

Panel no 9A. and the slot no. 9

Analysis of Power in Lake Victoria's Fisheries: Challenges to the Adaptive Governance

Approach

Pranietha Mudliar and Karin Wedig

Prepared for the International Association of the Commons, July 1st-5th, Lima, Peru, Copyright ©

Author

Analysis of Power in Lake Victoria's Fisheries: Challenges to the Adaptive Governance Approach

Abstract

Links between power and adaptive governance are recognized in the fisheries literature, but little reference has been made to show how power dynamics can influence the emergence of adaptive governance in Lake Victoria's fisheries. By examining the legitimate and informal sources of power, through three case studies in Kenya, Uganda, and Tanzania, we demonstrate that i) while the official discourse is supportive of power sharing between governments and fishers in co-management institutions, power, instead has been eroded away from local fishers and local governments, ii) Newer actors such as the military, police, and coast guard in the co-management system are not recognized by official policy, but are highly influential and powerful, supported by an increasingly authoritarian state. The article concludes that for adaptive governance to emerge, co-management institutions need to be responsive, flexible and supportive of accountability, transparency, and inclusivity. However, the destruction and weakening of co-management institutions and the delegitimizing of local authorities makes power sharing impossible, severely constraining the emergence of adaptive governance in Lake Victoria's fisheries.

Fisheries in Lake Victoria

Lake Victoria, shared by Uganda, Tanzania and Kenya¹, is home to Africa's largest freshwater fisheries, but the lake's capacities to provide vital ecosystem services is threatened by unsustainable fishing practices, increased watershed degradation, water pollution, conversion of sensitive shoreline wetlands, reduced water inflows, a return in the proliferation of water hyacinth, eutrophication, and drought-like conditions (AU-IBAR, 2016; Ogutu-Ohwayo et al., 1997). The interrelations of these social-ecological pressures remain insufficiently understood, but a dramatic decline in Nile perch catches since the early 2000s have increased the urgency for achieving the sustainable management of the lake's resources (Balirwa et al., 2003). Nile perch is the highest-value export fish in the lake and all three riparian states depend on it for a significant share of their export earnings. The rapid reduction of catches further affects the incomes and potentially the nutritional security of large numbers of people: an estimated 35 million people in the densely-

¹ The catchment area includes two additional countries, Rwanda and Burundi, which affect the lake through runoff water from rivers. The catchment area is divided as follows: Tanzania 44%, Kenya 22%, Uganda 16%, Rwanda 11% and Burundi 7% (LVBC, 2007).

populated lake basin depends on small-scale fisheries for a living, and few have access to alternative income sources.

Decentralization in all three countries was envisioned to transfer powers to the districts, but challenges in planning and capital investment, budgeting and fiscal management, personnel systems and management, finance and revenue, and the central government's reluctance in relinquishing authority to local government abound (Wunsch, 2001). Other challenges include low compliance with existing laws, inadequate monitoring and enforcement of laws, and corruption at local and national levels, limited effective involvement of stakeholders in the fisheries management process; and limited inclusion of scientific and traditional knowledge about artisanal and industrial fisheries; illegal, unreported and unregulated fishing (IUUF), which includes excessive fishing, poor management practices, and the extraction of ornamental fish, all of which have resulted in declining fish stocks and destruction of critical fish breeding grounds and nurseries (AU-IBAR, 2016) even though all three riparian states have promoted a co-management approach for well over a decade² that has resulted in poor management of Lake Victoria's fisheries (Lawrence, 2013; Nunan et al., 2012). Additionally, fisherfolks in Lake Victoria remain under excessive economic pressure and face highly insufficient access to basic social services resulting in complexity and uncertainty in Lake Victoria's fisheries (Nunan, 2010). To cope with complexity and uncertainty, an adaptive approach to governance has been suggested, but questions remain on the role of power to foster adaptive governance (Chaffin et al., 2014).

Power in Adaptive Governance and Co-management Institutions

Adaptive governance is an approach for addressing complexity and uncertainty in natural resource issues in the face of rapid environmental change (Chaffin et al, 2014; Dietz et al., 2003; Folke et al., 2005; Folke 2006). As the term suggests, this approach seeks to develop the adaptability of socio-ecological systems (SESs) to respond to changing conditions and disturbances such as climate change, shifts in land use, and population growth by reorganizing the system to desired states (Folke et al., 2005, pg. 444). Chaffin et al (2014) define adaptive governance as “a range of interactions between actors, networks, organizations, and institutions emerging in pursuit of a desired state for social-ecological systems.”

² In Tanzania, the process of BMU formation began in the late 1990s (Nunan, 2010), while Uganda and Kenya introduced BMUs in 2003 and 2004 respectively (LVFO REF).

Adaptive governance seeks to address some of the challenges inherent in top-down governance such as difficulties in coordinating governance across large-scale ecosystems in the face of complexity (Cumming et al, 2006; Young 2002,) and bottom-up governance such as problems of coordination, lack of inclusivity, and locally-embedded power relations that silence the voices of weaker actors (Lemos and Agrawal, 2006). Adaptive governance, thus, is considered to address the problems of top-down and bottom-up governance because of its flexibility and its ability to tackle complex, unpredictable loops between social and ecological system components in highly contextualized SESs (Chaffin et al. 2014). Actors involved in making policy decisions in adaptive governance consist of broad range of state and non-state actors with different interests and beliefs who would need to self-organize to enable the emergence of adaptive governance (Sabatier, 1987; Rhodes, 1996; Ostrom and Janssen, 2005; Duit and Galaz, 2008). The self-organization of these actors is dependent on power and its distribution in the institutions (Mahon, McConney, and Roy, 2008).

While the adaptive governance literature recognizes links between power dynamics and the emergence of adaptive governance, there has been little focus on how exactly power dynamics between actors facilitate or create barriers for the emergence of adaptive governance (Jentoft, 2007; Orach and Schlüter, 2016). There is a recognition that power, a fundamental aspect of governance may very well influence the capacity and ability of a system to be adaptive (Nunan 2010). Armitage (2008), therefore, argues that “any attempt to catalyze adaptive governance must be preceded by an explicit analysis of relevant power and politics that may be precipitating environmental and social injustices stemming from the marginalization of minority cultures, religions, worldviews, and environmental ethics.”

Co-management, considered to operationalize adaptive governance, provides a more concrete concept in which to examine the distribution of power. Co-management, a power-sharing arrangement between resource users and government authority seeks to establish community participation for implementing decisions and actions according to rules (Béné and Neiland, 2006; Béné et al., 2009; Folke et al., 2005; Plummer and Armitage, 2007; Sen and Nielsen 1996). Presence of traditional authorities, artisanal fishers, specifically boat crew, and the absence of industrial fishers, as well as the existence of clear operational rules, are the context conditions that support the most successful co-management initiatives (Njaya et al., 2012; Nunan et al., 2012; d’Armengol et al., 2018). Sharing power and responsibility are

essential characteristics of co-management, with enabling legislation, participation, representation and empowerment critical for success (Pomeroy et al., 2001; Raakjær Nielsen et al., 2004). Co-management is considered to bring about the ability to respond, and cope with, sources of uncertainty, and dynamic, complex, and diverse systems, highlighting the need for flexible and responsive institutions, (Armitage et al., 2007a) learning by doing, collaboration and power sharing, and management flexibility (Olsson et al. 2004, Folke et al. 2005), Armitage et al. (2007b).

Jentoft (2007a:428) observes that co-management is concerned with the ‘restructuring of relations and moving towards a more equal sharing of power among interested stakeholders’ and notes that ‘indeed, co-management is defined as power sharing.’ Scholars caution, however, that co-management does not necessarily eliminate power games or challenge existing power structures and suggests that questions should be asked about how power is shared in fisheries co-management institutions given the lack of balance in the power relationship between governments and fishers (Jentoft, 2007a; Townsend and Pooley, 1995).

Research suggests that ensuring representativeness and sharing power and benefits results in more sustainable outcomes in co-management regimes (Jentoft, 2007; Pascual et al., 2014). Challenges in redistributing power between government and local collectives in co-management regimes persist because states are unwilling to give up on their political power (Berkes, 2010; Finkbeiner and Basurto, 2015; Lawrence, 2013). For instance, failure to involve fishers in decision-making processes and the authority of the central government to overturn local decisions resulted in a failure to redistribute power in Mexican fisheries (Finkbeiner and Basurto, 2015).

Power asymmetries persist even as management rights are devolved to local users (Armitage et al., 2007a; Berkes, 2010; Russell and Dobson, 2011). At the local level, co-management can also skew benefits towards traditional leaders and elites by further entrenching asymmetric power relationships (Adger et al., 2005; Davis and Bailey, 1996; Béné and Neiland 2004; Njaya, Donda, and Béné, 2012). Informal power structures and knowledge sharing can hinder the ability of a community to move from open-access to some form of collective action for resource management (Crona and Bodin, 2010).

Lack of legitimacy to fishers and poor institutional alignment also impede effective co-management (Ho et al., 2015; Lawrence, 2013). Ho et al., (2015) show that power sharing

between government and fishers although intended in the design of fisheries co-management in Tam Giang Lagoon, Vietnam, resulted in fishers being unable to exercise the shared powers due to lack of legal support and the influence of other policies at higher levels of government. Institutional mismatch between national and provincial policies, rules and regulations, and co-management agreements can also undermine the implementation of co-management by making it difficult for fishers to exercise their power while also making some of their exercise of power illegal. Lawrence (2013) documents that the lack of legitimacy to co-management institutions in Lake Victoria's fisheries damages the ability of the BMUs to enforce regulations and the lack of financial returns to the BMUs limits the ability of the BMUs to function. Nunan et al., (2018) show that corrupt practices linked to illegalities discourages local level fisheries management structures – the Beach Management Units – from enforcing regulations and contributes to a lack of trust between fishers and government. These corrupt practices reflect power relations where government officers have the power to demand bribes and fishers have little power to avoid paying bribes, given that the other option is risk going to court (Medard et al., 2016). Thus, even as co-management has been theorized to result in power sharing, more and more scholars have called for an increased emphasis to provide more evidence on the role of co-management in dealing with conflicts, power asymmetries and equity.

Nunan (2010) argues that there is a strong case for an adaptive governance approach in Lake Victoria because of high complexity arising from three major fisheries, with more than 200,000 fishers, traders, processors, migrants, fish agents bringing in additional interests to the lake basin at more than 1400 landing sites around the lake in three counties with 34 district governments and many lower level local governments. Sources of uncertainty in the lake basin emanate from the interplay between factors influencing stock decline of the Nile perch fisheries, such as ecosystem influences, overfishing and illegal fishing, and the potential impacts of climate change (Glaser et al., 2019; Nunan 2010). While there are numerous sources of information and knowledge across the lake, challenges remain in collating and sharing the information. These variables of complexity and uncertainty contribute to a low or moderate level of governability found in many small-scale fisheries (Chuenpagdee et al., 2008). D'Armengol et al., (2018) suggest that examining case studies where co-management has been in place for at least more than 10 years will shed light on the extent to which co-management is effective in resolving existing grievances or buffering against potential new conflicts and in balancing power

asymmetries. In the nine years since Nunan's (2010) investigated the potential for adaptive governance to emerge in Lake Victoria's fisheries, we examine whether and how have the co-management institutions resulted in power sharing to facilitate the emergence of adaptive governance in Lake Victoria's fisheries.

In the next section, we present the theoretical framework for the study following Agrawal and Ribot's (1999) decentralization framework and Lukes' (2005) three dimensions of power. In Section 3 we present our methods followed by the results in Section 4. In Section 5 we discuss the implications of the study and in Section 6 we present our conclusions.

Section 2: Theoretical Framework

We consider the role of actors, powers and accountability in decentralization following Agrawal and Ribot's (1999) and Lukes' (2005) three dimensions of power to describe the distribution and manifestation of different kinds of power among actors in the co-management of Lake Victoria's fisheries. By focusing attention on actors and power, the decentralization framework helps describe various power relations between older and newer actors entering the co-management space that are critical for the emergence or hindering of adaptive governance. The following key steps constitute the basis of the framework: a. Identifying the key stakeholders in the local arena who exercise power over public resources, including appointed or elected officials, NGOs, traditional leaders, influential individuals, and corporate bodies such as community leaders, cooperatives, and committees and b. classifying power into three types: legislative (power to create rules), executive (powers to make, implement, and enforce rules and decisions), and judicial (powers to adjudicate disputes).

As Njaya et al (2012) point out, Agrawal and Ribot's (1999) decentralization framework has limited applicability because it focuses on the exercise of power by the government powers and not on the exercise of power by informal and local actors who may play crucial roles in the emergence of adaptive governance. The decentralization framework may be able to capture actors not recognized or described in formal policy, but may not be able to describe the power that they wield. Therefore Lukes' (2005) three dimensions of power allows for an analysis of power held by actors that are not included in policy, rules, and regulations. According to Lukes' (2005), visible power are situations whereby a community and or interest groups openly hold power to influence formal decision-making processes. In this context, empowered actors openly make decisions based on their set goals. Hidden power involves situations whereby an agenda is

set or pushed “behind the scene” by a certain group of actors—often to the exclusion of others—and where interests are mobilized to shape the agenda and outcomes. Invisible power centers on deeper social conditioning, culturally embedded norms and values, effects of knowledge, ideology, and global views. Taken together, these two frameworks provide an analytical tool for examining how power dynamics in co-management institutions can facilitate or hinder the emergence of adaptive governance in Lake Victoria’s fisheries.

Section 3: Methods

Data Collection and Analysis

The findings are based on 108 semi-structured interviews conducted in 2017 and 2018 with local government officials, district fisheries officers, directors of fisheries, principal secretaries of fisheries, BMUs, and fisherfolks. Interviews with BMUs were conducted in Luganda in Uganda, in English in Kenya, and Swahili in Tanzania with the help of a field assistant fluent in English. Interviews lasted for 60-90 minutes. Interviews with government officers were conducted by the principal investigator in English. Interviews were complemented by a policy analysis of documents such as fisheries regulations and BMU guidelines for Kenya, Uganda, and Tanzania. Following Miles & Huberman (2005), we used qualitative data analysis techniques to analyze the interviews and documents. Coding was largely deductive and was guided by the theoretical framework to generate findings organized according to Agrawal and Ribot’s (1999) actors, power, and accountability framework and Lukes’ (2005) three dimensions of power (see Appendix 1 for the semi-structured questionnaire and Appendix 2 for the codebook).

Study Context

Since the early 1990s, Uganda, Kenya, and Tanzania have been promoting a co-management approach to Lake Victoria’s fisheries (Nunan, 2010). While Lake Victoria’s fisheries operates under an open-access regime, every person involved in fishing has to be a member of a Beach Management Unit (BMU)—local co-management organizations tasked with fisheries resource management at beaches and landing sites (LVFO 2007, Nunan 2010). By 2016, a total of 1069 BMUs had been formed: 281 in Kenya, 355 in Uganda, and 433 in Tanzania. BMUs must be registered directly with the LVFO (LVFO 2015). The BMUs, along with BMU networks and co-management committees at the sub-district, district, national, and regional level are responsible for fisheries management. BMUs work in direct partnership with local government officials who, together with elected fisherfolks, form the BMU committees. Anyone who is directly involved in

fishing (boat owners, boat crew, traders) must be registered with a BMU, which guarantees fishing rights, the right to speak at meetings and to elect members to the committee, and the right to be nominated to the BMU committee.

At the regional level, the key stakeholders are the fisheries departments and the fisheries research institutes that come under the Lake Victoria Fisheries Organization (LVFO). The LVFO Secretariat located in Jinja, Uganda, through working groups and committees facilitates policy-making and review of implementation and indicators of fish productivity and fisherfolk livelihoods. The LVFO, formed in 1994, oversees the management of the lake’s fishery resources and aquaculture. Its principal objectives are to foster co-operation among the EAC Partner States, harmonize national policies for the sustainable utilization of fisheries and aquaculture resources of EAC water bodies, and to develop and adopt conservation and management measures. It undertakes regular hydro-acoustic surveys, catch assessment and Biennial Frame Surveys that assess the intensity of fishing efforts to inform management decisions (AU-IBAR, 2016). (See Figure 1).

A key policy instrument that the LVFO develops and implements is the Fisheries Management Plan (FMP), is now in its third phase (2005-2008, 2009-2014, and 2016-20). The current plan (FMP III) incorporates the lessons of the EU-funded FMP I and II and calls for an ecosystem, adaptive, collaborative management approach to fisheries in Lake Victoria (AU-IBAR, 2016). With the FMP, and largely through the BMUs, the LVFO aims to move from a command-and-control regime to adaptive co-management of fisheries.

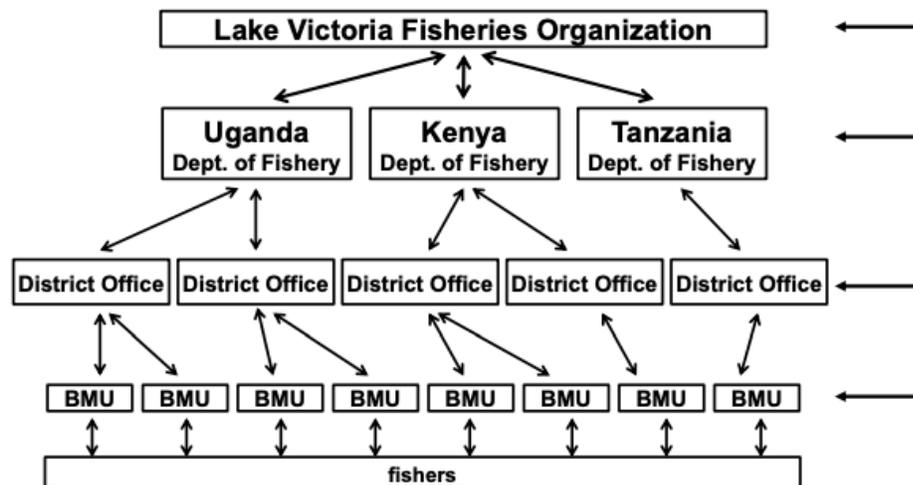


Figure 1: A simplified schematic representation of the actors in fisheries management on Lake Victoria.

Section 4: Power Analysis in Fisheries Co-management

In this section, we use the actors, power, and accountability framework by Agrawal and Ribot (1999) and Lukes' (2005) visible, invisible, and hidden dimensions of power to examine power sharing in co-management of Lake Victoria's fisheries through three case studies located in Kenya, Uganda, and Tanzania (see Table 1 below)

		Kenya	Uganda	Tanzania
Actors	Regional	Lake Victoria Fisheries Organization		
	National	Ministries of Fisheries and Aquaculture, Water and Environment, Kenya Fisheries Council (KFC) Kenya Fisheries Service (KFS)	President Musevini, Ministry of Agriculture, Animal Industry, and Fisheries (MAAIF), Uganda People's Defense Force (UPDF), Department of Fisheries	President Magafuli, Ministry of Agriculture, Livestock, and Fisheries Development, Directorate of Fisheries, Coast Guard, Police
	District	District Fisheries Officer (DCO)	District Fisheries Officer (DFO)	District Fisheries Officers who answer to the District Council i.e. the local government also known as TAMISEMI
	County	County Fisheries Officer (CFO), BMU Assembly	Fisheries Officers, but they are currently suspended by President Musevini	County fisheries officers
	Landing Site	Ward fisheries officers, BMUs, BMU Chairperson, fishers.	Previously BMUs and now Landing Site Management Committees (LSMCs) created by the UPDF.	Ward Fisheries Officers, BMUs, fishers.
Legislative Powers		KFS formulates policy. Fisheries officers at the district and ward level can develop management measures.	Department of Fisheries formulates policy.	Directorate of Fisheries formulates policy BMUs propose by-laws for endorsement by the District Authorities.

	BMUs can adopt new by-laws and amend existing by-laws.		
Executive Powers	<p>The KFS undertakes monitoring, control and surveillance operations.</p> <p>County governments distribute recreational fishing and fish processing licenses, and KFS issues licenses for, industrial fishing or commercial aquaculture.</p> <p>BMU Chairperson has the power to arrest fishers for illegal and overfishing.</p> <p>BMUs have the power to register fishers, undertake monitoring and surveillance of fisheries as well as arrest illegal fishers.</p>	<p>BMUs would provide permits to fishers, and consult with central government and local government to establish fishing zones in specified areas.</p> <p>BMUs would ensure fish is landed and generally transacted exclusively by registered fishers, owners.</p> <p>LSMCSs have now taken over these activities under the leadership of the army.</p>	<p>BMUs collaborate with the Director of Fisheries, TAFIRI and or Local Authority, to identify fish breeding areas on the basis of indigenous knowledge and identify and clearly demarcate them as breeding and nursery areas</p>
Judicial powers	<p>Director General of Fisheries has the power to resolve conflicts between the County fisheries management plan and the Fisheries Act.</p> <p>BMUs are in-charge of conflict resolution at the landing site.</p>	LSMCSs and the UPDF	<p>BMUs identify development interventions at the landing site, collect fisheries data, undertake monitoring and surveillance operations, identify fish breeding areas, collaborating with relevant authorities to eliminate harmful and illegal fish trading practices, and raise awareness of HIV/AIDS at the landing site.</p>

			Directorate conserves fisheries and TAMISEMI collects revenue. The Directorate of Fisheries enforces regulations against illegal fishing.
Visible Power	KFD, police, and the coast guard burn illegal gear.	UPDF enforces regulations by burning nets and boats of illegal fishers in full sight to dissuade fishers from fishing illegally.	The Directorate of Fisheries is visible on the lake enforcing regulations and burning illegal gears.
Hidden Power	Double licensing by the central and the county government is one way to assert control of fisheries. Politicians allow illegal fishing to continue to further their own interests of gaining votes. Family ties prevent BMUs from enforcing regulations against illegal fishing.	Fisheries officers undermine the BMU by allowing illegal fishing to occur. Local politicians wield hidden power.	Enforcement by BMUs is undermined by fisheries officers and family ties. Enforcement by fisheries officers is undermined by local politicians. Enforcement by the central government undermines the authority of the local government.
Invisible Power	Corruption is endemic throughout multiple levels of management.	The widespread culture of corruption and bribes has become the status quo that enables illegal fishing to continue.	Corruption and lack of capacity has become the status quo.

Table 1: Actors in Lake Victoria’s fisheries and the different kinds of power that they wield

a. Kenya

Actors in Co-management

At the national level in Kenya, main stakeholders include the Ministries of Fisheries and Aquaculture, Water and Environment and the Kenya Fisheries Service (KFS). The Fisheries Management and Development Act of 2016 establishes the Kenya Fisheries Council (KFC) that

consists of representatives from different ministries, universities, and from the fisheries sector that develop fisheries policy. At the county level, the actors involved include the fishers, BMUs, and the ward fisheries officers who report to the District Fisheries Officer (DCO) at the district level. The police and the coast guard are involved in conducting monitoring and enforcement operations, but policy documents do not refer to these actors.

Legislative Power

The KFS has the authority to formulate policy. The county government, composed of the Fisheries Officers at the District and the Ward level, is permitted to develop management measures and plans for fisheries consistent with the Fisheries Management and Development Act, 2016. At the local level, the BMUs are allowed to create bylaws.

Executive Power

The KFS is in-charge for the conservation, management, and development of Kenya's fisheries; viz. the implementation of policy regarding conservation, management through a Monitoring, Control, and Surveillance Unit, and utilization of fisheries resources as well as raising revenue through levies and fees.

Fisheries officers at the county level and officer from the KFS mentioned confusions about the power of the county government and the state government to provide licenses. According to the Kenya Fisheries and Development Act of 2016, county governments distribute recreational fishing and fish processing licenses, and the KFS, issues all other fishery-related licenses, such as industrial fishing or commercial aquaculture. According to the KFS, the misinterpretation of this law has resulted in the "double licensing of many fishers, as individuals purchase licenses from both governmental bodies. The fishermen are licensed, but they still accept our licenses because our licenses are more national, they allow them to move from one county to another, but the one they would get from Kisumu county, for example, will only be limited to Kisumu." An officer of the KFS said,

This confusion, is, like I said before, is deliberate. It's about people choosing not to do the right thing because you can refer to the law. Whenever the counties are not satisfied with the licenses they are issuing for trading, they are tempted to license the fishers, but they are not supposed to license them.

At the local level, the BMUs are supposed to enforce fisheries regulations, collect data for improving fisheries management and research, but interviewees said that a lack of capacity and funds prevents the BMUs from carrying out their functions.

Judicial Power

While the Fisheries Management and Development Act, 2016 provides authority to the Director General of Fisheries to resolve conflicts between the County fisheries management plan and the management-related provisions of the Act, interviewees mentioned that conflicts and confusions over licensing persist.

At the landing site, BMUs are in-charge of conflict resolution as they are considered to be the closest to the fishers, but challenges of capacity, awareness, and human personnel remain. An officer said, “For the BMU, conflict resolution is very easy. It was envisioned that by the time a problem reaches the county, the BMU chairman will have solved the problem, but lack of education level on the beaches and the lack of people in the committee prevents them from resolving conflicts.” BMU members said that they are threatened with violence whenever they attempt to curb illegal fishing. Thus, even though the BMUs have the authority to punish illegal fishers, they lack the ability to do so because they lack legitimacy. Interviewees also said that BMUs no longer organize their own patrols anymore but accompany the KFS when it comes to their landing site.

Visible Power

In a visible depiction of power, the KFD, police, and the coast guard conduct operations to seize illegal gear, which are set ablaze in full view to curb illegal fishing. However, interviewees said that illegalities still continue on the lake.

Hidden Power

Both national and county governments have their own agendas that interferes with the management of the fisheries. Officers in the KFS conjectured that the double licensing is a case of deliberate and willful misinterpretation of the law for their own purposes, specifically for gaining funds and ownership of the resource. The interviewee said that some county governments conclude, “This is our area of jurisdiction; this lake is our resource. How can we stop the central government to take revenue from here? Why should the national government be licensing our resource?” Interviewees in the central government suggested that double licensing indicates the failure of decentralization and that recentralization and consolidating authority back with the central government would be a solution to meet the challenges of decentralization. The county government, echoing this perception, said that the central government is attempting to take control

of fisheries through licensing. An officer said, “Control of access to fisheries is in licensing, so you find the upper office trying to do that, given that law is not very clear.”

The hidden agenda of politicians also allows for illegal fishing to continue unabated. An officer said, “Politics plays a very big role. Because the politicians get votes from the fishers, the politician gets many complaints from the fishermen, so they interfere with the closure of the lake.”

Interviewees also mentioned that the BMUs are rendered powerless when they attempt enforcing regulations against illegal fishing because of issues of enforcing regulations against their own relatives. An officer said,

Many BMU officials have suffered setbacks because whenever they have tried to be strict, they end up discovering that the illegal fisher is a cousin or some relative. Even if they arrest the illegal fisher and take them to court, it becomes difficult to persecute them. The BMUs are then blacklisted at home, so it has been a big challenge and I don't know how we can get the leadership, if they are not coming from the same area, and that's why this has not worked well in my view. BMUs have not been able to do the work well because of the interference from issues of tribalism, clans, and so on.

Invisible Power

As has been previously documented by Nunan et al., (2012) and supported by our interviews, endemic corruption in the system fuels illegalities. Lack of funds to the BMUs to undertake monitoring and enforcement activities, as well as the voluntary labor expected out of BMUs are some of the factors that enable corruption.

b. Uganda

Actors in Co-management

Until 2015, actors involved in co-management include the Beach Management Units, the BMU Chairperson, and the BMU Assembly at the local level. The District Fisheries Officer (DFO) is present at the district level, in-charge of policy implementation, monitoring and surveillance, and data collection. At the national level, the Ministry of Agriculture, Animal Industry, and Fisheries (MAAIF) makes policy guidelines and rules. However, in November 2015, Museveni issued an executive order dissolving all community-based BMUs in the country, even though he had previously allowed fishers to continue fishing illegally during his political campaigns. As one interviewee said, “But the President, back then, is also to blame because during the times of campaigns he would also give conflicting information, telling the fishermen now you can fish, who is stopping you?” Another interviewee described the confusion during this period:

We never got any intimation. It's like during elections the president just woke up one day, and said there are illegalities in the lake, the fisheries officers are not doing, and that you're all suspended. But now when we researchers went out, we had challenges, because there was lawlessness in the lake, people were fishing as and when and with whatever they wanted and that stayed all through the period before, after voting.

Museveni's 2015 order, framed as necessary to clean up corruption, took the MAAIF officials by surprise. Senior officials of MAAIF appointed temporary two-person fishing landing site committees along lake and river shores (Kantel, 2018). Next, in February 2017, the Ugandan People's Defense Force (UPDF) was introduced as a new actor on Lake Victoria by the President. In some landing sites the UPDF appointed new committees are now called Landing Site Management Committees. One fisher described the formation of the LSMCs

The BMUs were a community venture. Then the soldiers came. They organized us—forced us—mobilized us into attending a meeting. They created a LSMC and appointed leaders by asking us to say, 'yes or no' to show support for a candidate. This is how the elections for the LSMC were 'free and fair'. There is no legal framework to guide the management of the LSMC, so they work under the leadership of the army.

Another fisher said,

They [the fishers] all got involved though there was no say, because these people were scared, they were fearful of the army, but they didn't have any say in what was going on. They could only say, yes, yes, and that they were available as the army was constituting the committee.

Legislative Powers

Before 2017, the CFO and the BMUs had the power had the power to create bylaws, but after the suspension of the CFOs and the disbanding of the BMUs, interviewees said that BMUs rules and regulations were adopted by the LSMCs, under the leadership of the army. At the central level, the Fisheries Act of 2000 authorizes the Department of Fisheries to make policy. A new draft is currently under review. Currently, Presidential orders and declarations, without going through the legislative process, have replaced lower level institutions such as the BMUs and fisheries officers at the county level.

Executive Powers

In Uganda, until about the end of 2017, the BMUs, the Chairperson, the BMU Assembly, and the CFO had the power to enforce rules and provide permits to fishers. In 2017, the UPDF disbanded the old BMUs and created new LSMCs by appointing new members. Interviews said that the LSMCs enforce rules on illegal fishing, with the UPDF's backing, suggesting that the UPDF's hold executive power without any formal policy. A fisher said,

That [the appointments of the LSMC members] will depend on the army, so, in case you make a mistake, or you don't really abide by their rules and regulations, the following month you won't be on the committee

Fishers said that there is no difference between the BMUs and the LSMCs other than the forceful implementation of rules to curb illegal fishing. One fisher said, "There is a distinct difference, only that the new LSMCs are supposed to forcefully implement policies, whereas the BMUs had a community approach. These ones are –do this, don't do this. You only touch the boat, they come and beat you, and take you off, or even imprison you."

With regard to the executive powers of the UPDF, there are no guidelines, rules, or policies that demarcate the authority and the powers of the UPDF other than the presidential declaration. As one interviewee said, "There is no known documentation saying that the army will take over the enforcement. It is just an order from above with no known justification as to why the army should be seen as better enforcers and whether that is sustainable. Will using the army change the way fishers are thinking, the way they are fishing? I don't know."

Judicial Powers

BMUs would previously play an important role in resolving disputes between fishers, but after the disbanding of the BMUs, LSMCs and the UPDF have taken over these functions. Similarly, while the Fisheries Act authorized fisheries officers to arrest offenders, with the suspension of the fisheries' officers, the UPDF now carry out these tasks.

Visible Powers

There are several kinds of visible power operating at the local level in Uganda. While BMUs had the legislative power to arrest illegal fishers as explained above, these powers are severely curtailed by several factors such as retaliation by the fishers in the form of vandalizing property of the BMU members, killing livestock, and burning vehicles of fisheries officers.

With regard to visible power of the UPDF, nets and boats of illegal fishers are burned in full sight to dissuade fishers from fishing illegally. Yet, interviewees said that these tactics have not been completely successful because fishers resort to even riskier measures such as fishing illegally at night to avoid detection by the army.

The President's declaration to use the UPDF to crack down on illegal and over fishing on the lake is another manifestation of visible power that has superseded any formal policy document, even in the absence of formal policy authorizing the use of the army to crackdown on illegal fishing. The army, too, employs violent tactics and abuses to curtail illegal fishing. Fishers

in Uganda mentioned that this tactic has proven to be effective in cracking down on illegal fisheries, but some fishers resort to illegal fishing at night to avoid detection by the army. The tactic of using the UPDF has also created an environment of distrust and fear. One fisher said,

So when they [the fishers] go to the lake, yes they go but they're doing it in fear, and most of the time they even can't catch the fish thinking it's maybe small, it's not the recommended fish that they want, and some of them just don't go to the lake because of the fear that they will catch an immature fish and they will be maybe taken to prison for that.

Another fisher said,

The approach that the government used was just to chase out people from the lake, tell them to leave the lake, and then burn their nets and the boats, without providing an alternative to them. That's the major problem they are having, that they were just left there and no one has come back to see how they are faring, what happened to them after breaking and destroying their boats and their nets. So, who is the government planning for? For us on the lake, or for some group of people elsewhere?

Hidden Powers

Along with the President in creating an environment of confusion, Minister of Parliaments (MPs) also contributed to this culture by encouraging illegal fishing that prevents the FOs and the BMUs from enforcing regulations. For instance, one interviewee said, "Political interference whereby the area MPs tend to interfere with the management of the lake in the sense that they're telling these illegal fishers, no, who's stopping you from fishing?"

Invisible Powers

The widespread culture of corruption across multiple levels of management has become the status quo that enables illegal fishing to continue. For instance, one fisher said, "I know they pay bribes at three levels; the DFO, the fisheries officer, and the BMUs. The DFO, oh yes!! He drives his car here and the BMU goes around the fishers collecting his bribe. And he is sometimes present to witness the process."

On corruption in the BMUs an interviewee said,

The BMUs cannot enforce the regulations because their preoccupation is with eating bribes. Because of money, these BMU guys who were elected are poor, they cannot serve. Unless there is another authority that can force them to serve. For example, there is no one involved in illegal fishing that the BMU doesn't know. They know what everyone here is doing and all the illegal materials. But the BMU tells me to give him 'his' (to pay a bribe) and you continue doing whatever you want.

Explaining the continuation of illegal fishing, one interviewee said,

Many people have devised means of survival in the industry, each fish trader or fisherman has a connection with the authorities, these ones can rescue them in case they have been arrested for illegal activities. You have to bribe these guys to survive in the industry. Otherwise you can easily lose the trading license.

Currently, even though the UPDF has been tasked with wiping out corruption, interviewees said that the UPDF also engages in corruption. One interviewee said, “We have heard that tendencies of corruption has also crept in within the UPDF. If they find a fisherman with a big fish, they’ll just take it from him because its lucrative.”

c. Tanzania

Actors in Fisheries Management

In Tanzania, at the national government the Ministry of Agriculture, Livestock and Fisheries Development is in-charge of making policy. This includes the Principal Secretary. There are three Directorate of Fisheries and Assistant Directors in-charge of Fisheries Planning, Fisheries Resources Protection Unit (FRPU), Fish Quality Control and Marketing, under the Department of Fisheries. The local government that is in-charge of policy implementation, at the district council there are the District Fisheries Officers (DFOs) and at the ward level there are the Ward Fisheries Officers. On January 1, President Magafuli introduced Operation Sangara (Nile Perch) 2018 to crack down on illegal fishing. The FRPU, comprising of the fisheries division, the coast guard, and the police was entrusted with this responsibility. At the local level, BMUs continue to function in Tanzania.

Legislative Powers

The Department of Fisheries is responsible for promoting, developing, controlling, and monitoring fisheries. While the BMUs have the authority to propose rules, similar to BMUs in Kenya and LSMCs in Uganda, their capacity is limited.

Executive Power

BMUs are tasked with identifying development interventions at the landing site, collecting fisheries data, undertaking monitoring and surveillance operations, identifying fish breeding areas, collaborating with relevant authorities to eliminate harmful and illegal fish trading practices, and raising awareness of HIV/AIDS at the landing site.

There are conflicts in the executive powers between the county government also known as TAMISEMI (Ministry of Regional Administration and Local Government) and the central government. An interviewee said,

TAMISEMI is interested in revenues and the Fisheries Division is interested in managing the resources so there are conflicts between those two. This sort of conflict really affects fisheries management because some people are only thinking how they can get revenue out of the resources, but they don't think about how to manage the resource

There is also an overlap in the responsibilities of the TAMISEMI and the central government that creates problems of accountability as well as inefficiencies. For instance, one officer said,

The local government also has fisheries officers who are also responsible for enforcing similar services, law enforcement and we are responsible for it, too. They feel like they are the ones who own the fishers and the resources. But as a central government, we are responsible for the entire region where we have districts in our region. But the local government is not accountable to me. I am not their boss. They are accountable to their executive director and I am accountable to the central government. In my view, if anything goes wrong, who is accountable? Are you going to charge the local government or the central government? So, there is this kind of system where no one is held accountable and both governments are blaming one another because there is no clear demarcation about the activities undertaken by the local and the central governments.

Another interviewee elaborated on the conflict:

The director is interested in collecting revenue to run his own district while the national fisheries director is interested in conservation. So, on one hand, district director is telling the fisheries officer to collect more money while the other one [national director] is telling the Fisheries Officer under the central government to protect the resource. This is the problem. And the DFO will not listen to the national regulation because if he is not bringing in money, then he is redundant.

Fisheries officers said that since “the local government does not do enough to reduce illegal fishing”, the presence of the fisheries officers under the national government at the landing sites becomes necessary. The presence of the central government at the landing sites also contributes to conflicts between the central and the local government. As one interviewee said,

Sometimes when we go to the districts for enforcing a law, we get complaints from the district that we went without informing them. They want us to inform them, but if I am doing something good, why should you complain? I have come there to make some kind of enforcement, so why don't you like it?

The county government, on the other hand, perceives the lack of communication about enforcement operations between the central and the local government as undermining their authority. A fisheries officer said,

We are not informed that they [CG] are coming. If they tell me, I will at least know that such an activity is being conducted in my area. If my supervisor asks what is x and x, I don't have the answer for that because I was not involved in that. And if someone has told me, I know how to

answer them, but if I am not involved in an activity in my area, then it will be very difficult to answer them. For instance, Operation Sangara 2018 does not involve the councilmen. They feel that we will discourage those exercises, but it is better if they tell us because we are in-charge of managing the fisheries. It is better to hear from them than hear from the fishing community.

Another officer said, “There is also a conflict between BMUs, FO, and the DFO about who is the boss. So, if I say don’t do this and the DFO says do this, it is a problem and dilemma for the BMU regarding from whom they should get the command.” Fisheries officers from the local government in Tanzania, too, were suspended on charges of encouraging illegalities and corruption.

Judicial Power:

Adjudicating disputes is an important task for the BMU, but similar to Uganda, these tasks have been taken over the central government.

Visible Power

Similar to Uganda and Kenya, the FRPU in Tanzania burns the illegal gear to render illegal actions visible so that fishers will be deterred from illegal fishing in the future.

Hidden Power

Fisheries officers undermine the BMU by allowing illegal fishing to occur, which then poses another challenge to the BMU’s authority. For instance, one fisher said, “the BMU cannot dare stop me from fishing illegally when the professionally trained boss i.e. my fisheries officer has allowed me to fish.” Similar to Kenya and Uganda, interference from local politicians also undermines enforcement operations. Even if the officers want to enforce regulations, they are prevented from doing so by the local politicians. One officer said,

We have the elected leaders who would like to be popular even in cases where they are contradicting the government policy. For instance, patrols intervene to make sure that illegal gears, fishing methods and illegal fishers are controlled. And, so, people who expect their votes from those groups interfere to show that these people should be left alone. This makes the illegal fishers stronger because they are supported by strong people.

Invisible Power

Finally, on corruption and the lack of capacity as the status quo, an interviewee said,

We have the leaders such as secretary, treasurer, chairperson- they are not paid. They are volunteering, which makes them vulnerable to corruption and they don’t get anything. It is easy for them to be bribed. There could be paid, but they are not. That is why they are engaging in corruption. As our BMUs don’t have self-financing mechanism. They cannot stand on their own

and cannot undertake day-to-day activities. They are not trained and keep changing their leader after 2 years, but they don't get training on how to operate and how to run the BMU. Initially it was promising but now everything has changed. They are just coping with the situation.

Furthermore, the use of the police and the coast guard for undertaking undermines the authority of the DFOs as well as the BMUs, undermining their legitimacy in fisheries management, creating widespread discouragement among the DFOs. One officer said, "We are supposed to be enforcing the fishing regulation so that the fishermen adhere to the regulations. But because of the political agenda, we can't. What can you do? And when you attempt to do it, they say you are disturbing their voters."

Section 5: Discussion

This article sought to answer the research question, 'what is the extent of power-sharing in the co-management of Lake Victoria's fisheries that can enable or hinder adaptive governance?' Using Agrawal and Ribot's (1999) framework and Lukes' (2005) three dimensions of power, we could discern power dynamics that undermine the co-management of fisheries in Lake Victoria, and consequently the shift toward adaptive governance. We found that while higher authorities are supportive of co-management, all three states are unwilling to transfer power to lower levels of government. Furthermore, the introduction of newer actors, into the system, with no previous experience in the fisheries sector without any formal policy or guidelines seriously undermines the legitimacy and authority of mid-level entities (e.g. county government) and lower level entities (e.g. BMUs). These newer actors such as the UPDF in Uganda and the police and the coast guard in Kenya and Tanzania are considered to be even more powerful than any authorities created by formal policy, negating any move toward power-sharing between local and higher authorities. Our analysis confirms previous observations where the legitimacy of the BMUs are threatened by the involvement of the police and army personnel in fisheries enforcement, the corrupt relationships between BMUs and Fisheries Officers that are "legitimated" throughout the local, mid-level, and higher management levels, and non-compliance of fisheries regulations (Lawrence, 2013; Ogwang et al. 2009).

. Instead of sharing power, the state has withdrawn power from the local and mid-level authorities—more clearly and suddenly in Uganda through disbanding BMUs and suspending fisheries officers, and gradually in Kenya and Tanzania through confusions in licensing to secure access to fisheries and by conducting monitoring and enforcement operations without involving the local government. This incursion of the state in local level functions, results in no downward

accountability and transparency in decision-making, constraining the ability of co-management institutions to be flexible and responsive, and, thus, making the shift towards adaptive governance challenging.

Kenya

A lack of clarity regarding rules and regulations seriously undermines the legitimacy of institutions (Lawrence, 2013). The challenges posed by the distribution of licenses by state and county governments reflects the state's failure to grant resource users and county governments agency over their resource and funds. Without this sense of ownership, county governments and other local actors have considerably less motivation or urgency in the conservation of the Lake Victoria fisheries, as they may still view it as property of the national government, resulting in the inefficiencies such as double licensing and continued disenfranchisement of local actors. The confusion over licensing also reflects a tendency of devolved governments to not commit to sustaining institutions, share power, and build capacity because of other sectors are competing for limited resources. However, such failed redistributions of power weaken both national and local government bodies that are ultimately detrimental to the resource needing conservation as well as the local resource users. Thus, the creation of co-management institutions through decentralization has merely been the extension of the central administration into rural communities, without actually granting any power, resources, or responsibilities to local branches of government (Agrawal and Ribot, 1999; Ribot, 2002).

BMUs are expected to play a role in the conservation of Lake Victoria, but they have little or no say in the regulations which they are supposed to carry out, as the state develops policies and prescribes counties and BMUs with the responsibility of implementation. BMUs and counties are constrained in fulfilling these functions because of lack of capacity, corruption, lack of funds and training (Lawrence, 2013; Onyango and Jentoft 2010).

Uganda

According to Njaya et al (2012) visible power is the easiest source of power to deal with from an analytical point of view as it is openly exercised and reinforced by legislation, law, or the constitution. However, our data suggest that other forms of visible power occur even in the absence of formal policy that mandates the presence of such power. Without legislative backing, newer actors have little accountability as well as little impetus for power sharing (Agrawal and Ribot, 1999). For instance, in Uganda, the UPDF is also a new actor in Lake Victoria's fisheries

that has not been identified in the co-management literature so far but has an influential and powerful role to play in enforcing regulations. The presence of the military on the lake also reflects the authoritarian tendencies of the Ugandan state (Kantel, 2018).

We also find that challenges to enforcing of regulations emanates from a combination of visible, hidden, and invisible forms of power. While BMUs derive much of their power from legislative backing, they are severely challenged by fisheries officers and local politicians who turn a blind eye toward illegal fishing exercising their hidden power. Fishers too exhibit visible power by openly defying regulations. These challenges evolve from invisible manifestations of power such as the endemic culture of bribery that pervades across all level of governance and interference from politicians that allows illegal fishing, undermining the legitimacy of co-management institutions (Lawrence, 2013; Nunan et al., 2018; Onyango and Jentoft 2010).

Tanzania

Tanzania has a combination of challenges seen in Kenya and Uganda. Similar to the other three countries, BMUs and mid-level authorities have legislative, executive, and judicial powers that are seriously undermined by the lack of legitimacy to these institutions from higher authorities. There are conflicts between DFOs and the central government with regard to undertaking enforcement measures—Operation Sangara 2018—that came after a directive from the President. DFOs find their authority severely compromised even as newer actors such as the police and the coast guard enforce fisheries regulations to curb illegal fishing (Lawrence, 2013). The confusion over conducting enforcement operations between the central and the local government also illustrates the absence of real devolvement to the local government revealing the hidden agenda of the central government to relinquish power to the local government. (Agrawal and Ribot, 1999; Onyango and Jentoft, 2010; Smoke and Lewis, 1996). Such instances have been documented in other parts of Africa, where despite the official discourse in support of co-management, much of it remains on paper. Instead centralized management of fisheries remains the dominant mode of functioning, undermining the powers of the local fishers and the county governments (Chinsinga, 2005).

Section 6: Conclusion

Co-management benefits from involving a diversity of actors, but it faces the challenge of doing so while strengthening cooperation, dealing with conflict and achieving ecological outcomes, particularly when community representatives and industrial fishers are involved

(d'Armengol, 2018, Nunan, 2010). Co-management has the potential to provide structures and processes to enable the move towards adaptive governance. In the past ten years, co-management on Lake Victoria has gradually and at times, suddenly, eroded power away from local fishers. With the introduction of powerful new actors without legislative backing in the waters, the power scales have tipped towards the state, with little accountability, transparency, and representation in the system.

In order to make the move toward adaptive governance, there is a need to develop the capacity of the system to be responsive and flexible. However, without adequate power (in the case of Uganda no power at all) with lower entities, the ability of co-management structures to be responsive to environmental challenges may be severely constrained. Furthermore, with the wiping out of BMUs in Uganda, and reluctance of the state to relinquish authority to county governments in Kenya and Tanzania, it is evident that the state does not see BMUs and county governments as an equal and legitimate partner in co-management. Ten years ago, Nunan (2010) documented that power-sharing had begun in the early stages of co-management in Lake Victoria. Yet, our analysis shows that in the past ten years, the state has systematically dismantled co-management structures and processes and has taken back the initial power that was devolved to lower authorities and local fishers. This inflexibility poses a challenge not just to the emergence of adaptive governance, but to the existence of co-management and the sustainability of Lake Victoria's fisheries.

References

- Adger, W. N., Hughes, T. P., Folke, C., Carpenter, S. R., & Rockström, J. (2005). Social-ecological resilience to coastal disasters. *Science*, 309(5737), 1036-1039.
- African Union Interafrican Bureau for Animal Resources (2016). Fisheries Management and Development Processes in Lake Victoria - Enhancing Regional Fisheries Management Plan. AU-IBAR Reports
- Agrawal, A. and J. C. Ribot (1999) 'Accountability in decentralization: A framework with South Asian and African cases', *Journal of Developing Areas*, vol 33, summer, pp473–502
- Armitage, D., Berkes, F., & Doubleday, N. (2007). Introduction: moving beyond co-management. *Adaptive co-management: Collaboration, learning, and multi-level governance*, 1-19.
- Armitage, D. 2008. "Governance and the Commons in a Multi-Level World." *International Journal of the Commons* 2(1):7–32.
- Armitage, D., Marschke, M., & Plummer, R. (2008). Adaptive co-management and the paradox of learning. *Global environmental change*, 18(1), 86-98.
- Balirwa, J. S., Chapman, C. A., Chapman, L. J., Cowx, I. G., Geheb, K., Kaufman, L., ... & Witte, F. (2003). Biodiversity and fishery sustainability in the Lake Victoria basin: an unexpected marriage?. *BioScience*, 53(8), 703-715.
- Berkes, F. (2010). Devolution of environment and resources governance: trends and future. *Environmental Conservation*, 37(4), 489-500.
- Béné, C., & Neiland, A. E. (2006). From participation to governance. *A critical review of governance, co-management and participation in natural resources management. Policy, Economics and Social Science Discussion Paper Series*, 74.
- Béné, C., Belal, E., Baba, M. O., Ovie, S., Raji, A., Malasha, I., ... & Neiland, A. (2009). Power struggle, dispute and alliance over local resources: analyzing 'democratic' decentralization of natural resources through the lenses of Africa inland fisheries. *World Development*, 37(12), 1935-1950.
- Chaffin, B. C., H. Gosnell, and B. A. Cosens. 2014. A decade of adaptive governance scholarship: synthesis and future directions. *Ecology and Society* 19(3): 56.
<http://dx.doi.org/10.5751/ES-06824-190356>
- Chinsinga, B. (2005). The clash of voices: community-based targeting of safety-net interventions in Malawi. *Social Policy & Administration*, 39(3), 284-301.

- Chuenpagdee, R., Kooiman, J., & Pullin, R. (2008). Assessing governability in capture fisheries, aquaculture and coastal zones. *The Journal of Transdisciplinary Environmental Studies*, 7(1), 1-20.
- Crona, B., & Bodin, Ö. (2010). Power asymmetries in small-scale fisheries: a barrier to governance transformability?. *Ecology and Society*, 15(4).
- Cumming, G. S., D. H. M. Cumming, and C. L. Redman. 2006. Scale mismatches in social-ecological systems: causes, consequences, and solutions. *Ecology and Society* 11(1): 14. [online] URL: <http://www.ecologyandsociety.org/vol11/iss1/art14>
- d'Armengol, L., Castillo, M. P., Ruiz-Mallén, I., & Corbera, E. (2018). A systematic review of co-managed small-scale fisheries: Social diversity and adaptive management improve outcomes. *Global environmental change*, 52, 212-225.
- Davis, A., & Bailey, C. (1996). Common in custom, uncommon in advantage: common property, local elites, and alternative approaches to fisheries management. *Society & Natural Resources*, 9(3), 251-265.
- Dietz, T., Ostrom, E., & Stern, P. C. (2003). The struggle to govern the commons. *science*, 302(5652), 1907-1912.
- Duit, A., & Galaz, V. (2008). Governance and complexity—emerging issues for governance theory. *Governance*, 21(3), 311-335.
- Finkbeiner, E. M., & Basurto, X. (2015). Re-defining co-management to facilitate small-scale fisheries reform: An illustration from northwest Mexico. *Marine Policy*, 51, 433-441.
- Folke, C., Hahn, T., Olsson, P., & Norberg, J. (2005). Adaptive Governance of Social-Ecological Systems. *Annual Review of Environment and Resources*, 30(1), 441–473. <http://doi.org/10.1146/annurev.energy.30.050504.144511>
- Folke, C. (2006). Resilience: The emergence of a perspective for social–ecological systems analyses. *Global environmental change*, 16(3), 253-267.
- Geheb, K., Kalloch, S., Medard, M., Nyapendi, A. T., Lwenya, C., & Kyangwa, M. (2008). Nile perch and the hungry of Lake Victoria: Gender, status and food in an East African fishery. *Food Policy*, 33(1), 85-98.
- Glaser, S., Hendrix, C., Franck, B., Wedig, K., & Kaufman, L. (2019). Armed conflict and fisheries in the Lake Victoria basin. *Ecology and Society*, 24(1).
- Ho, N. T. T., Ross, H., & Coutts, J. (2015). Power sharing in fisheries co-management in Tam Giang Lagoon, Vietnam. *Marine Policy*, 53, 171-179.

Jentoft, S. (2007). In the power of power: the understated aspect of fisheries and coastal management. *Human Organization*, 426-437.

Kantel, A. J. (2019). Fishing for Power: Incursions of the Ugandan Authoritarian State. *Annals of the American Association of Geographers*, 1-13.

Lawrence, T (2013). Taking the 'Co' out of 'Co-management': The Deligitimization of Fishing Communities on Lake Victoria, E. Africa. *Water Co-Management*. Krantzberg, G and Grover, V. I eds. Boca Raton, FL: CRC Press, pp. 168–196.

Lemos, M. C., and A. Agrawal. 2006. Environmental governance. *Annual Review of Environment and Resources* 31:297-325.
[http:// dx.doi.org/10.1146/annurev.energy.31.042605.135621](http://dx.doi.org/10.1146/annurev.energy.31.042605.135621)

Lukes, S. (2012). Power: A Radical View [2005]. *Contemporary Sociological Theory*, 266.

Mahon, R., McConney, P., & Roy, R. N. (2008). Governing fisheries as complex adaptive systems. *Marine Policy*, 32(1), 104-112.

Medard, M, Van Dijk, H, Hebinck, P and Geheb, K (2016). Governance in a Beach Seine Fishery: A Case Study from Lake Victoria, Tanzania. *Maritime Studies* 15: 11.
DOI:10.1186/s40152-016-0051-3.

Miles, M. B., & Huberman, AM (2005). *Qualitative data analysis: An expanded sourcebook*, 2.

Njaya, F., Donda, S., & Béné, C. (2012). Analysis of power in fisheries co-management: Experiences from Malawi. *Society & Natural Resources*, 25(7), 652-666.

Nunan, F. (2010). "Governance and fisheries co-management on Lake Victoria: Challenges to the adaptive governance approach." *Maritime Studies*, Vol. 9(1), pp. 103-125.

Nunan, F., Cepić, D., Yongo, E., Salehe, M., Mbilingi, B., Odongkara, K., Onyango, P., Mlahagwa, E. and Owili, M., 2018. Compliance, corruption and co-management: how corruption fuels illegalities and undermines the legitimacy of fisheries co-management. *International Journal of the Commons*, 12(2), pp.58–79. DOI: <http://doi.org/10.18352/ijc.827>

Ogutu-Ohwayo, R., Hecky, R. E., Cohen, A. S., & Kaufman, L. (1997). Human impacts on the African great lakes. *Environmental Biology of Fishes*, 50(2), 117-131.

Ogwang', V. O., J. I. Nyeko and R. Mbilinyi (2009). Implementing co-management of lake victoria's fisheries: Achievements and challenges. *African Journal of Tropical Hydrobiology and Fisheries* 12: 52-58.

Olsson, P., Folke, C., & Berkes, F. (2004). Adaptive co-management for building resilience in social–ecological systems. *Environmental management*, 34(1), 75-90.

- Onyango, P., & Jentoft, S. (2010). Assessing poverty in small-scale fisheries in Lake Victoria, Tanzania. *Fish and Fisheries*, 11(3), 250-263.
- Orach, K., & Schlüter, M. (2016). Uncovering the political dimension of social-ecological systems: Contributions from policy process frameworks. *Global environmental change*, 40, 13-25.
- Ostrom, E., & Janssen, M. (2005). Multi-level governance and resilience of social-ecological systems. In *Globalisation, Poverty and Conflict: A "Critical Development" Reader* (pp. 239-259). Springer Netherlands. https://doi.org/10.1007/1-4020-2858-X_13
- Plummer, R., & Armitage, D. (2007). A resilience-based framework for evaluating adaptive co-management: linking ecology, economics and society in a complex world. *Ecological economics*, 61(1), 62-74.
- Pomeroy, R. S, Katon, B. M and Harkes, I (2001). Conditions Affecting the Success of Fisheries Co-Management: Lessons from Asia. *Marine Policy* 25(3): 197–208. DOI:10.1016/S0308-597X(01)00010-0
- Raakjær Nielsen, J (2003). An Analytical Framework for Studying: Compliance and Legitimacy in Fisheries Management. *Marine Policy* 27(5): 425–432. [http://doi.org/10.1016/S0308-597X\(03\)00022-8](http://doi.org/10.1016/S0308-597X(03)00022-8)
- Rhodes, R. A. W. (1996). The new governance: governing without government. *Political studies*, 44(4), 652-667.
- Russell, A. J., & Dobson, T. (2011). Chiefs as critical partners for decentralized governance of fisheries: An analysis of co-management case studies in Malawi. *Society & Natural Resources*, 24(7), 734-750.
- Sabatier, P. A. (1987). Knowledge, policy-oriented learning, and policy change: An advocacy coalition framework. *Knowledge*, 8(4), 649-692.
- Smoke, P., & Lewis, B. D. (1996). Fiscal decentralization in Indonesia: A new approach to an old idea. *World Development*, 24(8), 1281-1299.
- Sen, S., & Nielsen, J. R. (1996). Fisheries co-management: a comparative analysis. *Marine policy*, 20(5), 405-418.
- Townsend, R. E., & Pooley, S. G. (1995). Distributed governance in fisheries. *Property rights and the environment: social and ecological issues*, 47-58.
- Wunsch, J. S. (2001). Decentralization, local governance and ‘recentralization’ in Africa. *Public Administration and Development: The International Journal of Management Research and Practice*, 21(4), 277-288.

Young, O. R. 2002. The institutional dimensions of environmental change: fit, interplay, and scale. MIT Press, Cambridge, Massachusetts, USA.

Appendix 1

Semi-structured interview protocol with policy-makers, scientists, fisheries officers, and administrative personnel

Name:

Introduction

1. What are the major problems concerning Lake Victoria's fisheries?
2. What are the effects of these problems that you describe?
3. What do you think are some of the solutions to address these problems?
4. How do you think such solutions can be implemented?
5. What are the sanctions for offenders?
6. Who enforces sanctions on offenders? Do they work? Why or why not?
7. What are the problems/constraints in enforcing rules?
8. How are you involved in fisheries management?
9. What are some of the agencies with whom you collaborate to manage fisheries?
10. What is the nature of this relationship?
11. What are some of the tasks for which you collaborate?
12. What are the challenges in collaboration? What are the advantages to collaboration?
13. Who do you report to? How often? Any changes? When? Why?
14. How are conflicts resolved when you'll work together?
15. What kind of support do you receive from other ministries/agencies/departments?

Appendix 2

Code	Description	Example
Legislative power	Power to create rules	Each County may develop fisheries management measures and plans for fisheries resources within its jurisdiction
Executive power	Power to implement, and enforce rules and decisions	The local government also has fisheries officers who are also responsible for enforcing similar services, law enforcement and we are responsible for it, too.
Judicial Power	Power to adjudicate disputes and resolve conflicts	BMUs shall prevent or reduce conflicts in the fisheries sector.
Visible Power	situations whereby a community and or interest groups openly hold power to make decisions	We will take the beach seine and burn it but they will find another way to get the beach seine because they do not understand the impact of illegal gears.
Hidden Power	situations whereby an agenda is set or pushed “behind the scene” by a certain group of actors—often to the exclusion of others—and where interests are mobilized to shape the agenda and outcomes.	Politics plays a very big role. Because the politicians get votes from the fishers, the politician gets many complaints from the fishermen, so they interfere with the closure of the lake.
Invisible Power	Invisible power centers on deeper social conditioning, culturally embedded norms and values, effects of knowledge, ideology, and global views.	The BMUs cannot enforce the regulations because their preoccupation is with eating bribes. Because of money, these BMU guys who were elected are poor, they cannot serve. Unless there is another authority that can force them to serve. For example, there is no one involved in illegal fishing that the BMU doesn’t know. They know what everyone here is doing and all the illegal materials. But the BMU tells me to give him ‘his’ (to pay a bribe) and you continue doing whatever you want.