Since 2001 ajfand AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 25 No. 7
August 2025
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

Afr. J. Food Agric. Nutr. Dev. 2025; 25(7): 27366-27383 https://doi.org/10.18697/ajfand.143.25740

Date	Submitted	Accepted	Published
	23rd January 2025	10th May 2025	5th September 2025

ASSESSING THE GENDER ROLES IN THE AQUACULTURE VALUE CHAIN IN MBEYA REGION, TANZANIA

Mgaya AM[1,2], Mpenda Z[3] and MM Limuwa[1]*

Athanas MIchael Mgaya

*Corresponding author email: mlimuwa@luanar.ac.mw

[1]Centre of Excellence in Aquaculture and Fisheries (AquaFish), Lilongwe University of Agriculture and Natural Resources, P.O. Box 219, Lilongwe, Malawi

[2]Mbarali District Council, P.O. Box 237, Rujewa-Mbeya, Tanzania

[3]Sokoine University of Agriculture, College of Economics and Business Studies, P.O. Box 3007, Chuo Kikuu, Sokoine University of Agriculture, Morogoro, Tanzania

Since 2001 ajfand AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 25 No. 7
August 2025
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

ABSTRACT

Gender inclusion within the aquaculture value chain is a critical factor in the development of the subsector. However, the extent to which gender roles influence participation in the *Oreochromis niloticus* (Nile tilapia) value chain in Mbeya region, Tanzania, is still unknown. Therefore, this study investigated the involvement of men and women on various nodes of the cultured Nile tilapia value chain in Mbeya region. Data collection spanned six months from January to June 2022, employing a combination of primary and secondary data (mixed methods) gathered through both field and desk research. Furthermore, a multi-stage sampling approach was utilized to select respondents, and both qualitative and quantitative data were collected and analyzed. The Duncan index of similarities revealed a 40% segregation of nodes within the cultured Nile tilapia value chain. Further examination revealed that men dominated the production stage at 82.7%, while women had active roles in the processing (58.7%) and trading (78.7%) stages. A significant majority (60%) of the sample size perceived equitable participation of all household members in value chain responsibilities. In terms of decision-making, both men and women were actively engaged, amounting to 69.3% of the respondents. Whereas on income generation, most (78.7%) of the respondents observed no significant gender disparities. Furthermore, in the context of land ownership, the majority (45.3%) reported family ownership. While task allocation decisions were made with input from both males and females, accounting for 70.7% of respondents. These findings suggest that gender roles indeed play a significant role in the *Oreochromis niloticus* value chain in Mbeya Region. Therefore, it is important to increase female participation in the production phase, while also encouraging greater male involvement in other parts of the value chain, such as processing and trade. This strategy will help to promote diversity and inclusion. Diverse teams bring a variety of perspectives, ideas, and approaches, leading to better problem-solving and improving overall value chain performance.

Key words: Fish farming, Gender, Nile Tilapia, Value chain, Mbeya region, Tanzania

Citation: **Mgaya AM, Mpenda Z and MM Limuwa** Assessing the Gender Roles in the Aquaculture Value Chain in Mbeya Region, Tanzania. *Afr. J. Food Agric. Nutr. Dev.* 2025; **25(7):** 27366-27383
https://doi.org/10.18697/ajfand.144.25740

Since 2001 ajfand AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 25 No. 7
August 2025
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

INTRODUCTION

Despite the rapid growth of aquaculture and its substantial employment opportunities globally, there exists a gender disparity in terms of opportunities and benefits within the aquaculture value chain [1]. Women actively participate in various aspects of the value chain, yet their contributions are frequently unpaid, overlooked, and regarded as extensions of their domestic responsibilities [2]. This under-valuation and under-representation of women's roles in aquaculture have been recognized by several authors [3, 4, 5], all of whom emphasize the vital role of women in improving food security, nutrition, and household economic well-being.

Studies conducted on the Dagaa fishery value chain in Lake Victoria have shed light on factors influencing gender roles [6]. These factors encompass limited access to production resources, cultural, social, economic, and political aspects, the subordinate status of women, characteristics of fishing areas (on-shore and off-shore fishing), long working hours, restricted access to credit facilities, high interest rates, poverty, and delays in selling produce. Gender inequality in agriculture often manifests disparities in access to resources and benefits [7]. Women are frequently excluded from lucrative segments and competitive economic opportunities within the value chain also due to patriarchal systems governing resource control, such as land, capital, labor, and economic prospects [8, 9].

Numerous studies have also underscored the significant involvement of women in fisheries market chains [10, 11, 12, 13]. However, women's economic potential and contributions are frequently undervalued. Women engage in unpaid tasks related to pre-and post-harvesting that are not recognized as formal employment. However, control over fisheries resources within the value chain typically lies with men, while women tend to be more involved in post-harvest activities such as smoking, drying, and subsistence marketing [14]. Despite such drawbacks, research shows that men and women encounter distinct barriers to value chain participation. These challenges stem from gender-based social norms and unequal access to assets such as land, financial capital, social capital, information, and education [15]. Therefore, value chain participation can un intentionally exacerbate gender disparities in areas such as time constraints, energy demands, childcare responsibilities, or the appropriation of women's gains by other stakeholders [16].

Therefore, understanding the positions of women within the value chains and the impact of value chain changes on gender inequality is crucial. Additionally, addressing the primary challenges women face in benefiting from value chain participation requires considering gender within the context of intra-household negotiations and broader social processes [17,18]. Countries that have made progress in achieving gender equity have also experienced higher levels of

ajfand Since 2001
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 25 No. 7
August 2025
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

economic growth and social well-being [19, 20]. Nevertheless, in numerous countries, particularly in South Asia and Africa, there is still untapped potential for increasing women's participation and incomes in aquaculture through improved extension services, innovative policies, and institutional practices designed with a specific focus on women [21]. Therefore, this study aims to investigate the role played by gender in the cultured Nile tilapia value chain in the Mbeya region.

Conceptual framework

Intersectionality serves as a pivotal framework, offering both a perspective and vocabulary to delve into the interconnections and interdependencies among social categories and systems [22]. Within this framework, there is a notable focus on individual subjectivities at points where various intersecting identities converge, exemplified by endeavors such as scrutinizing the professional identities of minority ethnic women [22]. This emphasis on individual experiences and the distinctions within groups has been termed “content specialization” or an “intra-categorical approach” [22].

The intersectionality framework provides a valuable perspective for comprehending the intricate nature of gender roles within the realms of aquaculture and agriculture. By examining the intersections of identities such as gender, race, ethnicity, and class, this framework illuminates the diverse and complex experiences of individuals within these sectors. Intersectionality underscores the necessity of considering the broader socio-cultural, economic, and political contexts in which gender roles manifest in aquaculture and agriculture [23].

Moreover, it acknowledges that gender roles are not uniform across various communities, regions, or cultural contexts. Instead, they intersect with other identities such as race, ethnicity, and class to shape the experiences and opportunities available to individuals within these sectors [24]. In the context of this study, the intersectionality framework facilitates a nuanced analysis of access to resources, opportunities, and decision-making power within the aquaculture and fisheries sectors. It accounts for how gender interacts with other factors such as socio-economic status, geographical location, and cultural norms to influence individuals’ access to crucial resources such as land, credit, technology, markets, and more, all of which are vital for their participation and success in these sectors.

ajfand Since 2001
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 25 No. 7
August 2025
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

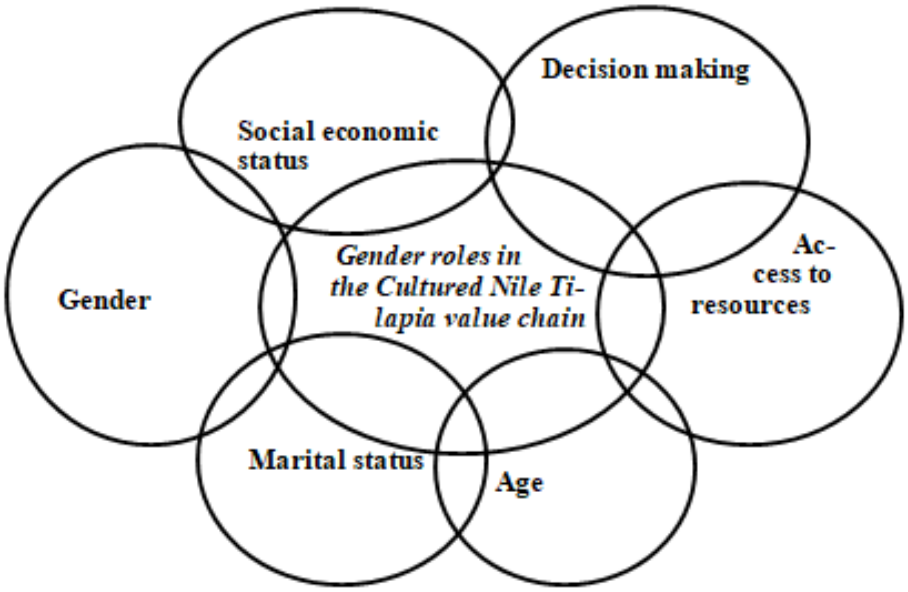

Figure 1: Intersectionality Conceptual Framework to illustrate factors for gender participation in the cultured Nile tilapia value chain

MATERIALS AND METHODS

Description of the study area

The research was conducted in the Mbeya region in the Southern Highlands of Tanzania between January to June 2022. Out of the six districts in the region, three were chosen for the study based on their significant involvement in fish farming, which contributes approximately 14.5% to Busokelo, 15% to Mbarali, and 12% to Mbeya districts' revenue [25]. Mbarali District is situated between the following coordinates 08°04'S 34°38'E. The district had a population of 300,515 [26], with a total area of 15,560 square kilometers. Busokelo District is situated between the following coordinates 900 30'0" S 800 30'E district had a population of 96348. Mbeya Rural District is situated between the following coordinates 80 30" S 340 00" E and has a population of 305,319.

ajfand Since 2001
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 25 No. 7
August 2025
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

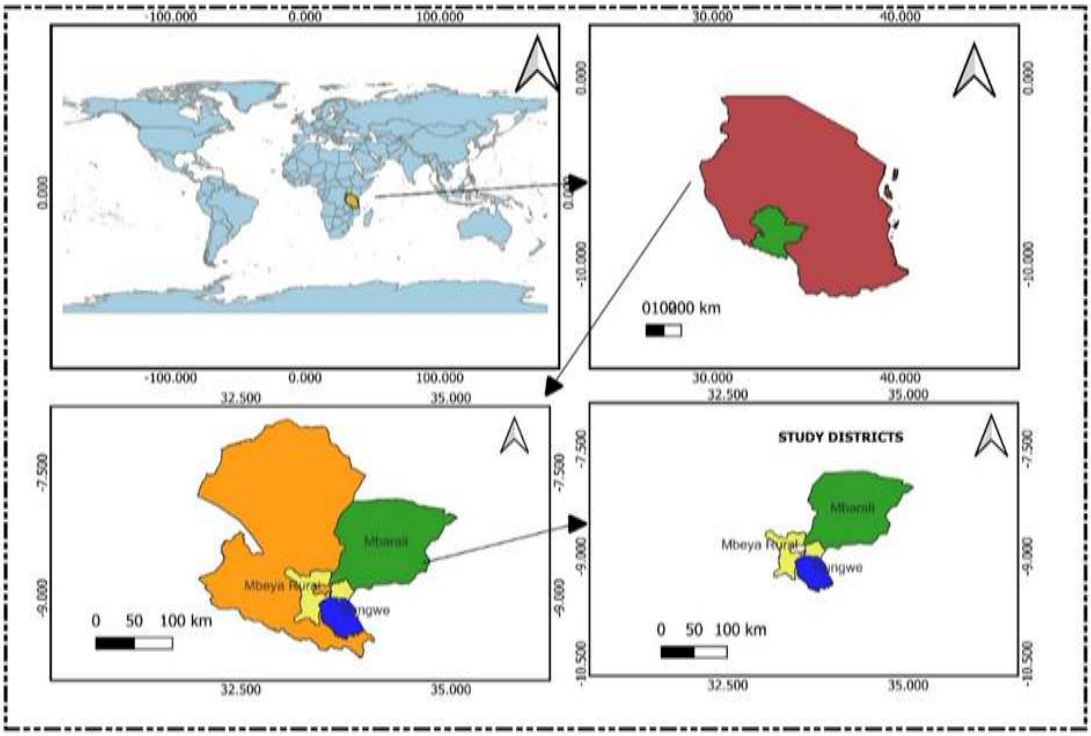

Figure 2: Map of Tanzania showing study locations

Data collection

Data from participants were collected from 258 respondents through semi structured questionnaires and overt observation, with individual opinions and experiences serving as the unit of analysis. During data collection informed consent was sought from all the respondents and the data was anonymized to remove identifiable traits associated with each respondent. The responses from the respondents informed the kind of analysis in relation to the research questions posed. Moreover, this approach bolstered the utilization of the intersectionality conceptual framework, which extends beyond the examination of gender roles alone. The study was guided by the intersectionality framework as set out by Crenshaw [27]. The focus of this study was primarily on gender roles within the Nile Tilapia value chain, to explore aspects such as control over income, decision-making, ownership, and task allocation.

Data processing and analysis

Descriptive statistics (means, ranges, frequencies, and proportions) were analysed using IBM SPSS Statistics 29 version. Whereas a t-test was used to show if there were significant levels of income between females and males. Furthermore, the Duncan's index of dissimilarities was used to measure gender segmentation as indicated below:

Since 2001 ajfand AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 25 No. 7
August 2025
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

$$D=\frac{1}{2}\sum_{i=1}^{N} \left|\frac{mi}{M}-\frac{fi}{F}\right|$$

Whereas;

- ½ stand for half of the sum of absolute differences in proportions in all groups/ nodes in the area.
- fi= number of women at a value chain node
- mi= number of men at a value chain node
- M= Total population of men in the value chain
- F= Total population of female in the value chain

The index has a range of 0-1. A value of 0 means the sector is not gender segregated (perfect gender integration) and a value of 1 means otherwise (complete gender segregation).

RESULTS AND DISCUSSION

Socio-economic characteristics of Nile tilapia value chain actors.

Table 1 below displays the results regarding the socioeconomic characteristics of participants within the Nile Tilapia value chain. The data shows that in the production phase, males comprised the majority (82.7%), whereas females accounted for only 17.3%. Conversely, females held a higher percentage in both the processing stages (58.7%) and the trading phase (78.7%), while males constituted 41.3% and 21.3%, respectively.

Regarding age, most respondents fell within the age mean of 40 (33.3%), 35 (36%), 30 (28%), and 25 (27%) for producers, processors, traders, and consumers, respectively. Education-wise, most respondents achieved secondary education, representing 46.7%, 49.7%, and 37.3% for producers, processors, and traders, respectively, while most consumers (63.6%) attained a college education. Marital status-wise, most respondents were married, accounting for 63.7%, which may suggest that these individuals have stable personal lives that could positively influence their professional endeavors.

Regarding the economic status of the respondents, disparities emerged across different stages of the value chain. In the production stage, the majority (77%) identified fish farming as their secondary business, while only 23% cited it as their primary business. Conversely, in the trade and processing stages, the majority (81%) declared it as their primary activity, with a minority (19%) indicating it as secondary.

Information on respondents' race, class, and ethnicity

According to data from Nile Tilapia value chain actors, most farmers (88%) were middle class, 7% were upper class, and 5% were lower class. The majority (88%)

ajfand Since 2001
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 25 No. 7
August 2025
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

were African, and 12% were Asian. According to data gathered from dealers and processors involved in the Nile Tilapia value chain, most of them (65%) belonged to lower social groups. An imbalance in the distribution of wealth along the value chain is suggested by the fact that a large percentage of farmers are middle class, and most traders and processors are from lower socioeconomic backgrounds. While dealers and processors, who are mostly from lower classes, may have difficulties, including insufficient capital, weak infrastructure, and restricted market access, middle-class farmers may have better access to resources, financing, and technologies to increase productivity. While dealers and processors are exclusively Black and African, farmers exhibit a slight degree of racial and cultural variety. Because there are fewer opportunities for racial or ethnic variety in the downstream portions of the value chain, this homogeneity in the latter group may reflect insufficient inclusion.

Production stage of the value chain

What is the distribution of control over income by gender in the cultured Nile tilapia value chain?

Information regarding the control over the income generated by fish farming in the study area is summarized in Figure 3. Males (40.0%) had more control than females (17.3%) while 41.3% stands for both males and females. This pattern suggests that actors in the production stage had alternative income sources and possessed more investment resources compared to those solely reliant on fish farming. Given the capital-intensive nature of production, necessitating investment in pond construction, land, and other resources, having additional income streams at this stage could be advantageous.

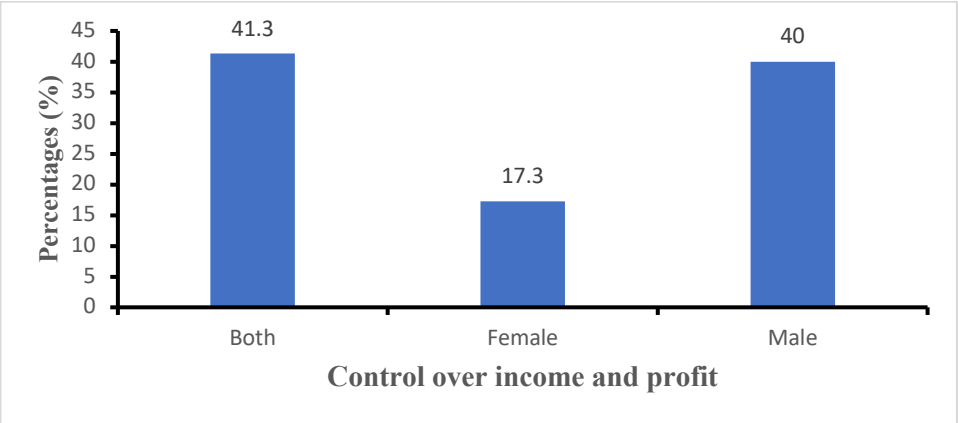

Figure 3: Gender control over income generated by fish farming

A fisheries officer in Mbarali District noted, "*In some cases, men traditionally hold more authority over how income is used. However, I have recently observed significant changes. When I spoke with women in my area about their earnings,*

ajfand Since 2001
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 25 No. 7
August 2025
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

many expressed that they now share financial decisions with their husbands, planning together on how to utilize their joint income"

The findings reflect a common pattern observed in many agricultural and aquacultural sectors, where gender roles often dictate who has control over resources and decision-making. According to Medard and Wilson [11] control over fisheries resources within the value chain typically lies with men, while women tend to be more involved in post-harvest activities such as smoking, drying, and subsistence marketing. Furthermore, Ogutu [10], urged that despite women constituting the majority in the fisheries value chain, their access to and control over economic resources are limited. The higher percentage of male control over income could be attributed to traditional gender norms and roles that assign financial responsibilities and decision-making to men within households. These norms may influence the distribution of income, access to resources, and opportunities for women in the value chain. About half (41.3%) of respondents reported shared control over income, suggesting a more cooperative and potentially equitable arrangement within some households. This shared control could be a positive indicator of evolving gender dynamics in the study area, where both male and female members of the household are actively involved in financial decision-making related to fish farming income. It's essential to explore the factors that contribute to this shared control and understand whether it leads to more equitable resource allocation and decision-making.

How does gender influence decision-making regarding fish management in the cultured Nile tilapia value chain?

Information regarding the decision-making on fish management is summarized in Figure 4. Males dominated (21.3%) compared to females 8.0%. Furthermore, 69.3% responded that both males and females were involved in decision-making. The results reflect a common gender disparity observed in natural resource management, where traditional gender roles and norms often allocate decision-making authority to men.

ajfand Since 2001
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 25 No. 7
August 2025
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

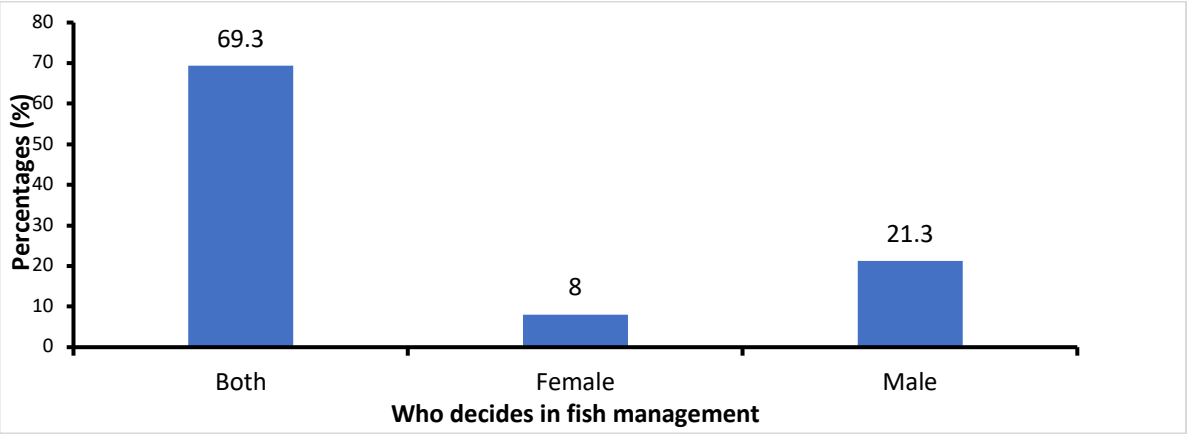

Figure 4: Gender involvement in making decisions on fish management

Processing stage of the Nile tilapia value chain

The results concur with those of Crenshaw [27] that the pattern of decision-making indicates that in a majority of the households, husbands alone took the decision (62 %), and the participation of women was only 10.50 %. The higher proportion of male dominance in decision-making might be attributed to historical practices and perceptions regarding who possesses the necessary knowledge and skills for effective fish management. This disparity could potentially limit women's influence in shaping sustainable practices and conservation efforts within the Nile Tilapia value chain. On a more positive note, a significant portion of respondents (69.3%) indicated joint decision-making between males and females, suggesting a collaborative approach to managing fish resources. This shared decision-making could potentially lead to more balanced and sustainable fishery management practices. It is essential to investigate the nature of this collaboration further and whether it results in more informed, equitable, and ecologically responsible decisions.

An interview with a fisheries officer from Busokelo District highlighted that, while men and women often perform different tasks within the value chain, decision-making is generally shared.

The officer noted, *"I have observed in my area of work that they approach the business as a family entity, collaborating on decisions. They sometimes consult me for support and advice, but ultimately, decision-making is inclusive and collective*."

The processing activities in the Nile tilapia are frying, drying, smoking, and freezing (ice cold). The findings showed that in this node, female actors dominated with 58.7% and 41.3% males.

Fisheries officers across all districts observed that fish processing is predominantly carried out by women. As one officer explained, "*The nature of fish processing often*

Since 2001 ajfand AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 25 No. 7
August 2025
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

involves cooking, a task traditionally associated with women in our society. Consequently, this role is primarily fulfilled by female workers within the value chain."

Dominance of females in this stage of the value chain reflects the nature of the activities undertaken, which are frying, drying, smoking, and freezing (ice cold). A study on gender roles in aquaculture production in Nigeria found that women played a significant role in the industrial fisheries labor force, primarily in post-harvesting and processing [28]. It is obvious that women play a significant role in ensuring the hygiene and cleanliness of the processing environment. These findings shed light on the gender dynamics within the Nile tilapia processing industry, highlighting the significant contributions of women in various critical processing activities. Understanding these gender roles and distribution can be valuable for improving labor allocation, ensuring equitable opportunities, and optimizing the efficiency of Nile tilapia processing operations.

What is the gender distribution in ownership of equipment within the cultured Nile tilapia value chain?

Some (49.3%) of the equipment for processing fish was owned by males, while female-owned only 42.7% and equipment owned by both were few and accounted for 8.0% only. An interview with a key informant revealed that, while equipment is typically owned by husbands, who are regarded as the heads of households, these resources are used by all household members without restrictions. The findings reflect a common pattern observed in many sectors where traditional gender roles and access to resources can result in unequal ownership of productive assets. Ownership of equipment is often a critical factor in determining one's ability to engage in productive activities, generate income, and make decisions about processing techniques and quality. The lower ownership percentage among females may limit their agency and influence within the value chain.

What is the gender distribution in capital ownership within the cultured Nile tilapia value chain?

To undergo fish processing, capital is important in ensuring the presence of some inputs to facilitate the processing, such as cooking oil, utensils, and money to buy the fish. In this category females 42.7% had more capital than males 41.4%, while both (male and female) accounted for 16.0%. These findings suggest that there is a degree of gender equity in terms of access to capital for fish processing within the study area. It is against the findings of Mafimisebi [9] that women are frequently excluded from lucrative segments and competitive economic opportunities within the value chain due to patriarchal systems governing resource control, such as capital. This balance in capital ownership between genders can be seen as a positive sign for gender inclusivity and entrepreneurship within the Nile Tilapia value chain. This implies that both males and females have the financial means to engage in and

ajfand Since 2001
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 25 No. 7
August 2025
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

sustain fish processing activities, and they can potentially benefit from the economic opportunities this sector offers. The relatively equal distribution of capital also indicates that both males and females are actively investing in and participating in the fish processing business. This can contribute to a more diversified and resilient fish processing sector, as it draws on the expertise, resources, and perspectives of individuals from both genders.

How does gender influence decision-making regarding the use of profit generated in the cultured Nile tilapia value chain?

In the case of decision-making on the use of profit generated, the findings showed that males and females together (77.3%) were involved in deciding the profit that was generated from the business. On a few occasions, females (16%) were making decisions than males (6.7%). The data reveal that decision-making regarding the use of profits is predominantly a collaborative effort between males and females, with most respondents indicating the involvement of both genders in this process. This is against the result of Quisumbing *et al.* [15] that even though value chain activities generate profits for actors, the distribution of these profits is often unequal, particularly for women. This collaborative approach suggests that, in most cases, decisions about how to allocate and use profits are made collectively within households or businesses. This is a positive sign as it implies that both males and females have a say in determining the best course of action for the generated income.

How does gender influence decision-making regarding task assignment within the cultured Nile tilapia value chain?

In case of the decision on who will do what role in the processing node the findings revealed that females dominated (21.3%) in making decisions compared to males (8.0%) while both males and females accounted for 70.7%. These findings challenge traditional gender norms that often dictate specific roles within the processing stage of the value chain. Historically, processing activities have been stereotypically associated with female roles, reflecting a division of labor that is perceived as more gender appropriate. However, the results suggest that there is a significant shift occurring within the Nile Tilapia processing node, with females actively involved in determining role assignments and responsibilities.

The dominance of females in decision-making regarding roles within the processing node signifies a more inclusive and equitable approach to task allocation. This approach recognizes the skills, capabilities, and preferences of both genders, allowing for a more diversified and potentially efficient workforce within this critical stage of the value chain.

ajfand Since 2001
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 25 No. 7
August 2025
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

Marketing node of the Nile tilapia value chain

The findings showed that this node of the value chain was dominated more by females (78.7%) than males (21.3%). Most respondents (92.0%) answered that both females and males were satisfied with what they got from their participation in the marketing node. However, only 8.0% responded that they were not satisfied with what they got from their involvement. The domination of this node by females could be due to various socio-economic and cultural factors such as tradition and gender roles. In many cultures, women are traditionally responsible for activities such as food processing, preservation, and marketing. As a result, they may naturally gravitate towards trading nodes in the agricultural value chain. Furthermore, women may have limited access to land and productive resources compared to men, making it more viable for them to engage in activities such as trading, where initial capital requirements may be lower.

How do earnings and involvement in unpaid work differ between males and females participating in the Nile tilapia value chain?

There were no statistically significant differences (*t-test, p > 0.05*) in what females and males receive for their involvement in the Nile Tilapia value chain. However, reports from key informants, particularly Fisheries Officers, indicated that wages earned by individuals, regardless of gender were not different across various roles within the value chain. "*All individuals engaged in these activities receive equal compensation, ensuring gender equity in pay across the different types of work performed.*"

This may be seen as positive news in terms of gender equality, suggesting that both genders are fairly treated within this context. It suggests that the value chain, as it currently operates, is not systematically biased against females. However, it doesn't necessarily mean that gender equity is fully achieved; other factors such as opportunities, access, and representation should also be considered.

Duncan's index of dissimilarities measures of occupational segregation

The index (40%) indicates that the nodes of the value chain of cultured Nile tilapia are segregated (Table 2). As shown in the gender distribution males were more dominant at the production node as for females in processing and trading node.

$$D=100 \text{ X } ½ [| \frac{13}{136} - \frac{62}{127} | + | \frac{44}{136} - \frac{31}{127} | + | \frac{59}{136} - \frac{16}{127} | = 40\%$$

Males were dominant at the production node, as it requires labor intensive for instance in ponds construction. Also, it indicated that males have more power to control the means of production such as land and capital which is essential in the production stage. However, it is not the case in other nodes of the value chain where females were more dominant than males. This could be because of many cultures;

women have traditionally been involved in food processing and trade. This historical role has carried over into the modern era, making women more likely to engage in these aspects of the value chain. Therefore, about 40% of men would have to move to other levels of the value chain to yield a more even distribution of men and women across the levels of the value chain.

CONCLUSION AND RECOMMENDATIONS FOR DEVELOPMENT

The results reveal the importance of gender roles in the *Oreochromis niloticus* value chain of Mbeya region in Tanzania. A noteworthy pattern of shared responsibilities and decision-making within households involved in the Nile tilapia value chain. Both males and females played vital roles in various aspects of fish management, equipment ownership, and decision-making processes. These findings have several implications for promoting gender equality, improving resource management, and ensuring the sustainability of fish-related activities. The study suggests a gender-inclusive approach in the sustainable management of fish resources and equitable distribution of benefits within households.

ACKNOWLEDGEMENTS

Special thanks are extended to DAAD for funding this endeavor. Mbarali, Busokelo and Mbeya District Fisheries Office are thanked for field work support. Sincere appreciation is also extended to the Department of Aquaculture and Fisheries and its staff for their valuable contributions to this project.

Conflict of interest

The authors declare no conflict of interest.

ajfand Since 2001
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
SCHOLARLY, PEER REVIEWED
Volume 25 No. 7
August 2025
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

Table 1: Socio-demographic characteristics of cultured Nile Tilapia value chain actors in Mbeya region

Socio-economic characteristics	Percentages			
	Producers n=75	Processors n=75	Traders n=75	Consumers n= 33
i. Age				
18-22	1.3	6.7	1.3	3
23-27	6.7	6.7	9.3	27.3
28-32	5.3	20	16	15.2
33-37	25.3	36	28	3
38-42	33.3	22.7	25.3	12.1
43-47	14.7	8	10.7	3
48+	13.3	0	9.3	6
Total	100	100	100	100
ii. Education				
Informal	12	5.3	16	3
Primary	18.7	22.7	36	12.1
Secondary	46.7	49.7	37.3	21.2
College	22.7	22.7	10.7	63.6
Total	100	100	100	100
iii. Marital status				
Single	9.3	36	24	42.4
Married	84	64	56	51.5
Divorced	1.3	0	5.3	3
Widowed	5.3	0	17.7	3
Total	100	100	100	100
iv. Gender				
Female	17.3	58.7	78.7	60.6
Male	82.7	41.3	21.3	39.4
Total	100	100	100	100

Table 2: Duncan's index of dissimilarities measure of occupational segregation

value chain nodes	Number of workers		Fraction of worker			Absolute value
	Female	Male	Female	Male	fi-mi	fi-mi
Producers	13	62	0.1	0.5	-0.4	0.4
Processors	44	31	0.3	0.2	0.1	0.1
Traders	59	16	0.4	0.1	0.3	0.3
	136	**127**				**0.8/2=0.4**

REFERENCES

1. **Kaminski AM, Genschick S, Kefi AS and F Kruijssen** Commercialization and Upgrading in the Aquaculture Value Chain in Zambia. *Aquaculture,* 2018; **493**: 355–364.

2. **Ndanga LZ, Quagrainie KK and JH Dennis** Economically Feasible Options for Increased Women Participation in Kenyan Aquaculture Value Chain. *Aquaculture,* 2013; **414**: 183–190.

3. **Lewis D** Rethinking Aquaculture for Resource-Poor Farmers: Perspectives from Bangladesh. *Food Policy,* 1997; **22(6)**: 533–546.

4. **Edwards P** Aquaculture, Poverty Impacts, and Livelihoods. *Overseas Development Institute*, 2000; **56:** 1-4.

5. **Genschick S, Marinda P, Tembo G, Kaminski AM and SH Thilsted** Fish Consumption in Urban Lusaka: The Need for Aquaculture to Improve Targeting of the Poor. *Aquaculture*, 2018; **492**: 280–289.

6. **Odhone AO, Mahiri I and F Onsongo** Assessing Gender Roles in Dagaa Fishery Value Chain among Fishing Communities on Lake Victoria: A Case Study of Lake Victoria Beaches in Siaya County, Kenya. *International Journal of Current Aspects,* 2020*;* **4(2)**: 13–32.

7. **Chete OB** Gender and Agricultural Practice in Developing Countries: Literature Review." *South Asian Journal of Social Studies and Economics,* 2019; **5(2)**: 1–11.

8. **Shalesha A and VA Stanley** Involvement of Rural Women in Agriculture: An Innovation Approach. *Naga: The ICLARM Quarterly,* 2000; **23(3)**: 13–17.

9. **Mafimisebi TE** A Comparative Economic Analysis of Two Cassava-Based Business Activities Exclusive to the Female Gender in Oyo State, Nigeria. *Journal of Agricultural Extension,* 2007; 10.

10. **Ogutu GEM** Socio-Economic Conditions of Artisanal Fishermen and Fish Traders. In Artisanal fisheries of Lake Victoria, Kenya: Options for management, production and marketing. Proceeding of a workshop for the Artisanal Fisheries (Kenya) Project, held in Kisumu, Kenya. *Shiriisho Publishers Nairobi*, 1992;15-44.

11. **Medard M and DC Wilson** Changing Economic Problems for Women in the Nile Perch Fishing Communities on Lake Victoria. *Anthropologica*, 1996; 149–172.

12. **Geheb KIM and T Binns** Fishing Farmers' or 'Farming Fishermen'? The Quest for Household Income and Nutritional Security on the Kenyan Shores of Lake Victoria. *African Affairs*, 1997; **96(382)**: 73–93.

13. **Lwenya CA and R Abila** The Gender Role in Fish Processing and Trading Practices in Lake Victoria (Kenya). *Lake Victoria Fisheries Organization*, 2000.

14. **Medard MN and K Geheb** Fisheries Management in the Social Domain: Perspectives from Tanzania's Lake Victoria Fishery. 2000.

15. **Quisumbing AR, Rubin D, Manfre C, Waithanji E, van den Bold M, Olney D and R Meinzen-Dick** Gender, Assets, and Market-Oriented Agriculture: Learning from High-Value Crop and Livestock Projects in Africa and Asia. *Agricultural Economics*, 2015; **46(3)**: 279–302.

16. **Rubin D, Manfre C and KN Barrett** Promoting Gender Equitable Opportunities in Agricultural Value Chains: A Handbook. *Publication Prepared under the Greater Access to Trade Expansion (GATE) Project, under the Women in Development IQC Contract No*. No. 02. GEW-I-00-02-00018-00, Task Order, 2009.

17. **Wyrod R** Between Women's Rights and Men's Authority: Masculinity and Shifting Discourses of Gender Difference in Urban Uganda. *Gender and Society*, 2008; **22(6)**: 799 – 823.

18. **Laven A, Eerdewijk A, Senders A, van Wees C and R Snelder** Gender in Value Chains: Emerging Lessons and Questions. *Agri-ProFocus working paper*, 2009.

19. **Pigman GA** The World Economic Forum: A Multi-Stakeholder Approach to Global Governance. Routledge, 2007.

20. **Krasnikova N, Ivanov R, Krupskyi OP and O Dzyad** Factors for Reducing the Global Gender Gap. *Economic Studies*, 2004; **33(2)**: 5.

21. **Kusakabe K and S Thongprasert** Women and Men in Small-Scale Fisheries and Aquaculture in Asia: Barriers, Constraints, and Opportunities Towards Equality and Secure Livelihoods. *Food and Agriculture Organization*, 2022.

22. **Corpuz ECO** Gender and Race as Social Practice in Leadership: The Management of Intersecting Identities among Women with Marginalized Backgrounds. Doctoral dissertation, 2024.

23. **Board AF** A Study on Intersectional Approaches to Gender Mainstreaming in Adaptation-Relevant Intervention. 2022.

24. **Kelly C, Kasperavicius D, Duncan D, Etherington C, Giangregorio L, Presseau J, Sibley KM and S Straus** 'Doing' or 'Using' Intersectionality? Opportunities and Challenges in Incorporating Intersectionality into Knowledge Translation Theory and Practice. *International Journal for Equity in Health*, 2021; **20(1)**: 187.

25. **Regional Fisheries Officer**. Fish Farming Workshop at Mbalizi, Mbeya, March 10, 2022.

26. **Republic of Tanzania.** National Census - *Population and Housing Report: 2023 Census Summary.* National Bureau of Statistics, 2022.

27. **Crenshaw KW** Mapping the Margins: Intersectionality, Identity Politics, and Violence Against Women of Color. In *the Public Nature of Private Violence,* 2013; 93–118.

28. **Chayal K, Dhaka BL, Poonia MK, Tyagi SVS and SR Verma** Involvement of Farm Women in Decision-Making in Agriculture. *Studies on Home and Community Science*, 2013; **7(1)**: 35–37.

29. **Nwabeza GO, Ifegika PI, Tafida AA, Oyanda JO, Erie AP and NE Belonwu** Gender and Fisheries of Lake Kainji, Nigeria: A Review. *Journal of Fisheries and Aquaculture*, 2013; **8(1)**: 9–13.

30. **Quisumbing A, Heckert J, Faas S, Ramani G, Raghunathan K, Malapit H and pro-WEAI** Women's Empowerment and Gender Equality in Agricultural Value Chains: Evidence from Four Countries in Asia and Africa. *Food Security*, 2021; **13:** 1101–1124.