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# Factors restraining youth involvement in fish farming business: Case study of Kamuthanga Village, Kenya

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## Abstract

Fish farming serves as one of the important strategies for reducing unemployment and improving the standard of living for many households. However, in many African countries, including Kenya, a large number of young people tend to pursue administrative and white-collar jobs, resulting in a noticeable lack of youth participation in the fish farming sector. This trend underscores the challenge of attracting youth to agricultural enterprises like fish farming, despite its promising opportunities. This study explored the factors limiting youth participation in the fish farming business, targeting some individuals aged 18-35 in Kamuthanga village. The research follows a qualitative case study approach, with twenty-six (26) individuals interviewed. The study is grounded in the anthropological entrepreneurship theory, utilizing triangulation to ensure a holistic understanding. In-depth interviews and key informant interviews were employed to capture perceptions regarding barriers to youth involvement. The data was gathered through focus group discussions and in-depth interviews and analyzed using Qualitative Data Analysis (QDA) Miner Lite software. Data organization, coding, and theme development were conducted systematically to align with the study's objectives. The findings revealed several challenges hindering youth involvement in fish farming, including the semi-arid conditions of Kamuthanga village, which lead to water scarcity; limited access to capital; insufficient technical knowledge; inadequate support structures; and some cultural barriers. These findings shed light on the critical factors that must be addressed to foster greater youth involvement in fish farming and ultimately unlock its potential for economic development and unemployment reduction in Kamuthanga village.

**Keywords:** Fish Farming; Youth Employment; Unemployment; Water Scarcity; Financial Problems; Cultural Barriers.

## 1. Introduction

Fish farming, or aquaculture, is the practice of cultivating fish within controlled environments. Goldburg and Naylor [1] highlight that the reduction of natural fisheries has driven the expansion of aquaculture as a means to meet the growing global demand for seafood. While fish farming has existed since ancient times, Sangirova et al. [2] note that it has historically received less attention compared to wild fishing and animal husbandry. Today, however, fish farming is gaining prominence as a viable economic activity worldwide. It offers a sustainable alternative to wild fishing and aquatic food production while reducing pressure on natural ecosystems [3]. Beyond its environmental benefits, the sector is seen as a potential driver of economic growth, poverty alleviation, and improved livelihoods in developing nations [4].

The fish farming industry offers a wide range of employment opportunities, including roles as farm technicians, hatchery workers, fish health specialists, biologists, aquaculture engineers, and administrative staff. For unemployed

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youth, fish farming presents a promising avenue for entrepreneurship and self-employment. The Food and Agriculture Organization [5] underscores the numerous advantages fish farming provides to farmers, their households, and their communities. Globally, regions such as Asia, South America, and some European countries have successfully harnessed the economic potential of aquaculture, while several African nations are beginning to recognize its significance.

Over the last two decades, Asia has led the global fish farming sector, responsible for 89% of the total production volume [6]. In 2017, Indonesia stood out as the largest contributor in the region, supplying around 50.3% of the fish production volume. Vietnam followed with 16.1%, Myanmar with 12.5%, the Philippines with 9.5%, Thailand with 5.3%, and Malaysia with 4.2%. In terms of economic value, Indonesia also held the top spot, representing 55.7% of the region's fisheries production value [7]. In many Asian countries, fish farming has become a more profitable and appealing option compared to other agricultural activities. In Pakistan, Laghari [8] emphasized the critical role that fisheries play in generating employment, boosting income, and supporting both food production and the national economy. Likewise, Das et al. [9] highlighted the importance of freshwater fisheries in supporting the livelihoods of rural and impoverished communities in Bangladesh.

Several South American countries have played a key role in expanding the fishing and aquaculture sectors, highlighting the significance of these industries in improving the livelihoods of young people. According to Valladão et al. [10], aquaculture is vital not only for local employment and food production but also for its influence on the global economy through international exports. A study by Alves et al. [11] in Acre, Brazil, showed that the region's fish farming program successfully creates jobs and income, indicating its promising potential in domestic and international markets.

In Europe, the fish farming sector has provided significant employment opportunities, particularly for young people. Many European governments have introduced policies and funding initiatives aimed at boosting aquaculture and youth employment. The European Union's European Maritime and Fisheries Fund supports training and job creation in this sector. In Galicia, Spain, a key maritime area, Garza-Gil et al. [12] revealed that fishing and aquaculture industries contribute considerably to job creation and provide income across other economic sectors. In 2013, Galicia's fishing and aquaculture industries generated almost one million euros, contributing nearly 2% to the regional economy and creating more than 17,000 full-time jobs [12].

In Africa, governments are increasingly recognizing the fish farming industry's potential to create jobs. This growing awareness has led to the establishment of large-scale commercial fish farming operations, driven by factors such as public support, expertise, foreign investment, and rising interest in aquaculture. The New Partnership for Africa's Development has also helped raise global awareness of aquaculture's benefits [13]. Currently, countries like Egypt, Nigeria, Uganda, and Ghana are seeing a surge in investments that are boosting fish production [14].

In Kenya, the government has identified fish farming as a key area for promoting youth employment and economic development. Programs like the Economic Stimulus Programme and the Youth Enterprise Development Fund have been implemented to support young entrepreneurs in establishing fish farming ventures [15]. The sector's growth, from producing less than 1,000 tonnes in 2006 to approximately 24,000 tonnes in the mid-2010s, illustrates the success of these initiatives [16]. Fish farming is increasingly seen as a viable path toward youth employment, food security, and poverty alleviation under the framework of Kenya Vision 2030 and the Medium-Term Plan III (MTP).

Despite the opportunities and government support, many Kenyan youth, particularly in Kamuthanga village, Machakos County, have not fully embraced fish farming. Young people are increasingly migrating to urban areas in search of white-collar jobs, neglecting profitable opportunities like fish farming and agriculture [17]. The high youth unemployment rate in Kenya, which reached 38.9 percent in 2018 [18], highlights the urgency of addressing this issue.

Given the potential of fish farming to provide sustainable livelihoods, the reasons behind youth disengagement from this sector warrant deeper exploration. This study seeks to investigate the factors restraining youth involvement in fish farming in Kamuthanga village, with the aim of understanding and addressing the challenges preventing young people from taking advantage of this promising economic opportunity.

## 2. Materials and methods

This study explores the factors limiting youth participation in fish farming in Kamuthanga, using a qualitative approach with a case study research design. The research was conducted in Kamuthanga village, located in Machakos County, one of Kenya's 47 counties. Kamuthanga was selected due to the presence of the Kamuthanga Fish Farm, a leading fish farming enterprise in the region. Specializing in the cultivation of Tilapia and Catfish, the farm employs a modern recirculation aquaculture system (RAS) to conserve water. The farm breeds, raises, and sells fish at all life stages,

including fingerlings, adult tilapia, and catfish. Notably, Kamuthanga Fish Farm is recognized across East Africa for its use of hormone treatment, achieving a 95% success rate in producing male fish stocks [19].

### 2.1. Data Collection

Data was gathered from youth aged 18 to 35 years through in-depth interviews and focus group discussions. A total of 26 individuals participated, including youth workers from Kamuthanga Fish Farm, unemployed youth, and key informants. In-depth interviews were conducted with both employed and unemployed young people, while key informant interviews were held with experts in the fish farming industry. These key informants included the farm owner, manager, and experienced older fish farmers, all of whom provided valuable insights into employment dynamics within the sector.

The collected data was then triangulated, a method in qualitative research that involves using multiple sources or methods to gain a more comprehensive understanding of a phenomenon [20]. This approach ensures validity by converging data from various angles. In this study, triangulation was achieved by engaging different participant groups and using tailored interview techniques. The use of both key informant guides and interview guides allowed for a structured and exhaustive examination of the research questions, ensuring systematic gathering of insights from diverse perspectives.

### 2.2. Data analysis

Data was analyzed through content analysis. Recorded interviews were grouped into specific categories and then transcribed for detailed examination. The responses were processed using Qualitative Data Analysis (QDA) Miner Lite software, which aided in organizing and analyzing the data. Themes were identified based on the study's objectives, guiding the development of the interview questions. Key themes included "problem of water," "cultural problem," and "financial problem." Transcripts were organized according to their source, with separate groupings for in-depth interviews, key informant interviews, and content analysis. Each data set was analyzed individually using consistent qualitative methods to reflect their qualitative nature. Overall, the analysis followed a structured approach to categorize and interpret the information, ensuring a comprehensive exploration of the research objectives.

## 3. Results

Three key themes were explored in this study: issues related to water, cultural challenges, financial constraints, and other factors that individuals identified also as influencing youth participation in fish farming.

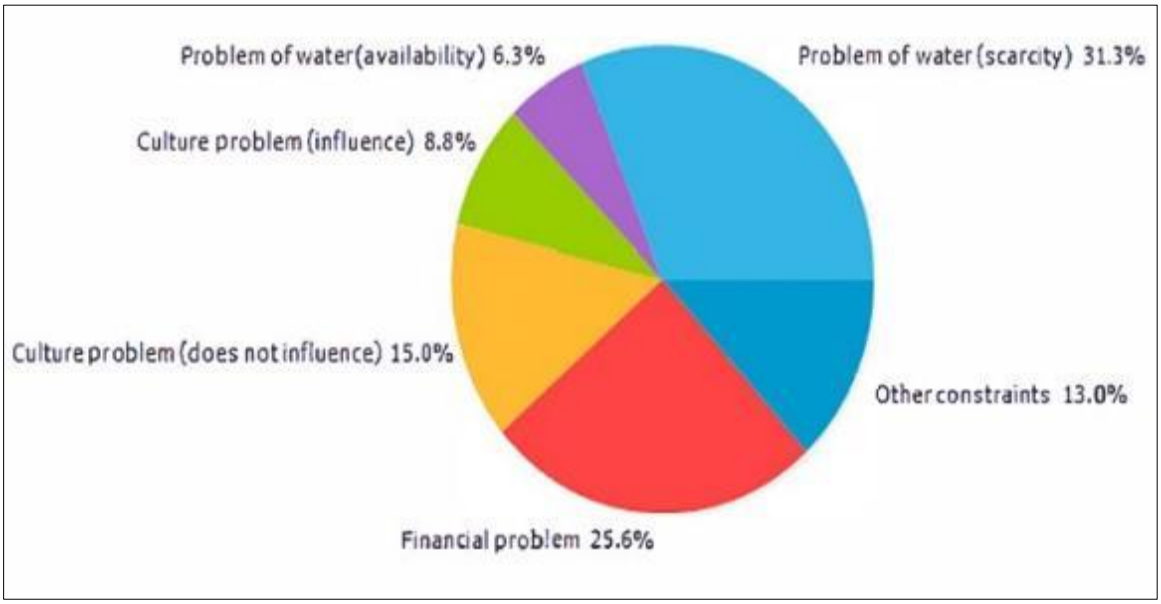


**Figure 1** Constraints in fish farming

*3.1.1. Theme 1: Problem of Water*

For many respondents, water-related challenges are prominent, with 31.3% of participants (20 cases, 74.1% of the responses) pointing out the problem of water scarcity. In the unemployed youth focus group discussion, all youth agreed that water is scarce in Kamuthanga. One unemployed youth in the focus group said that "If there were more water, many people could get involved in fish farming because the fish farming could be easier." Additionally, the key informants also agreed that water is scarce in the region and the situation affects a lot the involvement of youth in fish farming. Key informant two (KI 2) said: "First, you have to think of water, the source of water. Because without water, there is no fish farming." Similarly, for most of the youth workers at Kamuthanga fish farm, water is not available in Kamuthanga village. The youth worker three (YW 3) said: "You know Kamuthanga is in Machakos County and Machakos County is semi-arid. So, the availability of water sometimes is so low. It is so low."

However, few youth workers thought that water is available in the area. Approximately 6.3% (7 cases, 25.9% of the responses) of respondents indicated the availability of water. Youth worker one (YW 1) remarked: "We normally use boreholes. So, in water there is no problem because even in the villages, there is water from dams. They have the dams; they have the wells." Furthermore, YW 1 emphasized about this availability of water that, "It is enough." Similarly, Youth Worker five (YW 5) affirmed, "There are dams [...] There is a lot of water in this place."

*3.1.2. Theme 2: Culture Problem*

Most of the participants did not find any influence of culture on the development or on the involvement of youth in fish farming business. There were 15% of respondents who thought that culture has no influence in fish farming (17 cases, 63.0% of the responses). Indeed, one youth said (YU 1) that "there is no traditional impact which influences the fish farming business". Additionally, key informant four (KI 4) said that: "even culturally they are not prohibited from eating fish. […] It was just lack of exposure. Now that people are exposed, everybody is showing willingness to eat fish and to do fish farming."

About how the gender roles and cultural norms affect the fish farming business, key informant four (KI 4) said that:

One of these fish farming businesses is not gender specific. It is open to any gender. Like in Kamuthanga, we have both genders, equally presented, almost 40-60%. Like female gender is 40, male gender is 60%. So, there is no gender limitation. It only comes during the operation of getting into the water. It is only men who get into the water. The women take part in the feeding of fish, processing of fish, cleaning of the units, production units, and breeding of the fish. So, it is just like 50-50 operation. (KI 4)

However, some thought that there are some cultural aspects or perceptions that inhibit fish farming from developing in Kamuthanga village. There were just 8.8% of respondents (7 cases, 25.9% of the responses). Key informant two (KI 2) said: "Coffee brings money to the people. So, they do not see the need of going to fish farming. And also, the scarcity of water prevents them to think about fish farming." Some youth in the focus group said that "Fish is more for Kisumu people", some others said that "Many believe that the bones of fish can choke one to death." Additionally, the youth worker six (YW 6) explained:

This village is not one of those known communities that grew up knowing fish. […] Kamuthanga is far away from the natural water resources like Lakes on the side of Victoria, Naivasha, and Nakuru. So, for them, they were not appreciating fish that much. But in the recent past, because Kamuthanga fish farm is here, they have had a chance to know fish, taste it, and most of them like it now. (YW 6)

Furthermore, he argued that:

Some cultural perceptions, like now we find people say, you know, like the catfish, they look like snake, they look ugly. Those kind of perceptions. The other perception or notion is, farmed fish is not sweet compared to natural fish. Farmed fish is not tasty compared to natural. But culturally, there is no culture that is against the eating fish. Maybe the perception, a few notions here and there against eating fish or farming fish. (YW 6)

About the gender roles affecting fish farming in Kamuthanga village, key informant two (KI 2) said that: "So, I think it has affected fish farming. Like here in Kamuhtanga, the gender is a problem. It is a problem because most of the work is done by the men."

*3.1.3. Theme 3: Financial Problems*

Financial constraints are a significant barrier, with 25.6% of participants (21 cases, 77.8%) indicating challenges related to funding. It was practically obvious for the participant that it is very difficult to start fish farming without money and they also recognized that fish farming is quite costly. One youth worker said that "Capital. It is also a huge limiting factor because it is money evolving … You also need investment, capital, the capital expenditure for building the structures and also for the operation costs. So, you have to have money for it." (YW 6). Additionally, key informant one (KI 1) said that fish farming business is costly: "Yeah, the cost of the feeding. Getting the fish to breed. Yeah, if you have to get water from the boreholes, you have to cater for it. You have to pay for it, which it is not."

*3.1.4. Theme 4: Other Constraints*

The researcher identified unforeseen constraints that differed from the initially planned variables but proved crucial to consider. These additional constraints were raised by 13% of the participants (9 cases, 33.3%). Key informant one (KI 1), on the significance of water accessibility influencing youth participation in fish farming, acknowledged that water is a factor but emphasized the impatience of youth as a more prominent issue. She expressed, "Water is one factor. But the youth are not patient enough with fish to grow and sell. Without patience, I do not think they can keep fish until they reach the average size. They are not patient enough." Some unemployed youth also pointed out nepotism as a hindrance to engaging in fish farming unless they had a family member already involved (YU 2).

Additionally, issues of support and misconceptions were highlighted. Within this context, the unemployed youth eight (YU 8) pointed out significant misconceptions and challenges faced by young entrepreneurs in Kamuthanga, including the "lack of moral support, misconceptions based on gender, and a lack of necessary skills." These issues are crucial as they hinder the confidence and progress of young entrepreneurs, potentially affecting the overall entrepreneurial ecosystem. There were also infrastructure challenges. Youth Unemployed nine (YU 9) highlighted challenges related to infrastructure, specifically "electricity shortages, and inadequate security measures." These infrastructural challenges are essential as they directly impact the viability and sustainability of fish farming business ventures. The accessibility of land was also found as a serious impact. Respondent two (YU 2) emphasized the importance of land for successful fish farming, particularly in densely populated areas like Kamuthanga. Moreover, respondent YU 3 expressed concerns about the high costs associated with government requirements, such as obtaining licenses for starting a business. Additionally, respondent four (YU 4) highlighted poor transportation of goods as another significant challenge faced by entrepreneurs in Kamuthanga.

## 4. Discussion

The discussion of the results followed the four key themes that emerged and were presented in the results section. These themes are the problem of water, financial problems, cultural problems, and other constraints. Concerning the first theme, the study findings revealed that the scarcity of water resources poses a significant challenge to the viability of fish farming as a sustainable enterprise for the youth. Indeed, in regions where water resources are limited, establishing and maintaining fish ponds or other aquaculture facilities becomes inherently more difficult. Inadequate water availability can compromise water quality, affecting the health and growth of fish stocks. Research by Mehrim and Refaey [21] underlined the impact of climate change on fish farming in Egypt, highlighting that water scarcity in aquaculture operations affects production levels and overall sustainability. Similarly, Adeleke et al. [22] noted the issue of water availability as a key constraint influencing the success of fish farming. Without sufficient water, the possibility of successful fish farming is severely diminished.

Regarding the second theme, the study findings showed that financial constraints are a significant barrier for youth interested in entering the fish farming industry. Financial constraints can be understood as limited access to capital or resources needed to start and sustain a fish farming operation. The majority of youth in Kamuthanga lack the necessary funds to purchase or lease land or water bodies, acquire equipment and infrastructure (such as fish ponds or tanks), purchase fingerlings or fish feed, and cover other operational expenses. Research by Arulingam et al. [23] stressed this financial barrier that youth typically face when starting their fish farming businesses, indicating that lack of capital can impede the growth of aquaculture ventures.

While numerous respondents claimed that cultural and traditional practices do not influence the involvement of youth in fish farming within Kamuthanga village, some noted that the village's reputation as non-consumers of fish impacts the youth's inclination towards engaging in the fish farming industry. Since Kamuthanga is known for not being fish consumers, youth perceive fish farming as less relevant or lucrative compared to other agricultural or economic activities. This finding aligns with the research of Morgan et al. [24], which showed that cultural norms and values can shape how aquaculture improves accessibility to fish, employment, income, and nutritional utilization.

Moreover, various other obstacles surfaced during participant interviews, including issues related to land availability, electricity challenges, security concerns in the area, the exorbitant costs associated with government license requirements, and the impatience observed among the youth. Notably, some of these hindrances were also underscored by Arulingam et al. [23], who revealed that youth face constraints in acquiring land, financial services, and other resources, while also encountering barriers within decision-making circles due to prevailing gerontocratic systems. Indeed, the findings regarding the various factors hindering youth participation in fish farming underscore the necessity of identifying strategies to attract young people to this business.

## 5. Conclusion

This study explored the factors limiting youth participation in fish farming in Kamuthanga village, Machakos County, through the lens of anthropological entrepreneurship theory. The investigation revealed several barriers, including water scarcity, financial difficulties, cultural factors, land availability issues, electricity shortages, security concerns, high government licensing fees, and youth impatience. Water scarcity was identified as a key issue, with 31.3% of respondents pointing to the semi-arid nature of Kamuthanga as a major challenge. Financial constraints were highlighted by 25.6% of participants, while 8.8% mentioned cultural barriers. The other impediments were noted by 13%, although some respondents restrained concerns related to water (6.3%) and cultural factors (15%).

To address these challenges, the study recommends that both County and national governments introduce supportive regulations to ease business licensing processes and reduce associated costs. Non-Governmental Organizations could help by offering capacity-building programs focused on entrepreneurship, financial literacy, and sustainable farming. Local community leaders can raise awareness about the benefits of fish farming through meetings, workshops, and educational campaigns. To address land accessibility issues, they can also encourage landowners to lease or allocate land for youth interested in starting fish farms.

Additionally, Kamuthanga fish farm can play a crucial role by providing technical support and mentorship to aspiring young fish farmers, offering guidance on farm management, disease control, and market access. Establishing a demonstration facility would allow youths to gain hands-on experience under the mentorship of experienced farmers. The farm could also foster market linkages by partnering with local markets, restaurants, and supermarkets, ensuring a stable demand for locally produced fish.

## Compliance with ethical standards

*Disclosure of conflict of interest*

No conflict of interest to be disclosed.

## References

[1] Goldburg R, Naylor R. Future seascapes, fishing, and fish farming. Front Ecol Environ. 2005;3(1):21–8. Available from: https://doi.org/10.1890/1540-9295 (2005)003[0021: FSFAFF] 2.0.CO; 2

[2] Sangirova U, Khafizova Z, Yunusov I, Rakhmankulova B, Kholiyorov U. The benefits of development cage fish farming. E3S Web Conf. 2020; 217:09006. Available from: https://doi.org/10.1051/e3sconf/202021709006

[3] Longo SB, Clark B, York R, Jorgenson AK. Aquaculture and the displacement of fisheries captures. Conserv Biol. 2019; 33(4):832–41. Available from: https://doi.org/10.1111/cobi.13295

[4] Filipski M, Belton B. Give a man a fishpond: modeling the impacts of aquaculture in the rural economy. World Dev. 2018; 110:205-23.

[5] Food and Agriculture Organization (FAO). The state of world fisheries and aquaculture, 2008. Rome, Italy: FAO Fisheries and Aquaculture Department, Food and Agriculture Organization of the United Nations; 2009.

[6] Food and Agriculture Organization (FAO). The State of World Fisheries and Aquaculture 2020. [Internet]. FAO; 2020. Available from: https://doi.org/10.4060/ca9229en

[7] Kaewnuratchadasorn P, Smithrithee M, Sato A, Wanchana W, Tongdee N, Sulit VT. Capturing the impacts of COVID-19 on the fisheries value chain of Southeast Asia. Fish for People. 2020; 18(2):2-8.

[8] Laghari MY. Aquaculture in Pakistan: challenges and opportunities. 2018

[9] Das M, Islam MR, Akter T, Kawser AQMR, Mondal MN. Present status, problems and prospect of fish farming at Gazipur Sadar upazila in Bangladesh. Prog Agric. 2018; 29(1):53-63.

[10] Valladão GMR, Gallani SU, Pilarski F. South American fish for continental aquaculture. Rev Aquac. 2018; 10(2):351-69.

[11] Alves MR, Codeço CT, Peiter PC, Souza-Santos R. Malaria and fish farming in the Brazilian Amazon Region: a strengths, weaknesses, opportunities, and threats analysis. Rev Soc Bras Med Trop. 2019;52.

[12] Garza-Gil MD, Surís-Regueiro JC, Varela-Lafuente MM. Using input–output methods to assess the effects of fishing and aquaculture on a regional economy: the case of Galicia, Spain. Mar Policy. 2017; 85:48-53

[13] Obiero KO, Waidbacher H, Nyawanda BO, Munguti JM, Manyala JO, Kaunda-Arara B. Predicting uptake of aquaculture technologies among smallholder fish farmers in Kenya. Aquacult Int. 2019; 27(6):1689–707. Available from: https://doi.org/10.1007/s10499-019-00423-0

[14] Cai L, Wang J, Peng J, Tan Z, Zhan Z, Tan X, Chen Q. Characteristic of microplastics in the atmospheric fallout from Dongguan city, China: preliminary research and first evidence. Environ Sci Pollut Res. 2017; 24(32):24928-35.

[15] Ole-Moiyoi LK. Fishing for answers: can aquaculture transform food security in rural Kenya [Doctoral dissertation]. Stanford University; 2017.

[16] Obiero K, Cai J, Abila R, Ajayi O. Kenya: high aquaculture growth needed to improve food security and nutrition. Rome, Italy; 2019. Available from: http://www.fao.org/3/ca4693en/ca4693en.pdf

[17] County Government of Machakos. Machakos County Integrated Development Plan 2018-2022 [Internet]. 2018. Available from: https://www.scribd.com/document/449067961/Machakos-County-Integrated-Development-Plan-2018-2022-2-pdf

[18] International Labour Organization. World Employment and Social Outlook: Trends 2019. Geneva: International Labour Office; 2019.

[19] Matolla GK. Integrated aquaculture: balancing food production systems and livelihoods in Kenya. In: Multifunctional Land Uses in Africa. Routledge; 2019. p. 78-95.

[20] Patton MQ. Enhancing the quality and credibility of qualitative analysis. Health Serv Res. 1999; 34 (5 Pt 2):1189.

[21] Mehrim AI, Refaey MM. An overview of the implication of climate change on fish farming in Egypt. Sustainability. 2023; 15 (2):1679.

[22] Adeleke B, Robertson-Andersson D, Moodley G, Taylor S. Aquaculture in Africa: a comparative review of Egypt, Nigeria, and Uganda vis-a-vis South Africa. Rev Fish Sci Aquac. 2020; 29 (2):167-97.

[23] Arulingam I, Nigussie L, Senaratna Sellamuttu S, Debevec L. Youth participation in small-scale fisheries, aquaculture and value chains in Africa and the Asia-Pacific. CGIAR Research Program on Fish Agri-Food Systems; 2019.

[24] Morgan M, Terry G, Rajaratnam S, Pant J. Socio-cultural dynamics shaping the potential of aquaculture to deliver development outcomes. Rev Aquac. 2017; 9(4):317-25.