



Participatory governance in Lake Victoria (Kenya) fisheries: whose voices are heard?

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Abstract

Co-management is advocated as a means to improve human equity and the ecological sustainability of common-pool resources. The promotion of co-management of fisheries often assumes the participation of resource users in decision-making ensures more ecologically sustainable outcomes than top-down management approaches while improving livelihoods and food security. However, in fisheries co-management approaches, participation is often poorly defined and measured by co-management proponents. For resource users, it may not be clear what their participation in co-management entails, and what such participation might involve or achieve. For the fisheries of Lake Victoria (Kenya), the introduction of co-management established Beach Management Units (BMUs) on a model of participatory decision-making. Unsurprisingly, given global experiences of institutions for resource users' participation in co-management, the structures established across Lake Victoria (Kenya) have not resulted in effective participation of fisher folk. We examine why this is so. Specifically, we examine the influence of institutions on fisher folks' participation in co-management, using critical institutionalism to explain how participation of resource users is shaped by the relation between formal government institutions and informal social norms. We take four BMUs as case studies to investigate how historical administrative structures shape the development of co-management, how power relationships within co-management are negotiated at the local beach level and the fisher folks' understanding of their participation in co-management. We document how informal institutions undermine and replace formal institutions at the local beach level, while formal institutions suppress and ignore informal ones at the national and regional levels. From this, we argue power sharing between the government and fisher folk is key for fisher folk participation in fisheries co-management, capable of addressing both social and ecological challenges facing fisheries management.

Keywords BMUs · Co-management · Critical institutionalism · Fisheries · Lake Victoria · Participation

Introduction

Co-management has been widely promoted as a preferred approach for managing common-pool resources such as

fisheries, moving away from top-down government control and providing greater opportunities to integrate views of stakeholders in decision-making (Armitage et al. 2009; Ayers and Kittinger 2014; Pomeroy and Berkes 1997). A powerful drive toward co-managed resources is the claims that it improves resource yields, ecological sustainability and legitimacy of governance (Herrera-Racionero et al. 2015; Measham and Lumbasi 2013). A co-managed resource implicitly involves greater participation among resource users. There are different typologies and definitions of participation. Here, we mean an active process through which resource users influence the management of natural resources to enhance their livelihoods and improve food security (Tiller et al. 2015). A fundamental necessity for a move from traditional top-down to co-management arrangements is that the government must be willing to share power and involve resource users in decision-making (Pinkerton et al. 2014). This might

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involve creation by government of appropriate facilitation and logistics for participation, including provision of resources to support the process. At the local level, cultural values and practices, leadership by resource users' leaders and attention to the influence of power dynamics among stakeholders are important to foster participation and equity (Ho et al. 2016b; Ostrom 1990).

A number of approaches to participation have been identified depending on the management goals and power dynamics (Puente-Rodríguez 2014). Arnstein (1969) described increasing levels of participation, using the analogy of a ladder. The lower rungs, manipulation and therapy coincide with non-participation. At these levels, the government is expected to train resource users on what they are expected to do. The next three rungs—informing, consultation and placation—allow for limited consultations among resource users and government. The views of resource users may be invited, but these may have limited influence on the actions of more powerful stakeholders. The last three upper rungs—partnership, delegated power and citizen control—allow for more decision-making power to be vested in resource user communities, who are better empowered to make decisions on the management of resources. In the recent past, other participation typologies have been described. For instance, Fung (2006) participatory cube consists of three participation dimensions, namely, direct participation by those who participate, how information is shared by stakeholders for decision-making, and the link between what is decided and action taken. The cube consists of three axes that focus on interactive communication, access to space for participation and power for decision-making. Pretty (1995) presents a seven-level participation typology, from manipulation in which unelected and powerless representatives participate, to self-mobilization in which participation consists of people taking initiatives. Another typology by White (1996) provides some insights into how various stakeholders use participation to drive their interests. The typologies highlighted previously indicate that participation is about power and control (Cornwall 2008).

Introduction of co-management often involves the development of new institutions at the local level to enable resource users' participation in management decisions. Co-management integrates institutions—understood as rules, norms and organizations (Hodgson 2006)—and stakeholders at different scales, providing linkages among resource users, government and other stakeholders (Nielsen et al. 2004). The linkages may be horizontal or vertical, enabling collaboration among stakeholders (Pomeroy and Berkes 1997). The vertical linkages involve institutions at the local level with those at the national and regional levels. Horizontal linkages involve institutions for managing natural resources that involve multiple uses such as fisheries and other economic activities like tourism, aquaculture and wildlife management (Pascaul-Fernández et al. 2005). The development of new institutions

to encourage resource users' participation (Islam et al. 2017) includes Beach Village Committees (BVCs) in the fisheries of Lake Malawi (Njaya et al. 2012), forest committees established in the Amazon to manage timber and other forest products' use (de Koning 2011), Gippsland Plains Tree Health Group (GPTHG) to conserve and manage remnant vegetation in the threatened grassy woodland in Australia (Measham and Lumbasi 2013) and fishers' organizations, called *van*, in the Tam Giang Lagoon in Vietnam, involved in the management of fisheries in collaboration with the government (Ho et al. 2016a). For Lake Victoria, Africa, community-based institutions known as Beach Management Units (BMUs) were formed in 2007, with networks at the regional, national and beach levels, to enable fisher folk participation in co-management. Despite the widespread emphasis on the development of these local institutions, there is limited discussion in literature about how power is negotiated among the co-management partners and how this influences participation of resource users.

Power sharing is an important element of co-management (Béné et al. 2009; Njaya et al. 2012). However, discussions of power within co-management often centre on power sharing within formal institutions, with limited attention to power exercised among resource users and within informal arrangements (Quimby and Levine 2018). Formal institutions include government and resource users' regulations, rules and organizations, while informal institutions are socially embedded and include accepted norms and bonds of kinship (Etiegni et al. 2016, 2019; Nunan et al. 2015). These institutions play a key role in guiding practice and interactions among resource users. Power relations are inseparable from institutions and inevitably shape interactions among stakeholders (Berger and Luckmann 1967; Chuenpagdee and Jentoft 2007; Van Hecken et al. 2015). This applies to both formal and informal institutions (Agrawal and Gibson 1999; Ho et al. 2015; Lwenya et al. 2009; Njaya et al. 2012; Nunan et al. 2015). More understanding is needed on how formal and informal institutions influence resource users' participation in co-management. Other factors identified in literature that influence participation include logistical, relational and trust issues (Ballou et al. 2016).

Within co-management, institutions can be political, administrative or social in nature and are the mechanisms through which power and authority are held and exercised (May 2012). Power is continuously negotiated (Berkes 2009; Njaya et al. 2012; Nunan et al. 2015; Quimby and Levine 2018), creating new forms of power (Carlsson and Berkes 2005). Participation in co-management involves power sharing among resource users and external agents such as government (Borrini-Feyerabend et al. 2004; Cleaver and Whaley 2018; Nunan et al. 2015; Quimby and Levine 2018). Unequal power relations have been shown to impede participation of resource users (Ballou et al. 2016; Nunan et al.

2015), while poorly crafted co-management simply redistributes power among co-management partners, disadvantaging categories of resource users (Béné et al. 2009). Power influences who gets to participate, where to participate (space for participation), what can be put on the agenda and decisions to be made (Gaventa 2006). Limited participation happens more often within invited spaces (Gaventa 2006; Nunan et al. 2012), meaning that those who invite have the opportunity to control what goes on within those spaces. Power redistribution in co-management happens within institutions and, therefore, understanding co-management requires an understanding of institutions, including those operating within local communities (Agrawal and Gibson 1999; Borrini-Feyerabend et al. 2004; Nunan 2006; Nunan et al. 2015).

Literature on institutions for resource users' participation in co-management is divided into two distinct groups: mainstream institutionalism and critical institutionalism. The analysis of institutions for natural resource management under mainstream institutionalism has focused mostly on formalized institutional arrangements (bureaucratic institutions), including legislative frameworks and policy processes aimed at achieving optimum resource use (Ostrom 1990). The assumption has been that institutions are crafted for a specific purpose. This assumption overlooks the fact that there are socially embedded institutions that play a key role in determining participation in natural resource management (Cleaver 2002; de Koning 2011). Mainstream institutionalism does not take into account the local specific situations in which power asymmetries occur, with varied interests among stakeholders (de Koning 2011).

Critical institutionalism recognizes both social and historical contexts in which institutions are embedded, with more focus on local institutions and practices (de Koning 2014; Etiegni et al. 2016; Nunan et al. 2015). It draws on a critical realism in that decisions are shaped not by rules and regulations but through human actions determined by formal and informal institutions (Cleaver and Koning 2015). This approach to institutional analysis views institutional influence in natural resource governance as a non-linear process (de Koning 2011), away from the formal–informal dichotomy. Critical institutionalism emphasizes (i) “the complexity of institutions entwined in every day social life; (ii) their historical formation; and (iii) the interplay between traditional and modern, formal and informal arrangements” (Hall et al. 2014). Specifically, critical institutionalism provides the conceptual lens through which governance arrangements are understood, how power is shared (benefiting some and not others) and how these arrangements have meaning and legitimacy among stakeholders (Cleaver and Whaley 2018). It recognizes that institutions are entrenched within specific social, political and economic structures (Mosse 1997), providing insights on processes, power and meaning within co-management (Cleaver and Whaley 2018). Attempts, therefore, to introduce

new institutions at the local level, without regard to existing social relations and cultural practices, often lead to unintended outcomes (de Koning 2011; Russell and Dobson 2011). A critical institutionalism perspective also avoids a more normative approach assessing deviation from compliance and views of “good” or “bad” practice.

A good deal of critical institutionalism engages institutional bricolage—a concept that describes the way resource users consciously and unconsciously piece together institutional arrangements from social and cultural resources available to them (Cleaver 2002). This is a process that occurs when new formal institutions are introduced within a local context where socially embedded institutions already exist (Cleaver 2002; de Koning 2014). In her research on forest practices within the Amazon, de Koning (2011) identified three processes of institutional bricolage as aggregation, alteration and articulation. Aggregation involves recombining introduced institutions with existing ones in order to come up with institutions that are practical to the prevailing circumstances at the local level. Alteration involves changing both formal and informal institutions in order to adapt them to the local context. Articulation entails making traditions and norms visible in resistance to introduced formal institutions.

For Lake Victoria (Africa), the BMUs were created to follow co-management principles. BMUs comprise registered members engaged in all the fish value chains of the lake's fisheries, primarily the Nile perch (*Lates niloticus*), Nile tilapia (*Oreochromis niloticus*), a high economic value cichlid and a small cyprinid omena (*Rastrineobola argentea*), also known in the lake as dagaa. The fisheries of the three main species provide a major source of food and support for livelihoods. This paper focuses on the Nile perch fishery because of its dominance in influencing the structure of the fishery and its economic importance as a high-value fish for international markets.

Three decades after its introduction to the lake in the 1950s, the Nile perch had proliferated to an extent that it both supported an industrial fishery and, through its predation on other fish species, led to the decimation of endemic haplochromines and the traditional fishery they supported (Marshall 2018). Landings of Nile perch had grown from 335 tonnes in 1975 (Geheb et al. 2008) to 340,000 tonnes in 1990 (LVFO 2016), although fluctuations in reported landings were later noted (Indian Ocean Commission 2015). By that time, there were also clear signs of overfishing, with a reduction of mean size of landed perch and reductions of catch per unit effort (CPUE). Reduced catch of Nile perch has continued, attributed mainly to the use of outlawed fishing gears, eutrophication, proliferation of the invasive water hyacinth (*Eichhornia crassipes*) in some areas and destruction of fish breeding areas (Aura et al. 2019). The decline of the Nile perch coincided with increases of the much smaller omena, used mainly as local food for humans. Omena contributes to food security,

nutritional requirements and socio-economic development of the riparian communities and is also an important raw material in the fish meal industry. The third main commercial species, the introduced Nile tilapia (*Oreochromis niloticus*), currently comprises about 9.5% of the commercial catch (Mkumbo and Marshall 2015).

As the nature of the fishery changed, with increasing concerns over sustainable yields of the Nile perch as well as the quality of fish to meet health standards required for the EU market (Geheb et al. 2008; Medard 2015), the governance of the fishery moved from top-down to co-management. This shift in governance reflects a global trend over the last few decades away from “command and control”, designed and implemented by governments and their agencies, to greater empowerment in decision-making of local communities (Ann Zanetell and Knuth 2004; May 2012; Sen and Nielsen 1996). An underlying assumption is that sustainable yields of local resources are best managed by local communities, involving local governance structures and processes that have legitimacy (Ayers and Kittinger 2014; Pomeroy and Berkes 1997). In Lake Victoria, agreement among the riparian governments (Kenya, Uganda and Tanzania), development partners (European Union and World Bank) and the regional Lake Victoria Fisheries Organization (LVFO) led to the production of government guidelines for the establishment and operations of the locally organized Beach Management Units (BMUs) (Nunan et al. 2015; Obiero et al. 2015). The guidelines define roles and responsibilities, and the standardization of fisheries operations and governance structures (Government of Kenya 2006). Each BMU forms an assembly of stakeholders including boat owners, fishers, fish traders, fish gear dealers and ice sellers.

The changes in fisheries governance in Lake Victoria has been a major undertaking. In Kenya, this created 283 BMUs comprising over 40,000 crew and other stakeholders (Government of Kenya 2014). The BMUs were designed to enable participation of fisher folk in management decisions through local democratic structures. The former fisheries institution mandated through the Fisheries Act of 1989 (Government of Kenya 1989) was managed by local fisheries officers, with powers of enforcement for breaches of fishery regulations. This has been replaced by the Fisheries Management and Development Act, 2016 (Government of Kenya 2016) that devolves fisheries compliance and enforcement to the BMUs. The shift in governance raises important questions on the extent that resource users are included in decision-making and co-management (OECD 2015), the process of participation and, especially, the extent power and decision-making is devolved from upper tiers of governance to local levels. This is not dependent on how a certain management structure is created or imagined, but how government actors, resources users and other stakeholders are actually involved in the process of governance, and the extent that co-

management includes collective decision-making within and among heterogeneous groups of stakeholders. These move from high-level government to fisher folk, with stakeholder participation occurring within hierarchies that are embedded within formally stated settings, as well as the rules, norms and practices of informal ones (Nelson 2010; Robinson and Makupa 2015).

For the participation of fisher folk within the newly created Lake Victoria (Kenya) BMUs, how participation was designed and occurs within the new fisheries institutions and whether they can afford to abide by the new rules are of critical importance for acceptance by fisher folk of the new order. All institutions are human constructs bounded by “humanly devised constraints that shape interaction” (North 1990) and elusive to predictions of how they may in practice shape/determine use of natural resources (Nunan et al. 2015) and, hence, the actions of fisher folk. Motivations of actors and the social relations among them shape/determine who participates, in what, how, when and for whose benefits (Béné et al. 2009; Ho et al. 2015). In the BMUs of Lake Victoria (Kenya), this can include restriction to decision-making for the less powerful or, through cultural biases such as clanship, even to the fishery itself.

Seen from a social ontology perspective, an institution needs more than a formal declaration to “exist”. Only if the status and authority of the BMUs is collectively recognized and accepted by stakeholders, and the shift of power relations is reflected in their actions, does an institution, and its structure, become a “reality” with relevance and meaning (Searle 2010). For the BMUs, this can determine compliance of local users (fishers, boat owners, traders, etc.) with the new regulations and participation in governance procedures. This requires fisher folks’ recognition of BMUs as an authority through which the State Department for Fisheries operates, enabling BMUs to fulfil their intended (status) functions. Collective acceptance that maintains the authority of the formal institution¹ of the BMU is demonstrated and re-affirmed by participants in their actions and speech, and in documents expressing collective intent. The formal institutions of the BMUs are different from informal institutions, which are typically emergent phenomena that do not require any formal declaration of status by a central authority. Rather, they manifest implicit collective recognition of an authority.

The formal and informal institutions can be connected in the sense that they both work to shape practices, and can be fully or partially supportive of, or against, each other. For the fisheries of Lake Victoria, participatory governance processes would be expected to include (1) formalized mechanisms of stakeholder engagement, (2) processes that promote collective acceptance of the new authority of the BMU demonstrated

¹ Formal institution is an institution invested with authority through a formal act of legislation or regulation.

through compliance of rules and (3) mechanisms to maintain the new institution, with stakeholders demonstrating and re-affirming their acceptance through on-going participation. For participation in co-management, it is also necessary that upper-tier government stakeholders (in this case, the State Department for Fisheries) recognize the authority and status of lower tiers (in this case the BMUs). It too has to demonstrate and re-affirm its recognition of the BMU's *deontic* power (that which is exercised in human institutions formed from social relations) just like any other stakeholder. If the State Department for Fisheries demonstrates in its actions that the BMUs have incomplete power, or will not receive support and backup, it can send a powerful negative signal to fisher folk (Ribot et al. 2006).

Participation within the BMUs is therefore a “two-way street”. A critical institutionalism approach helps in understanding how stakeholder participation is influenced by traditions of fishing practice, local social order and power dynamics, and the expectation of whether decision-making powers devolved to the BMUs lead to better management outcomes. For this study, a critical institutionalism approach seeks to understand participation within three key aspects of the co-management of the Lake Victoria (Kenya) Nile perch fishery. First, how did historical administrative structures shape the process for stakeholder participation in co-management institutions? Second, how did the ostensible shift in the Mainstream Institution from top-down control to co-management affect power constellations at the beach level? Third, to what extent is participation understood and has meaning for fisher folk? This work focuses particularly on the role of individual participation in design and practice of co-management of the fishery of the lake, and contributes empirical evidence on participation to the broader examination of the interactions between institutions and co-management provided by Nunan et al. (2015), who drew on experience of working in Lake Victoria (Uganda) and in Lake Malawi.

Methods and research area

Our analysis of co-management in Lake Victoria used four selected BMUs, labelled A, B, C and D to retain confidentiality. In consultations with fisheries officials, the BMUs were chosen based on (1) willingness of fisher folk to participate and (2) beach accessibility. The number of BMUs included was constrained by time and finances, and the need to build familiarity and trust of the communities with the researcher. On the advice of local fisheries department personnel, the selected BMUs were those viewed as two with a good and two with poor reputation for record and account keeping based on quarterly inspections of the BMUs. An implicit

assumption was that record keeping would reflect operational legitimacy of the BMUs.

A case-study approach was used to provide an in-depth understanding of fisher folks' involvement in the implementation of co-management. Information collected through individual interviews and document review were followed up with focus group discussions in each BMU with BMU executives, fisher folk, fisheries officials and local leaders. Forty-nine (49) individual interviews concentrated on identifying institutions involved in the creation and operation of co-management structure, the stakeholders involved and how they participated. The questions asked started with “how” to enable the respondent to talk at length while choosing their own words. Further probing was done using questions beginning with “what” to understand further what was being explained by the respondent. In group meetings, questions were chosen to generate a discussion without fisher folk feeling intimidated by their leaders or government officials. Data collected from May 2013 to June 2014 from different methods were triangulated such that findings generated for the research questions from the different methods used were cross-checked for consistency (Yin 2003).

We asked fisher folk to recall activities that involved participation during and following the drafting of BMU guidelines and regulations in 2006 and 2007, respectively. Questions asked of participants required them to remember past events. To mitigate recall bias, a number of measures were put in place including (1) ensuring the questions were well articulated in a language the respondent understands best; (2) employing interview techniques like probing to get more and better understanding of the information given by the respondent; and (3) giving the respondent ample time to reflect on questions before answering them. The term “participation” used the Kiswahili *kuhusishwa* and the Luo *tio kanyakla*, followed by a description of what was being drafted. Prompting and probing were used to help respondents' recall (Beegle et al. 2012), while guarding against leading questions which could lead to biased answers. Individual confidentiality was central to the study design to avoid any personal repercussions from other fisher folk, their leaders or fisheries officials. Questioning was both at individual level as well as use of open questions during the focus group discussions. Confidentiality was maintained at the individual level interview to avoid identification of illegal activities at specific locations and to encourage respondents to speak in confidence and avoid the concern of repercussion for engaging in illegal activities. Conclusions made are based only on the four BMUs studied, with any wider interpretation a matter of conjecture.

To better understand the emerging BMU formal institutional structure following the shift from previous government-directed top-down management to a local participatory approach, a review of government policy and BMU documents was done. This was supplemented through the interviews of

fisher folk, fisheries officials and local leaders using pre-determined semi-structured questions. The 49 interviews included 38 fisher folk and were stratified according to BMU membership categories (crew, boat owners, traders, processors, fishing gear makers and repairers and other members registered with the BMU, and 9 BMU-elected executives). Interviewees were selected by approaching anyone who was willing to participate in the interview from each stratum. In addition, four fisheries officials, three chiefs and four village heads were interviewed. The chiefs and village heads provide a link between the government and local population and provide important perspectives of what took place when co-management was introduced. The total number of interviews was deemed sufficient after reaching a point of saturation where it was considered that the inclusion of more respondents in the study was unlikely to provide additional insights. Interviews were undertaken in Luo (local) and Kiswahili (national) languages both of which are spoken at the beaches, and in which the researcher and an assistant were fluent. Notes were taken during the interviews and data organized using ATLAS.ti software and analysed using a thematic content analysis approach.

Results

Historical formation of institutions for fisheries governance in Lake Victoria (Kenya)

The review of literature on fisheries governance in Lake Victoria (Kenya) and interviews constructed the historical development of the fisheries institutions from pre-colonial traditional management to current co-management. Before colonization, predating 1900, clan elders and local leaders (chiefs, sub-chiefs and village heads) controlled access to and use of fisheries by decree, determining when fishing could be done, where it was allowed and who could do it. The local leaders were very influential in fisheries management then (Opondo 2011). Following adoption of the co-management model in Lake Victoria, the local leaders seem to have lost this influence. From a review of co-management documents (BMU guidelines, regulations and the Fisheries Act), it was noted that local leaders have not been allocated any roles in co-management. Overall demand for fish during the pre-colonial period was limited by low density of the riparian population, and fishing gears comprising mainly inshore deployment of nets and baskets, although this could have localized impact on stocks (Kudhongania and Chitamwebwa 1995; Marshall 2018).

The colonial period (1901–1962) coincided with the increase in human population, with documented signs of overfishing on some species (Graham 1929). The demand for fish, both for consumption and export, increased following growth

in local population, immigration to the lake region and expansion of fish export markets (Geheb et al. 2008; Kirema-Mukasa and Abura 2013; Mkumbo and Marshall 2015). These changes altered the process of participation in the lake as demand for fish grew and more efficient gears were used to harvest fish. The increase in fish demand coincided with an upsurge in unsustainable fishing practices (Etiegni et al. 2016).

The first Fisheries Act to manage the fisheries was the Cap 378 of the laws of Kenya of 1945, prohibiting fishing in certain areas and limiting certain fishing gears and sizes of fish caught. A major shift in the ecological state of the lake came from the introduction in the 1950s of the Nile perch and later that of the Nile tilapia (Marshall 2018). The impacts of, especially, the Nile perch took two decades to be clearly realized and coincided with a second major ecological impact from nutrient enrichment (Hecky et al. 1994). Meanwhile, fisheries governance after independence in 1963 retained the structure from the colonial period while the fishery adapted from one based largely on species of endemic haplochromines to high-value Nile perch and Nile tilapia. The increasing profitability of the Nile perch fishery led to industrial-scale offshore fishing by trawlers and hook-and-line (Medard 2015) and value chain that increasingly relied on an international export market (Schuurhuizen et al. 2005). By the mid-1990s, total catch and mean size of Nile perch was in decline, with an increasing catch of the smaller *omena* suggesting changes in trophic structure in the lake (Irvine et al. 2019).

A transition from state-led fishery control toward participatory co-management was instigated and financed by development partners (World Bank and European Union) as a higher-level government and regional initiative through the Lake Victoria Environment Management Programme 1 (LVEMPI) from 1997 to 2002, and the Implementation of Fisheries Management Plan (IFMP) project from 2003 to 2010. LVFO developed harmonized guidelines for BMUs at the regional level (Government of Kenya 2006). This included addressing procedures for establishing BMUs, and defining their role, financing and election of BMU leaders. During this period preceding implementation of co-management, fisher folk involvement was confined to fisher folk representatives and other stakeholders (including government officials and NGOs) attending LVFO workshops to comment on drafts of BMU guidelines. Most fisher folk representatives at these workshops worked as beach leaders, appointed by local chiefs before the adoption of co-management. They continued working as the first BMU leaders following formal adoption of co-management, raising doubts if the primary needs of fisher folk were fully represented in the workshops since they were not elected leaders. The draft of the BMU guidelines were further developed by a team of three co-management specialists appointed from ministries in-charge of fisheries in riparian

states, one from each state. During this period, between 1997 and 1999, Nile perch was subject to three export bans from the European Union because of bacterial contamination (Geheb et al. 2008; Medard 2015) that accentuated the need for improved management of the fishery, providing a motivation for the creation of the BMUs. A fisheries official at beach C considered that “the bans were as a result of salmonella detection in fish, cholera outbreaks along the shores of L. Victoria which were linked to fish contamination and unacceptable fishing methods including use of toxic substances to capture fish. The ban affected livelihoods of many fisher folk.” To add to this, a fisheries official at beach D said, “The ban did not only affect livelihood activities around the lake, but the economy of the country too, due to loss of revenue from fish exports. However, to lift the ban, co-management was one of the conditions from the European Union.” This placed a particular focus on the creation of BMUs on landing sites to improve post-harvest handling of fish. Infrastructure to support this including toilets, potable water supply and fish handling equipment (gloves and boots) was noted from a review of co-management documents and interviews with fisher folk, fisheries officials, local leaders and BMU leaders. Although co-management was initiated in the late 1990s, it would take around 7 years for its implementation to begin.

From the harmonized regional guidelines, Kenya developed country-specific BMU guidelines and development of co-management (Fig. 1). A team of fisheries officers was mandated to design draft country BMU guidelines, subject to consultation through government-organized meetings and workshops at which fisher folk representatives and other actors (NGOs, local leaders and research institutes) were invited. This led to the development of country-specific BMU regulations by another team of fisheries officers. The regulations were crafted from the BMU guidelines and they provided legal backing for the BMUs (Government of Kenya 2007). The BMU regulations were first presented to the Lake Victoria (Kenya) riparian fisheries officers and later to fisher folk representatives (BMU chairpersons and secretaries), local leaders, researchers and local and national NGOs at workshops organized by the government. Government organized training of extension staff, NGOs, faith-based organizations (FBOs) and community-based organizations (CBOs) on co-management principles. The NGOs and FBOs have a history of working with fisher folk by providing training, credit and development of alternative income-generating activities.

It is clear that the creation of the BMUs was a process driven by the riparian governments in consultation with, and possibly driven by, powerful external actors, also representing economic and consumer interests beyond the region. The new formal structures and implementing institutions were directly influenced by existing and historical government-led fisheries

management. At best, information was conveyed from the government of how BMUs should organize fisher folk participation at the local level.

Interactions between formal and informal institutions within Lake Victoria (Kenya) co-management

Following the formal process in creating the BMUs, development of their structures and governance at the local level required the participation of fisher folk. For instance, part III of the BMU regulations stipulates that fisher folk need to participate in the election of their BMU leaders. In part IV of the regulations, fisher folk need to fund the operations of the BMUs from fees they pay to undertake various activities on the beach. BMU development also involved establishing the boundaries of the BMU, its organizational structure for registration of assembly members, and financing through payment of membership and fishing gear registration fees. The BMU boundaries were delineated by the Director of Fisheries in consultation with local chiefs (Government of Kenya 2006). The beach area was surveyed and boundaries marked to form the BMU areas of jurisdiction and this required participation of fisher folk in various activities (Table 1). Co-management implementation determined who could earn their livelihood from the fishery, in contrast to informal institutional arrangements where clan membership was required. With co-management, fisher folk need to register through payment of a fee to become a member of a BMU and be allowed to participate in the fishery. Before co-management adoption, being a member of a clan was enough to earn entry to the fishery. In the development of BMU structures at the beach level, fisher folk participated personally rather than represented by their leaders. The space for participation was at the local level where most registered BMU members could access and participate. Participation at national and regional levels required resources that most members did not have and spaces for participation were located far from the beach. At the national and regional levels, participation was through beach leaders who had served before the adoption of co-management.

Each BMU developed by-laws, based on government guidelines, for day-to-day running of BMU activities. A review of the by-laws from the four BMUs studied showed no major differences among them, with all adhering to government guidelines. BMU assembly members were allowed to suggest ways for revenue generation to pay for the day-to-day running of activities (Table 2) and to be approved as by-laws by the Director of Fisheries.

The sources of revenue generation for the BMUs are based on BMU regulations. The regulations set out that BMUs are at liberty to identify any means through which they can generate revenue for their activities. Thus, co-management

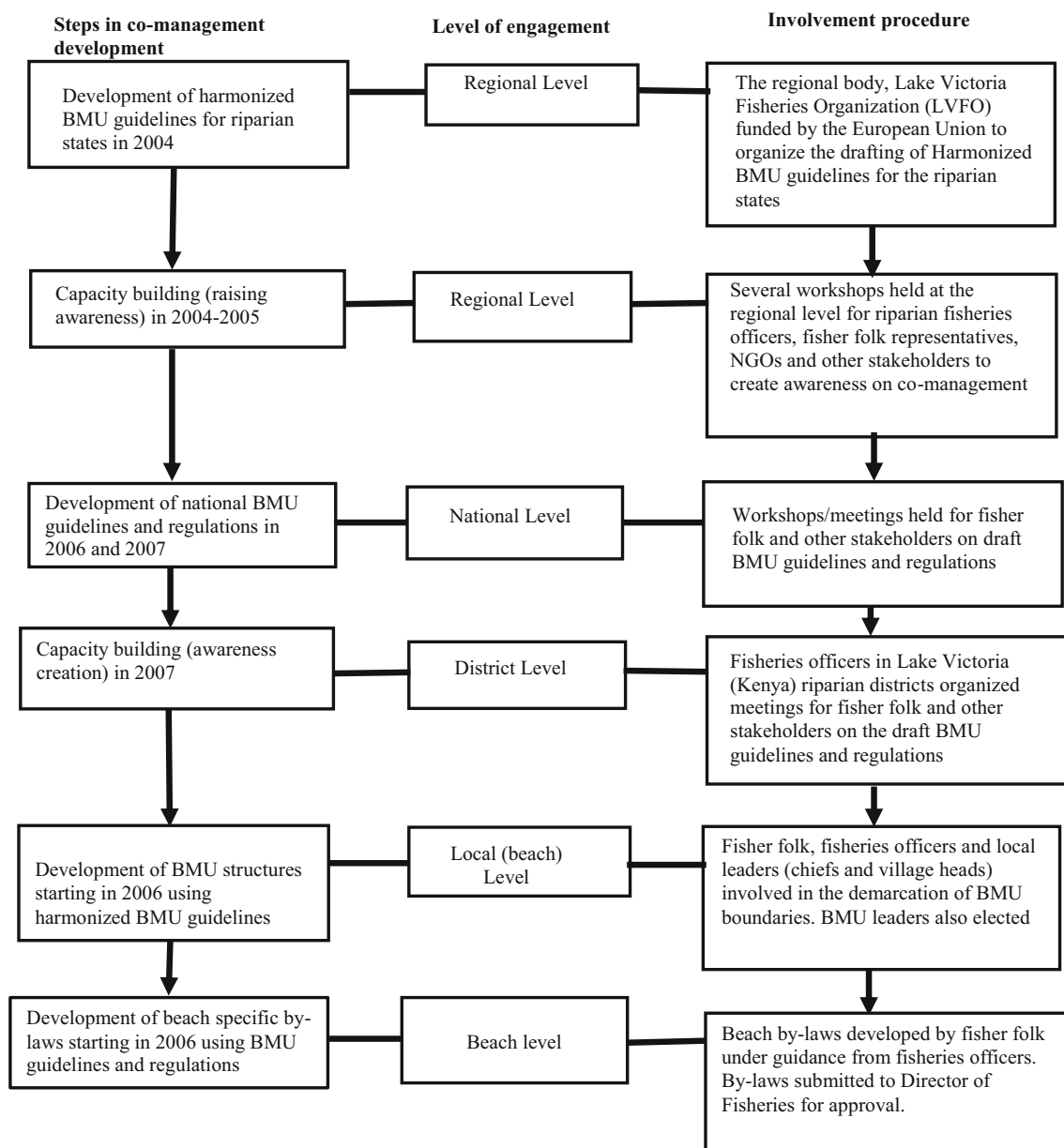


Fig. 1 The process of co-management institutions' development in Lake Victoria (Kenya) that occurred from 2004 to 2007

implementation introduced payment of fees, identified by respondents as an assured source of BMU revenue and as compliance to BMU rules. Out of 38 fisher folk interviewed, the vast majority (95%) were registered members of the BMUs where they operate, indicating they had paid their annual membership; as described by a fisherman from beach C:

In this place you cannot fish if you are not registered. Where will you land your fish because the leaders here cannot allow you to land if you are not registered? Also, if you try to land in areas not allowed for fish landing and they find you, you will be fined a lot of money. More than the registration fee you would have paid and they can also make your life difficult by making

sure you do not fish at all. If they do that to me or my friends here, where shall we get our "ugali"² from? Look at our area here. Can you farm anything in this rocky place? This is why I am careful and I must register with the BMU. I do not want problems.

Payment of an annual membership fee at the beginning of every calendar year, or through periodic instalments, is an outcome of formal institutional structure of the BMU. This illustrates power relations based on authority of the

² Ugali is a dish made of maize, sorghum, millet, or cassava flour mixed in boiling water and cooked to a dough-like consistency. It is considered a staple food for a majority of Kenyans and also consumed in some other parts of Africa.

Table 1 Lake Victoria (Kenya) BMU structures and institutions developed for fisher folk participation in co-management

BMU structures/institutions	Participation level	Who participated	Area of participation
Structures			
BMU assembly	Beach level	Individual fisher folk	Membership registration
BMU executive	Beach level	Individual fisher folk	Election/removal of leaders
BMU sub-committees	Beach level	Individual fisher folk	Election/removal of members
BMU networks	All levels	Fisher folk/representatives	Election of network leaders
Institutions			
BMU revenue	Beach level	Individual fisher folk	BMU funding
BMU regulations	National level	Representatives	Development of regulations
BMU guidelines	Regional/national level	Representatives	Development of guidelines
BMU by-laws	Beach level	Fisher folk/representatives	By-laws development

government over the BMUs, which is later reflected as power of BMU leaders over fisher folk. Non-payment is an observed reason within the formal BMU institution to exclude individuals from fishing and, hence, not only from their livelihood but capacity to participate in elections of BMU assembly members. As such, informal institutions based on clan membership to access the fisheries appear lost or weakened. A BMU leader in beach A stated “it is only through member registration that we can have an assembly and some of us can be elected. If you do not have a membership card, you cannot vote.” A fisheries official from beach D added:

For one to undertake fisheries activities in this lake, they must register with a BMU. They are free to choose which BMU they want to register with, but the point is, they must be registered. That is what the law says, and we are doing well in this because the BMU leaders are on the spot to ensure this rule is implemented.

For at least some BMU members, it was possible to circumvent the formal institutional requirement to register, as illustrated by a trader from beach A:

Currently I am not registered because I noted there are some traders who come from outside and they are not registered but they are allowed to buy fish from this beach. I used to register but for the last 2 years I have not because I do not see the point of registering if outsiders can come and compete with me for fish. The leaders know I have not registered but there is nothing they can do to me because they know I am aware of what they are doing.

Despite not paying the registration fee, BMU leaders did not stop the trader from engaging in his livelihood, but it does prevent the trader from voting in BMU assembly elections, for which a registration card is needed. Such a view was contrary to that of fisheries officials that registration was mandatory. However, because registration is related to voting it is in the interest of more influential candidates at election time for fisher folk to be registered. It is not possible to know the motivation that allowed this particular trader to continue business without registering (and in contrast to the example of the fisher not being allowed to fish given previously), but there was evidence more generally that inter-personal relationships can play an important role in the informal institutional aspects that allows BMU leaders to exert power selectively based on kinship, marriage or friendship. The importance of interpersonal relations between BMU leaders and their associates in determining participation of users in formal institutions was corroborated by a fisherman from beach D who noted “a BMU chairman may find a relative using an illegal gear and he will do nothing, but if he finds someone who is not a friend or relative, he will confiscate his gear.”

Table 2 Examples of possible sources for BMU revenue generation identified in the study

1. Membership fee as prescribed in the by-laws
2. Annual registration fee for members based on member categories
3. Fish landing fees
4. Support from development partners
5. Use of BMU assets charges
6. Income from projects
7. Other ways stipulated in the by-laws and approved by assembly such as fines and penalties
8. Occasional support from the government

Institutions and fisher folk participation in co-management

To gauge the extent to which institutions developed for co-management involved fisher folk participation, we considered

Table 3 Response of fisher folk ($N=38$) relating to their participation in the development of the co-management institutions for the Lake Victoria (Kenya) BMUs

Fisher folk in co-management	Activity	Number of respondents	
Fisher folk's views for BMU development	Views collected by fisheries officials and BMU leaders	11	
	Views included in the by-laws	5	
	Views not collected	27	
Knowledge of co-management documents (number of respondent answers in brackets)	Knowledge of BMU guidelines	Yes (14)	No (24)
	Knowledge of BMU regulations	Yes (6)	No (32)
	Knowledge of BMU by-laws	Yes (24)	No (14)
Fisher folk's representation in document's drafting process	Represented by BMU leaders	21	
	Group category leaders	7	
	Do not know	10	

(1) the extent to which fisher folks' views were considered for decision-making; (2) their knowledge of BMU guidelines, regulations and by-laws; (3) who represented them in situations where individual participation was not possible; and (4) the powers devolved to them by the government within the co-management arrangement. Fisher folk were involved in various activities and steps during the development of co-management institutions (Table 3).

Fisher folk considered that participation in developing co-management institutions was through representation by BMU executives (55% of respondents). At that time, these representatives, who were not elected but had been serving as beach leaders selected by chiefs, assumed BMU leadership during the transition from top-down to co-management and were considered as group category³ leaders (19% of respondents). However, 26% of fisher folk interviewed were not aware of who participated or represented them in developing BMU guidelines and regulations. Although a majority of fisher folk were of the opinion they were represented by BMU chairpersons, these leaders were mainly the wealthier and more powerful boat owners. Boat owners may have championed their interests over those of other fisher folk categories (fishers, traders, fishing gear repairers, etc.) within decision-making space where they represent others as members of BMU executive. BMU regulations specify each BMU executive committee should comprise at least three women (Government of Kenya 2007), but none of the chairpersons was a woman although there were women registered as members of BMUs. Most of the women were fish traders, although a few owned boats.

In the four beaches sampled, 71% of fisher folk considered their views were not collected for the initial drafting of BMU guidelines and regulations. A fish trader from beach B, who had witnessed the BMU development,

stated, "I was not consulted when the BMU regulations and guidelines were being drafted. These are things that were done by our leaders and I do not know what their contents are." A fisherman from beach A, who was not consulted, stated "only a few people were selected from the beach to attend the meetings". A boat owner from beach D added, "I was not involved, but some of my colleagues were consulted". A fish trader from beach A, who reported having participated in the development of BMU guidelines (Fig. 1, tier 3) stated, "I was involved in the development of BMU guidelines though the document had already been drafted and we went to Kisumu (a city on the shores of Lake Victoria) to familiarize ourselves with it and we even made amendments to sections we were not happy with". He added there was a clause in the BMU guidelines that required all BMU leaders to have primary-level certificates, but they were able to change the requirement to apply only to beach secretaries and treasurers. Similarly, a fish trader from beach B indicated, "the regulations and guidelines were complete by the time we got to hear about them. However, little has been done to let us know what they contain. Some of us have not even seen those documents. We need to be trained on these things."

Of the 11 (29% of the sample) fisher folk who reported their views were collected, only five indicated that any of their proposals were included, mainly in the development of by-laws. A fisherman from beach C claimed, "what we proposed to be paid as allowances for the BMU leaders was maintained", and a fish trader from beach B stated, "the fines we proposed for those who do not follow the by-laws are the way we passed them as an assembly". Referring to a reduction of an annual membership fees from Ksh 500 (US \$5) to Ksh 200 (US \$2), a boat owner from beach C said, "I was involved in that the BMU executives drafted the by-laws after which they called an assembly meeting and the draft laws were discussed. We were able to remove some of the proposed laws through

³ Fisher folk are registered in various groups based on activities they undertake in the beach, e.g. fishermen, traders, boat owners and fishing gear repairers, and each group has its elected leader.

the assembly and we also added some.” In reference to being involved in the drafting of beach by-laws, a boat owner from beach D stated:

Yes, I was involved but some of the issues we gave were not fully included. We discussed as assembly members and proposed in our by-laws we should use money collected from licenses sold to crew, boat owners and traders as part of BMU revenue but this was rejected by the government.

The influence of fisher folk in crafting fisheries management rules seems to have been minor. There was no evidence that the management rules included any degree of co-design with users of the resource, but a firm depiction of government as the higher authority and adjudicator of what was included in fisheries management rules. This influences the way the rules are viewed by fisher folk, although they are required to comply with fisheries regulations of the Fisheries Act (Government of Kenya 2016). Nonetheless, fisher folk seemed to have a larger influence on whether fisheries rules would be implemented or not, and outcome of co-management. From observations at the four beaches studied, it was evident that although the government expected fisher folk to implement fisheries rules, observed practice in all four BMUs were contravening government fisheries rules, most clearly seen through the increased use of illegal fishing gears and methods.

Fisher folk, however, were able to craft various rules for managing beach activities and fines to be administered in case of violation of BMU rules, and included in specific by-laws. For example, an ice seller from beach C described how they took part in developing the by-laws by demonstrating his understanding of the laws by stating “by-laws are used to ensure members work in a secure environment. They are also used to solve problems that occur among members. We are also able to propose conditions under which work should be done such as the type of uniform to be worn while on duty”.

A boat owner from beach A described how conflicts at the beach were resolved using by-laws, stating “we (complainant and the accused) go to the BMU office to have our case heard. We both first pay Ksh 200 (approximately US\$2) each for taking the case to the BMU office. The case is heard and determined using our by-laws”. Nevertheless, limited types of cases could be resolved using the by-laws, as described by a fish trader in beach C, “BMU office also solves problems that emanate from family issues. What they cannot resolve is referred to the chiefs.” The limit to the cases that could be heard and determined using the by-laws was further confirmed by a fisheries officer-in-charge of beach C who indicated:

The by-laws basically contain rules used to run the beaches by the BMU executives and resolve minor problems in the beach. There are also fines in the by-laws administered by the BMU executives. However, that goes as far as beach running is concerned, but fisheries rule violations are handled by courts. When fisheries rules are violated, the BMU executives report the same to fisheries officials who take the matter to court.

The capacity of the BMU executives to levy fines under the by-laws suggests a leverage of power and influence over other fisher folk, with possible consequences on fisher folk participation in the BMU.

Fisher folk participated in the crafting of by-laws and they have a good awareness of them, but less so on the meaning of co-management. Enabling fisher folk participation in co-management, capacity building through training and raising awareness were reported by respondents as activities undertaken to prepare fisher folk for participation. BMU leaders, trained at the national and regional levels, were expected to create awareness of other fisher folk on co-management and how to structure BMUs and develop institutions (by-laws) at the beach level. Fisheries officials and local leaders (chiefs and village elders) were also involved in the awareness creation on co-management and the crafting of by-laws at the beach level. A majority (63%) of fisher folk interviewed agreed there were attempts to create awareness on co-management by BMU leaders during assembly meetings. This comprised stating the importance of co-management, composition of BMU committees and procedures such as electing and removing their leaders from office, most of which seemed to involve them in the formation of BMU structures at the local level. Only 13% of respondents reported having undergone training in co-management. Local leaders used “barazas”⁴ to create awareness on co-management among fisher folk and local beach inhabitants who may not be involved in active fisheries. However, interviews eliciting fisher folk’s views of co-management demonstrated little understanding of co-management principle of involvement of fisher folk and the state in fisheries management decision-making, what is required of them, and how they are supposed to benefit from co-management. For instance, when asked about their understanding of co-management, a majority (90%) of fisher folk linked co-management to government rules, suggesting government’s dominance in co-management.

Only in BMUs A and C were some leaders conversant with the meaning of co-management as some form of collaboration among stakeholders. A leader from beach A defined co-management as “collaboration between fishers and government in the management of L. Victoria fisheries”, while a leader from beach C defined co-management as

⁴ Village gatherings convened by local leaders (chiefs and village heads) to share information and discuss matters that concern the community.

“collaboration of stakeholders in fisheries management”. A leader from BMU D attributed his lack of understanding of co-management by “I was just elected 2 years ago and I was not in office when BMUs were being established”, while a leader from BMU B linked his low knowledge of co-management to absence of training since elected to office. Limited knowledge of co-management was also evident among some fisheries officials. For instance, a fisheries official from beach C understood co-management as “the drafting of new laws by government to improve fisheries management”, while a fisheries official from beach B defined co-management as “implementation of fisheries rules.” In addition, there were three fisheries officials who could not attempt to define co-management during the interviews, indicating their own low level of awareness.

To understand power sharing between the two main co-management stakeholders (government and fisher folk) involved in fisheries governance, we examined the powers held by the government before co-management and powers devolved afterwards to fisher folk through the institutions of BMUs (Table 4). Our results indicate the government still holds most of the formal decision-making powers within co-management except for power of enforcement of fisheries rules, which have been fully devolved to BMUs. Fisher folk found violating fisheries rules by BMU executives are handed over to fisheries officials for onward transmission to the courts. In the previous order, it was the duty of fisheries officials to enforce fisheries rules, a task that they did not have the human capacity to perform. The power to levy fines under by-laws for non-compliance with rules, although described as a minor operational issue, was found to be a lucrative source of income for the BMU executives. The real power and influence stems from the national regulations.

Discussion

Resource users’ participation has long been considered as an important part of natural resource governance (Ansink and Bouma 2013; Ayers and Kittinger 2014) for benefits that include inclusive decision-making (Armitage 2005) and empowerment of resource users (Ho et al. 2015; Nunan 2006). These elements are linked to sustainable resource management outcomes (Ann Zanetell and Knuth 2004). The present study used the case of Lake Victoria (Kenya) to explore how fisher folk participate in co-management decision-making.

In the introduction of this paper, we posed three questions, which we re-visit here:

1. How did historical administrative structures shape the process for stakeholder participation in co-management institutions?

From the findings, it was established that the historical administrative structures at the local level consisting of chiefs, sub-chiefs, and village heads played a key role in determining how fisher folk participated in the development of co-management local institutions. The local leaders were powerful and influential in fisheries management prior to co-management, and in most cases, they were obeyed without questioning. They determined who, when, where, and how fishing was done (Opondo 2011). The local administrative structures provided a link between the government and fisher folk during co-management development. However, during co-management implementation, the local administration seems to have lost fisheries management power. Instead, implementation of fisheries rules within co-management at the beach level is undertaken by the

Table 4 A summary of powers held by the key stakeholders involved in fisheries governance identified from interviews with respondents involved in Lake Victoria co-management

Powers held by government before co-management	Power held by government after co-management adoption	Powers devolved to BMUs by government	Extent of power devolution to BMUs
Create rules or modify old ones (legislative)	Create fisheries rules or modify old ones	Craft by-laws for managing internal BMU activities	Limited to by-laws
Power to make decisions on fisheries resource use held by the government	Power to make decisions on fisheries resource use remained with the government	No power devolved to the BMUs by the government	No resource use decision-making powers devolved to BMUs. They implement fisheries rules contained in the Fisheries Act
Government the main enforcer of fisheries rules	Government still involved in fisheries rule enforcement	Power to enforce fisheries rules	Power to enforce fisheries rules fully devolved to BMUs. Both government and BMU institutions involved in fisheries rule enforcement
Conflict resolution (judicial)	Powers to resolve conflicts from rule enforcement held by the judicial arm of the government (courts)	Power to adjudicate social disputes among BMU members	Limited-only power to resolve conflicts among BMU members devolved

BMUs, while local leaders handle social disputes within their locations.

Formal institutions including Fisheries Act, BMU regulations, guidelines and by-laws do not include the roles played by local leaders in fisheries management (Government of Kenya 2007, 2016). This has largely removed the participation of those leaders in fisheries management. This is contrary to what has been reported in the fisheries of Lake Malawi, where chiefs have an influential and important role in fisheries co-management (Njaya et al. 2012; Russell and Dobson 2011). The local leaders have power to make fisheries management decisions, although these can be motivated primarily by self-interest rather than improving fisheries management (Njaya et al. 2012). The powers exercised by local leaders, who are not elected in Lake Malawi, is used to marginalize fishers further, suggesting that co-management does not guarantee fisher folk participation. In some instances, poorly designed co-management merely re-enforces control by the more powerful stakeholders (Béné et al. 2009).

Co-management in Lake Victoria was instigated and implemented from the highest tiers of government (Beem 2007; Herrera-Racionero et al. 2015; Njaya et al. 2012), influenced by donors and external partners over international food safety concerns of exported Nile perch (Medard 2015). This drove a process that relied on existing formal institutional structures as provided by the Fisheries Act and associated regulations. The process appeared to have largely ignored the realities of the informal institutions of fishing. Such an approach can have little effect on informal institutions (Pejovich 2006), leading to an undermining of formal structures and ambitions for sustainable resource use (Etiegni et al. 2016; Nunan et al. 2018). While co-management theory acknowledges the influence of institutions on the participation of fisher folk in co-management (Agrawal and Gibson 1999; Rahman et al. 2012; Snell et al. 2013), the interaction between formal and informal institutions are important to co-management.

2. How did the ostensible shift in the mainstream institution from top-down control to co-management affect power constellations at the beach level?

Power is key to participation in co-management (Njaya et al. 2012; Nunan et al. 2012; Quimby and Levine 2018). Power devolved to fisher folk in Lake Victoria by the government to enable their participation in co-management is limited and, therefore, does not enable meaningful resource users' participation (Béné et al. 2009). The ostensible shift from top-down management to co-management has not changed substantially the way power is distributed and exercised within the fisheries of Lake Victoria (Kenya). Only limited powers to enforce/implement fisheries regulations are fully devolved by the government to fisher folk, while the government still controls the more important fisheries management powers,

including power to craft and modify fisheries regulations and power to make decisions on fisheries resource use. Limited power devolution from the government to fisher folk is a barrier to fisher folk participation. This impedes them from having a voice in fisheries management decision-making. However, that does not mean that they implement what the government prescribes for them. They implement what they perceive as acceptable to them based on their accepted norms and practices, influenced by informal institutions and the need to earn a livelihood. Such approach to participation by resource users is mainly due to lack of involvement in the initial stages of co-management planning and development, which are needed for building legitimacy of co-management institutions. A similar outcome was discussed by Herrera-Racionero et al. (2015) among fishermen operating in the Spanish Mediterranean port of Gandia, who lost legitimacy of co-management institutions due to lack of their involvement in the development of those institutions.

Among the different fisher folk categories, the limited powers that were devolved by government are held and exercised by a few wealthier and more powerful boat owners who determine how co-management is implemented and, therefore, how fisher folk participate. More centres of power were developed within BMUs with co-management, giving rise to more fisheries elites at the local level (Etiegni et al. 2019). Power to implement fisheries rules is devolved to the BMUs, which in practice are extremely limited in their role to craft fisheries management rules. However, informal rules operating within the BMUs determine what rules are implemented at the beach level. As such, BMUs may not have been influential in the planning and structuring of Lake Victoria co-management institutions, but they determine to a larger extent the effect of co-management on the fishery. Within the BMUs, our work concurs with Nunan et al. (2012, 2015) in Uganda that BMU chairperson and executive positions are dominated by the wealthier and more powerful boat owners who champion their interests, and not the interests of the people they represent. While BMU regulations stipulate that at least three of the executive committee positions should be reserved for women and 30% of positions should go to crew, it is unusual, although not impossible, for women, traders or crew to be elected to the more powerful position of the BMU chairperson. Relations of power are critical to the outcome of co-management (Quimby and Levine 2018). These relations, however, should be considered not only between the government and the recipients of devolved powers (resource users) but also among resource users. The findings of this research have shown that power relations/sharing among fisher folk was not considered during the design and shift to co-management. The domination of boat owners in the BMU executive provides unequal power relations among fisher folk, leading to interference and inefficiencies in fisheries management.

3. To what extent is participation understood and has meaning for fisher folk?

Co-management is implemented in many countries and in different contexts, and focuses on increasing resource users' participation in management for improved ecological sustainability and livelihoods (Ayers and Kittinger 2014; Measham and Lumbasi 2013; Quimby and Levine 2018). To understand the extent to which participation is understood and has meaning for resource users, we first determined fisher folks' understanding of co-management since participation is a key principle of co-management (May 2012; Quimby and Levine 2018). The general understanding of co-management by fisher folk, and even fisheries officials, weakens the likelihood of fisher folks' understanding of participation or, more importantly, the benefits of participating (Ostrom 1990; Pomeroy et al. 2001). Among the fisher folk of the four Kenyan BMUs involved in the study, co-management is viewed as a government project they implement or, at least, need to conform to. To them, participation is some sort of government support which they can give or fail to give, instead of being active partners in co-management. This appears to fit the reality of "what does happen" as opposed to "what should happen" (Blackstock et al. 2012). Overall, the disconnect between the stated rationale for a devolution to co-management has hardly translated to a serious engagement of fisher folk to support the process, risking a lack of institutional legitimacy of fisheries policies, perceived as made by far-away decision centres (Herrera-Racionero et al. 2015).

Our research suggests many fisher folks seem not to have understood the problems that co-management aims to solve and, by extension, why they should be part of the process. The approach given to co-management development process is equally important. The top-down approach to co-management provides less incentives to fisher folk to participate (Islam et al. 2017). Similarly, when what seems to be benefits that accrue from co-management, in this case, money from licensing, goes only to the government, this acts as a disincentive to fisher folk participation. That they view co-management as external to them suggest a lack of institutional legitimacy. It can also be a consequence of low-level engagement during the initial stages of co-management development. So, while there may be a good to reasonable comprehension of co-management, the meaning of participation to fisher folk as indicated by extent of non-compliance seems deficient. Broader meaning of wider rationale of participation in co-management for sustainable resource use can, at best, be theoretical as, in reality, the BMUs do not, and cannot, lead to sustainable yields. As all institutions require legitimacy and meaning (Cleaver and Whaley 2018), the BMUs face a number of serious challenges.

For the four BMUs that were the topic of this research, there is little evidence that there was any meaningful engagement of fisher folk in the design of the government-mandated fishing regulations. Documented participation of fisher folk leaders in the development of the BMU institutions appears

to comprise informing them of decisions already made, and they were supported by government through payment of their transport and accommodation fees to attend workshops. Fisher folk participation was primarily informative, thus corresponding to Arnstein's (1969) lower rungs. Decisions had already been made at the regional and national levels, and fisher folks' inputs were only considered if they supported what had already been decided at those levels. Participation occurred mainly within invited spaces (Gaventa 2006) and the regional agenda, which was also the national agenda, prevailed. This corresponds to what was later discussed by Pretty (1995) as manipulation of stakeholders, in which participation is by those who have not been elected and are powerless. For the BMUs, fisher folk leaders who participated in the development of co-management and in the initial implementation were not elected and they did not have power to influence decisions. They did not understand what was expected of their participation. However, the election of BMU leaders in the later years has not changed the way co-management is implemented in Lake Victoria (Kenya). How fisher folk are to participate is decided externally, although the participation cube developed by Fung (2006) advocates direct participation, information sharing for decision-making and understanding the link between decisions made and action taken. For Lake Victoria (Kenya) co-management, communication between fisher folk and the government is not interactive but informative. Power is not devolved from the government to fisher folk in a way that encourages meaningful participation in co-management. Government, as the more powerful stakeholder at the national level, uses participation to drive her interests, while at the beach level, the more powerful boat owners' interests are advanced. This approach to participation is, therefore, determined by power and interests (White 1996). As such, information sharing and linking of fisheries management decisions to actions are unlikely to play any role in improving fisheries management.

The government exercised hidden power, used by some actors due to their positions to achieve their objectives (Njaya et al. 2012), to decide on who to invite to the workshop and also control the nature of discussions taking place by determining the agenda (Cleaver and Whaley 2018). This conforms with "instrumental" co-management (Arthur 2005; Nielsen et al. 2004) that restricts resource users' participation in decisions. Since the government facilitated fisher folk participation, it very much controlled the space for participation (Gaventa 2006). The review of the by-laws of the four BMUs showed these simply adhered to government guidelines and the Fisheries Act (Government of Kenya 2016). This was seen with the similarities of the sources of revenue suggested by the four BMUs and what the revenue was to be used for.

The stated formal ambition to establish a sustainable fishery as an outcome of co-management has very little substance in the face of the maintenance of an open-access fishery

(Irvine et al. 2019), the realities of the informal institutions that subvert compliance of rules (Etiegni et al. 2016) as a result of a governance structure of co-management providing limited space for fisher folk participation in the crafting of the fisheries management rules. Participation of fisher folk at the four BMUs is largely limited to co-management implementation, with only minor capacity to influence matters of governance. Nunan (2010), investigating co-management on Lake Victoria in 2007, also concluded a general lack of participation perceived by BMU members. This concurs with our findings that participation among most of the BMU members remains restricted, with power very much invested in the BMU executives. See also Etiegni et al. (2019). The persistence and even increase in illegal fishing practice (Irvine et al. 2019) provide a strong signal that the formal institutional structure of a regulated fishery is not aligned with the informal institutions, where clan and kinship relationships foster local corruption (Etiegni et al. 2016; Nunan et al. 2015; Obiero et al. 2015). This could be viewed as aspects of institutional bricolage in which fisher folk ignore or bend formal government rules as they participate in the fishery (de Koning 2011). This they do with the sole aim of earning a livelihood. BMU leaders use interpersonal relations to selectively enforce formal regulations that require fisher folk registration to participate. They use their power to determine who can participate without registering and who must register to participate. As such, the formal regulation is not fully implemented, but subverted through power and interpersonal relations that exist between the BMU executives and other fisher folk.

The categories of fisher folk laid out in the BMU regulations comprise a heterogeneous mix and the extent that each category participates or influences co-management of the fishery is debatable. For many fisher folk, participation is dominated by picking their way through the formal and informal institutions, including payment of bribes and fines to continue fishing (Nunan et al. 2015). At the very least, this provides a particular flavour to the concept of participation. For others, it may be about the next sliver of income. In the fishery of Lake Victoria, many crew are low-skilled transient workers (personal communication BMU Chairperson) in the employ of a boat owner, but nevertheless, crew are required to register with the BMU. While a noble ideal, especially for collective action, boat crew have limited space for participation in co-management (Nunan et al. 2012), other than providing a cohort of votes for BMU executives. It is, therefore, a contestable point why they should be required to participate in the payment of membership fees to a BMU. This seems to be recognized in Malawi, where a fisher is defined as a gear owner, restricting any role a crew member has in formal co-management structures, even though it is those who actively fish that effect compliant fishing or not (Hara 2006).

Conclusions

This paper used the case of Lake Victoria (Kenya) to explore the nature of resource users' participation in the development and implementation of co-management. As currently constituted, the government still holds most decision-making powers that structure co-management, with fisheries management retaining the character of a traditional top-down approach. Fisher folk's participation is largely a formalized action aimed at implementing externally crafted rules (Nielsen et al. 2004). However, from the evidence, it can be concluded that institutions and the interactions between them are important for the social-ecological structure of that co-management. The formal and informal institutions interact in ways that are not complementary, undermining the ambitions of fisheries co-management. Informal rules shape fisheries practices at the beach level. For instance, corruption undermines enforcement of fisheries rules with outcomes that are socially and ecologically damaging (Etiegni et al. 2016). As such, a greater level of understanding of how formal and informal institutions interact can help develop more meaningful participation of stakeholders to better align fisheries management objectives with fishing practice. This would also improve accountability of BMU leaders to their local constituents as well as to government.

Our study suggests that to have meaningful participation of fisher folk in co-management, there is a need for greater devolution of power. Considering both hidden and open sources of power, taking into account the realities of inter-personal relations at different scales, and from the earliest stages of co-management design, will promote better outcomes. For the Lake Victoria BMUs, this was not done, and revising the now established governance structures, with their current power dynamics, will be extremely difficult. At the beach level, this would require an effort to open spaces for participation to less powerful fisher folk for their better involvement in decision-making on fishing practice. It would necessitate an enabling environment supported by local fisheries officers, including addressing local instances of criminality and corrupt practices (Etiegni et al. 2016), and an extension service that provides better awareness of the benefits of sustainable resource use. Enhancing fisher folks' understanding of the goals of co-management, and their role in that, can also help identify misuse of power by their leaders. This will enable participation of fisher folk that goes beyond being advised by more powerful actors within co-management, to one that they participate on a more equal basis.

To make co-management more inclusive (Armitage 2005), emphasis should be on resource users' empowerment that also facilitates the empowerment of marginalized resource users. Co-management structures that provide more space, vertically and horizontally, for fisher folk participation foster meaningful participation at all levels. Ceded powers to resource users

within co-management is a general principle that can lead to more meaningful participation in fisheries management and for participants to claim their space in fisheries management (Béné et al. 2009; Borrini-Feyerabend et al. 2004). Such development does not negate the role of informal institutions but likely moves closer the where processes of bricolage work to reduce rather than increase potential management conflicts.

The example of how fisher folk participate in co-management discussed in this study suggests that research on co-management should give greater attention to factors that impede and facilitate resource users' participation in co-management. This view is supported by Ballou et al. (2016) who, while acknowledging the importance of resource users' participation in resource management, suggest a focus on barriers to participation, which may be logistical or relational, to boost participation. For the current structure of fisheries governance in Lake Victoria (Kenya), it is hard not to conclude that this is not a simple denial of reality, driven by a top-down management philosophy, inevitably resulting in non-compliance of fisheries regulations (Etiegni et al. 2016), which themselves fall short of the fundamental challenge presented by an overexploited open-access resource. The critical institutionalism perspective shines a light on these conclusions but, more importantly, provides a way forward that can help achieve more sustainable outcomes that support local beneficiaries.

The process of co-management development in Lake Victoria (Kenya) was instigated from the top and it focused on external interests rather than resource users' interests. Fisher folk do not, therefore, know the problems co-management is intended to solve, why they should participate, and what benefit participation is to them. The management benefit of the BMUs is not what was envisaged. In its development, fisher folk involvement was effectively absent. Their involvement in the implementation stage is limited to being informed of decisions already taken. Since what precedes co-management implementation and what happens during implementation stages are important to co-management success (Chuenpagdee and Jentoft 2007), for the lake's co-management, neither the beginning nor the implementation has been done with any clear objective legitimacy. A lot of focus was put on developing formal institutions with little regard to the influence and importance of informal ones. As such, the lake's co-management is unlikely to provide benefits that include sustainable fisheries and improved livelihoods for fisher folk (FAO 1995, 2015).

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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