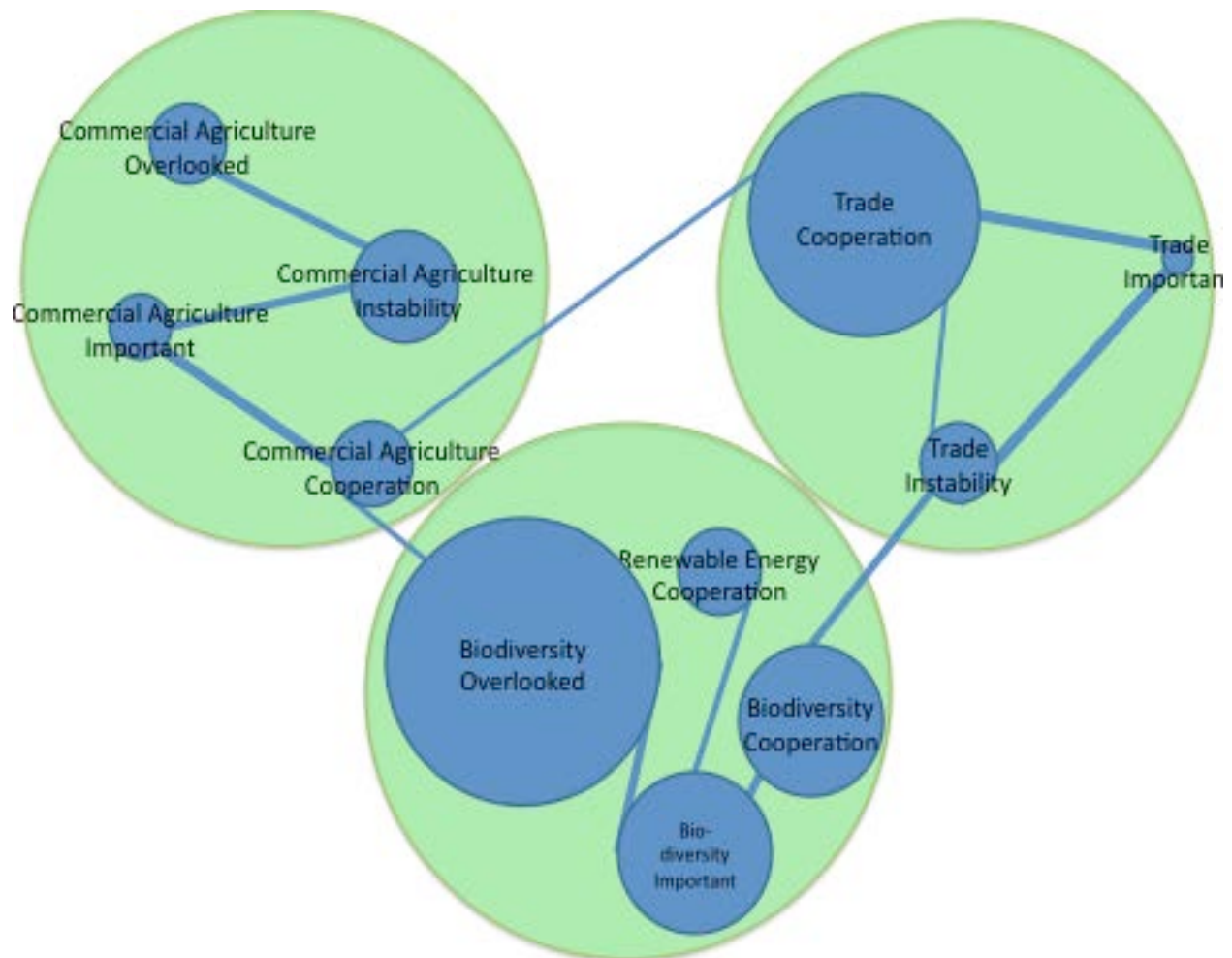
Experts who saw local agriculture as an overlooked issue were likely to also see potential for instability in commercial agriculture and in trade. In contrast, experts who foresee cooperation in commercial agriculture also foresee it in trade, and vice versa. This finding indicates dichotomous views within our sample about the nature of agriculture and globalization. It further suggests that when considering issues of trade and agriculture, there are entrenched viewpoints that must first be understood for greater success in working towards cooperation.

Figure 7: Relationships between Local Agriculture, Commercial Agriculture, and Trade



Similarly, there are contrasting worldviews on the relationship between biodiversity and trade. Experts who said that biodiversity is overlooked were also likely to indicate that commercial agriculture is a potential source of cooperation (Figure 8). We interpret this response to reflect the view that working cooperatively on commercial agriculture makes it possible to incorporate overlooked aspects of biodiversity protection. This relationship might also mean that experts who see cooperation in commercial agriculture acknowledge that one way of achieving this cooperation is by including biodiversity. Notably, however, the cluster of responses in which biodiversity is dominant also links with trade, and the link is characterized by experts who see cooperation in biodiversity and anticipate instability in trade. In other words, the sample seems to be divided between experts who see opportunities for biodiversity conservation via trade-based commercial agricultural cooperation, and those who favor direct biodiversity cooperation and see trade as a potential disruptor.

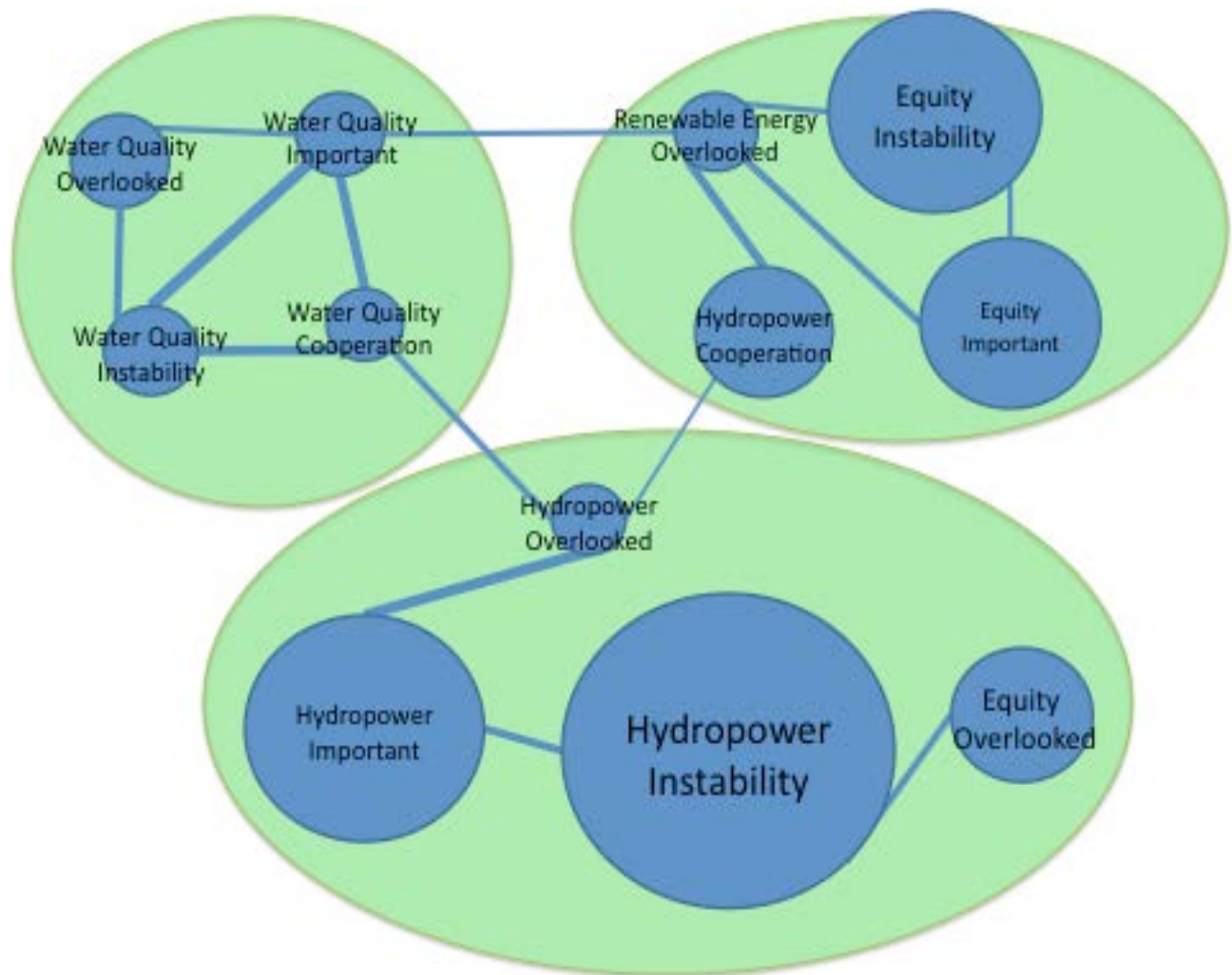
Figure 8: Relationships between Commercial Agriculture, Biodiversity, and Trade



Experts who see hydropower as important are likely to view it as both overlooked and a source of instability (Figure 9). Further, the surveyed experts who see hydropower as a source of instability also view equity as an overlooked issue. This indicates that there is strong consensus that hydropower is a source of instability and that this is at least partially rooted in the fact that not enough consideration is given to issues of equity in hydro project development.

It is noteworthy that the group of experts who saw hydropower as a source of instability was not more likely to view it as a source of cooperation. While cooperation and instability are linked on some issues, this is not the case with hydropower, indicating two separate pathways forward. Most experts anticipate the path rooted in political instability. Meanwhile, the experts who did view hydropower as a potential source of cooperation were more likely to indicate that renewable energy is an issue that is overlooked. This could mean that the survey respondents who see cooperation in hydropower are viewing it through the lens of renewable energy in general.

Figure 9: Relationships between Water Quality, Hydropower, and Equity

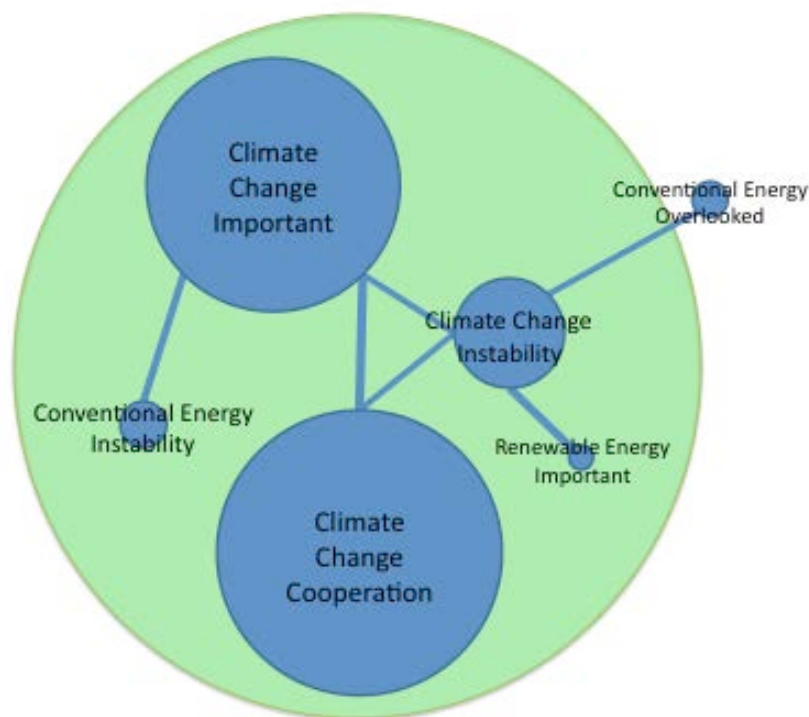


Water quality and commercial agriculture are linked together by experts who see both as potential sources of instability (Figure 10). Surprisingly, the “sources of instability” category is the only significant connection between the issues related to food and the issues related to water - that is, between two corners of the triangular nexus around which this research is based. It is striking that the only overlap here is anticipation of conflict surrounding these issues. The survey results show no cooperative link between food and water.

Experts who view climate change as one of the most important issues are more likely to see it as a source of instability than a potential platform for cooperation (Figure 10). In terms of linkages to other issues, climate change, one of the most highly ranked issues across all categories, is linked directly only to energy. Respondents linked climate change to instability in conventional energy, to cooperation potential in renewable energy, and to conventional energy being overlooked. This may suggest that respondents concerned about climate change feel that insufficient attention is paid to the dangers of conventional energy. Or, it may indicate that those who see conventional energy as important are also concerned about climate change.

The survey responses show that experts are likely to have strong agreement about the importance of climate change, but beyond this, views diverge. Climate change issues are only indirectly linked to biodiversity and trade. While this cluster of experts is more likely than average to show concern about issues related to energy, they do not show similarly strong agreement on other issues. (In Figure 10, “conventional energy as an overlooked issue” is not within the cluster because it is linked to the other responses with a lower confidence level.)

Figure 10: Climate Change



Key Findings

There are several key findings to draw out of the preceding discussion. As discussed previously, the aggregate survey results showed that experts viewed hydropower, climate change, biodiversity, equity, and water supply/quality as the most critical issues facing the region.

However, by understanding that there are separate clusters of experts who share similar ideas of what matters most, it is possible to construct a deeper understanding of how these issues are related in the views of experts, and where viewpoints diverge within our respondent sample. Several themes can be pulled from the data as clear “headlines” regarding the trajectory of the Mekong region:

- **Climate change is an important issue, and experts anticipate that it is more likely to cause political instability than cooperation.**
- **Hydropower is foreseen as a source of conflict, and a significant component of this view is that equity is being overlooked.**
- **Trade is seen as a unique point of cooperation.**
- **Experts anticipate conflict in the trade-offs between water and agriculture.**

These findings may be useful in identifying several intervention points where policy or dialogue could target specific clusters among issues rather than single issues, allowing for greater progress in moving towards a cooperative future for the basin.



Photo credit: Mekong River Commission. Reprinted with permission.

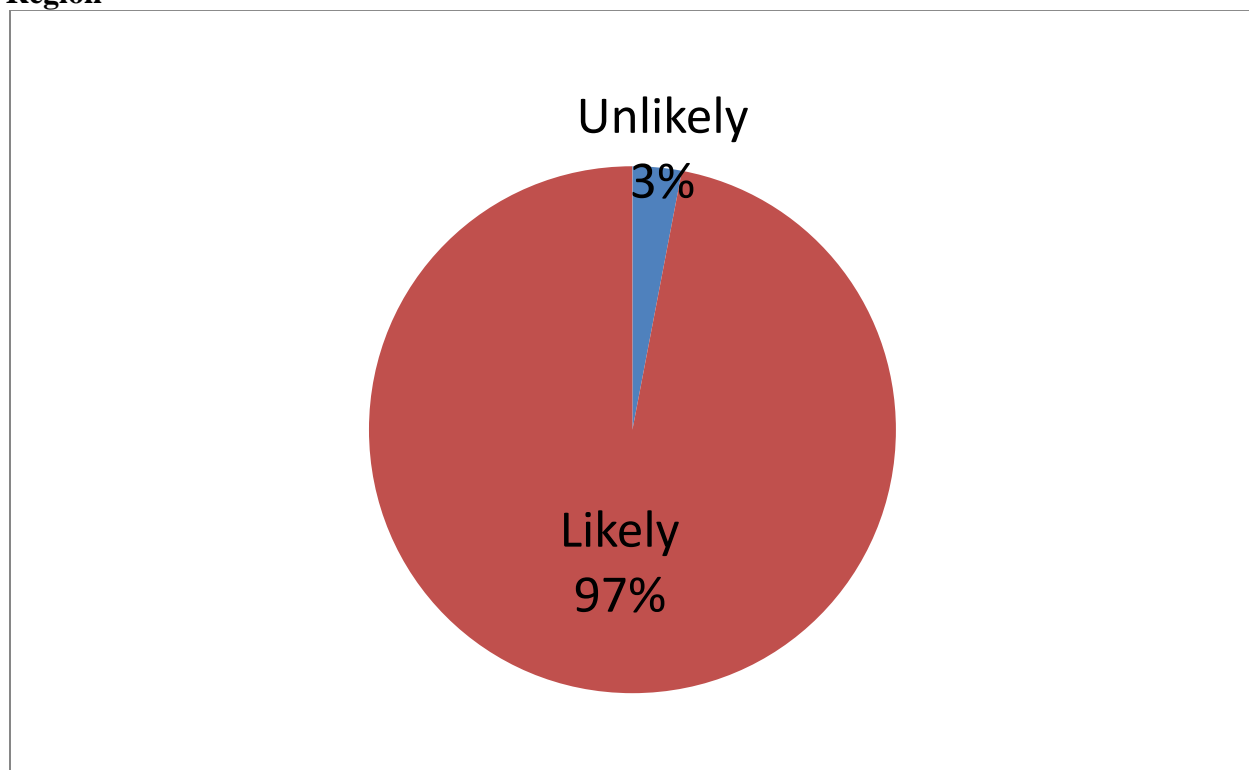
conflict

4. CONFLICT: PERCEIVED LIKELIHOOD, SCALE, AND FREQUENCY

After analyzing the issues driving the trajectory of the Mekong, respondents were asked for their views on the most likely form of social conflict in the Mekong region related to development issues in the coming decade. Respondents were allowed to interpret the meaning of the term “social conflict”; in this sense, the responses can be taken as a general measure of expectations about instability. Responses offered alternatives regarding both frequency (chronic or episodic) and scale (local, national, or international), as well as an option to indicate that any form of social conflict was unlikely.

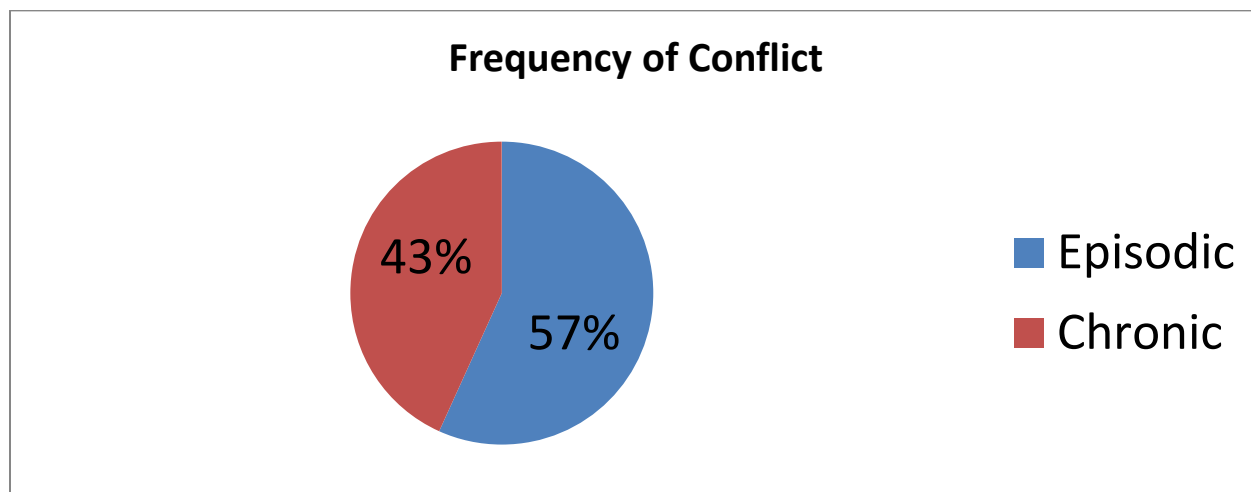
Ninety-seven percent of experts surveyed selected an expectation of social conflict other than “unlikely” (Figure 11). While this statistic is striking, by itself it offers little information regarding the nature of the conflict that may emerge.

Figure 11: Responses on Likelihood of Social Conflict in the Coming Decade in the Mekong Region



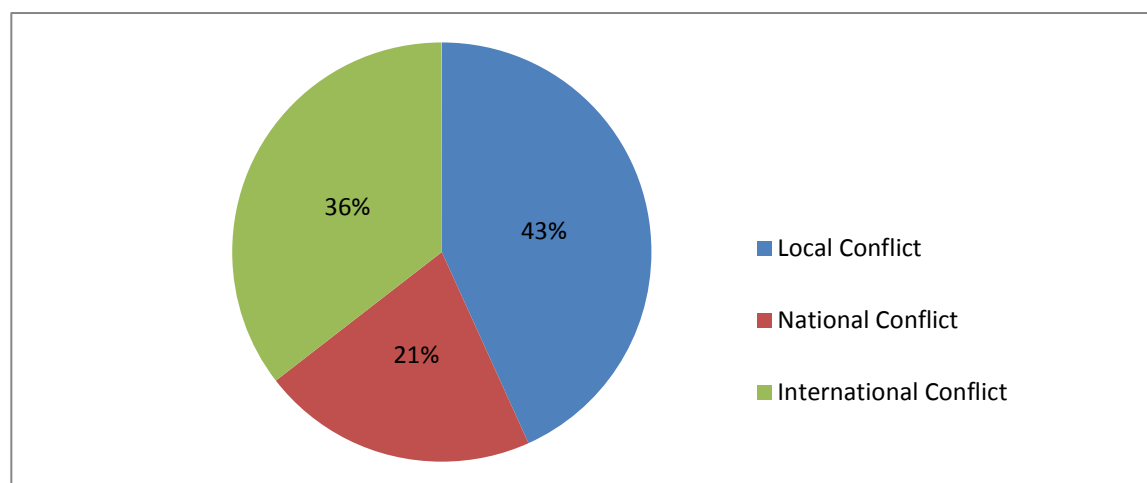
With regard to frequency, **nearly half of respondents expect conflict to be chronic (Figure 12).** In order to better understand the nature of predicted conflict, experts were asked whether they foresee conflict as being episodic or chronic. Responses showed a rough split: 57% reported episodic and 43%, chronic. While there is not a consensus among experts outside of the general likelihood of conflict, it is noteworthy, and perhaps troubling, that nearly half of respondents expect the frequency of conflict to go beyond occasional or isolated events.

Figure 12: Responses on Likely Frequency of Social Conflict in the Coming Decade in the Mekong Region



Given the presumption that social conflict is highly likely and that a significant portion of surveyed experts expect it to be a chronic issue within the region, it is useful to attempt to anticipate the scale of possible conflict. Here there was no clear consensus; 43% indicated that conflict is most likely at the local level, while 21% and 36% felt conflict was most likely to manifest at the national and international levels, respectively (Figure 13).

Figure 13: Responses on Likely Scale of Social Conflict in the Coming Decade in the Mekong Region



Aggregating responses citing national and local-level conflict, 64% of experts surveyed think that conflict is more likely to occur within countries, as opposed to between countries. This is a significant finding, as the chief instrument for potential conflict resolution, the Mekong River Commission, operates at an international scale within the region and may be poorly equipped to mitigate or resolve conflict at the levels where experts foresee social conflict as most likely.

Comparing the expectations of different types of respondents indicates a few important discrepancies in expectations regarding conflict (Figures 14 and 15). First, **non-governmental organizations see a much higher likelihood of chronic (as opposed to episodic) social conflict than the sample as a whole.** This may be because their access to different types of societal actors and information, or because of their particular sense of urgency about the issues on which they work. Second, **respondents working for governments within the region perceive a very low likelihood for local-level conflict when compared to the sample as a whole.** Perhaps this tells us that when working at the state level, respondents tend to be more concerned about international conflict. It might also be an indication, however, of a governmental blind spot, with state institutions less attuned than civil society-based actors to the potential for localized conflict.

Figure 14: Expectations Regarding Frequency of Social Conflict in the Coming Decade in the Mekong Region, by Type of Respondent

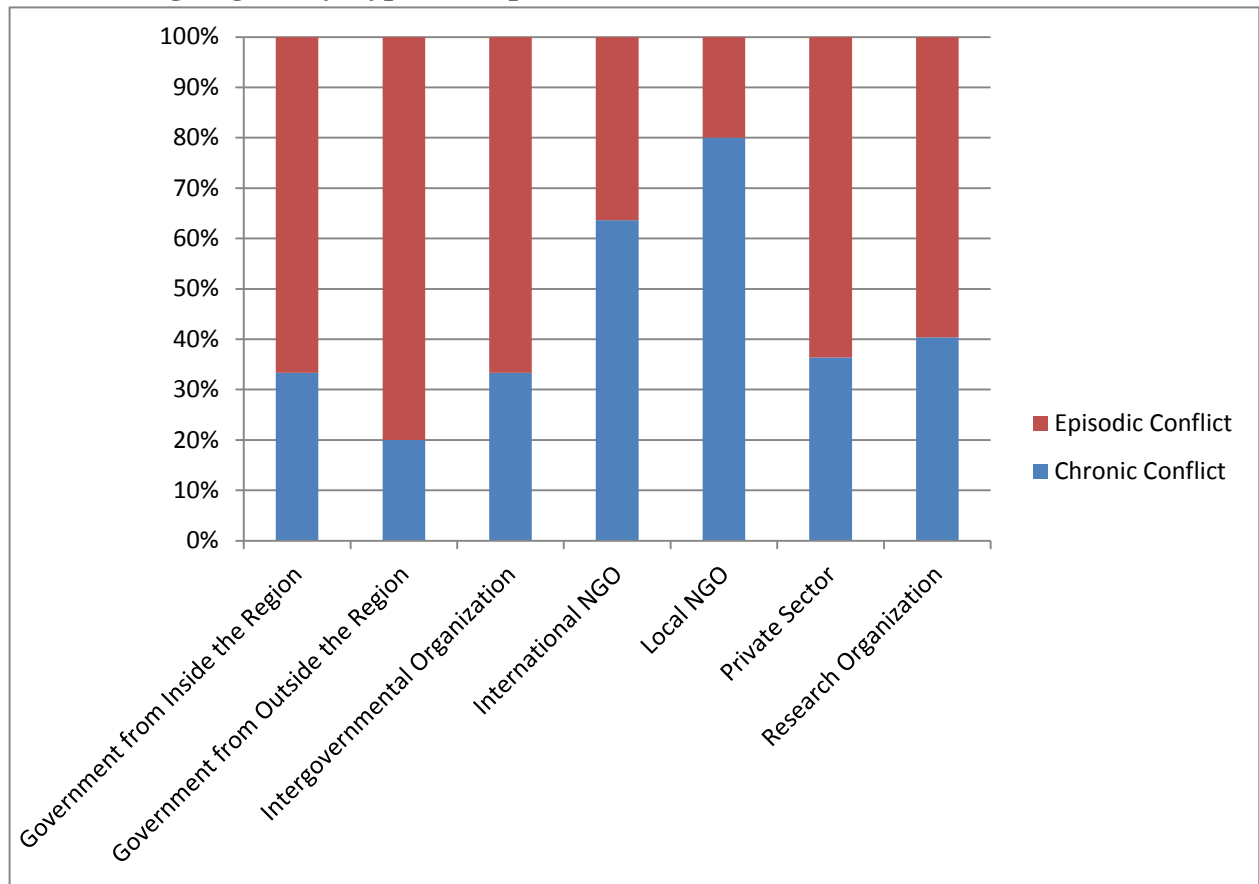


Figure 15: Expectations Regarding Scale of Conflict in the Coming Decade in the Mekong Region, by Type of Respondent

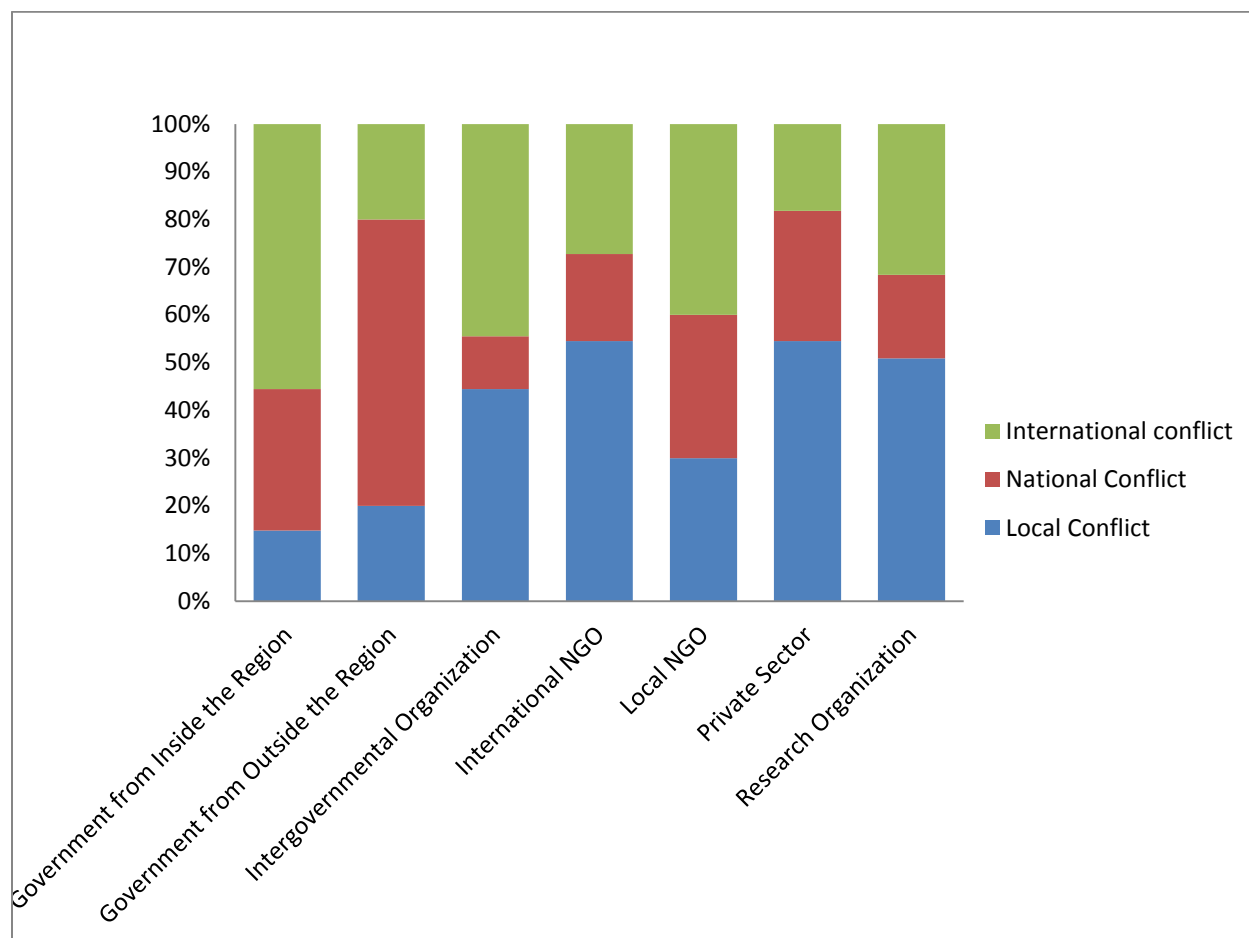




Photo credit: Mekong River Commission. Reprinted with permission.

Regional networks

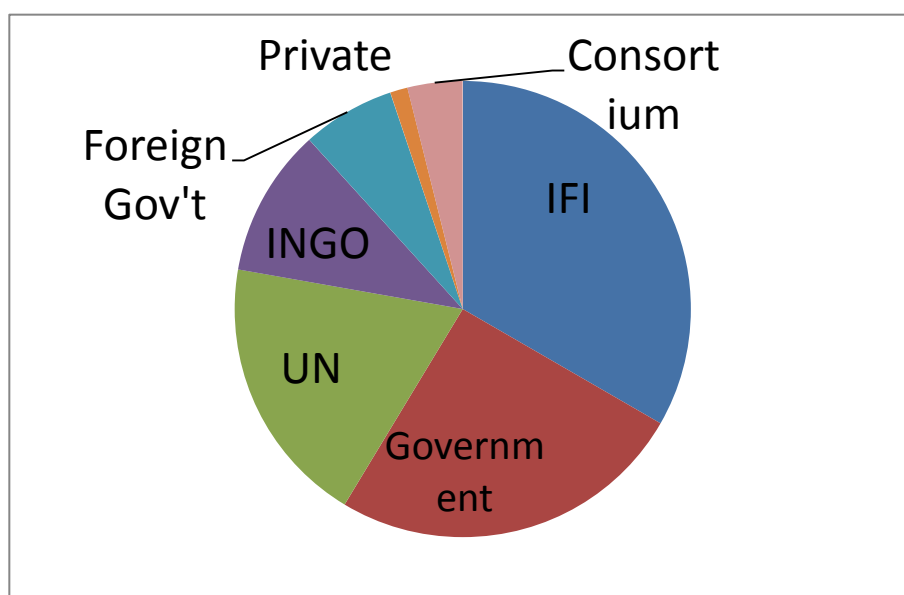
5. REGIONAL NETWORKS: INFLUENTIAL ACTORS, KEY SETTINGS, AND STAKEHOLDER TIES

The survey results also make it possible to map patterns of networking and influence across the region. The MRC's lack of authority and influence over many key decisions shaping development patterns in the region raises important questions about the settings in which decisions are taken, and the ability of various types of stakeholders to influence those decisions. With these questions in mind, respondents were asked (a) to gauge the relative influence of organizations active in the region in the food, water, and energy sectors; (b) to determine the strengths of ties among different stakeholder groups (including intergovernmental organizations, NGOs, governments in the region, the private sector, and local communities); and (c) to identify the most influential institutional settings where actors come together and make decisions.

Most influential actors

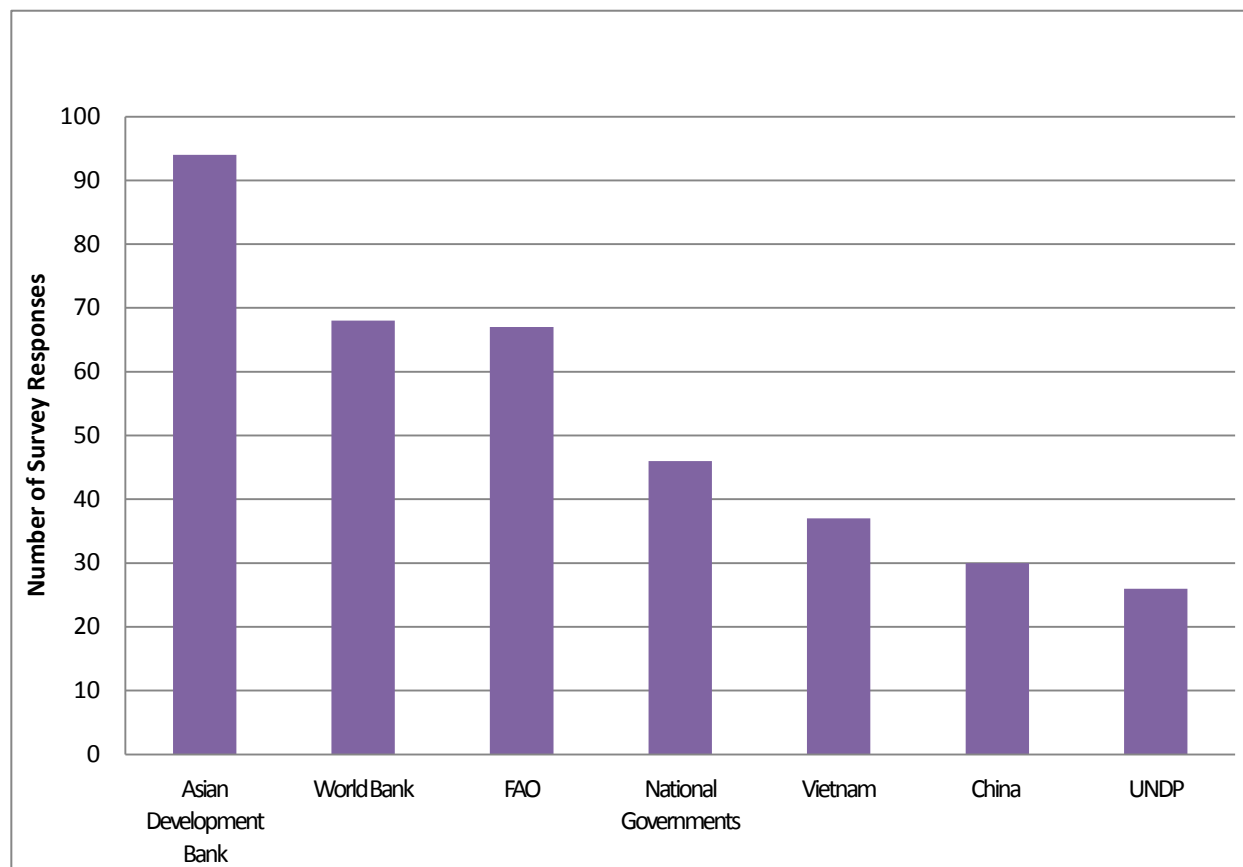
Survey respondents identified governments within the Mekong region and International Financial Institutions (IFIs) as the most influential actors across the food-water-energy nexus. Governments outside the region and the private sector were mentioned considerably less (Figure 16). The prominence of UN-affiliated organizations is due primarily to the frequent flagging of the Food and Agriculture Organization as influential in the food sector.

Figure 16: Types of actors most frequently identified by survey respondents as influential



Across the food-water-energy nexus, respondents indicated that the Asian Development Bank (ADB), World Bank, and FAO were the most influential actors, followed by national governments within the region and UNDP (Figure 17). Among national governments, China and Vietnam were flagged most frequently and thus are represented separately in Figure 17.

Figure 17: Most influential organizations: Aggregation of food, water, and energy sectors



Although the aggregate picture with regard to the most influential organizations within the food-water-energy nexus is unsurprising, an interesting pattern emerges when the responses are disaggregated by sector. For example, in the food sector (Figure 18), experts surveyed identified intergovernmental organizations, including both UN bodies and international financial institutions as the most influential actors (IFIs) as the most influential actors. Responses suggest that national governments and the private sector have considerably less influence (although it is noteworthy that all of the private-sector organizations identified are involved in the cultivation or export of rice). Of the three sectors, food reflected most strongly a “functional” model of development, with IGOs providing funding and expertise.

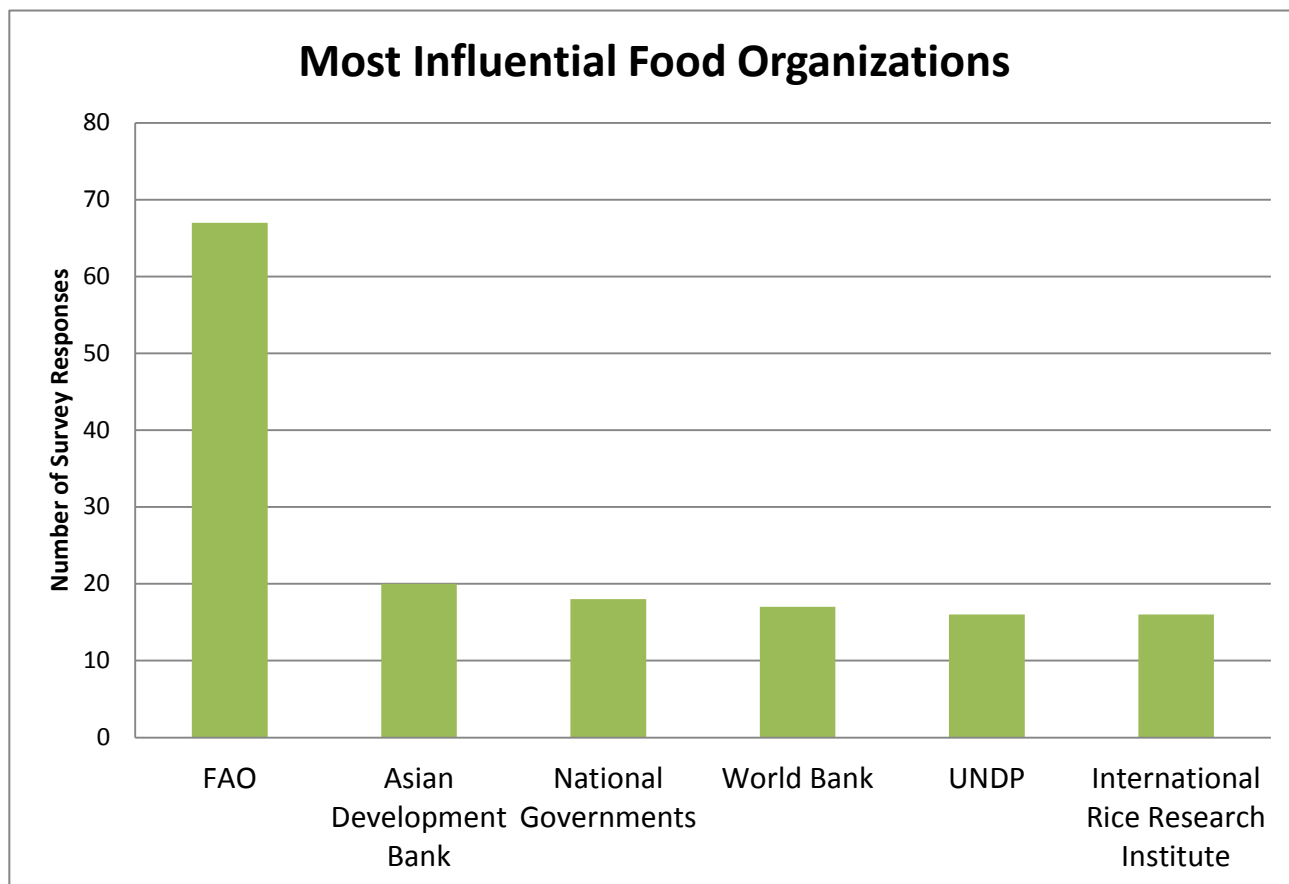
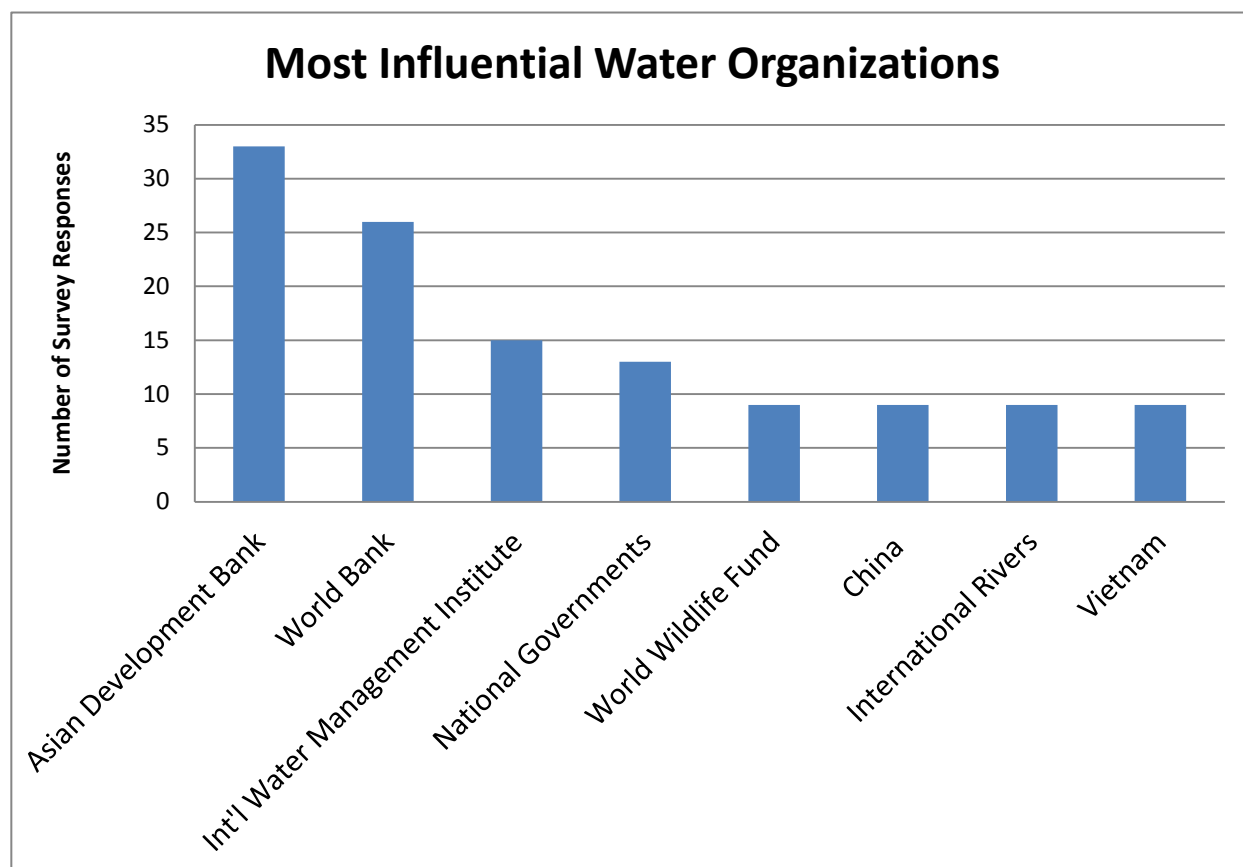
Figure 18: Most influential organizations: Food sector

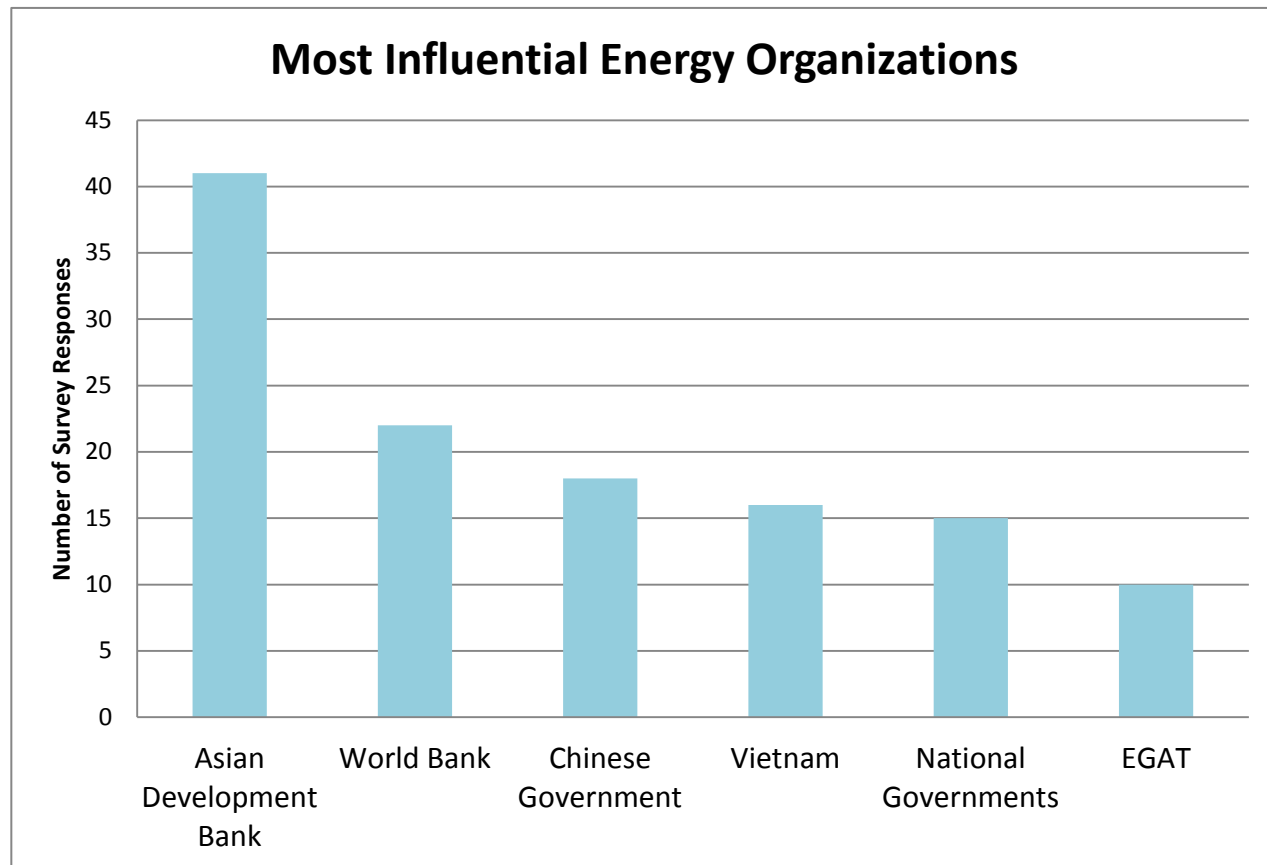
Figure 19: Most influential organizations: Water sector



The water sector, in contrast, reflects more of a “stakeholder” model of influence (Figure 19). The survey results indicate that the most influential actors in the water sector include IFIs and national governments, but also show the importance of prominent NGOs and research institutions. Specifically, the international NGOs International Rivers and WWF are seen as being just as influential as the government of China, and the International Water Management Institute is seen as more influential.

If food and water were marked by functional and stakeholder models of influence, respectively, the energy sector reflects a more traditional geopolitical model, with national governments and IFIs nearly equal in terms of influence. This result seems consistent with the interest of national governments in protecting energy security and given the trend of IFIs encouraging, through a variety of channels, the development of energy sectors in the region, specifically hydropower, for the purposes of economic growth and development.

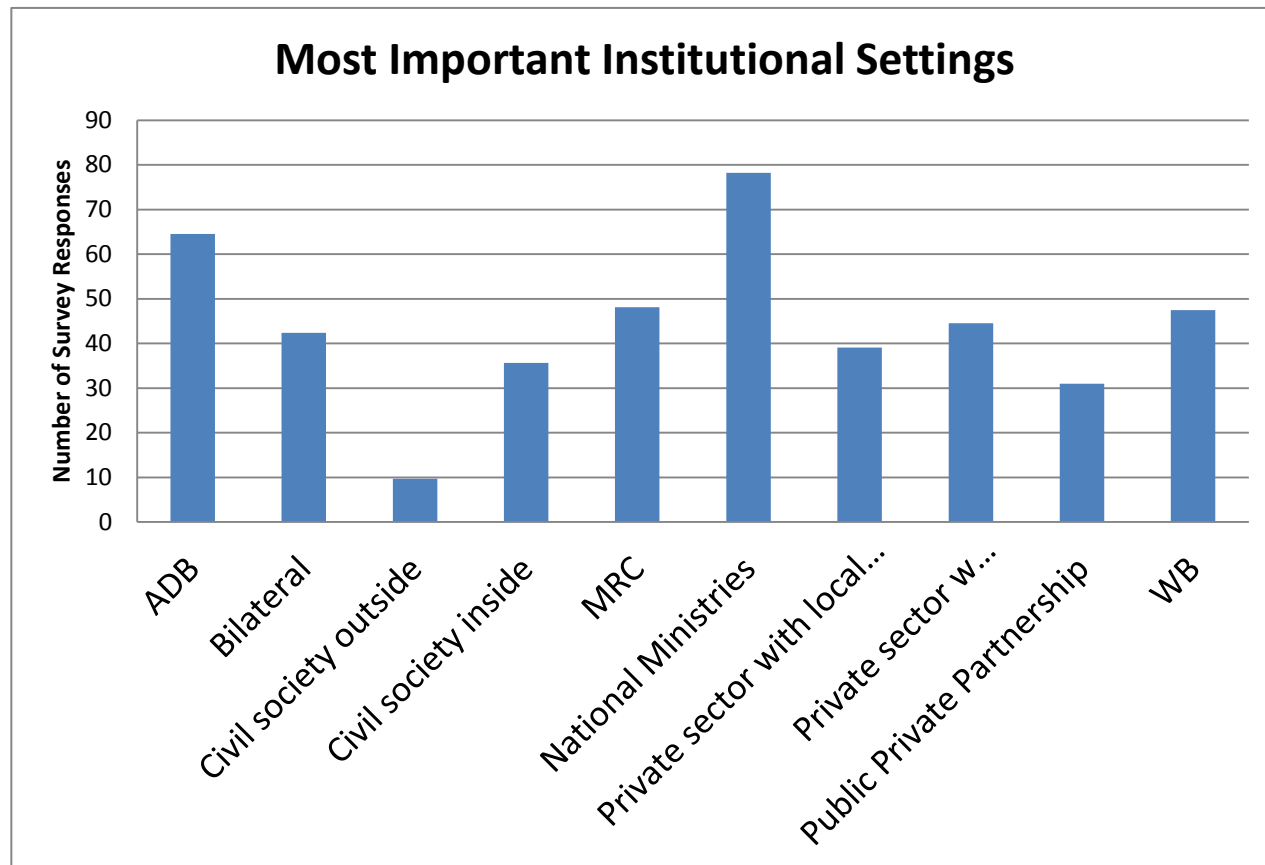
Thus, emerging from this data, we see each sector comprised of a different model of influence. Water is a multi-stakeholder sector. National governments and international donors dominate energy. Food is largely shaped by intergovernmental organizations, including both donors and expert agencies. **These different patterns of influence make coordination across the separate sectoral poles of the food-water-energy nexus challenging.**

Figure 20: Most influential organizations: Energy sector

Most important institutional settings

Surveyed experts were asked to identify the most significant institutional settings for decision-making. Respondents indicated that national ministries are the most important settings, followed by the ADB, MRC and World Bank (Figure 21). Despite recent efforts by IFIs and foreign donors to encourage public-private partnership, incorporation of the private sector into local supply chains, and greater participation of the private sector in local communities, survey results indicate that public-private partnerships remain low in terms of decision-making influence. Civil society networks also appear to be relatively weak as settings where key decisions are taken, despite the aforementioned influence of some particular NGOs.

Figure 21: Most important institutional settings

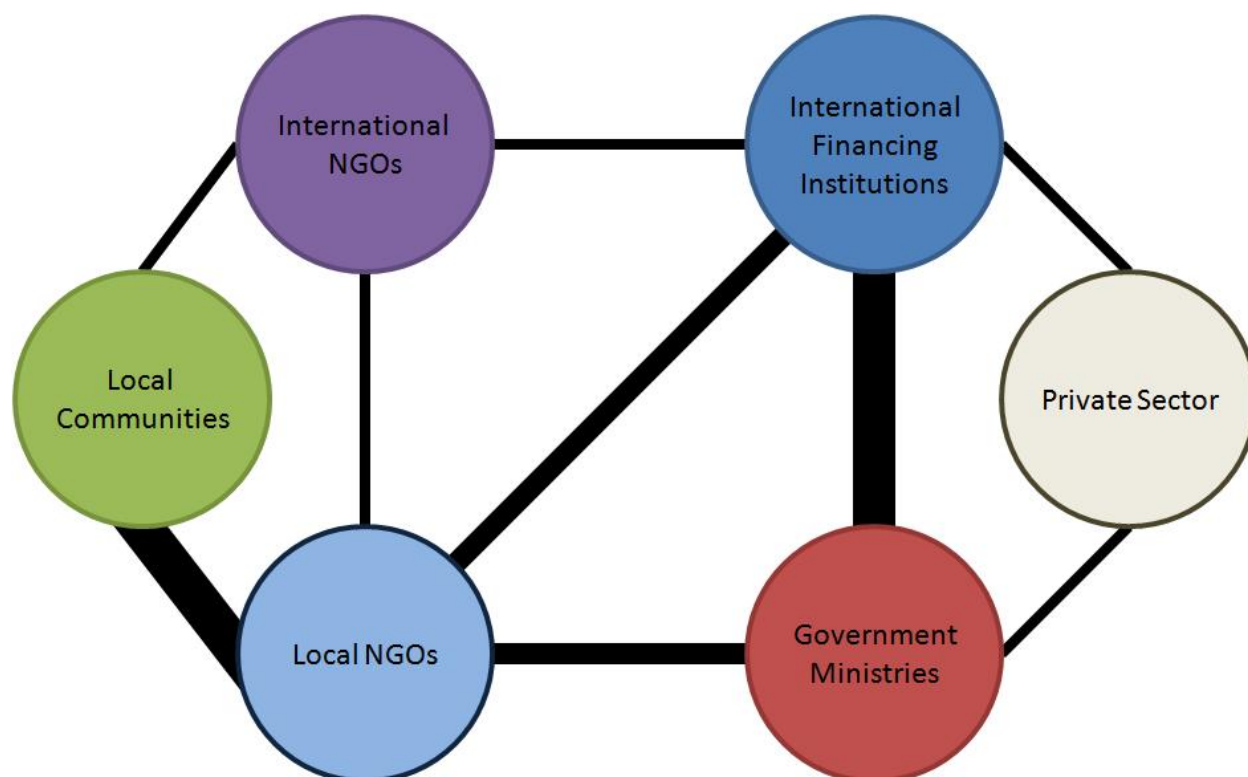


Ties among different types of stakeholders

Survey respondents were also asked to identify the strength of engagement among different types of regional stakeholders, including IFIs, national governments in the region, national governments from outside the region, international NGOs, the private sector, local NGOs, and local communities. For each dyadic relationship among these actor types, respondents were asked to characterize the relationship as close engagement, periodic engagement, or limited to no engagement. Figure 22 visually represents the survey results, with the strength of interaction indicated by the thickness of the connecting lines. Where lines are not present, actors were deemed by survey respondents to have limited to no engagement.

Several patterns are noteworthy in Figure 22. First, the results indicate that **IFIs and local NGOs are seen to have significant engagement with the largest number of other actor types, suggesting that they occupy key nodal positions in regional policy networks.**

Figure 22: Strength of engagement between different types of regional actors



Not surprisingly, IFIs have strong engagement with government ministries. Their significant engagement with local NGOs, however, is noteworthy. The IFI/NGO link is also noteworthy given the robust ties perceived between local NGOs and local communities, and the absence of any perceived IFI/local community direct linkages.

Not surprisingly, local NGOs have the most frequent interaction with local communities. This perception among survey respondents makes sense, as local NGOs often act as advocates for local communities, or serve as facilitators for communication and cooperation with other actors. Because of their frequent engagement with international NGOs, IFIs, and national governments, **local NGOs appear well positioned to be the conduits for cooperation and conflict resolution.**

Figure 22 also indicates that **local communities and the private sector are the most marginalized in terms of their lack of engagement with other types of actors.** With the exception of the strong local community/local NGO tie, they appear to rely on both relatively weak links and links to few other types of actors.



Photo credit: Mekong River Commission. Reprinted with permission.

Financial flows

6. FINANCIAL FLOWS

This portion of the research aims to identify the primary funders and pathways of decision-making for hydroelectric projects in the Mekong River Basin. The preceding results suggest that hydropower is a particularly contentious issue; that decisions in the energy sphere are often poorly coordinated or involve a different cast of characters than in the food and water spheres; and that the institutionalized relationships among key stakeholders are often fragmented or underdeveloped. Under these circumstances, it is useful to explore how specific hydropower projects are funded, to help identify key relationships, the loci of decision making, and the types of actors involved.

Eight representative case studies were chosen after identifying all dams in the basin in order to make assessments regarding the basin as a whole. Each study included identifying the set of funders who contributed to the project. The resulting assessment is a breakdown of the patterns of funding and decision-making surrounding hydropower projects in the Mekong River Basin.

Case selection and data collection

The full list of Mekong dams was constructed by combining several documents, with data drawn primarily from the Mekong River Commission's Hydropower Database³³ along with additional information in their Hydropower Sector Review for the Joint Basin Planning Process report.³⁴ These sources list 136 dams in the four countries of the lower basin and include information regarding construction, financial costs, electricity production and consumption, and dam impact.

Using this list of dams, 8 case studies were selected to conduct a more detailed analysis of the pattern of funding and decision-making regarding dam construction in the MRB. The 8 case studies include: the Lower Sesan 2 in Cambodia; Nam Theun 2, Nam Lik 2, Nam Ngum 5, and the Nam Ou Cascade (Nam Ou 1 through Nam Ou 7) in Laos; and Yali Falls, Boun Tua Sra, and Sre Pok 4 in Vietnam. Detailed information regarding each of these hydropower projects is available in the MRC's Hydropower Database. Using statistical analysis to compare differences between the selected case studies and the total list of dams from which they were selected, the case studies selected were determined to be representative of the total set of dams in the MRC Hydropower Database in terms of project costs, power produced, and recipients of electricity.³⁵

³³ Mekong River Commission 2009b.

³⁴ Mekong River Commission 2009a.

³⁵ To test whether the set of case studies is representative of the total set of dams in the basin, the cases were compared to the full set of dams in the MRC Hydropower Database. Using SPSS, variables in the database were summarized to find distributive and frequency data; histograms were constructed for visual representation of the distribution of data. Next, the case studies were pulled from the data and their distributive information was found. Using one-sample t-tests, the distribution of the case studies was tested against the average values from the full set of data. (As one of our case studies is a cascade of dams, it is represented in the data with 8 entries. All of these entries were considered, so in the database our case studies number 14. The difference exists because the entire cascade was funded as a single project, so it is considered one project and one case study in our report instead of 7.) The case studies were found to differ from the total set on only a few variables. At the significance level p-value less than 0.1, we over-measured electricity provided to Thailand, and measured a more positive total impact. With a p-value smaller than .05, our cases under-measured electricity provided to Laos and measured a more positive impact on both flood control and navigation. With a p-value smaller than .01, we under-measured electricity provided to Cambodia. For the impact on micro climate, no comparison could be created because all values for our

Data were collected for each of the 8 cases to draw a picture of broader trends in hydropower funding in the Mekong River Basin. The following guiding questions were used to focus to the analysis:

- Who are the major donors?
- What is the role of funding from outside the region?
- What motivates companies and banks in one country to invest in dams in the other countries of the basin?
- What decision-making processes govern key organizations such as Sinohydro and EGAT?
- What are the relative benefits and costs of seeking funding from single or multiple sources?

Brief sketch of case studies

Lower Sesan 2

The Lower Sesan 2 is located in the Sesan River of Stung Treng Province in Cambodia. The 400 MW dam will be commissioned in 2019. Founded by Vietnam Ministry of Planning and Investment and licensed by EVN, this dam is estimated to cost US \$ 781.52 million.³⁶ Seventy percent of funding will come from bank loans while the remaining 30 percent will be sourced from the national electricity company's capital.³⁷ The Royal Group, a private Cambodian company, and Hydrolancang International Energy Co. Ltd will be responsible for 90 percent of the construction work.³⁸ All remaining work will be conducted by EVN International Joint Stock Company, a subsidiary of the Electricity of Vietnam.

During its bidding process, the economic viability of Lower Sesan 2 Dam was called into question, especially in light of increased droughts due to climate change and upstream dam operations.³⁹ In addition to the economic costs, the dam is also likely to lead to environmental costs, which are expected to drastically reduce the fishery resources.⁴⁰ According to experts, the dam will cause a 9.3 percent drop in fish stocks basin-wide, while threatening more than 50 fish species.⁴¹ Its impacts will be felt in Viet Nam, Laos and Thailand. The dam's Environmental Impact Assessment report failed to meet international best practices.⁴²

Nam Theun 2

The Nam Theun 2 dam is located in the Khammouane province of Laos on the Nam Theun River. The 1070 MW dam was commissioned in 2010. Of the power that it produces, 95 percent is allocated to EGAT, while the other 5 percent is reserved for EdL. Nam Theun 2 is the largest dam in Laos and the largest of the case studies included in this report. It was financed with US\$1,450 million, compiled from several sources including the World Bank, the Asian

case studies were 0. Variables with significant p-values are the characteristics in which our dam case studies significantly differ from the total list of dams in the MRB. On other variables, t-tests revealed no significant difference between our case studies and the total set of dams in the basin.

³⁶ Open Development 2012.

³⁷ International Rivers 2013.

³⁸ Ibid.

³⁹ Ibid.

⁴⁰ Ibid.

⁴¹ Ibid.

⁴² Ibid.

Development Bank, private investment, and direct loans and grants. This is a Build-Own-Operate-Transfer (BOOT) project.

The primary goal of the dam is to improve the economic productivity of Laos; revenues were planned to average \$30 million annually for the first ten years of operation.⁴³ It was further estimated to generate revenues of \$110 million annually by the 2020s, after debt payments. Using 2003 values and figures, this would account for 3 to 5 percent of the entire economy of Laos, with revenues equivalent to 60 percent of expenditures on education and health.⁴⁴ Due to concerns over appropriate budgeting in Laos, one portion of the project provides for the creation of Public Expenditure Management Strengthening Program to ensure that revenues for the project are used for poverty reduction, education, and health.⁴⁵

Due to the size of the project and reservoir, there are significant environmental and social impacts. The project is estimated to displace several thousand people and affect a total of over 100,000. It will additionally disrupt fisheries and water quality, and the reservoir will flood protected areas on the Nakai Plateau.⁴⁶ In response to these concerns, the World Bank created a social and environment mitigation program for the Nam Theun 2 project that is intended to promote “sustainable” hydropower development. Included in this plan is a monitoring system for wildlife and biodiversity. However, International Rivers has asserted that these plans have been violated and have not resulted in greater environmental and social protection.⁴⁷

The Nam Theun 2 Power Company received US\$450 million of investment for this project.⁴⁸ Of this, 35 percent was from Electricite de France International, 25 percent from Electricity Generating Public Company Limited, and 15 percent from Italian-Thai Development Public Company Limited. The final portion of investment was from the Government of Laos, which it provided through loans and grants from several development agencies and IFIs. In 2010, Italian-Thai Development Public Company Limited sold all of its shares.⁴⁹ This increased Electricite de France’s ownership of the Nam Theun 2 Power Company to 40 percent and Electricity Generating Public Company Limited’s share to 35 percent. The sale of these shares totaled \$110 million, compared to the \$67.5 million that the same shares represented at the time of investment.

The turbines for the dam were delivered by EGAT, which will also be the recipient of most of the electricity produced.⁵⁰ The Nam Theun 2 Electricity Consortium was responsible for overseeing construction, and now the operation of the project.⁵¹ The consortium consists of Electricite de France as the head contractor, Montgomery Watson Harza (USA), EGCO (Thailand), and Ital-Thai Development.

Nam Ngum 5

The Nam Ngum 5 dam is located in the Luang Prabang province of Laos on the Nam Ngum River. This 120 MW project was commissioned in 2011. All of the electricity that is

⁴³ World Bank 2005.

⁴⁴ Ibid.

⁴⁵ World Bank 2005.

⁴⁶ International Rivers 2013.

⁴⁷ Ibid.

⁴⁸ World Bank 2005.

⁴⁹ Italian Thai Development Company 2013.

⁵⁰ Ibid.

⁵¹ Ibid.

produced by the Nam Ngum 5 dam is sent to Laos' electricity grid.⁵² The dam was funded by US\$200 million through a partnership between Electricite du Laos and Sinohydro.⁵³

Sinohydro is the primary funder, representing 85 percent of the total commitment, equal to US\$170 million.⁵⁴ This funding took the form of direct capital investment in Nam Ngum 5 Power Company. This is a BOOT project with a term of 25 years.⁵⁵ However, International Rivers has reported different sources of funding for Nam Ngum 5, suggesting that the project was likely financed in part by the National Bank of China.⁵⁶ Because public information has been inconsistent regarding the specifics of funding for this project, this study chose to use the funding breakdown filed with the Clean Development Mechanism.

Altogether, the Nam Ngum cascade of dams is expected to have a significant environmental impact, including disruption of river species and forest loss.⁵⁷ Further social consequences will result from the relocation of people living along the river.⁵⁸ As this is Sinohydro's first BOOT project in Laos, it has published an environmental mitigation plan, and Sinohydro considers the Nam Ngum 5 project a test for environmental and social sustainability.⁵⁹

Sre Pok 4

The Sre Pok 4 dam is located in the Dak Lak and Dak Nong provinces of Viet Nam on the Sre Pok River. This 80 MW dam was commissioned in 2010. All of the electricity that is produced by the Sre Pok 4 dam is sent to Viet Nam's electricity grid. The dam was funded by 1,800,581 million VND, which at the time of planning in 2007 was equal to US\$111.7 million.⁶⁰

All of the funding for the project was obtained through a single funder, the Dai Hai Power Development and Investment Joint Stock Company.⁶¹ The company itself provided 656,547 million VND, while the other 1,144,034 million VND was obtained through loans. The loans were obtained from three Agriculture and Rural Development Banks (Saigon, Dak Lak, and Quang Tri), the Rubber Finance Corporation, and Viet A Joint Stock Bank.⁶²

Tariffs on generated electricity are set at VND 685/kWh (US\$ 0.0425). Including sales of electricity and tariffs, the dam is estimated to be profitable by 2018, according to financial spreadsheets. The Construction Joint Stock Company constructed the dam, and electro-mechanical equipment was purchased from the Dongfang Electric Corporation in China.⁶³ Carbon Resource Management assisted with organizing the use of the Sre Pok 4 dam as a clean energy source, according to documentation with the UN's Clean Development Mechanism.⁶⁴

⁵² CDM 2011a.

⁵³ Ibid.

⁵⁴ Vientiane Times 2008.

⁵⁵ CDM 2011a.

⁵⁶ Hungerford and Yan 2011.

⁵⁷ Vientiane Times 2012.

⁵⁸ Ibid.

⁵⁹ Sinohydro 2007.

⁶⁰ CDM 2011b.

⁶¹ Ibid.

⁶² Ibid.

⁶³ Ibid.

⁶⁴ Ibid.

Yali Falls Dam

Vietnam's Yali Falls Dam is located in the Gia Lai and Kon Tum provinces on the Krong Poko, a tributary of the Sesan River.⁶⁵ Development plans for a large dam at Yali Falls have existed since the French colonial period; Yali Falls has long been part of the Mekong Secretariat's planning under the former Mekong Committee.⁶⁶ It is one of the largest hydropower projects in the Lower Mekong Basin and has also been one of the most controversial.

Constructed in late 1993 to 2001, Yali Falls has an installed capacity of 720 MW.⁶⁷ Electricity of Vietnam (EVN) – Vietnam's state-owned electricity utility – constructed the dam with Swiss consultancy Electrowatt Engineering Services.⁶⁸ Its cost totals US\$1 billion.⁶⁹

The Russian and Ukrainian governments are the main financiers of the project, along with the Government of Viet Nam.⁷⁰ Publicly available information providing more detailed financial information on Yali Falls is scarce. It was not possible to find detailed information on investors' capital input and ownership share, details of a power purchase agreement (PPA) for the electricity, tax revenue provisions, or underwriting of risk or guaranteeing revenues.

International aid for the project was provided by Russia and Ukraine; the Swedish aid agency SIDA assisted with tunnel construction for the project.⁷¹ The World Bank agreed to fund a 500 KV transmission line as part of a US \$575 million loan for Yali Falls' transmission and distribution facilities.⁷² Other countries, such as Switzerland, Sweden, and Japan have provided technical support, and the Interim Mekong Committee helped plan and coordinate the project.⁷³ The Swiss government completely funded the EIA at the cost of US \$1.1 million.⁷⁴

Until early 2000, the construction of the Yali Falls dam has received little regional or international press coverage. Consequently, the Cambodian populations dependent on downstream river flows have very little information regarding the activities occurring upstream in Vietnam.⁷⁵

The Swiss government funded an environmental impact assessment (EIA) for Yali Falls that was carried out by the Swiss consultant Electrowatt, on behalf of EVN and coordinated by the Interim Mekong Committee.^{76,77} However, the Cambodians were never informed, consulted or officially given a copy of the EIA.⁷⁸ The content of the EIA is problematic as well. Project impact is calculated only for upstream resettlement areas and the powerhouse, and its impact to the downstream area was "considered to extend only 6 km from the dam, with downstream impacts in Cambodia not investigated or contemplated."⁷⁹

⁶⁵ The Fisheries Office, Ratanakiri Province and The Non-Timber Forest Products (NTFP) Project, Ratanakiri Province, 2000.

⁶⁶ Wyatt and Baird 2007, 427-442.

⁶⁷ Wyatt and Baird 2007, 427-442.

⁶⁸ Philip et al. 2006.

⁶⁹ Center for Natural Resources and Environmental Studies (CRES) 2001.

⁷⁰ The Fisheries Office, Ratanakiri Province 2000.

⁷¹ Ibid.

⁷² Wyatt and Baird 2007, 427-442

⁷³ The Fisheries Office, Ratanakiri Province 2000.

⁷⁴ Ojendal, Vikrom, and Sithirith 2002.

⁷⁵ The Fisheries Office, Ratanakiri Province 2000.

⁷⁶ Ojendal, Vikrom, and Sithirith 2002.

⁷⁷ Ibid.

⁷⁸ The Fisheries Office, Ratanakiri Province 2000.

⁷⁹ Wyatt and Baird 2007, 427-442.

Nam Lik 1-2

The Nam Lik 1-2 Hydropower Project⁸⁰ is located on the Nam Lik River, 150 kilometers from Vientiane, the capital of Lao PDR. With a generation capacity of 100 megawatts, the project will produce an estimated 353 GWh of electricity annually.⁸¹ In 2004, China International Water & Electric Corporation (CWE) signed a Memorandum of Understanding (MOU) with the government of Laos for a project feasibility study.⁸² A 25-year build-own-operate-transfer (BOOT) concession was granted in 2006.⁸³ The construction of the \$150 million power plant started in 2007 and was completed in August 2010, at which time the dam was officially opened.⁸⁴

Several international entities were involved in the construction, financing, and negotiating of Nam Lik 1-2. It is registered as a Clean Development Mechanism (CDM) Project under the premise that it will reduce greenhouse gas emissions compared to the fossil fuel-dominated Lao and Thai electricity grids.⁸⁵ After meeting Lao domestic demand, excess power is supposed to be sent to the Thai electric for sales.⁸⁶ Germanischer Lloyd Certification GmbH in Hamburg, Germany wrote the validation report to qualify Nam Lik 1-2 as a CDM project.⁸⁷ However, the project does not receive any public funding from Annex I countries in the United Nations Framework Convention on Climate Change, nor does it use official development assistance directly or indirectly.⁸⁸ Instead, the project is owned by Nam Lik 1-2 Power Co Ltd, invested by CWE (90 percent ownership share) and Electricite du Laos (EdL, 10 percent).⁸⁹

Many contributing parties to Nam Lik 1-2 are Chinese. For example, its turbine generator supplier is Hangzhou Resource Power Equipment Co Ltd, a state-owned enterprise that manufactures and sells hydropower equipment.⁹⁰ Furthermore, the China Three Gorges Corporation reportedly subsidizes the dam's major investor, CWE.⁹¹ The project loan is from China National Development Bank.⁹² There is limited publicly available information on the financing of Nam Lik 1-2, including the power purchase agreement or information about any guarantees provided by governments. It is unknown whether the project has a commitment to a certain amount of tax revenues.

Nam Lik 1-2 has been called an example of an “uncoordinated approach to development” on the Nam Lik River in the Nam Ngum River Basin (NNRB).⁹³ As the only remaining unregulated connecting channel in the NNRB, Nam Lik River is a crucial habitat for fish that

⁸⁰ Nam Lik 1-2 Hydropower Project is also called “Nam Lik 2” in many materials. No material has clarified or unified the names, but according to their locations, generation capacity, and budgets, this research concludes that they refer to the same project.

⁸¹ Vattenfall Power Consultant AB 2009.

⁸² Industcards, “Hydroelectric Power Plants in Laos,” last modified March 2, 2013, <http://www.industcards.com/hydro-laos.htm>.

⁸³ Ibid.

⁸⁴ Ibid.

⁸⁵ Germanischer Lloyd Certification GmbH 2011.

⁸⁶ Ibid.

⁸⁷ Ibid.

⁸⁸ Ibid.

⁸⁹ Powering Progress 2013.

⁹⁰ Industcards 2010.

⁹¹ International Rivers 2010.

⁹² Germanischer Lloyd Certification GmbH 2011.

⁹³ International Rivers 2008.

migrate from the mainstream Mekong to the lower Nam Ngum and Nam Lik-Nam Xong basins.⁹⁴

Buon Tua Srah

Buon Tua Srah is an 86 MW hydropower plant located in the Dac Lac Province in Viet Nam.⁹⁵ Commissioned in 2009, the project had a budget of 2270 billion VND (US\$ 141.8 million in 2004).⁹⁶ The project funding is sourced from Electricity of Viet Nam (EVN) and “soft loans from domestic and foreign organizations.”⁹⁷ Hydroelectric Plants and Dam Construction Cavico Vietnam constructed the dam.⁹⁸ An internationally active Chinese power project contractor, Dongfang Electricity Corporation, supplied equipment.⁹⁹ ¹⁰⁰ In September 2005, EVN converted its shares in Buon Tua Srah to stocks due to capital shortage.¹⁰¹

Recent media coverage on the project has been negative. Severe landslides and flooding occurred in the Krong No District in Dak Nong Province after the Buon Tua Srah power plant released excess waters.¹⁰² Although research has been done to explore the project’s impact on flow regimes and livelihoods,¹⁰³ information regarding Buon Tua Srah’s financing is rather limited. Little is known publicly about ownership share in the project, tax revenue provisions, or the underwriting of the project’s risk or guaranteeing revenues.

Analysis of Trends in Funding

The case studies indicate that **there is no single model for dam construction**, meaning that there are no universal patterns present across all of the cases. IFIs currently play a smaller role in funding and construction of dams than they have previously, and new players have emerged to fill the funding and decision-making void created by this absence.

The cases also show that, rather than being replaced with a single model, however, such as public-private partnerships or private investment consortia, multiple approaches to financing and ownership are being used. The lack of clarity behind these patterns is also due to the dearth of available information regarding the details of these projects. With projects funded by small groups of funders, or just one funder, publicly available project information is often prohibitively restricted. The absence of a uniform model is best illustrated by comparing the financial models behind three of the cases (Figures 23-25).

The construction of these flowcharts is fully described in the methods section. In each figure, the size of each circle and arrow is proportional to the funds that organizations and companies contribute or the revenues they receive, with proportional arrows demonstrating the flow. This includes equity, loans, and grants, but does not include coverage or underwriting of loans. Hollow circles represent organizations that cover or underwrite loans. Organizations that contribute in both capacities are depicted through embedded circles, with a hollow circle

⁹⁴ International Rivers 2008.

⁹⁵ Bloomberg Businessweek.

⁹⁶ Communist Party of Vietnam Online Newspaper 2004.

⁹⁷ Ibid.

⁹⁸ Bloomberg Businessweek.

⁹⁹ International Water Power & Dam Construction 2006.

¹⁰⁰ Dongfang Electric Corporation Limited.

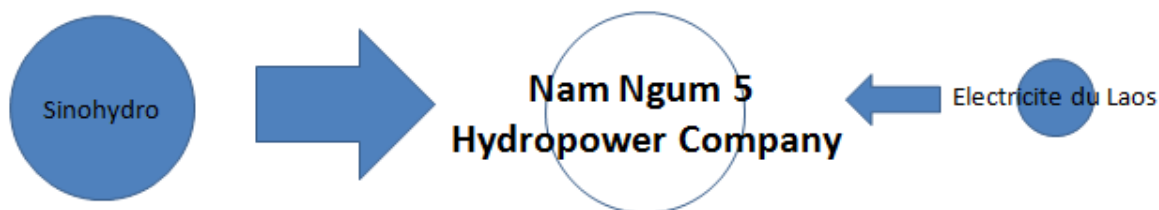
¹⁰¹ Anonymous 2005.

¹⁰² Saigon GPDaily 2012.

¹⁰³ Trieu et al. 2013.

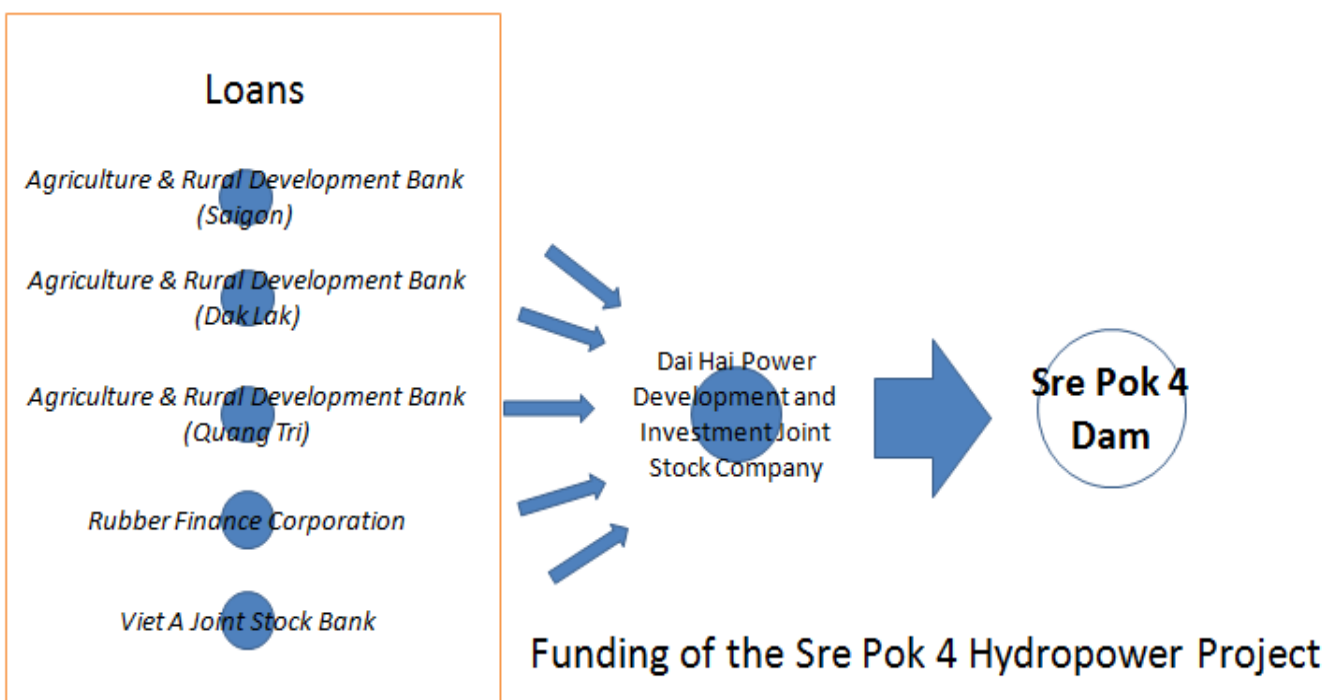
representing the full value behind a filled circle representing the funding they contribute. Arrows illustrate the flow of funding from one organization to another. As with the circles, filled arrows represent equity, loans, and grants. Hollow arrows represent covered loans or underwriting. A comparison of the figures indicates the variability in funding models currently in use.

Figure 23: Funding of the Nam Ngum 5 Hydropower Project



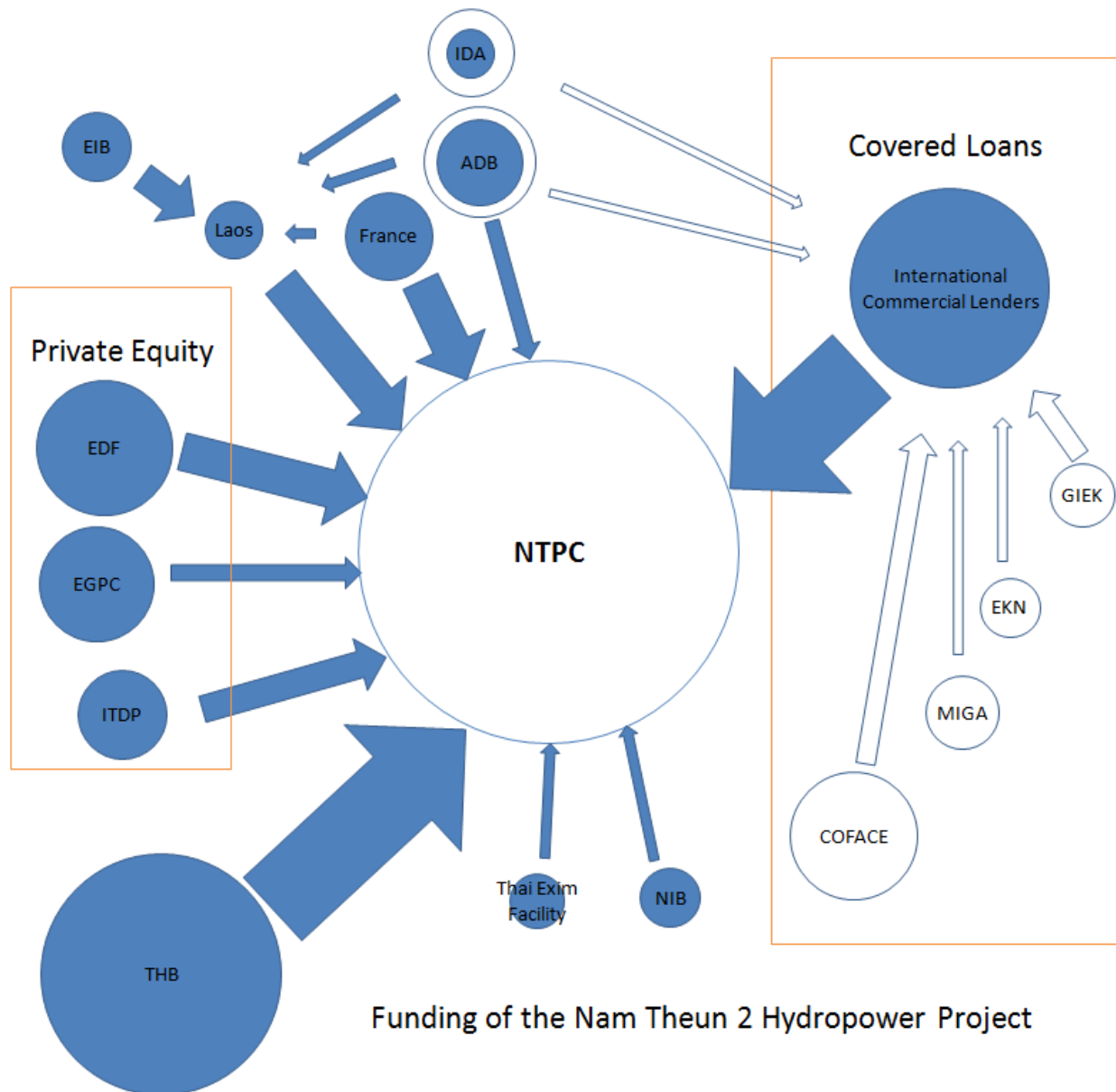
Funding of the Nam Ngum 5 Hydropower Project

Figure 24: Funding of the Sre Pok 4 Hydropower Project



Funding of the Sre Pok 4 Hydropower Project

Figure 25: Funding of the Nam Theun 2 Hydropower Project



Despite the absence of a single funding model, several trends are apparent in the case studies. As mentioned previously, **the role played by IFIs is reduced** compared with construction of dams in previous decades. This may be occurring because of the conditions that accompany funding from the World Bank, Asian Development Bank, and other development organizations, including regulations for mitigating social and environmental harm. Such safeguards policies are often seen as burdensome by host countries, prompting them to turn to emerging financiers with less stringent standards. This observation may be inconsistent with the survey responses, however, as many experts identified funding from international financing

agencies was important in the energy and water sectors.. One way to reconcile these observations is to note that the primary IFI role may not be as a source of funding, but in some other capacity such as sector planning, knowledge frameworks, or information provision.

Instead, **funding is being provided primarily by banks, hydropower and energy companies, and government agencies.** Examples from the case studies include Buon Tua Srah, which received investment solely from EVN. Other important hydropower companies operating in the Mekong River Basin include Sinohydro, EGAT, and EdL. These institutions appear to be less concerned with the negative consequences of dam construction and more interested in return on investment, electricity production, and the policy maneuvers possible in dam construction. These organizations also lack the incentives of the IFIs to address wider issues such as environmental impact or poverty reduction, rooted in public pressure, organizational rules, or the oversight of donor-country directors.

Although public-private partnerships have grown in importance globally in the water sector, this appears not yet to be the case in the Mekong region. Rather, **state-owned companies are prevalent as funders of hydropower projects.** Notable players in this capacity are Thai, Chinese, Vietnamese, and Lao state-owned companies. Many of these function as energy or electricity companies. While private companies are involved in some projects, such as Sre Pok 4, it is more common for the key actors to be state-owned. Considering the opaque situation regarding information release, and a lack of mobilized civil society in relevant countries such as China and Viet Nam, it is impossible to determine the extent to which the financial arrangements in these projects are economically competitive in market terms.

There is low involvement by the agriculture sector. Dams in the Mekong River Basin appear to be primarily focused on energy production, without much concern given to the use of water and irrigation for agricultural purposes. However, this may be a changing trend in the foreseeable future, as plans exist to increase dry-season irrigation in the Mekong River Basin by 50 percent over the next 20 years, some of which is linked to investments in flood control, specifically in the undeveloped Cambodian Delta.¹⁰⁴ Agricultural and rural development banks supported the Sre Pok 4 project, but this is the only project among the case studies that had any significant involvement from an agriculturally oriented organization. This finding further emphasizes the close ties between energy and water, and the more distant relationship between these sectors on the one hand and food and agriculture on the other. Additionally, **there is little room for involvement for small investors.** While many of these are relatively small dams, they tend to be funded by a small group of large funders. Many of these same funders are involved in multiple projects, such as Sinohydro, EGAT, EdL, EVN, and others.

Smaller dams tend to be funded solely by domestic sources, while larger dams tend to bring in the international funders. Most of the dams studied have international funding, but looking at the case studies, the two smallest dams (Sre Pok 4 and Buon Tua Srah, both in Vietnam) were also the only ones to have solely domestic funding sources. These are. These small dams also provide electricity solely for domestic consumption. Thus, the decision-making process for these projects is contained in just one country, while the impacts are not.

For some dams, **the economic benefits are unclear;** it is also unknown who will be responsible for potential failures. Lower Sesan 2 is an example. Funded by Vietnam's Ministry of Planning and Investment and licensed by EVN, the dam will be built in Cambodia at an estimated total cost of US\$781.52 million.¹⁰⁵ However, the economic viability of this project has

¹⁰⁴ Mekong River Commission 2011.

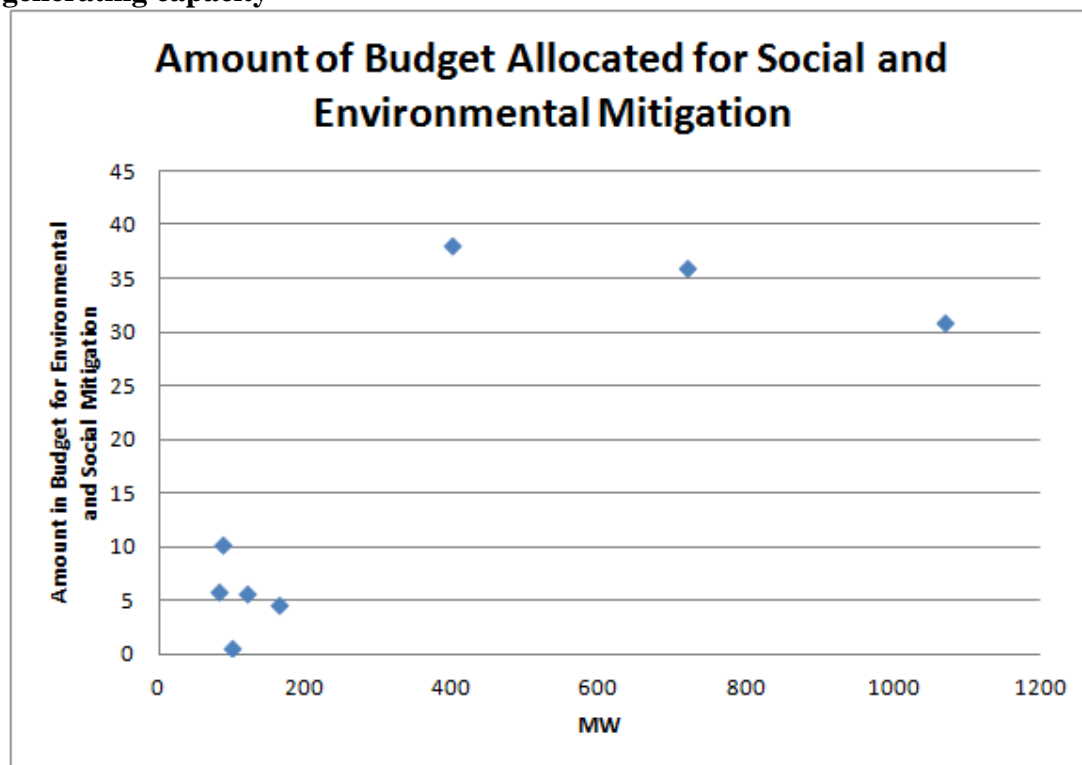
¹⁰⁵ International Rivers 2013.

been called into question, especially in light of an anticipated increase in droughts due to climate change and upstream dam operations.¹⁰⁶

There is little regard given to environmental and social impacts, and those who are impacted have no voice. While Thai civil society has successfully discouraged dam construction in Thailand, they have not prevented Thai companies from investing in projects elsewhere in the basin that continue to have negative environmental and economic impacts in Thailand and elsewhere. In several countries in the region, including China, Burma, Vietnam and Laos, civil society is comparatively voiceless and unable to prevent dam construction. Laos has recently received attention for the abduction of civil society activist Sombath Somphone, which illustrates the limited and often vulnerable role of civil society in hydropower politics.

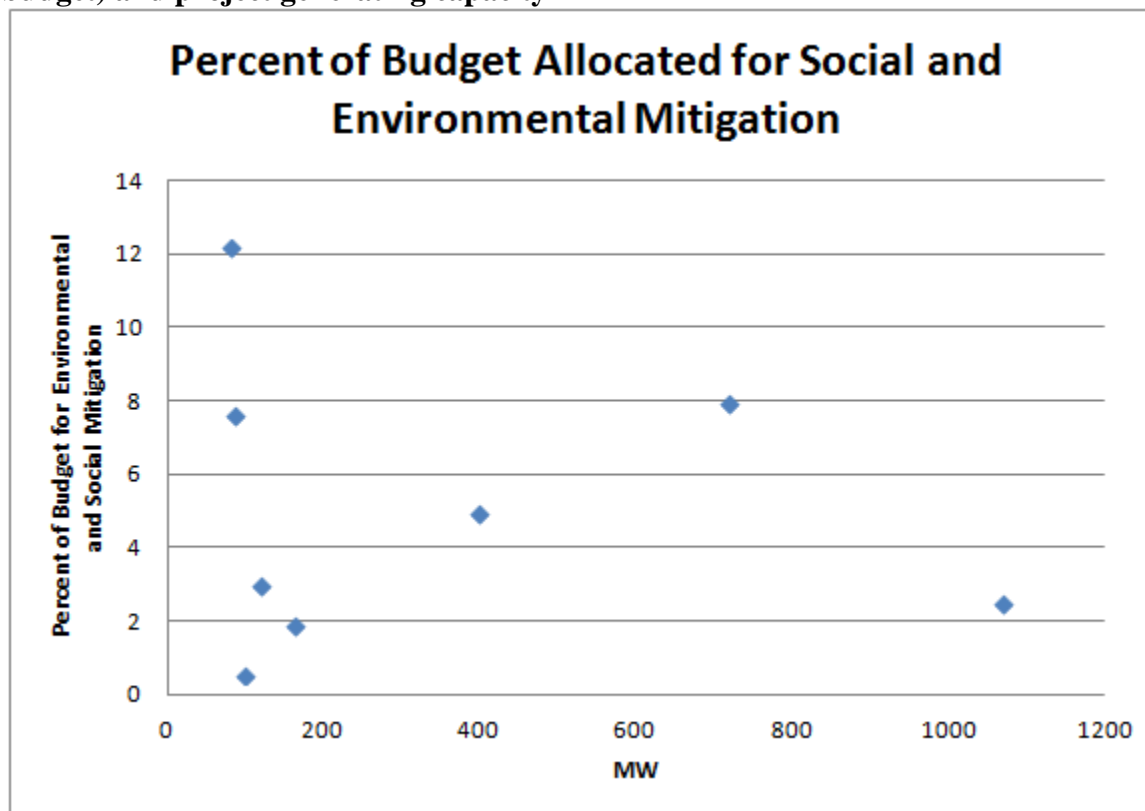
The larger dams among the case studies do have larger budgets for environmental and social mitigation needs (Figure 26). But there is only a loose relationship between dam size and the size of the mitigation budget, no correlation at all in a given size category, and no correlation between dam size (which gives a crude measure of impact) and the proportion of the overall project budget set aside for mitigation (Figure 27). The same lack of correlation is seen when using the MRC’s “ecosystem impact score” rather than dam size as a measure of impact (Figure 28).

Figure 26: Budgeting for social and environmental mitigation (million US\$) and project generating capacity



¹⁰⁶ Ibid.

Figure 27: Budgeting for social and environmental mitigation (percent of total project budget) and project generating capacity



Dams continue to be constructed despite negative consequences because powerful actors and funders do not bear the burden of the impacts. Even from a purely economic standpoint many dam projects are not sustainable. According to MRC data, many of the dams negatively impact Thailand's economy. This raises the question of why Thailand continues to fund such detrimental projects. EGAT is prone to investment in dam projects, domestic and international, because it typically sees returns of 6 percent on such investments. Even if the dams negatively impact the country, EGAT is structurally inclined to support more investment.¹⁰⁷ Dam construction continues even as the capacity of the river to produce electricity is exceeded. This occurs because there are profits in construction, and public funding is confident in energy and infrastructure investment, even if the dam is not necessary. Revenue from construction, electricity sales, taxes and tariffs all go to the funders, who do not pay for the negative impacts of the dams.

¹⁰⁷ Cronin and Dickey 2013.

Figure 28: Budgeting for social and environmental mitigation and Ecosystem Impact Score

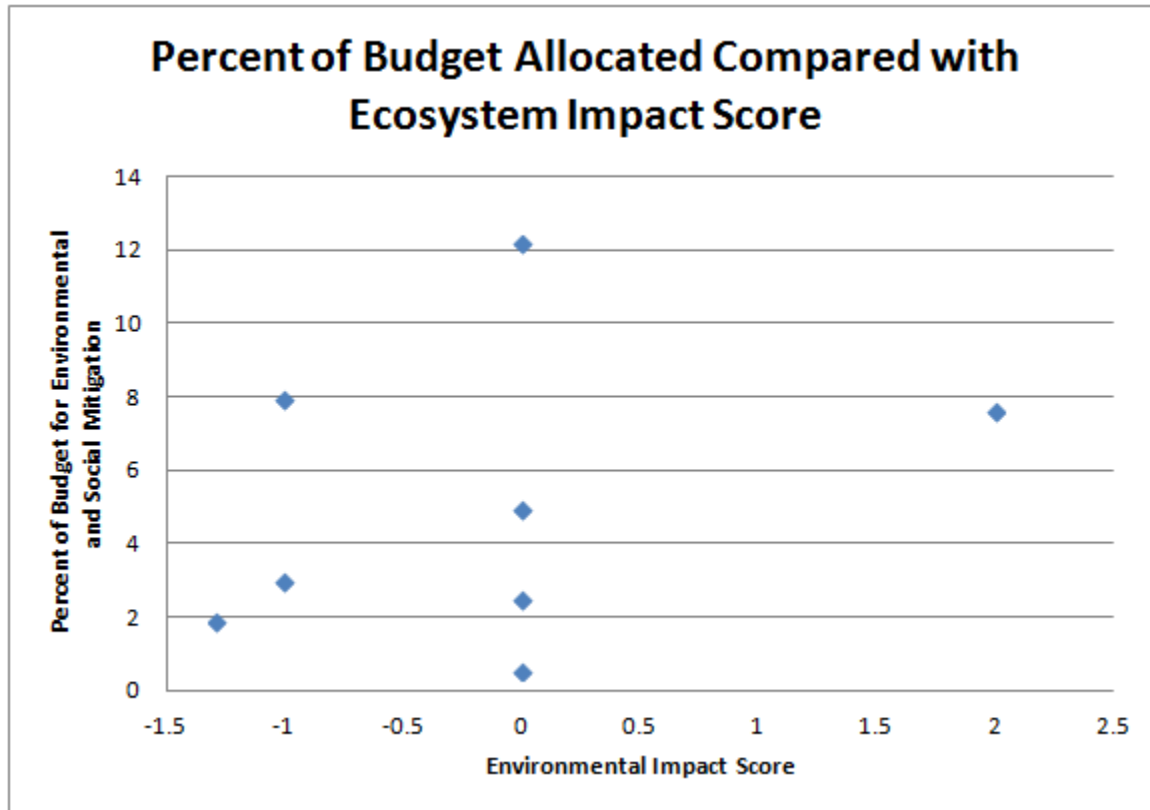




Photo credit: Mekong River Commission. Reprinted with permission.

Conclusions

7. CONCLUSION

Hydropower, climate change, biodiversity, equity, and water supply/quality are all major issues facing the dynamic and complex region comprising the Mekong River Basin. Unfortunately, the issues that have been identified as critical to the future of the river basin and the millions of people who rely on it are often the most overlooked. A coordinated authority on trans-boundary watershed management is lacking in the Mekong: countries and major decision makers currently act without considering downstream impacts. Social and environmental instability are the likely results of mismanagement of natural resources in the basin.

According to the experts surveyed for this research, conflict in the Mekong River Basin is likely in the coming decade. Although there was no consensus on precisely how that conflict would manifest, a majority of experts see conflict as most likely at the national or sub-national level, as opposed to conflict between nation-states in the basin, and many expect it to be chronic rather than episodic in nature. Organizations such as the MRC, designed to foster cooperation and communication between governments, may be poorly adapted to manage conflict where it is most likely. Our results suggest that conflict management is also compromised by the currently fragmented levels of interaction among different types of stakeholders, the marginalization of some important voices, and the different distribution of authority and influence seen at each of the three poles of the food-water-energy nexus.

States in the region have a clear interest in taking steps to prevent conflict. Governments, and international donors, could begin by focusing on issues our survey respondents felt were both the most likely to cause conflict and the most likely to be overlooked; social equity, poverty reduction, water supply, water quality, climate change, and disaster management. Each of these issues relates directly to the livelihoods and human security of actors at the local level.

Hydropower in particular is seen as a key driver of conflict, but also an issue with strong potential for cooperation. National governments are the most powerful actors in this realm and often act unilaterally in ways that affect all of the countries in the basin, with local actors being impacted the most directly and severely by these decisions. Effective cooperation on issues of water infrastructure and hydropower will require an institutional structure that provides a platform for all actors with an interest to voice their opinions and be heard by the key decision-making bodies. The key is how to empower the full range of stakeholders with an agency that allows them to be heard and their arguments considered when key decisions are made.

APPENDIX I: SURVEY METHODOLOGY

A survey of experts who work in or whose work focuses on the Mekong region, particularly those concerned with some aspect of the food-water-energy nexus, was the primary data collection method used for this research. As the goal of the research is to understand the drivers of development and conflict and the decisions-making processes that govern these factors in the region, a survey of experts was considered a suitable method to aggregate knowledge across sectors and disciplines, in order to paint a representative picture of informed views about macro trends.

A. Identifying Experts

Experts were identified using a number of methods. To identify well known and cited scholars in development, sustainability, conflict, and governance in the Mekong River Basin, the team compiled a list of the most-cited and most abundantly published authors. Scholarly databases such as JSTOR, Google Scholar, and Proquest were used to identify journal articles, books, and papers published on relevant topics in the past ten years. Bibliographic information from these sources was used to expand the set of authors considered. Each publication was verified for relevancy before being included.

A second method of expert identification was to flag individuals quoted or cited in media coverage of food, water, and energy issues in the region. The LexisNexis search strings used were as follows: (Mekong AND Water), ("Mekong River" AND water AND HEADLINE (Mekong or energy or food or water)-144), ("Mekong River" AND food AND HEADLINE (Mekong or energy or food or water)-81), and ("Mekong River" AND energy AND HEADLINE (Mekong or energy or food or water)-51). Flagged articles were then searched electronically for quotes and indicative phrases (such as "according to", "says", and "said") to find individuals and organizations cited.

A third process used to identify experts was to pool any additional names found while reading academic articles, news articles, conference announcements, and research about the Mekong River Basin. This included members of civil society organizations, individuals attending conferences relevant to management in the Mekong River Basin, NGO employees, and political activists. This process largely confirmed the results of the first two search methods, and supplemented them with additional individuals.

Once the pool of experts had been identified, e-mail addresses were searched for on the Internet through publicly available information, so that the targeted individuals could receive the e-mailed survey questionnaire. Contact information was found for most identified experts; those for whom an e-mail address could not be identified were dropped from the sample.

Using this process, the research team identified names and contact information for 948 experts.

B. Survey Implementation

Implementation of the survey followed standard practices for protecting human subjects as defined by American University's Institutional Review Board (IRB). Respondents were guaranteed anonymity and were not required to provide any identifying or revealing information. Responses were collected through SurveyMonkey, allowing respondents to reply

anonymously. Respondents were given the option of identifying themselves at the end of the survey, but were not obligated to do so and the responses of self-identifying respondents have been kept confidential. The e-mail message sent to identified experts contained the following text:

Dear Mekong Expert:

We write to request your assistance with a research project on the Mekong River basin/Mekong sub-region. You are receiving this request because you have been identified as an expert on Mekong issues. We ask for a few moments of your time to complete a survey questionnaire.

The research is being conducted by a team of graduate students in the School of International Service at American University (Washington), under the supervision of Dr. Ken Conca. The purpose of the research is to evaluate how experts and organizations working on different issues in the region view future trends, cooperative relationships, and potential sources of future conflict.

We estimate that completing the survey will require approximately 15 minutes. The survey may be accessed through the following link: <https://www.surveymonkey.com/s/TC6MK33>

The survey is being conducted anonymously. Individual respondents will not be identified in our report; nor will any responses to the survey be attributed to individuals or organizations. At the end of the survey you will be asked if you wish to participate in a follow-up interview. There is no obligation to do so, and doing so will not affect the confidentiality of your response. Participation in the survey is voluntary, and you may choose to stop at any time during the survey. If you have any questions, you may reply to this e-mail or contact the team supervisor, Dr. Ken Conca (e-mail conca@american.edu, [+1-202-885-6391](tel:+12028856391)), before or after taking the survey.

With many thanks for your assistance,

Mekong Research Practicum Team
School of International Service
American University (Washington, DC)
mekongresearch@american.edu

The survey period started on March 11, 2013, with a reminder email sent on March 21st and March 26th. The survey was closed on April 2, 2013. Table A-1 summarizes the survey's administration and response rate.

Table A-1: Survey administration and response rate

Survey e-mails sent:	948
Surveys not received by targeted recipient:	166
158 failed e-mail addresses	
5 respondents unavailable throughout survey period	
3 recipients no longer working on Mekong	
Experts surveyed:	784
Responses received	165 (21%)

C. Data Preparation

Once data collection was complete, it was cleaned to check for consistency and validity. For example, if respondents provided an answer under “other” that clearly represented one of the answer choices provided, their response was recoded as the appropriate choice.

After cleaning, it was possible to analyze data. In addition to using Microsoft Excel to compile descriptive statistics and conduct simple forms of analysis, the statistical packages STATA and SPSS were used for more rigorous quantitative analysis.

D. Issues Analysis

Several questions asked respondents to rank issues according to their importance. Our analysis of these responses (see Section 3 of the body of the report) used a weighted point system, so to reflect both (a) the frequency with which a particular response was given, and (b) how highly each response was ranked (first, second, or third) when it was given. We assigned a score to each response of 4 points when it was ranked first, 2 for being ranked second, and 1 for third.

For the cluster analysis of Questions 7 through 10 (see Section 3 of the body of the report), there were 10 issues and 4 questions, yielding 40 possible unique responses and 780 possible scenarios for paired responses. (For example, an expert could respond that climate change is important and that hydropower is a source of cooperation, which is one of the 780 possible pairings of two responses across the four questions). Using the full data set, the likelihood that these relationships exist was tested using SPSS to find Goodman and Kruskal’s gamma statistic, which is a measure of correlation on ranked variables. These tests construct a table that compares actual rankings with the expected values that would occur at random. The gamma statistic is interpreted as a correlation coefficient, ranging from -1 (perfectly opposed) to 1 (perfectly correlated); it shows whether an increase in one variable is tied to an increase in the other.

Results identified 190 statistically significant relationships at a 90 percent confidence level. To depict the results in a visually informative way, circles were used to represent each of the 40 possible responses. The size of each circle was scaled to the sum of the weighted value of the responses. Connections were mapped between circles with lines, the weight of the line scaled to the strength of the gamma statistic. Circles that did not have connections were deleted for simplicity. Additionally, only positive gamma statistics were represented, showing the likelihood that responses would be associated rather than dissociated. Circles were then organized into a pattern such that there were no overlapping lines.

APPENDIX II: SURVEY INSTRUMENT

1. How long have you been working in or on the Mekong region, including work with your current organization but also prior experience?

- Less than 2 years
- 2-5 years
- 5-10 years
- More than 10 years

2. With what type of organization are you currently employed or affiliated?

- Government (within Mekong region)
- Government (outside Mekong region)
- Intergovernmental organization
- International non-governmental organization
- Local non-governmental organization
- Private sector organization
- Research organization
- Other (please specify)

3. What is your current role in the organization? (open-ended response)

4. In which country or countries in the Mekong region has your organization worked? Select all that apply.

- Cambodia
- China
- Lao PDR
- Myanmar/Burma
- Thailand
- Viet Nam

5. On which issues does your organization currently work? Select all that apply.

- Climate change or disaster management
- Commercial-scale agriculture
- Conservation of biodiversity
- Conventional energy resources
- Local-scale agriculture
- Renewable energy resources
- Social equity or poverty reduction
- Trade or private enterprise development
- Water infrastructure or hydropower
- Water supply or water quality

6. Which of the following are important sources of funding for your organization's activities? Select all that apply.

- Funding from contributions or donations

- Funding from governments in the region
- Funding from governments outside the region
- Funding from international aid or development organizations
- Funding from private sector
- Funding from private foundations
- Other (please specify)

7. Please identify from the following list the three **MOST IMPORTANT** issues for the Mekong Region in the coming decade. Place a '1' next to the most important, a '2' next to the second most important, and a '3' next to the third most important.

- Climate change or disaster management
- Commercial-scale agriculture
- Conservation of biodiversity
- Conventional energy resources
- Local-scale agriculture
- Renewable energy resources
- Social equity or poverty reduction
- Trade or private enterprise development
- Water infrastructure or hydropower
- Water supply or water quality

8. Please identify from the following list the three **MOST OVERLOOKED** or **UNDER-EMPHASIZED** issues for the Mekong Region in the coming decade. Place a '1' next to the most overlooked/under-emphasized, a '2' next to the second most overlooked/under-emphasized, and a '3' next to the third most overlooked/under-emphasized.

- Climate change or disaster management
- Commercial-scale agriculture
- Conservation of biodiversity
- Conventional energy resources
- Local-scale agriculture
- Renewable energy resources
- Social equity or poverty reduction
- Trade or private enterprise development
- Water infrastructure or hydropower
- Water supply or water quality

9. Please identify from the following list the three **ISSUES MOST LIKELY TO CAUSE POLITICAL INSTABILITY** in the Mekong Region in the coming decade. Place a '1' next to the most likely, a '2' next to the second most likely, and a '3' next to the third most likely.

- Climate change or disaster management
- Commercial-scale agriculture
- Conservation of biodiversity
- Conventional energy resources
- Local-scale agriculture

- Renewable energy resources
- Social equity or poverty reduction
- Trade or private enterprise development
- Water infrastructure or hydropower
- Water supply or water quality

10. Please identify from the following list the three ISSUES MOST PROMISING FOR COOPERATION in the Mekong Region in the coming decade. Place a '1' next to the most promising, a '2' next to the second most promising, and a '3' next to the third most promising.

- Climate change or disaster management
- Commercial-scale agriculture
- Conservation of biodiversity
- Conventional energy resources
- Local-scale agriculture
- Renewable energy resources
- Social equity or poverty reduction
- Trade or private enterprise development
- Water infrastructure or hydropower
- Water supply or water quality

11. Which of the following best describes your view of the most likely form of social conflict in the Mekong region concerning development issues in the coming decade?

- Unlikely
- Localized and episodic
- Localized and frequent/chronic
- National-scale and episodic
- National-scale and frequent/chronic
- International scale and episodic,
- International scale and frequent/chronic

12. Please rank the following in terms of their likely importance as sources of funding for economic development in the Mekong River Basin in the coming decade (1= most important, 5 = least important). The choices will be automatically reordered.

- Bilateral assistance donors
- Multilateral Development Banks
- Mekong governments
- Private sector from outside Mekong region
- Private sector from within Mekong region

13. For any of the following issue areas with which you are familiar, please identify up to five organizations (of any type) that you consider to be the most influential in the Mekong region on that issue.

- Food and Agriculture (Open-ended response)
- Water (Open-ended response)
- Energy (Open-ended response)

14. How important do you consider each of the following institutional settings to be in shaping the overall trajectory of development in the Mekong region? (Very important, Somewhat important, Not very important)

- Asian Development Bank
- Bilateral development assistance networks
- Civil society networks from outside the region
- Civil-society networks within the region
- Mekong River Commission
- National-level ministries
- Private-sector investment networks with local capital
- Private-sector investment networks with international capital
- Public-private partnership initiatives
- World Bank

15. We are interested in understanding the extent of interaction among different types of organizations working in the Mekong region. How would you describe the level of engagement between the following types of actors? (Respondents assigned a value to each dyadic pairing among the following types of actors, selecting from “Close engagement, periodic engagement, limited or no engagement”)

- International financial institutions/development agencies
- National ministries
- NGOs in the region
- NGOs outside the region
- Local affected communities
- Private sector

16. How extensive is your organization’s involvement in each of the following institutional settings? Choose the best response for each setting. (Close engagement, Periodic engagement, Limited engagement, No engagement)

- Asian Development Bank
- Bilateral development assistance networks
- Civil society networks beyond the region
- Civil-society networks within the region
- Mekong River Commission, National-level ministries
- Private-sector investment networks
- World Bank

17: If you would like to identify your organization, you may do so here. Please note that you are not required to do so, and that doing so will not affect the confidentiality of your responses. (Open-ended Response)

18. If you would be willing to take part in a focus group or interview as a follow-up to this survey, please provide your name and contact information here. Please note that you are not

required to do so, and that doing so will not affect the confidentiality of your responses. (Open-ended Response)

APPENDIX III: ADDITIONAL COUNTRY INFORMATION

Mekong Sub-region Country Summary Data¹⁰⁸ (2013)

	Cambodia	China	Lao PDR	Myanmar	Thailand	Vietnam
Population (thousands)	14,478.3	1,353,600.7	6,373.9	48,724.4	69,892.1	89,730.3
Population growth rate (percent) ¹⁰⁹	1.1	0.5	1.5	0.7	0.7	1.1
GNI per capita in PPP terms (constant 2005 international \$)	2,095	7,945	2,435	1,817	7,722	2,970
Life expectancy at birth (years)	63.6	73.7	67.8	65.7	74.3	75.4
Adult literacy rate, both sexes ¹¹⁰ (% aged 15 and above)	77.6	94.3	72.7	92.3	93.5	93.2
Improved water source, rural ¹¹¹ (% of rural population with access)	58	85	62	78	95	93
Improved water source, urban ¹¹² (% of urban population with access)	87	98	77	93	97	99
Improved sanitation facilities ¹¹³ (% of population with access)	31	64	63	76	96	76
Energy use ¹¹⁴ (kg of oil equivalent per capita)	355	1,807	N/A	292	1,699	681
Carbon dioxide emissions (tons per capita)	0.3	5.3	0.3	0.3	4.2	1.5
Food production index ¹¹⁵ (2004-2006 = 100)	155.0	124.0	141.9	138.9	123.8	126.0

¹⁰⁸ Country Profiles and International Human Development Indicators 2013. <http://hdr.undp.org/en/data/profiles/>

¹⁰⁹ UNDESA (2011). 2010 Revision of World Population Prospects.

<http://hdrstats.undp.org/en/indicators/47506.html>

¹¹⁰ Country Profiles and International Human Development Indicators. Source: UNESCO Institute for Statistics (2012). <http://hdrstats.undp.org/en/indicators/101406.html>

<http://stats.uis.unesco.org/unesco/tableviewer/document.aspx?ReportId=143>

¹¹¹ World Bank Data, 2010. <http://data.worldbank.org/indicator/SH.H2O.SAFE.RU.ZS>

¹¹² World Bank Data, 2010. <http://data.worldbank.org/indicator/SH.H2O.SAFE.UR.ZS>

¹¹³ World Bank Data, 2010. <http://data.worldbank.org/indicator/SH.STA.ACSN>

¹¹⁴ World Bank Data, 2010. <http://data.worldbank.org/indicator/EG.USE.PCAP.KG.OE>

¹¹⁵ World Bank Data, 2011. <http://data.worldbank.org/indicator/AG.PRD.FOOD.XD>