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Local-Scale Governance: A Review of the Zambian Approach to Fisheries Management

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Abstract: Despite Zambia's recent policies for optimizing sustainable management of fisheries, their success has been modest in practice. Artisanal and industrial fleets have led to decline in fish catches in the presence of currently prescribed management possibilities. Among other factors, excessive fishing and unsustainable fishing methods attributed to common property and free access to the resources are key. The country adopted co-management approach to fisheries management in the 1990s with a view to improve the fisheries stocks through community enforcement of fishery management regulations. Neither the success of co-management has been easy to measure nor its results appreciated. In view of overfishing, it is required to continue providing a range of empirical evidence of area-specific co-management interventions as basis for designing realistic and innovative solutions for the nation. This implies that new policies and institutions need to be developed by research to understand fisheries systems and better promote sustainable trajectories. The following review recommendation to central government is a coherent approach that uses and crystallizes the multiple interests and skills of co-management stakeholders. Most stakeholder groups have been involved in an *ad hoc* fashion through workshops, public meetings and consultative processes mainly organized by Department of Fisheries. Stakeholders should be involved from the design of the process to each step in the process, including the ongoing monitoring and evaluation. A form of memorandum of understanding is suggested. This will formally set out a process that acknowledges each stakeholder's interests and provide forums to facilitate discussion, consultation and monitoring of management activities.

Key words: Co-management, overfishing, government, community, stakeholder, participation.

1. Introduction

The rich endowment of water resources, accounting for approximately 145,194 km^2, provides Zambia with the potential for supporting significant economic growth and development [1]. These water resource catchments comprise those established by human, ranging from small villages to towns and cities. These highly populated centres host a variety of human activities, including farming, factories, commercial fishing industries and power generating stations.

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Zambia has 11 major fisheries, of which four are within the Congo basin (Bangweulu, Mweru-Luapula, Mweru-Wantipa and Tanganyika) and seven are in the Zambezi basin (Kafue, Kariba, Lukanga, Upper Zambezi, Lower Zambezi, Itezhi-Tezhi and Lusiwashi). Zambia is a landlocked country and shares some of the major fishery areas with other riparian states (Fig. 1).

The main species of fish in these fishery areas include Tilapia species, commonly known as Breams, a number of small pelagic sardine-like species known as Kapenta (*Limnothrissa miodon* and *Stolothrissa tanganicae*) and Chisense (*Angraulicypris* species and *Poecilothrissa moeruensis*) as well as Buka buka (*Lates stappersii*). These species are targeted by both

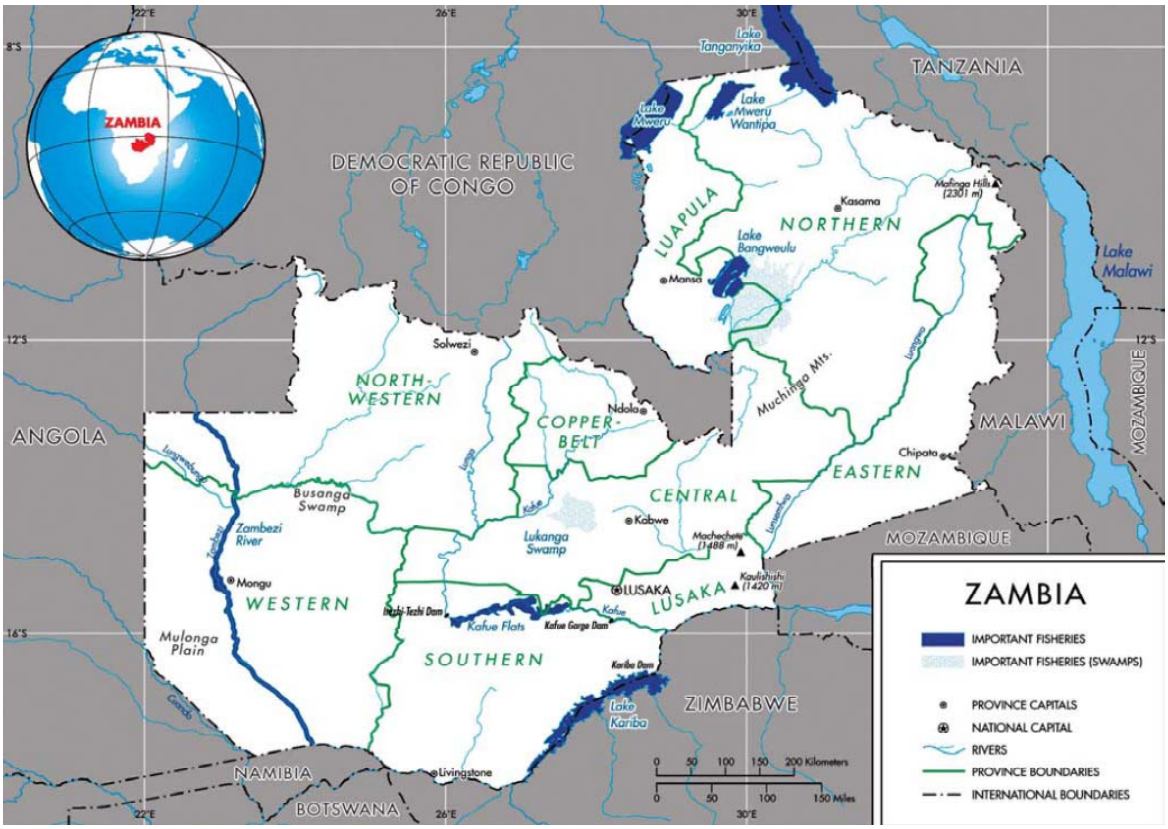

Fig. 1 Map of Zambia showing major fishery areas.
Adapted from Musumali et al. [1].

artisanal and commercial fishers of different ethnic background and religious belief, and have broad market acceptance throughout the country and in the region [1, 2]. The commercial gears predominantly used are gill nets and seines of various types.

However, selective overfishing and use of unsustainable fishing methods by local and industrial fleets [3] leading to decline in catches has continued in the presence of currently prescribed management possibilities, mainly due to population growth and increasing dependence on fisheries [4]. As a consequence, much of the fleet has been faced with declining profitability. This is contrary to the benefits which are anticipated at the time of co-management program design. Nonetheless, fisheries still play an important role in local food security by providing food, income and employment.

This review was undertaken for two reasons: (1) to provide a better understanding of the fisheries management arrangements in use, how they operate at different levels and how much benefits for their establishment; (2) to provide updated information to central government to assist in policy development around co-management for improved benefits (such as sustainable food and nutrition). This entails customizing the co-management initiative to suit the prevailing social, economic, cultural, political, technological and ecological circumstances.

1.1 Governance

Governance is about the politics of natural resource management. Many of the management issues are explained within the concept of governance [5]. It refers to the overall process of involving citizens in the political processes of resource allocation. Governance is based upon and contributes to a social contract between the state and its citizens, where both parties recognize the legitimacy of the rules that

govern society [6]. Governance could also be looked at as the process of decision-making within the legal frameworks, structures and processes, by which decisions are implemented. It relates to how people are involved in decision-making and how this affects their abilities to empower themselves and others and derive benefits from the process. Poor governance is variously characterized by corruption and a lack of transparency, participation by key stakeholders, accountability and the rule of law [5].

While privatization of the common-pool resource would be an optional form of enclosure of the commons, it would have tremendous negative impacts on vulnerable socioeconomic groups, especially the poorest and largely women. These people rely more heavily on these resources to sustain their livelihoods through subsistence harvesting, generally under informal communal access rights. While such recommendations inspire "out-of-the-box" thinking about alternative governance approaches and how they could be strengthened. Verelst [7] rightly notes that governance is about understanding human societies and environment, scientific findings and technologies, acceptable management approaches, political and economic prerogatives and specific location. However, almost all the fishery areas in Zambia seem to lack a systematic and clear mechanism of tracking progress on co-management since its inceptive situation that limits the extent. So in the review, the concept in use is clearly defined among the stakeholders.

1.2 The Management Argument

Berkes et al. [8] revealed that there was a strong argument in the co-management literature that the term co-management should be reserved in these situations, in which there is a sharing of power and responsibility between the users of a resource and the government manager. Merely informing or consulting does not constitute co-management. This is one of the reasons why Njaya [9] pointed out that it was imperative to use the term "co-management" in the context, as there is no "one size fits all" model co-management. However, the Zambian case draws from a conceptual model of co-management in the resource management context that involves the following attributes but at different levels: (1) the community involvement in decision-making; (2) sharing of responsibility for a resource between the resource manager and the community; (3) drawing on a range of knowledge systems to inform management; (4) focusing on negotiation and consensus. It is argued that significant effort is required to achieve the afore-stated attributes, as humanity is expected to adjust to sustainable ways of conduct. The study isolates some of the critical issues arising among fisheries participants with related arguments about co-management at national level (Table 1).

The main argument for co-management is that it can result in more efficient management while allowing greater resource users involvement in management decisions. Co-management is generally considered to be more democratic [10], more accountable, functioning at local level where self-interest and responsibility for sustainable resource management are potentially greater [11], with lower transaction costs and possibly more sustainable than top-down management due to better communication and less conflict among participating stakeholders [12]. However, Nemarundwe [13] observes that the local-level management regimes are generally weak and they have overlapping and inconsistent rules which are widely ignored and poorly enforced. By appropriating control over fisheries management, the Zambian government has underestimated the capacities of fishing communities to manage local fisheries resource systems to meet their needs. Reasons advanced for this skepticism include the lack of know-how among fisher communities and their general inability to organize themselves to manage for long-term sustainability. Unless the government and decision-makers are convinced of the desire and the ability of users to manage themselves, little progress

Table 1 Some of the critical issues arising among fisheries participants.

Issue category	Critical issues arising
In support of co-management	Need to address destructive behaviour towards natural resources; Need to promote interaction between resource users and their environment; Need for sufficient knowledge, skill and resources; Need a variety of stakeholders with influence on decision; Need equity, social justice and democratic involvement; Need to constantly address conflict among players/stakeholders; Mechanisms for conflict resolution need to be given high priority.
In opposition of co-management	Co-management is expensive to initiate and not worth the investment; Anticipated results take too long or are never achieved at all; Co-management is a political gimmick; Bottom-up approaches are a nightmare with co-management in fisheries; Tensions between various stakeholders remain a challenge; Co-management is not panacea to solve the collapsing fisheries resources.
Not taking sides (i.e., neither in support nor opposition)	There is complete dependence on fishery resources by thousands of full-time fishers—we do not care about management; Fishery resources are given by God; human intervention is not necessary—catch can only fluctuate, but will never deplete; How do you deal with ethical dilemmas of key players involved in co-management? E.g., while traditional authorities are vital in resource protection, they also have interests to fish for subsistence during closed seasons and use illegal means in some cases.

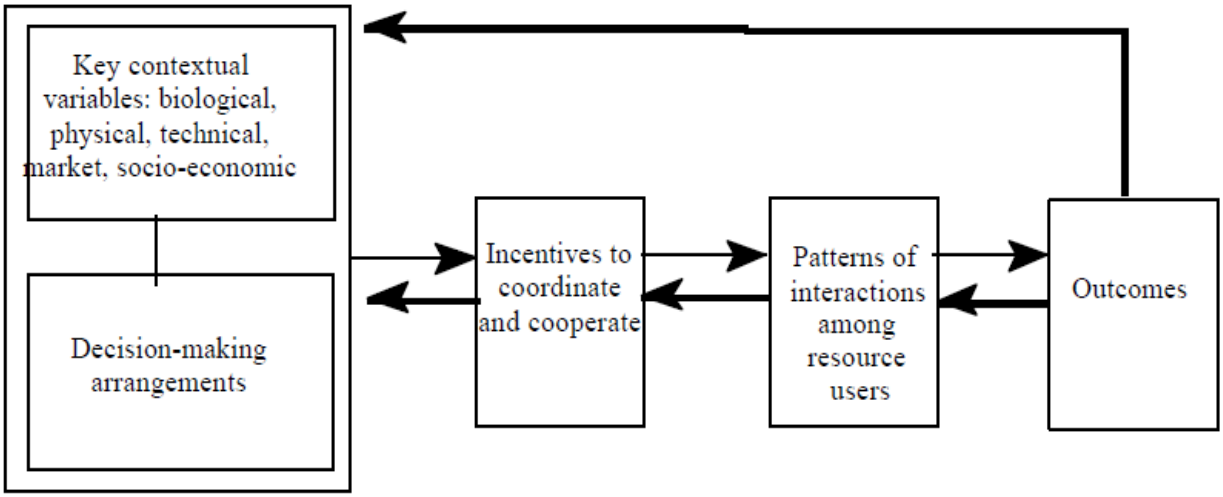

Fig. 2 Research framework.
Adapted from Sverdrup-Jensen and Nielsen [14].

will be made in co-management. This could imply that there is need to make more efforts towards moving potential players into category 1 in Table 1.

2. Study Methodology

This investigation is more of a curiosity-driven research conducted on the basis of a loosely conceived feeling that something useful might be revealed about theoretical advancements and practical challenges of co-management in Zambia. Besides personal experiences in the field, authors conducted interviews with fisheries personnel and selected others including fishers, traditional authorities and representatives of stakeholder groups. These semi-structured interviews of key informants were quite revealing. The other sources of information were provincial and national review meetings. Secondary sources were also very useful.

In order to understand key factors influencing the co-management which institutional and organizational set-up operate at local level in Zambia, the study adopted a framework described by Sverdrup-Jensen

and Nielsen [14]. The framework guides through description of a complex and dynamic process, where outcomes, incentives and patterns of interaction can continually affect the contextual variables and the decision-making arrangements (Fig. 2).

3. Results and Discussion

3.1 Co-management Conceptual Genesis

Historically, the Department of Fisheries (DoF) was the only institution with the mandate to manage fisheries resources. This meant the sole responsibility for policing the resource, besides monitoring activities and enforcing regulations in extensive and highly scattered fishing villages. However, fisheries management has been evolved from a traditional system to a centralized regime followed by the introduction of co-management fisheries systems in the early 1990s [15, 16]. Over the last 20 years or so, local authorities, communities, traditional leaders and associations are charged with both the day-to-day and long-term responsibilities for the management and governance of physical resources within their boundaries (Table 2). They have several roles, which are guided by such statues as the Local Government Act and Fisheries Act.

It is argued that implementation of co-management is an innovative response to challenges in practice and theoretical advancements [17]. For Zambia, a number of factors indicate the manner in which this management arrangement was instituted: the inability of DoF to effectively manage fisheries in the face of budgetary cuts by the treasury; and the liberalized political situation that brought about a multi-party political dispensation in 1991 [18]. These were compounded by the enabling political environment created by the formation of Southern Africa Development Community (SADC) that provided an opportunity to use the experience gained from Community Based Natural Resources Management (CBNRM) programmes to expand these initiatives across borders [19].

The co-management approach in Zambia is partly inspired by the thinking embodied in the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) programme relating to the wildlife sector, which was established in order to ensure that local communities would benefit from wildlife management policies. The CAMPFIRE concept has been adapted to fisheries with little success. Reasons could be sought in findings by Virtanen [20], who concluded that in most cases, the local CAMPFIRE rule systems had no link to local values and priorities, and consequently they enjoyed limited local legitimacy. Like most developing countries in Africa, Zambia is also compelled by pressure from international donor agencies to introduce co-management or at least establish a more democratic process in the formulation of fisheries policy objectives [14].

However, the government has a strong incentive for co-management to succeed in community fisheries. Such incentives include the threat of overexploitation, non sustainability in the fisheries, poor levels of compliance with regulations and the lack of resources for monitoring, control and enforcement under top-down management. While success also brings challenges, co-management has been evolving with challenges in its implementation in Sub-Saharan Africa as a whole. Nevertheless, Zambia endorses co-management and it is actively promoted by central government as a key management tool of a governance reform in fisheries. Table 2 shows that co-management has gained implementation at different times in different localities with some fishery areas, yet to begin implementing it. It has been difficult to make generic recommendations with respect to governance of fisheries in Zambia, because each management context is different and the impacts are experienced differently as well [21].

This review agrees with sentiments by Sen and Nielsen [22] that the type of co-management regime in place is determined by the aspirations and capabilities of co-management partners, and the most appropriate

Table 2 Co-management dynamics in major fishery areas of Zambia.

Major features	Lake Kariba	Lake Mweru-Luapula	Lake Tanganyika	Lake Bangweulu	Upper Zambezi	Kafue River
Estimated size of fishery	5,580 km² of water area, 223 km long	5,120 km² of water area, 131 km long	2,000 km² of water area, 215 km long	3,500 km² (combined area of the lake and wetlands; reaches 15,000 km²), 75 km long	700 km² of water area, 800 km long	155,000 km² of water area, 1,600 km long
When co-management started	1993	1998	1998	1996	1996	2004
How co-management started	Facilitated by a donor-funded programme—the Zambia/Zimbabwe SADC Fisheries Project with support from NORAD and DANIDA.	Conservation and Management Action Programme (CAMAP) was initiated by DoF in 1992 to spearhead co-management activities. It was supported by SNV.	Initiated under the auspices of the Lake Tanganyika Biodiversity Project (LTBP) with support from UNDP/GEF.	Done through a donor project.	A donor-funded project initiated a participatory approach in the management of natural resources.	Lessons drawn from other fishery areas.
Direction to governance reforms	Inadequate revenue collected by councils; Influx of immigrant fishers; Increased theft of catch from commercial fishers.	Inadequate promotion of conservation dialogue and inclusive management; need to improve livelihoods and sharing of responsibilities between government and fisher communities;. Reaction to gear thefts.	Overfishing and continued use of unsustainable fishing methods by local and industrial fleets leading to decline in catches.	Inadequate conservation awareness observed in rampant use of illegal gears and non compliance with licenses; Need to reduce the role of TAs in the affairs of VMCs and formation of parallel management institutions in the same fishery competing for recognition.	Need to reduce the role of TAs in the affairs of VNRCs and formation of parallel management institutions in the same fishery competing for recognition.	Inadequate social and health services (“fish-for-sex” exchanges leading to increased prevalence of HIV/AIDS); Inadequate sanitation and issues of immigrant fishers inform the type of reforms.
Key partners	TAs, fishers, business persons, local authorities and DoF.	TAs, DoF, local authorities, fishing associations, fishers, business persons, farmers and fish traders.	TAs, DoF, local authorities, fishers and Zambia Wildlife Authority.	TAs, DoF, local authorities and fishers.	DoF, BRE and fishers	DoF, fish-traders, fishers and TAs.
Activities by local institutions	Controlling access to the fishery, monitoring and enforcing fishing regulations.	Conducting fish conservation awareness.	Local resource user enforcement of fishery management regulations.	To conduct awareness campaigns.	To develop local by-laws to empower local communities to manage natural resources.	Implementation of bylaws, monitoring of fishing regulations, fighting the HIV/AIDS pandemic, sanctioning those who break by-laws and regulating fish-trade.

(Table 2 continued)

Major features	Lake Kariba	Lake Mweru-Luapula	Lake Tanganyika	Lake Bangweulu	Upper Zambezi	Kafue River
Major results	VMCs and ZMCs were established; Involvement of stakeholders in fishery management was widely accepted, yet the decision-making process has remained with DoF; ZMCs was registered as voluntary organization under the Registrar of Societies Act; User committees collect levies from fishers and fish traders.	A survey carried out in 2002/3 revealed that about 60% of the respondents acknowledged good representation on the VMCs, while 40% cited interference of traditional authorities and witchcraft in the running of VMCs as a reason for non-participation; The Deconcentration process has improved participation of fishers in management, but the decision-making process has remained with DoF.	VCDCs were formed; Stratum Committees and a Fishery Committee were initiated by DoF in conjunction with TAs with a view to complement efforts by VCDCs; Inconsistence in operations of local-level structures.	VMCs and ZMCs were created; VMC operations have been undermined by TAs and are currently not functional; Immigrant fishers do not support co-management, claiming that it is not an economically viable option; There is unresolved conflict between VMCs and local authorities over levies collected from fishers and fish traders.	VNRCs were formed; Increased tensions between government officials and traditional representatives; Competition between government and BRE renders VNRCs non functional.	Governance reforms emerged at a much later period compared to other fisheries in the country;. Management committees that regularly consult TAs were formed; Complete end to the paying of “entry fees” to the fishery; DoF considers health and sanitation issues outside their mandate.

SADC: Southern Africa Development Community; NORAD: Norwegian Agency for Development; DANIDA: Danish International Development Assistance; SNV: Stichting Nederlandse Vrijwilligers; DoF: Department of Fisheries; UNDP: United Nations Development Programme; GEF: Global Environmental Facility; TAs: traditional authorities; VMCs: Village Management Committees; ZMCs: Zonal Management Committees; VCDCs: Village Conservation and Development Committees; VNRCs: Village Natural Resources Committees; BRE: Barotse Royal Establishment.

type of arrangement depends on the specific characteristics of an individual fishery. This implies that the efficiency and implementability of the management measures are often highly dependent on the support gained from the parties interested in the initiative [23]. Nonetheless, regardless of contextual use, some researchers suggest that the design of co-management systems should strike a balance between the responsibilities given to institutions, groups and individuals and the means at their disposal [10, 24]. Government's limited financial resources resulted in many initiatives spearheaded by DoF, which was supported by donor funding. In most of the cases, the short spans of the projects have had a negative impact on overall operational designs of co-management initiatives, especially that capacity building components have not been able to substitute for long-term capacity building in strategic areas within DoF and other stakes.

3.2 Conflicting Interests of Use and Power Relations

All states of postcolonial Africa claim that fisheries resources are their property. It has been argued that state property being superimposed on common property and traditional management has often resulted in unclear and contradictory competences, mutual undermining of authority and absence of effective management [25]. Property rights to all fisheries in Zambia are not clearly assigned to resource users. The fisheries are still under open-access management, and it is worse that local resource users have no greater right to the resource than outsiders or migrants. Pomeroy et al. [26] state that without property rights, it is difficult to greatly change user attitude and behaviour towards conservation.

With regards to the legal framework, the Fisheries Act No. 21 of 1974 was the first post-independence principal legal instrument guiding development and control of the national fisheries sector. It provided for: authorization and prohibition of specific fishing methods; designation of areas (for recreational, subsistence, research, or commercial fishing); registration of fishers and fishing craft in commercial fishing areas; prohibition of non-native fish introduction to any water, or import of live fish without authorization. In 2007, the government passed the Fisheries Amendment Act of 2007 with the objective to improve the involvement of riparian communities in fisheries management, promote development of the aquaculture sector and establish a fisheries development fund. Under this act, each fishery would be designated as a fisheries management area and be run by a fisheries management committee. The committee would oversee the development and implementation of a fisheries management plan at the level of the fishery and would administer a fund to increase the welfare of riparian communities. The fifth National Development Plan (FNDP) [27] also outlines the government's strategy for inclusive growth and development, whose specific goals for the fisheries sub-sector aim at promoting community-based resource management of capture fisheries. Zambia's fisheries currently operate under Fisheries Act No. 22 of 2011, which simply clarifies a few gray areas in the previous one though still with limited emphasis on powers of management actors [28].

Njaya [29] emphasizes that "without an understanding of the powers of various actors—the domains in which they exercise their powers and to whom and how they are accountable, it is impossible to learn the extent to which meaningful decentralization has taken place". He emphasized the identification of key stakeholders and the positioning and categorizing of the types of power they hold. The power structure in Zambia's co-management arrangements is such that traditional customs and practices exert quite some influence on decision-making concerning collective action and operational rules. True fishers seldom hold powerful and influential positions.

3.3 Community Vitality and Solidarity

Not only are viable fish stocks necessary for the vitality of fishing communities, but the reverse also holds true: "viable fish stocks require viable fishing communities" [8]. Threats to the survival of commercial fish species occurs when the norms of self-restraint, prudence and community solidarity have been eroded. This occurs when fishermen and the other community members do not care about the resource, their community and each other—a common feature in most small-scale fisheries of Zambia. Table 3 highlights

Table 3 The co-management challenge in Zambian fisheries.

Source of challenge	Explanatory attributes leading to the challenge
Dependence on the fishery	Human populations are growing and access to fisheries is open to everyone;
	Full-time fishers need income to purchase all necessities;
	Fishery products attract high market value;
	A general lack of alternative livelihood opportunities leads people to encroach on natural resources in illegal, uncontrollable and unsustainable manners.
Incentives for fishing communities	Few incentives to participate in fishery management leading to reluctance to invest time and effort;
	No tangible benefits especially in the short-run (increased and sustained catches).
Indistinct physical boundaries to resources	Small-scale physical characteristics do not shape rights of access and use of natural resources—fishers are free to fish wherever they wish;
	Unsustainable government financial resources to support management and enforcement over extended shorelines;
	Pockets of conflict between ethnic groups over access to and exploitation of fish resources and between lodge owners and fishers over access to shoreline and adjust waters.
Sense of ownership	Sense of ownership is quite low among members;
	Objectives guiding implementation of co-management not jointly developed by stakeholders;
	Corruption makes the establishment of trust worth relationships difficult;
	Open access nature of fisheries—absence of exclusive fishing territories;
	Means of production not owned by those directly involved with fishing activities.
Decentralization reforms	Local people do not take on new responsibilities unless they gain legal recognition;
	Reforms are applied to all locations, but the process of implementation is asynchronous—occurs in context of site-specific donor supported programs;
	Differential influence over management of fisheries resources in Zambia;
	Government officials frequently resist to legitimize local resource use—only limited empowerment has been observed;
	Partners not held equally accountable for upholding the co-management agreement;
	Government still reserves the power to modify or create rules, power to make decisions, power to implement and ensure compliance and to a larger extent power to adjudicate disputes;
	Powerful local authorities have used co-management programs to serve themselves rather than fishers they represent.
Extreme mobility	Fish populations are resources of an open-access nature;
	Many fishermen migrate to other areas where fishing is carried out most effectively and efficiently;
	Migratory movements around fishery areas increase with diminishing fish stocks in fisher's respective localities;
	Conditions of entry into fisheries work seem relatively easy in times when overall rural economy offers very limited opportunities for gainful employment;
	The question of carrying capacity of attractive fishery areas has not been studied to determine; appropriate fishing effort.
Scepticism by fishers	Suspicious of motives and sincerity of government authorities when they propose collaboration and sharing of management responsibilities;
	Co-management is used mainly as a mechanism for conflict resolution rather than for achieving sustainability of resources;
	Co-management is mainly government-based where control and law enforcement are left;
	Government that always sets rules and regulations.
Support	Small scale fishers are inadequately supported to ensure food security and poverty alleviation through alternative income generating activities—during closed fishing periods and in heavily exploited fishery areas;
	Lack of concerted efforts by government line departments or ministries in promoting the co-management model.

some of the common challenges. When such accrues, their ability to communicate among themselves, reach an agreement and cooperate is lost [8]. The complex interactions of attributes in both of resource and resource users are fundamental to theoretical understanding of commons institutions [17] which are designed to support co-management.

However, empirical evidence shows that self governance of common pool resources is possible. For instance, the people of Lake Mweru-Luapula created associations to overcome the commons dilemma. This agrees with Donda [30], who argues that in the face of uncertainty of resource availability, fishers are more willing to team up in order to trade off some benefit from individual use of the resource for collective assurance. In this manner, the resource will most likely be used more equitable and sustainable. One of the crucial causes of fishery management failure in Zambia could be attributed to failure to implement necessary provisions in a timely manner due to social or economic pressures [31] compounded by an absence of sufficient and appropriate information. This implies that there is need for awareness creation on environmental and resource management issues, through active multi-stakeholder platforms in fishery specific areas.

4. Conclusions and Recommendations

Co-management regimes are dynamic, and a variety of arrangements are found in practice in Zambia. Co-management systems and processes in fishery areas vary in terms of the nature of power sharing, composition and functions. This review uncovers that a crucial factor limiting management success in Zambia is the lack of relevant enabling legislation. Currently, the community of fishers can create rules, but with limited scope. Most of the rules created by the community depend on the other institutions, such as the DoF, police, etc.. Setting objectives for the co-management arrangements is still primarily done by government representatives through the Fisheries Act, albeit with limited success owing to inadequate resources. Moreover, despite the differences in existing local institutional and ecological realities, Zambian fisheries are governed under the same act and regulations. The power to control access to fishing remains with government. This ignores the fact that the co-management process is seemingly inherently adaptive, relying on systematic learning and the progressive accumulation of knowledge among the stakeholders for improved resource management. It is therefore suggested that government should step in and support the user communities by approving the formulation and enforcement of fishery specific by-laws. This could be through consultations at the community level to refocus management objectives and activities. Stakeholder interests need to be harmonized, and their roles and responsibilities should be clearly defined in the management and decentralization plans. A form of memorandum of understanding (MoU) is suggested to formally set out a process that acknowledges each stakeholder's interests and provides a forum to facilitate discussion, consultation and monitoring of management activities. This will facilitate understanding of power relations among sectors which can affect the consultative process and institutional linkages. Therefore, in order to keep peace with changes, co-management must be examined not only in terms of how it works but also in view of the problems with which it works. It, however, should be borne in mind that for a number of reasons, co-management may not be suitable for every fishing community.

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