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Research Article

## “I am a Fisher”: Identity and livelihood diversification in Lake Tanganyika Fisheries, Tanzania

Gideon Bulengela\*

*Department of Social Studies, Mwalimu Nyerere Memorial Academy, Dar es Salaam, Tanzania*

Article information	Abstract
<p>Received: November 2, 2023            1<sup>st</sup> Revision: January 24, 2024            2<sup>nd</sup> Revision: March 7, 2024            Accepted: March 10, 2024</p> <p><b>Keywords</b>            Lake Tanganyika,            Identity,            Fishing practices,            Livelihood diversification</p>	<p>Human-environmental interaction is central to natural resources management. This interaction determines how the resource is utilized in a given cultural context. In Lake Tanganyika, evidence indicates a decline in fish catches. Despite this decline, fishers have demonstrated little motivation to leave fishing or diversify. A qualitative study was conducted to explore how identity influenced the phenomenon. Interviews, focus group discussions, and observation were employed to generate data. The findings of this study indicated that interactions between the fishing communities and the Lake generated identity, in which fishers came to identify themselves with the Lake. This identity shaped the fishing practices and influenced the motivation to not leave fishing or diversify. Strong attachment to the Lake and fishing activities contributed to little motivation to leave fishing or engage in other sources of livelihood, especially for old fishers. This was also the case for some young fishers in rural areas of the studied communities. This study concludes that considering how fishers identify with the resource is vital for developing future strategies to improve fisheries management. This may include options to expand fishing opportunities, such as the introduction of aquaculture and fish cages.</p>

### 1. Introduction

Human relationships with nature are complex and multi-faceted. They include using natural phenomena to confirm who we are, and linking our identity to nature through beliefs and practices (Clayton & Opotow, 2003; Ritov & Kahnemann, 1997). Identity is understood as “all the different ways people construe themselves concerning the earth as manifested in personality, values, action and sense of self which result in nature becoming an object of identification” (Zavestoski, 2007). Identity is discussed concerning human interaction with nature. The human-nature interaction makes communities identify themselves with resources. A strong sense of identity and place attachment has always been a characteristic of fishing families (O’Driscoll-Adam, 2014). Thus, claims for, and access to, natural resources are deeply embedded in people’s histories, identities, and livelihood experiences (Williams, 2021). Identities with natural resources, in this case, fisheries resources, shape how community members claim to access and control fish resources.

The environment in which people live provides them with their basic needs, such as food, shelter, and others, and also serves as an identity. Environmental identity is understood as all the different ways people construe themselves about the earth as manifested in personality, values, actions and sense of self, resulting in nature becoming an object of identification (Zavestoski, 2007).

\*Corresponding author: Department of Social Studies, Mwalimu Nyerere Memorial Academy, Dar es Salaam, Tanzania  
 E-mail address: [gbulengela@gmail.com](mailto:gbulengela@gmail.com)

Studies in natural resources and identity have revealed how people get attached to and identify themselves with nature. For example, Mwaipopo (2001) has argued that local people's perception of the environment is based on social categories, relationships developing from their multiple livelihood endeavors, and their claims to resources. In her study along the Indian Ocean, she demonstrated this fact. In Saadani village, for example, *kitweleo* (relish prepared from a sea product) establishes gender identity; it brings status, as it is vital to have a finfish for a dish to be regarded as complete. Kitweleo also fosters other relationships, such as between fishing folk, men, and women.

For the Wayanad tribe of India, forest and wildlife sanctuaries form the surrounding area's core and pristine habitats. These places (like Thakanpady, Ponkuzhy and Ambukuthy) were necessary for ceremonial, cultural, and social reasons, standing as an identity to them (Narayanan, 2008). A study conducted in Alaska indicated that the fishing community there regarded community members as valuing natural resources, their identity as fishers, their community, and their way of life (Schama, 1996). Studies in the Olifants River estuary in South Africa indicated that fishing was felt to be beyond merely earning a living. It shaped a strong identity in the fishing community; so, the district emphasized their traditional links to the area. When management proposals suggested the closure of fisheries, the community strongly opposed the idea (Williams, 2021).

In the context of Lake Tanganyika<sup>†</sup>, numerous studies have observed a decline in fish catches since the 1990s (Bulengela, 2019; Cirhuza et al., 2011; Petit & Shipton, 2012). Several arguments have been presented that explain the decline of fish catches in Lake Tanganyika. While some scholars emphasize the role of climate change impacts on declining fish catches (see Mziray et al., 2018: 237; Naithani et al., 2011; O'Reilly et al., 2003; Plisnier et al., 2018, p. 76; Plisnier et al., 2009; Sterckx et al., 2020), others put more weight on the influence of human-induced factors, mainly, increase in fishing pressures and destructive fishing practices (Bulengela et al. 2021; Sarvala et al., 2006). These two arguments dominate empirical data and literature on declining fish stock in Lake Tanganyika.

The Tanzanian government has encouraged fishers to engage in other sources of livelihood to reduce fishing pressure in Lake Tanganyika. However, evidence suggests that the motivation to diversify has been low, and fishing pressure is still high (Bulengela et al., 2019; Van der Knaap et al., 2014). Additionally, though studies exist on the coping strategies of fisheries with a decline in fish catches, most studies focused on changing fishing practices, such as changing fishing gears (see Bulengela et al. 2019; Cirhuza et al., 2015; Petit and Shipton, 2012; Van der Knaap et al., 2014). Little attention has been paid to understanding factors influencing diversification among fishers in Lake Tanganyika.

This study explores how fishers identified themselves with the Lake resource, and how this influences their perception of fishing and, consequently, their likelihood to leave fishing or diversify. This study follows the cultural perspective's conception of resource users. The cultural perspective focuses on the fact that cultural values and social constructions of nature, including landscape, are at the center of relationships between nature and communities (Li et al., 2015; Posey, 1999; Schama, 1996). Local communities and indigenous people have value systems that link them to the natural world (Awuah-Nyamekye, 2009; Evans & Jackson, 2001; Infield et al., 2013). Thus, this conception of resource users is vital for revealing how resource users interact with the resources, and the implications of such interactions on resource users' relation to the resource; in this case, fishers' relation with the Lake.

This paper continues with sections concerning materials and methods, study findings, and a discussion of the findings, and ends with conclusions.

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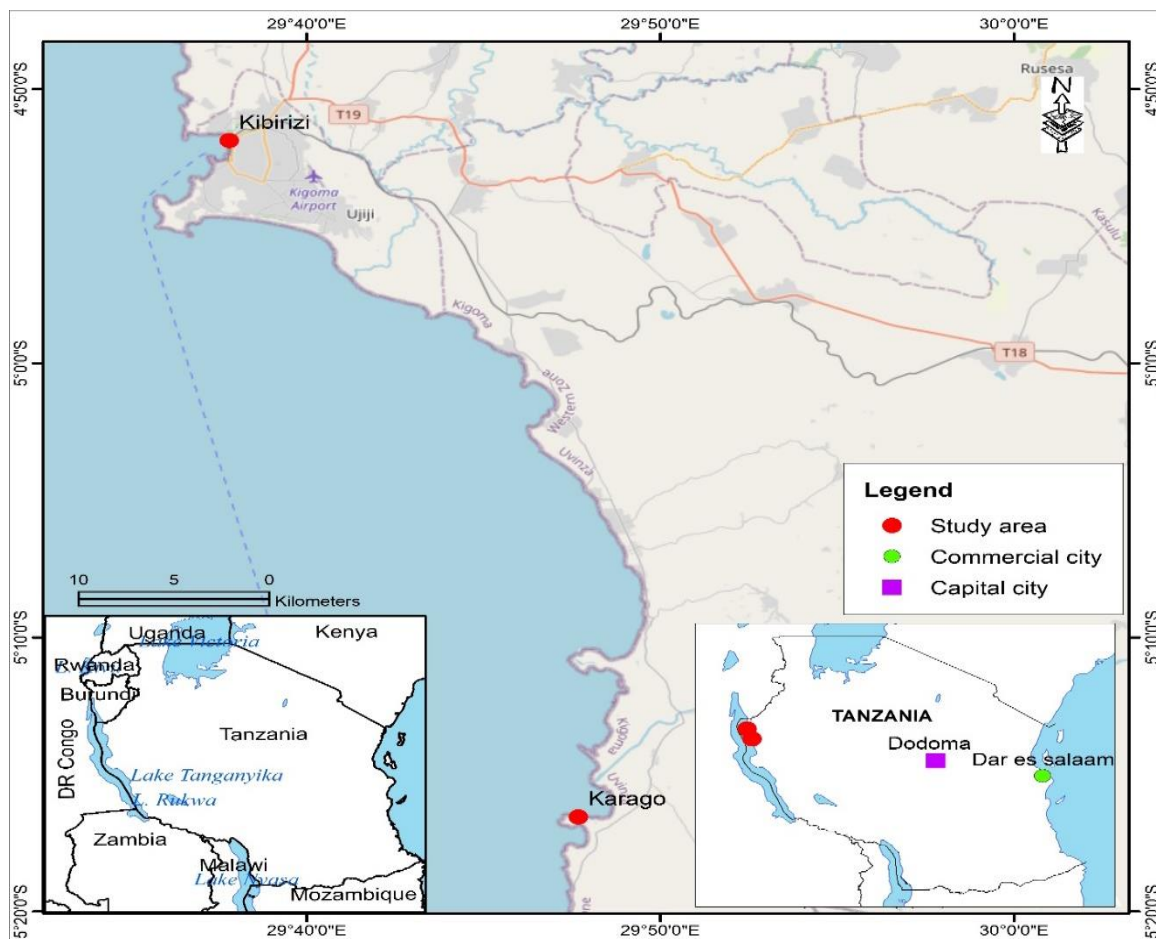
<sup>†</sup> Lake Tanganyika is situated within the Albertine Rift, the western branch of the East African Rift, and is confined by the mountainous walls of the valley. It is the largest rift lake in Africa, and the second-largest lake by volume in the world.

## 2. Materials and methods

### 2.1 Study communities

The study was conducted at two fishing communities along Lake Tanganyika: Karago and Kibirizi (**Figure 1**). Karago is about 70 kilometres south of Kigoma, and Kibirizi is in Kigoma. Karago is located in a rural area, while Kibirizi is in an urban area. The population of Kibirizi is 11,623, while that of Karago is 5,231. The idea of having these two different communities was to compare and contrast the way community members in the selected communities perceived the fish and fisheries. The fishing communities are also among the oldest in Kigoma. Thus, the older fishing communities are assumed to be the most salient locations to provide a rich and vital understanding of historical fishing activities and local knowledge over time.

This study targeted fishers, fish processors, boat owners, fish sellers, fisheries officers, and the Beach Management Unit (BMU) committee members as the primary informants. Community leaders and elders were also included, based on the assumption that they possess critical historical information about their communities and the fisheries.



**Figure 1** Map showing the study sites.

### 2.2 Data collection

This study focused on Lake and fishing communities, and employed a qualitative approach to explore the local community's perception of the Lake and its fishing practice. This approach makes it possible to assess everyday community life from the participants' perspective (Berg, 2001). Data were generated over two months, from June to July 2023. The researcher relied heavily on in-depth interviews, focus group discussions, and observation for all data collection.

**Table 1** Number of interviews, distribution among study sites, and categories of informants.

Location	Target group	Method	Gender of respondents	
			Male	Female
Karago	Fishers	Interview	7	0
	Boat owners	Interview	2	1
	Fish processors	Interview	2	2
	BMU leaders	Interview	1	0
	Community leaders	Interview	1	0
	Fishers/Boat owners	FGD	6	1
Kibirizi	Fishers	Interview	7	0
	Boat owners	Interview	2	0
	Fish processors	Interview	2	2
	BMU leaders	Interview	1	0
	Community leaders	Interview	1	0
	Fishers/Boat owners	FGD	7	0

A total of 30 interviews were conducted in the two study communities over two months. Discussions focused on fishers/boat owners, fish processors, fisheries officers, BMU leaders, and community leaders. Additionally, two Focus Group Discussions (FGDs) were conducted, one for each village. FGDs were conducted during the second phase of fieldwork. Participants for each focus group were selected from individuals who participated in interview sessions. Focus group discussions aimed to explore the shared experiences of fishing community members. It also explored fishers’ perceptions and knowledge regarding fishing practices in the area and livelihood options, more clearly illustrating shared norms and cultural expectations.

Observation was also utilized throughout the entire process of data collection. Observation focused on major livelihood activities, how people interacted with the Lake, fishing gear used, fish landing, fish processing activities, fish selling, and other related community activities.

### 2.3 Data analysis

Data analysis involved several steps. The N-Vivo version 11 software helped sort and organize data generated during the fieldwork; this included coding and identifying themes and sub-themes. A grounded theory approach to data analysis facilitated open coding and a constant comparison methodology. The process involved carefully reading data to gain an in-depth understanding, and then identifying key concepts and emerging themes (Hammersley & Atkinson, 1997). This process was followed by utilizing the “constant comparative method” (Glaser & Strauss, 1967, as cited in Corbin & Strauss, 1990), which requires finding meanings and exploring the relations within and among each data category. Data were compared and contrasted to explore similarities and differences in how fishing community members perceived fishing activities in the Lake and the likelihood of diversification.

### 2.4 Ethical considerations

Before data collection, researchers ensured informed consent by providing clear explanations of the objective of this study to the informants, and ensuring that each participant understood that their participation was voluntary and that the information they shared would remain confidential and only be used for this study. Pseudonyms were used in the study to ensure confidentiality.

### 3. Results

#### 3.1 Livelihood sources

The primary livelihood activity of the Kigoma region is agriculture. The majority of the region's population engages in subsistence farming. Agriculture depends much on natural rain for crops to grow. The major crops grown include maize, cassava, banana, groundnuts, oil palm, coffee, and tobacco. Livestock keeping is insignificant because of the widespread tsetse fly infestation (UTR, 1998). However, people have adopted the Tutsi cattle rearing culture in the highland of Kasulu district, where conditions are favorable. This is closely followed by the Kibondo district, which has a goat population (URT, 1998; Weiskopf, 2011). Other livelihoods in the region include fishing, beekeeping, and lumbering.

According to oral history, the now-known “fishing communities” of Lake Tanganyika, or as they call themselves, “*watu wa ziwani*”- the Lake people (emphasizing that they commonly have a close connection to the Lake), were largely cultivators. The major crops they were cultivating were cassava, maize, and beans. Fishing activity was secondary to agriculture. Fishing was done to get “*mboga*”- Lake food. *Ugali*, a carbohydrate-rich staple made of cassava together with dagaa (two small native pelagic clupeids, *Stolothrissa tanganyicae* and *Limnothrissa miodon*) or *migebuka* (*Lates stappersii*) have been the main ingredients in the daily diet of the people living by Lake Tanganyika. *Ugali* comes from the land, and *mboga* comes from the Lake.

Respondents in the research area reported that most communities along Lake Tanganyika on the Tanzanian side learned about fishing from people living on the other side of the Lake, such as Congo DRC and Burundi. The *Wabembe* from Congo was mentioned to be one of the communities migrating to Tanzania over a long time. These communities were traditionally fishers. So, as they crossed the Lake to Kagunga, Ujiji and other areas along the Lakeshore in Kigoma, they continued their fishing tradition, influencing these different communities to engage in fishing too.

The Fishery of Lake Tanganyika is artisanal. This fishery is characterized by two primary methods, namely, with the use of light attraction, and without. Fishing with light occurs during moonless nights. There are several ways of fishing with lights, such as *kawesulo* (traditional fishery that uses dugout or planked canoes), *vipe* (lift net), and *ringi* (ring net). The fishery without light attraction operates during the day and night. The gears used with this fishery are *ndoano* (lines), *makila* (gill net), *makila ya sumu* (monofilament), and *mikwabhu* (beach seine).

#### 3.2 Me and the Lake

In Lake Tanganyika, fisheries identified themselves with the Lake. This identity was formed long ago as people interacted with the Lake. The interviews noted that fishing in exchange for other goods was also available many years ago. Some fishers were exchanging fish for other goods with their fellow villagers who were not engaging themselves in fishing and to some neighboring villages. Mzee Idd noted that:-

*In most cases, we were fishing for food; however, some fish were sold to neighboring villages. As you can see, in the mountain (East of Karago), people from the mountains were coming down here with cassava (walikuwa wanatelemka na mihogo). They gave us their cassava, and we gave them mboga (Lake food); some came with banana. (IDI/fishermen/Karago.)*

As in the above quotation, the exchange of goods by goods was also reported in other villages as an essential aspect of the interaction between “*watu wa ziwani*”- people of the Lake- and “*watu wa milimani*”- people from the land. This interaction contributed much to shaping these two identities. Being suppliers of “*mboga*”, the Lake people became famous for their excellent service- “*sisi watu wa tulipata umaarufu kutokana na kuwapa mboga watu wa milimani*” (*lit. we, the Lake people became famous because of giving Lake food to the upland villagers*).

This study was interested in understanding how fishers in the fishing communities perceived the Lake. Respondents were asked to explain how they perceived and interacted with the Lake. Respondents provided different views on the subject. From the interactions with respondents, it was revealed that most people have a strong connection with the Lake, as Nandi noted;-

*My grandparents lived here, spending their life fishing in this Lake. When I was about 15, I started fishing until now at 50. So, the Lake means a lot to me. It is like my home, my parent, my everything. You cannot take me away from this Lake. (IDI, fisher, Karago.)*

This quote indicates how interaction with a resource can shape one's perception of the resource. This connection makes one feel that he/she cannot be separated from the Lake. The resource comes to be viewed as part and parcel of one's life. That solid attachment to the resource makes people claim the right to it.

The link between people and the Lake has also been associated with religious beliefs. Some fishers were of the view that there were places in the Lake that were considered sacred. These sacred places were attributed with good fortunes and blessings to members of society. In a focus group discussion, Malongo noted the following;-

*The Lake is important to us because of the resources it provides, and in the Lake resides supernatural powers that serve our community. The Lake is the home of the supernatural powers that bless our society. We, therefore, are very connected to the Lake because of this. (FGDs with fishers, Kibirizi.)*

In regular conversations and discussions, respondents mentioned several places considered key places for sacred beings. Some areas mentioned include Kabeba, Kibirizi Hill, and some shorelines close to Mahale National Park. It was noted that this connection was also evident with worship (*matambiko*) conducted to do away with bad things in society such as hunger, ill-health, and other misfortunes. Such worship was also undertaken in the event of low catches. The worshipping ceremonies were usually led by *Muteko* (singular.), *Bateko* (plural). The *Muteko* was the one who was the representative of the community members to the land spirits (*muteko ndo alikuwa mwakilishi wa jamii kwa miungu*). Despite changes that have taken place in Lake Tanganyika fishing communities, including the coming in of Western religious beliefs, the worship persists. In Karago, for example, *kukimbilia kipe*- traditional worship to request better catches- was a typical practice before fishers went to the Lake for fishing.

### **3.3 I am a Fisher**

During the interviews, respondents shared their histories about their families and how they engaged in fishing as part of their cultural life- “*tulizaliwa hapa ziwani ndo maana tunachojua sisi ni kuvua samaki tu*” (lit. we were raised from this Lake, that's why we know nothing else than fishing). So, having been raised by people who were fishers makes them love fishing. In a group discussion, one respondent had this to say;-

*I am proud of being a fisher. This is something that I love. I like to be called a fisher. This is real who I am. My parents, my grandparents were fishers. (FGD, fishers, Kibirizi.)*

In the interaction with respondents, it was revealed that fishing means more than income. To fishers, income is one thing, and fishing is something else. They indeed earned an income from fishing, but this was not the only thing that made them satisfied and happy. Being a fisher was

considered something to be proud of. Because they belong to a fishing family, they feel comfortable with life, and that life is incomplete without going fishing. Thus, low fish catches did not discourage them from fishing. It is part of everyday life, as Mau suggested:-

*As a fisher, you know there are days when you can get good catch and when you may return home with nothing. Even those who leave the Lake and try something else usually call us and say we have missed fishing. Most return and go fishing. (IDI, fishers, Karago.)*

### **3.4 Readiness to leave or diversify**

As indicated in the introduction, fish catches in Lake Tanganyika have been perceived as declining since the 1990s. The decline was attributed to factors such as fishing practices and climate change. This study wanted to explore fishers' readiness to leave fishing and engage themselves with other livelihood activities. Respondents were asked to explain their experience with a decline in fish catches and what they planned to do to ensure that they earned a living. In the interactions with respondents, several ideas emerged. It was noted that most respondents, and those noted in regular conversations, indicated little motivation to leave the fishers or engage in other livelihood activities. Musa, who has been fishing for about 40 years, had the following comment;

*We all accept that the fishery of the Lake has declined. Nowadays, we catch too little compared to the past, but if you ask me if I am considering engaging in other livelihood activities, I will tell you no. I am ready to live on this small income I get from fishing, looking for alternatives such as farming. You know why the Lake has become part of me. Nikiingia tu ziwani nasikia laha- when I just enter into the Lake I feel complete. The Lake is like my home. You cannot separate me from it. (IDI, Fisher, Karago.)*

This quote implies that, as people interact with the Lake, they get to be closely connected to it, to the extent that they feel imperfect when they try to detach themselves from it. As Musa noted, he is ready to remain with little income from fishing, rather than going to other sources of livelihood. In this way, identity is influential in shaping one's decisions.

Some fishers were of the view that they could not diversify or leave fishing; instead, they would change their fishing practices, such as fishing day and night, or their fishing gear. Kalimanzila, who has been fishing for over thirty years, had the following to say:-

*I wouldn't say I like doing other livelihood activities than fishing. Fishing is what I love. With the decline in fish catches, I usually cope by fishing day and night. I have been fishing with ring nets during the night. But with a decline in catches, I have decided to find ways to increase my income (kujiongeza) by fishing during the daytime. When I come from the Lake in the morning, I eat for sometimes then I take a line and go fishing. I am not planning to leave fishing. (FGD, fisher, Kibirizi.)*

Recently, the Lake Tanganyika authority responsible for monitoring the Lake explained its intention to introduce a seasonal closure of the Lake. This aim is to improve the breeding and maturity of fish. Respondents were asked to express their views on the ideas. Some supported the idea, pointing out that it would be advantageous to the Lake and the fishers. In interviews, one respondent noted the following:-

*The idea of seasonal closure of the Lake is good. It would help the Lake to rest (kupumzisha ziwa) and make it more productive. We are fishing too much; we have to be merciful to the Lake and the living things found in it. (IDI, fisher, Karago.)*

On the other hand, some fishers felt that the ideas were not good as it would somehow disconnect them from the Lake. They noted that “*tumezoea kukaa ziwani*” (lit. we are used to staying in the Lake), and that closing the Lake would deprive them of their fundamental right to enjoy moving and fishing. Some went even further to say that, if the Lake were to be closed, they would use other ways to ensure they continued fishing and enjoying their connection to the Lake. Mai, having been fishing for about thirty years, commented on the following:-

*Let us fish; all my life has been in this Lake. If you chase me from the Lake, you won't only deprive me of my means of earning a living, but also the happiness I receive from moving around the Lake and fishing. In all my life, I know nothing other than fishing. So, if the Lake is closed, you should expect me to use all the possible means to access the resource. (FGD, fishers, Karago.)*

This quote implies that the fact that some fishers have been fishing in the Lake for years has made a strong feeling about the Lake, so much so that they feel unhappy if disconnected. Additionally, since they are used to a single means of earning a living, they do not seem ready to engage in other sources of livelihood.

Respondents were also asked whether they were planning to engage in other sources of livelihood apart from depending on the Lake. Fishers had mixed feelings on this. Some were planning to engage in other livelihood activities, as Nao says:-

*To engage in other activities, yes, I am considering doing so. As you can see, fish catches have declined considerably. So, I need to look for alternative ways to meet my needs. I have no alternative, but if I find one, I will go for that. If you have one, please tell me (a laugh....). (IDI/ fishers/ Kibirizi.)*

On the other hand, some were not ready to look for other sources of income. Such fishers were not inclined to stop fishing or look for alternative sources of livelihood. The discussions showed that most fishers wanted to continue fishing, and some had already strategized ways to ensure that they went fishing. In an interview, Matokeo mentioned that:-

*I have been fishing in this Lake for years. Though there have been seasons of low catches (mkoso) over many years, I have never stopped fishing or engaging in other livelihood means. So, if there is a time when I am forced to stop fishing, I will not accept it; I will use design ways to make sure I fish. I constantly change fishing techniques but do not stop fishing. (IDI, fishers, Kibirizi.)*

This study compared the perception of fishers on the readiness to leave fishing or diversify. Through interviews and informal conversations with people in the study areas, it was noted that fishers in Kibirizi, an urban area, were less likely to diversify or leave the fishery. As indicated in the previous section, some were ready to diversify or leave fishing and engage in other activities. It was noted that some fishers, especially youth, were more likely to engage in other livelihood activities, such as casual labor in construction sites, petty trade, and motorcycling taxis (*bodaboda*). In interviews, Juma noted that:-



*I see that some fishers, especially youth, tend to leave fishing and engage in other income-generation activities. I have been fishing here for about five years now. I have seen young fishers moving to other activities. However, this is not common to older people. Most of them like to stay in fishing. (IDI, Kibirizi.)*

Our analysis in Karago, a rural area, suggests that some fishers were more likely to diversify, but not stop fishing. Most showed the motivation to diversify or engage in other sources of livelihoods, such as farming. This was the case because of the availability of arable land for agriculture. In a focus group discussion, one member mentioned that;-

*Some fishers do engage in other livelihood activities as well. Since we have arable land here, some people do like to fish, but also engage in farming, though not much. We also use the Lake as a source of capital for farming. For example, I normally fish, and when I get some money from fishing, I use it to pay laborers on my farm. I do not go to work on the farm, but I am a peasant. I pay people to work for me. (FGD, Karago.)*

Additionally, this study compared the perceptions of fishers between young and old fishers. It was revealed that old fishers were less likely to diversify than young ones. The discussions noted that young fishers were more likely to migrate to other places in search of opportunities than old ones. On the other hand, the old fishers mentioned that they have been used to fishing for a long time, so they feel uncomfortable leaving the Lake and engaging in other activities. In other words, their attachment to the Lake was perceived as more robust and thus, discouraged them from leaving fishing. The table below provides a summary of differences between Kibirizi and Karago on the likelihood of leaving fishing or diversifying.

**Table 2** Summary of the differences between Kibirizi and Karago.

Sn	Community perception	Old fishers	Young fishers	Location
1	Motivation to leave fishing activities	Little motivation to leave fishing activities	Less likely to leave fishing activities	Kibirizi
		Little motivation to leave fishing activities	Little motivation to leave fishing activities	Karago
2	Motivation to diversify	Less likely to diversify	Likely to diversify	Kibirizi
		Less likely to diversify	Less likely to diversify	Karago
3	Perceived alternative sources of income	Felt that they have no alternative source of income	Day works in construction sites, petty trade, <i>bodaboda</i>	Kibirizi
		Farming	Farming	Karago

#### 4. Discussion

This study aimed to explore how fishers were connected to the Lake and how this connection influenced their fishing practices and their readiness to leave fishing or diversify, particularly in the context of declining fish catches. This study’s findings indicate a strong connection between fishers and the Lake. This connection shaped their fishing practice and produced a strong sense of belonging to the Lake. Fishers’ identity was shaped by both their interaction with the Lake and how other non-fishing communities perceived them. These findings concur with the findings of other researchers. For example, Béné and Friend (2011, p. 121) and Johannes (1981, p. 9) noted that fishing activities

for many communities pose solid cultural and traditional links spanning many generations, and its value is seen beyond the means of earning a living (i.e., economic values). This connection had much to do with the fishing practices of respective fishing communities (O'Driscoll-Adam (2014).

Fishing activities at the Lake have been historically linked with shaping identity. For example, as indicated in the findings, fishers along Lake Tanganyika had been exchanging fish with other goods between them and communities that were cultivators. This strongly contributed to shaping their identity as fishers. Previous studies on natural resources and identity have noted that a group's social identity influences how its members set goals, act, and behave (Stern, 2018). Bryan (2008) indicated that human beings tend to define themselves and their peers as members of an in-group, while viewing outsiders as out-group members. As for the fishers in Kigoma, their interactions with other communities in connection to the fish trade contributed to shaping their identity. With time, fishers gained a stronger identity and connection to the Lake than farming communities along Lake Tanganyika.

The application of cultural perspective to this study was vital, as the perspective emphasizes the role of cultural values and social construction of nature in understanding human-environmental interactions and their implications for environmental sustainability. In that the relationship between nature and communities is central to understanding resource use and environmental change. For example, fishing has been widely considered a source of food and income, but it should be considered a way of life, and it has been so to many communities (O'Driscoll-Adam, 2014). Santos (2015) perceives fishing activity as a way of life that is constituted by deep social, cultural, and ecological ties. This view of fishing activity helps to recognize the diverse roles and perspectives of men and women in fisheries. Thus, fishing communities, such as Karago and Kibirizi, construct fisheries from their perspectives. Such construction shapes their fishing practices. Thus, different communities are likely to have different perspectives on fisheries and the corresponding fishing practices.

As indicated in the findings of this study, fishers claim the Lake and need to keep connected to it, including by continuing fishing. Additionally, fishers indicated little motivation to leave fishing or diversify. The evidence of this study indicated that this motivation stems from identity expressed through community values and the fishers' connection with the resource. Since researchers and policymakers have been largely focusing on fisheries as a source of food and income (Bryan, 2008; Santos, 2015), little attention has been paid to the role of identity in influencing fishing practices and diversification. In the context of Lake Tanganyika, a closer look at the role of identity is vital for understanding the recently noted increasing fishing pressure in the Lake and the little motivation to engage in other livelihood options. As evidence has indicated, the decline in fish catches is driven by increasing fishing pressure (Bulengela et al., 2019; Cirhuza et al., 2015; Petit & Shipton, 2012; Van der Knaap et al., 2014); policymakers need to strategize ways to ensure the well-being of fishers, as well as sustainable fisheries. This cannot be attained by stopping fishing, but we must identify ways to increase opportunities for fish resources. Such options include the introduction of aquaculture and fish cages in the fishing communities.

## 5. Conclusions

This study has demonstrated that interaction between fishing communities and Lake Tanganyika generated an identity in which fishers identified themselves with the Lake. This identity has a lot to do with shaping the fishing practices of the communities in the study areas. This study calls for fisheries management to consider identities embedded in interactions with the Lake and its implications for fishing practices. Ignoring the importance of these factors can fail to achieve inclusive and socially sustainable decision-making in natural resource management. Future fisheries management will likely improve by incorporating ways fishers interact with Lake resources. Since households hold a firm attachment to fishing, policymakers need to consider options such as promoting aquaculture and fish cages, particularly in the face of declining fish catches.

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## References

- Awuah-Nyamekye, S. (2009). Salvaging nature: The Akan Religio-cultural perspective. *Worldviews*, 13, 251-282. <https://doi.org/10.1163/136352409X12535203555713>
- Béné, C., & Friend, R. (2011). Poverty in small-scale inland fisheries: Old issues, new analysis. *Development Studies*, 11(2), 119-144. <https://doi.org/10.1177/146499341001100203>
- Berg, B. (2001). *Qualitative research methods for social sciences*. Allyn and Bacon, New York. <https://doi.org/10.2307/1317652>
- Bryan, T. (2008). *Aligning identity: Social identity and changing context in community-based environmental conflict* (Ph.D. Thesis). University of Michigan. <http://hdl.handle.net/2027.42/58511>
- Bulengela, G. S., Onyango, P. O., & Brehm, J. M. (2020). Exploring the agentic power in fishery: reflections from fishing communities of Lake Tanganyika, Kigoma, Tanzania. *Maritime Studies*, 19, 93-104. <https://doi.org/10.1007/s40152-019-00152-3>
- Bulengela, G. S., Onyango, P. O., Brehm, J., Staehr, P. A., & Sweke, E. (2020). Bring fishermen at the centre: The value of local knowledge for understanding fisheries resources and climate-related changes in Lake Tanganyika. *Environment, Development and Sustainability*, 22, 5621-5649. <https://doi.org/10.1007/s10668-019-00443-z>
- Bulengela, G., Brehm, J., & Onyango, P. (2021). Co-management in crisis? Reflections from Beach Management Units (BMUs) of Kigoma Fishing Communities, Tanzania. *International Journal of Contemporary Sociology*, 58(1), 9-46.
- Cirhuza, D. M., Micha, J. C., Ntakimazi, G., & Muderhwa, N. (2015). Brief evaluation of the current state of fish stocks landed by artisanal fishing units from the extreme northwest part of Lake Tanganyika. *International Journal of Fisheries and Aquatic Studies*, 2(4), 41-48.
- Clayton, S., & Opotow, S. (2003). *Identity and the natural environment* (pp. 1-24). In: Clayton, S., & Opotow, S. (Eds.) *Identity and the natural environment: The psychological significance of nature*. Cambridge: MIT Press. <https://doi.org/10.7551/mitpress/3644.001.0001>
- Evans, D., & Jackson, T. (2001). Sustainable consumption: Perspectives from social and cultural theory. *Resolve Working Paper Series*, 5(8), 3-21.
- Infield, M., & Mugisha, A. (2013). *Culture, values and conservation: A review of perspectives, policies and practices for the integration of cultural and ethical values into conservation*. Fauna and Flora International.
- Johannes, R. (1981). *Words of the Lagoon: Fishing and marine lore in the Palau district of Micronesia*. University of California Press, Berkeley, CA.
- Kelty, R., & Kelty, R. (2011). Human dimensions of a fishery at a crossroads: Resource valuation, identity, and way of life in a seasonal fishing community. *Society and Natural Resources*, 24(4), 334-348. <https://doi.org/10.1080/08941920903476814>
- Li, Y., Cheng, H., Beeton, R. J., Sigler, T., & Halog, A. (2016). Sustainability from a Chinese cultural perspective: The implications of harmonious development in environmental management. *Environment, Development and Sustainability*, 18, 679-696. <https://doi.org/10.1007/s10668-015-9671-9>
- Moffat, J. (1958). *Handbook of Tanganyika* (pp. 1-280). Government Printer, Dares Salam.
- Mwaipopo, R. (2001). *The power of meaning: People and the utilization and management of coastal resources in Saadani Village Tanzania*. University of Cape Town. <https://doi.org/10.4000/apad.252>

- Mziray, P., Kimirei, I. A., Lugomela, C., Perry, W. L., Trolle, D., & Mgana, H. (2018). Seasonal patterns of thermal stratification and primary production in the northern parts of Lake Tanganyika. *Journal of Great Lakes Research*, 44(6), 1209-1220.  
<https://doi.org/10.1016/j.jglr.2018.08.015>
- Naithani, J., Plisnier, P., & Deleersnijder, E. (2011). Possible effects of global climate change on the ecosystem of Lake Tanganyika. *Hydrobiologia*, 671, 147-163.  
<https://doi.org/10.1007/s10750-011-0713-5>
- O'Driscoll-Adam, E. (2014). *Fishing for a sense of cultural identity and place* (pp. 128-132). Snapshots of Doctoral Research at University College Cork.  
<https://doi.org/10.33178/boolean.2014.25>
- O'Reilly, C., Allin, S., Plisnier, P., Cohen, A., & McKee, B. (2003). Climate change decreases aquatic ecosystem productivity of Lake Tanganyika, Africa. *Nature*, 424(8), 7-9.  
<https://doi.org/10.1038/nature01833>
- Petit, P., & Shipton, T. (2012). *IUU Fishing on Lake Tanganyika*. Smart Fish (IOC).
- Plisnier, P., Mgana, H., Kimirei, I., Chande, A., Makasa, L., Chimanga, J., Zulu, F., Cocquyt, C., Horion, S., Bergamino, J., Naithani, J., Deleersnijder, E., Andre, L., Descy, J., & Cornet, Y. (2009). Limnological variability and pelagic fish abundance (*Stolothrissa tanganicae* and *Lates stappersii*) in Lake Tanganyika. *Hydrobiologia*, 625, 117-134.  
<https://doi.org/10.1007/s10750-009-9701-4>
- Plisnier, P., Nsombo, M., Mgana, H., & Ntakimazi, G. (2018). Monitoring climate change and anthropogenic pressure at Lake Tanganyika. *Journal of Great Lakes Research*, 44, 1194-1208. <https://doi.org/10.1016/j.jglr.2018.05.019>
- Posey, D. (1999). *Cultural and spiritual values of biodiversity*. London: Intermediate Technology Publications. <https://doi.org/10.3362/9781780445434.000>
- Ritov, I., & Kahnemann, D. (1997). *How people value the environment. Attitudes versus economic values* (pp. 33-51). In: Bazermann, M. H., Messick, D. M., Tenbrunsel, A. E., & Wade-Benzoni, K. A. (Eds.). *Environment, ethics, and behavior*. San Francisco: New Lexington Press.
- Santos, A. (2015). Fisheries as a way of life: Gendered livelihoods, identities and perspectives of artisanal fisheries in eastern Brazil. *Marine Policy*, 62, 279-288.  
<https://doi.org/10.1016/j.marpol.2015.09.007>
- Sarvala, J., Langenberg, V., Salonen, K., Chitamwebwa, D., Coulter, G., Huttula, T., Kanyaru R., Kotilainen, P., & Makasa, L. (2006). Fish catches from Lake Tanganyika mainly reflect changes in fishery practices not climate. *Verh. Internat. Verein. Limnol*, 29, 1182-1188.  
<https://doi.org/10.1080/03680770.2005.11902871>
- Schama, S. (1996). *Landscape and memory*. London: Fontana Press.  
<https://www.eupublishing.com/doi/pdf/10.3366/anh.1998.25.1.142a>
- Sterckx, K., Delandmeter, P., Lambrechts, J., Deleersnijder, E., & Thiery, W. (2020). Simulating Tanganyika's hydrodynamics under a changing climate. *Earth System Dynamics*.  
<https://doi.org/10.5194/esd-2020-36>
- Stern, M. (2018). *Social science theory for environmental sustainability: A practical guide*. Oxford: Oxford University Press. <https://doi.org/10.1017/S0030605319000462>
- URT. (1998). *Kigoma Socio-economic Profile*. Dares Salaam, Tanzania.
- Van Der Knaap, M., Katonda, K., & De Graaf, G. J. (2014). Lake Tanganyika fisheries frame survey analysis: Assessment of the options for management of the fisheries of Lake Tanganyika. *Aquatic Ecosystem Health & Management*, 17(1), 4-13.  
<https://doi.org/10.1080/14634988.2014.882733>
- Weiskopf, J. (2011). *Resettling Buha; A social history of resettled communities in Kigoma Region, Tanzania 1933-1975* (Ph.D. Thesis). Dar es Salaam.

Williams, S. (2021). I fish because I am a fisher: Exploring livelihood and fishing practices to justify claims for access to small-scale fisheries resources in South Africa. *HTS Teologiese Studies/ Theological Studies*, 77(3), a6585. <https://doi.org/10.4102/hts.v77i3.6585>