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Assessment of Gender and Cultural Dimensions of Aquaculture Farming for Food Sustainability in Nigeria: A Review

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ABSTRACT

In Nigeria, aquaculture farming is essential to improving food security and economic growth since it gives many people a reliable source of protein and a means of subsistence. The gender and cultural aspects of aquaculture are examined in this review along with the consequences for the sustainability of food. Within the aquaculture value chain, men and women have different responsibilities. Generally speaking, men manage pond building and maintenance, while women are more likely to be involved in post-harvest operations like processing and marketing. Despite their enormous contributions, women still confront obstacles such restricted training opportunities, decision-making authority, and resource availability. Aquaculture techniques and community acceptability are influenced by cultural variables, such as indigenous knowledge and traditional customs. But cultural norms can also provide problems, like opposition to novel approaches and gender-based participation limitations. To fully reap the benefits of aquaculture, it is imperative to address these gender and cultural issues. The analysis highlighted tactics including focused training, better resource availability, and fusing traditional knowledge with contemporary practices that support gender inclusion and cultural sensitivity. Aquaculture farming has the potential to make a substantial contribution to Nigeria's economic growth, poverty alleviation, and food sustainability by promoting an inclusive and culturally sensitive approach.

Keyword: Aquaculture, Gender, Cultural, Dimension, Sustainable, Nigeria

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INTRODUCTION

Sustainable food production and poverty alleviation as well as food security are global concerns. Nevertheless, it is estimated that over 1 billion people are already hungry and malnourished. Nigeria, with over 140 million people, is not an exception (Ikenga, *et.al,* 2023). Meeting the need for food in the face of a rapidly increasing population on limited land resources calls for attention, not only to potential yield, but also environmental sustainability and impact. A sustainable substitute that can support food security and economic growth in Nigeria, where overfishing and environmental degradation have reduced wild fish populations, and aquaculture in Nigeria offers a possible solution to the country's food insecurity and poverty because of its plentiful water resources and ideal climate

(FAO, 2020). However, aquaculture has become an essential component of the global food system, contributing significantly to food security, nutrition, and livelihoods. Notwithstanding these benefits, the industry has a number of obstacles that prevent it from growing and becoming sustainable. Among these difficulties, the dynamics of fish farming are significantly shaped by gender differences and cultural factors (Adebo & Ayelari, 2011; Ikenga, *et. al*, 2023.). In Nigeria, women play a crucial role in aquaculture operations, especially in post-harvest procedures such as fish processing, preservation, and selling (Akinrotimi *et al*., 2011). However, traditional gender roles and socio-cultural norms often limit women's participation in more lucrative and decision-making aspects of aquaculture. Furthermore, aquaculture operations are greatly impacted by cultural customs and beliefs, including taboos and rituals pertaining to fish species and bodies of water (Ekpo & Essien, 2005; Olufayo, 2012). Therefore, recognizing the significance of ethnic diversity in global policy planning and implementation requires the investigation of cultural variables to explain individual decisions and actions in managing natural resources in anthropological studies (Akinrotimi *et al*., 2011) and assert that including cultural components into aquaculture programs can improve community acceptance and engagement, ultimately resulting in more sustainable outcomes. The human environment is increasingly becoming a subject of interest in various aspects of natural resource management. Favorable environmental attitudes emerging from cultural identity prove that ethnic identity determines a certain way of life and behavior that can contribute to the conservation of forests and wildlife. Tradable property rights in fish play an essential role in the utilization of aquatic resources in line with the orientation of cultural variables. Marketable access provides a motive for the adoption of measures that would sustain fishing intensity, which includes enforcing rules to prevent overfishing, using hygienic techniques of fish harvest, or even avoiding the use of harmful substances in the lakes and rivers. Nigerian aquaculture has a great deal of promise to improve food security and stimulate economic growth. However, the industry's sustainability and production are restricted by cultural norms and gender gaps. Women's involvement in aquaculture is frequently limited by traditional gender roles and sociocultural norms, especially when it comes to decision-making and resource availability (Nwabeze et al., 2013). Aquaculture activities and sustainability are also impacted by cultural practices and beliefs regarding the kinds of fish that can be raised and eaten (Ekpo & Essien, 2005). Indeed, recognizing the role of gender and cultural diversity in the management of the fishing industry can significantly enhance the sector's efficiency in reducing the vulnerability of the industry.

Background of Aquaculture Farming in Nigeria

Currently as earlier suggested the world population is increasing at an alarming rate, and an inevitable consequence of rapid population growth is the increasing demand for food, (FAO, 2020; Ikenga, 2022; Ikenga, *et.al*, 2023). This food demand is further complicated by issues of the quality, safety, and affordability of food. Owing to profound poverty and the severe depletion of the natural environment, Nigeria, like many other African countries, is not on a path to sustainable economic or environmental governance. The perception that the Millennium Development Goals are heavily focused on alleviating poverty without much focus on the environment has long been expressed, and this is partly recognized by four of eight of these goals that directly or indirectly affect the environment. These involve reducing child mortality, improving maternal health, reducing HIV/AIDS, and other diseases with support expected from improved targets such as increasing access to safe drinking water, improving sanitary and environmental waste disposal systems, and the improvement and upgrade of water supply facilities including water catchment protection. Aquaculture operations are exposed to considerable hazards from environmental challenges, including water pollution and the effects of climate change (Eyo, 2013; Ikenga, *et. al*, 2023).

Aquaculture is the fastest growing food-producing sector in the world and accounts for more than 50% of the seafood are consumed by humans. It represents a massive source of protein in many parts of the world (WorldFish, 2024) and has been lauded in several quarters as the magic wand to solving the problem of food crisis in the world. Its contribution has increased since the 1970s when the concept of culture of aquatic organisms has evolved into the modern understanding of aquaculture. Government initiatives to support agricultural diversification and the growing demand for fish and seafood by the 1980s gave commercial aquaculture a boost (Fagbenro *et al*., 2010; Ikenga, 2022). According to Ozigbo *et al.* (2014), these initiatives include the creation of fish farm estates, extension services, and subsidies for fish farming inputs. Today, aquaculture is seen as offering the potential for rehabilitation of the environment and provides compensation for the reduced catch in recent years in some fishing areas. In the work of Adebo and Ayelari (2011), the goal of commercial aquaculture farming was to lessen the nation's dependency on fish imports while enhancing the aquaculture-based livelihoods of rural populace. However, Ayinla (2007) notes that enhanced disease resistance and increased yields have resulted from the cultivation of superior fish breeds, like the African catfish (Clarias gariepinus).

As is common with all human endeavors, women play roles as primary household providers. The sector holds important functions such as generating income to support household diets, especially in the developing world, and provides a vital safety net for small inland communities. It is also a profession that women have used to help reduce their marginality in society. They have upturned their role in traditional processes of harvesting from the wild to provi-

ding fish for markets (Ikenga, *et. al*, 2023). That is from fish farming to processing and marketing, women are essential to the aquaculture value chain (Ikenga, *et.al*, 2023). Nevertheless, they frequently encounter obstacles linked to decision-making authority and resource availability (Ibrahim et al., 2019). With the significant contribution of women in the aquaculture sector over the years, a review of women's role in fisheries sector policies revealed that there were no policies which specifically cater for the needs of women stakeholders. However, in order to achieve food sustainability and realize the full potential of aquaculture in Nigeria, it is imperative to address these gender and cultural factors.

Research Objectives

The primary objectives of this review are to:

1. Assess the gender roles and disparities in aquaculture farming in Nigeria.
2. Examine the influence of cultural beliefs and practices on aquaculture activities.
3. Analyze the implications of gender and cultural dimensions for food sustainability in Nigeria and
4. Provide recommendations for gender-inclusive and culturally sensitive policies and interventions to enhance the productivity and sustainability of aquaculture in Nigeria.

Literature Review

Gender Roles and Participation in Aquaculture Farming

The role of women in Nigerian agriculture has been viewed as increasing, contributing to the creation of private and public value and economic growth. Women are involved in the farming, processing, and sale of almost all food crops and cash crops. In small-scale aquaculture businesses, where family work is crucial, women's participation is typically more prevalent (Adebo & Ayelari, 2011; Ikenga, *et. al*, 2023, Ikenga, *et. al*, 2024). Within more recent economic development models, the link between increasing income inequality between men and women's economic development has become evident. Women who work in aquaculture have the opportunity to earn a living, which can elevate their social standing and lessen poverty (Akinrotimi *et al*., 2011). However, according to Ibrahim et al. (2019), women frequently juggle a variety of duties, such as childcare and home tasks, which can limit the amount of time and energy they can dedicate to aquaculture activities. The food value chain is a livelihood activity which provides direct benefits to women. Women's participation at different levels of the chain varies and differences depend on the production system and associated gender relations. Fish harvesting and post-harvest processing are actively carried out by women. They usually deal with jobs like cleaning, smoking, and sorting fish-all essential for enhancing the value and prolonging the shelf life of fish products (Nwabeze & Erie, 2013). Gender relations influence the opportunities and constraints for male and female fisherfolk to improve their livelihoods. Due to this difference, women are less able to obtain the technical know-how and skills required for efficient aquaculture management (Adebo & Ayelari, 2011).

Also, Nwabeze and Erie (2013) and Ikenga, *et.al*, (2024), noted that these limitations would limit their capacity to influence aquaculture policies and practices that would affect their livelihoods.

Cultural Practices and Beliefs Impacting Aquaculture Farming

Cultural practices and beliefs are fundamental in Nigerian culture, which significantly influence aquaculture or fish farming. The kinds of fish that can be raised and the places where aquaculture can be carried out may be restricted by these beliefs (Ajana, 2002). The acceptability and promotion of aquaculture can be influenced by the cultural significance of fish, since communities that place a high value on fish may be more likely to participate in fish farming (Anene *et al*., 2010). Enhancing sustainability and community acceptance can be achieved by integrating this indigenous knowledge into contemporary aquaculture operations (Satia, 2011). Nigerian societies are mostly patriarchal in nature, where men are predominantly regarded as the head of the family, influencing decisions in agricultural practices as well as the division of labor and decision-making processes in aquaculture operations are impacted by gender roles (Adebo & Ayelari, 2011). Fish farming settings, access to resources, and fish production. Women and young girls in these settings are primarily nurturers and perform most of the tasks, like pond management and collecting leaves used for feeding the fish, accounting for most of both the unpaid work and time-consuming activities in fish farming. Women may not be able to participate in aquaculture on their own or take advantage of all of its financial prospects due to these limitations (Ibrahim et al., 2019). These cultural norms and roles do influence women's participation, access to resources, control over income, fish production, and overall contribution to aquaculture. The propensity of communities to accept and engage in aquaculture is influenced by these beliefs (Akinrotimi *et al*., 2011) and integrating aquaculture with other means of livelihoods in such communities would require more efforts (Eyo, 2013). Under these norms and taboos, married women are also influenced by their husbands on what they can eat and their children's sex. The stigma associated with not being able to give birth to male children and the likelihood of divorce increases the determination to have male children. This may indirectly influence the decision to process and market the fish, which is not freely given to the women who are pregnant or nursing. Men more often have the control and rights over the fish to be used as a source of income,

food for the family, or a status symbol, while women and children are left with fish that are mixed with sand, cannot be sold, and is considered as food or consumed at home. Women in these areas with cultural issues have been known to source fish for social occasions from outside the community, (Ibrahim *et al.* 2019).

Food Sustainability and Aquaculture in Nigeria

A key industry in Nigeria's efforts to ensure the sustainability of its food supply is aquaculture. The increasing number of people on the planet is driving up demand for food, especially sources of protein. Aquaculture offers a practical way to improve food security, create revenue, and advance sustainable development in this situation. The population's nutritional needs are met in part by fish farming, especially in areas where conventional fisheries are disappearing as a result of overfishing and environmental deterioration (FAO, 2020). Aquaculture's growth can aid in closing the gap between the supply and demand for fish, lowering reliance on imported fish and boosting food security at home (Adebo & Ayelari, 2011); Worldfish,2020). The aquaculture industry can support wider socio-economic development by providing equal access to resources despite their considerable contribution to aquaculture, women still face severe obstacles that prevent them from fully participating and producing at their full potential and opportunity for marginalized populations, especially women (Williams *et al.,* 2012).

Gender and Cultural Dimensions of Aquaculture Policies and Programs

The gender and cultural dimensions of aquaculture policies and programs influence the use and access to resources, the distribution of benefits, and the setting of priorities within aquaculture systems. Gender, age, and social status determine who, under what circumstances, and to what extent (Ikenga, *et al,* 2023) can access certain resources and knowledge that shape activities within the aquaculture systems. Gender ideologies influence people in the decision-making process and offerings of these resources. Policies directly impact the rural population, therefore taking these considerations into account is recompensed. For Nigerian policymakers to change the existing policies and effectively promote sustainable aquaculture, they must first recognize that differences in the rights and responsibilities of men and women are rooted in their cultural structures. According to Adebo and Ayelari (2011), these rules are designed to guarantee that women have equal access to opportunities for decision-making, training, and resources. The most important rural inputs and resources include land, credit, information, technology, support services, infrastructure, and development programs. The acquisition of these and other factors is shaped by gender dimensions which must be given weight in the formulation of policy. Akinrotimi *et al*, (2011) and Enwa, *et al* (2024) recommended that women should organize themselves in cooperative groups in order to strengthen them financially and pull their resources together. Societies have different roles or responsibilities for men and women with regard to the development, use, and management of infrastructures, resources, and technological inputs for aquaculture development and management. Therefore, aquaculture policies and programs need to address such gender disparities to achieve sustainability, women gain an equal share of benefits from capacity-building initiatives when policies support gender-inclusive training programs (FAO, 2016). Both men and women are the main actors in aquaculture within their cultural and social structure hence, culture-specific obstacles to gender equality should be the focus of educational initiatives aimed at both men and women (Béné *et al*., 2016). In these environments, cultural beliefs and practices about gender roles have legal and socioeconomic implications that either support or constrain sustainable aquaculture development. However, key to planning and implementation is including local communities (Nwabeze & Erie, 2013).

Challenges and Barriers Faced by Women in Aquaculture Farming

Women face several challenges in the aquaculture industry in Nigeria. As a common issue in developing countries, most institutions designed for support and capacity building in aquaculture farming are gender biased. Due to their limited rights to own land, women often lack the collateral that many financial institutions seek (Adebo & Ayelari, 2011; FAO, 2016). Their capacity to expand operations and boost production is hampered by this financial obstacle (Ibrahim et al., 2019) and restricts their profit margins and makes it harder for them to offer their produce at prices that are competitive (Adebo & Ayelari, 2011). These institutions, policies, and programs instead of promoting the empowerment of aquaculture practicing women are enmeshed in continued subjugation. For instance, women are traditionally not allowed to handle certain fish species or do certain duties in certain communities (Ajana, 2002; Ikenga*, et.al,* 2024)

Consequent upon the absence of a formidable aquaculture policy whose focus is on women's participation, functions that can empower women in areas of the training needs, accessibility to productive resources, funds, markets, and enabling environment to develop as women fish farmers are not institutionalized. Women's access to resources, training, and decision-making platforms is frequently hampered by the absence of special measures (FAO, 2016). Training, an essential element for small-scale aquaculture development, is another opportunity where women are disadvantaged. Substantial gender unequal constraints are posited by numerous authors as the adoption rate of technical innovations in aquaculture is low among women the world over. According to Akinrotimi *et al*. (2011), there exists a

technical gap that may impede their capacity to maximize productivity and mitigate risks. Nevertheless, one of the major constraints in the technical innovations adoption rate is information.

Success Stories and Best Practices in Gender-Inclusive Aquaculture Farming in Nigeria

In this review, three success stories were reviewed as follows:

i). The Aqua Fish innovation Lab initiatives: The USAID-funded Aqua Fish Innovation Lab has carried out a number of projects to improve gender inclusion and aquaculture practices in Nigeria. One noteworthy accomplishment is the creation of women-led cooperatives for fish farming in the Niger Delta. With the help of these cooperatives, which have given women access to microfinance, market connections, and training in contemporary aquaculture techniques, women participants have reported higher fish yields, better incomes, and more participation in community decision-making (USAID, 2017).

ii). FADAMA III Project: Aiming to boost the incomes of rural farmers, especially those engaged in aquaculture, the World Bank supported the FADAMA III Project. The project's emphasis on women's empowerment and gender equality was one of its main features. Women who benefited from the FADAMA III Project were able to expand their aquaculture businesses, which enhanced their families' livelihoods and increased food security (World Bank, 2014). With funding from the World Bank and the Nigerian government, the FADAMA III Project in Nigeria aims to improve livelihoods, increase food security, and lessen rural poverty by encouraging sustainable agricultural techniques, including aquaculture. The following is a summary of FADAMA III's specific aquaculture mandate:

Enhancing Aquaculture Productivity

FADAMA III aims to boost fish farm productivity in order to raise aquaculture production. Better inputs, including fingerlings and fish feed, as well as access to contemporary methods and technologies for fish farming, are necessary to accomplish this (World Bank, 2008). The project helps farmers increase their production capacity by providing them with upgraded fish farming infrastructure, such as ponds, tanks, and hatcheries.

Capacity Building and Training

Fish farmers' capacity-building and training are given a lot of attention in this initiative. Fish farming best practices, such as pond management, feed optimization, water quality management, and fish health management, are taught to farmers through training programs (Fadama III AF, 2013). Training also covers record-keeping, business development, and financial literacy to enable farmers to run their aquaculture operations sustainably (World bank, 2017)

Access to Finance

Enhancing farmers' access to financial services is one of the main goals of FADAMA III. However, aquaculture farmers' groups can apply for matching grants to support their investment in productive assets. The project assists aquaculture farmers in obtaining microcredit and grants to support the purchase of inputs and infrastructure, ensuring that capital constraints do not limit their productivity through the FADAMA Users Equity Fund (FUEF) (World Bank, 2008; Nwabueze *et.al*, 2013).

Development of Aquaculture Value Chains

Facilitating market access, enhancing post-harvest handling, and producing value-added products from aquaculture operations are the three main ways that FADAMA III seeks to enhance the aquaculture value chain. According to Fadama III AF (2013), the initiative facilitates the establishment of market connections between fish farmers and traders, processors, and consumers. Furthermore, FADAMA III promotes the formation of farmer groups and cooperatives, which facilitates collective bargaining, enhances market accessibility, and lowers transaction costs for smallholder aquaculture producers (National FADAMA Development Office, 2013).

Women and Youth Inclusion in Aquaculture

Women's and young people's participation in aquaculture operations is given priority by FADAMA III. In order to guarantee that these groups fully engage in the industry and take advantage of chances to generate revenue, the initiative offers them specialized training and resources (World Bank, 2008). Priority is given to women and youth in capacity-building initiatives and grant applications, advancing youth empowerment and gender equality in the aquaculture industry (world bank, 2017).

Environmental Sustainability

Through the initiative, farmers are encouraged to embrace ecologically friendly techniques in aquaculture, which supports sustainability. To lessen environmental deterioration, this entails using less water, not overstocking fish, and properly managing garbage (Fadama III AF, 2013). In order to maintain aquaculture's long-term viability and resilience against the effects of climate change, FADAMA III also incorporates climate-smart methods ((National FADAMA Development Office, 2013).

iii). Nigerian Institute for Oceanography and Marine Research (NIOMR) Program: With its numerous training and capacity-building initiatives, NIOMR has been at the forefront of advocating for gender-inclusive aquaculture. One initiative and effective program that aims to empower and educate women in inland and coastal fish farming communities, which has been successful is called Women in Aquaculture (WiA). In addition, the program has made it

easier for women to access credit and market opportunities, which has increased their economic empowerment (NIOMR, 2019). The best practices noted in this review include gender- sensitive programs ((Akinrotimi et al., 2011); formation of women cooperative (USAID, 2017; Enwa, et al, 2024); access of credit and financial services ((Agbebi, 2012; Ikenga, et al (2024); market linkages and value addition (Sanni, 2014); finally, policy support and advocacy (Williams et al., 2012) and the use of technology and innovation (FAO, 2020).

Research Methodologies and Approaches in Studying Gender and Cultural Dimensions of Aquaculture Farming

The methodology involves a systematic literature review to gather, analyze, and interpret data from various sources. Adebo & Ayelri, (2011) used survey methods to gather data on socio-economic characteristics in order to access resources and challenges faced by male and female fish farmers in Nigeria while Ikenga, *et.al* (2023) used questionnaire to gather data on the profitability of aquaculture farming in Delta State, Nigeria by gender. Nwabeze and Erie (2013) used interview method for women fish farmers in Delta State, Nigeria to access their personal stories about their socio-cultural barriers and constraints. The Focused Group Discussions (FGDs) was used by Kruijssen *et. al*, 2018 in Bangladesh among mixed-gender groups to access how cultural norms affect women's role and decision- making power in aquaculture farming and Kassam, *et. al,* 2017 used participant observations in Kenyan aquaculture projects where practical challenges affecting women in fish farming were identified. Another method of gathering data is the case studies which provides an in-depth analysis as found by Kruijssen, et.al (2018) and Enwa, *et. al*, (2024). Food and Agriculture Organisation (FAO, 2020) identified another method which is secondary data analysis Gender researchers at the World Fish Institute (WFI) have adopted research approaches which critically examine women's and men's roles in aquaculture production processes, and in relation to the income and nutrition that comes from farm produce. The WFI research approach is based on the informed judgment and advice drawn from the latest thinking on social research methods including participatory, ethnography, discourse analysis, Bayesian belief networks, GIS, and cost-benefit analysis (Worldfish, 2020)

Key Findings and Trends in Gender and Cultural Studies in Aquaculture Farming

One of the most consistent findings in gender studies related to aquaculture in Nigeria is the gendered division of labor. Men are usually engaged in strenuous jobs such as creating ponds, harvesting fish, as well as large-scale marketing. On the other hand, women are more likely to work in post-harvest fields such as small-scale marketing, preservation, and fish processing (Akinrotimi *et al*., 2011; Nwabeze *et al*., 2013; Ikenga, *et a*l, 2023). Moreover, women's access to funding and contemporary aquaculture technologies is restricted, which hinders their capacity to expand their businesses and enhance production (Agbebi, 2012; Williams *et al*., 2012). Cultural beliefs and practices play a crucial role in shaping aquaculture practices in Nigeria, for instance, aquaculture was also found to be impacted by some customs and taboos around water bodies and fishing, which sometimes encourage sustainable practices but also limits the adoption of cutting-edge methods (Ekpo & Essien, 2005; Olufayo, 2012). Women are underrepresented in training and capacity-building programs related to aquaculture. According to Sanni (2014), their lack of representation makes it more difficult for them to obtain the information and abilities needed to implement cutting-edge, environmentally friendly aquaculture methods. Furthermore, research indicates that when women are empowered in aquaculture, there are significant positive impacts on household welfare. According to Adebo and Ayelari (2011) and Ikenga *et a*l, (2023) women who work in aquaculture can raise household income, improve nutrition, and generally enhance living conditions.

The trends in gender and cultural studies in aquaculture farming in Nigeria include increasing recognition of gender roles which FAO, (2020) notes that the knowledge of gender equality in aquaculture may improve productivity, food security, and economic development. This is what is driving the change and the trend of integration of cultural knowledge in aquaculture development focuses on women led aquaculture initiatives which leads to the processing of such situations. Aquaculture initiatives headed by women have demonstrated success in raising women's social status, income, and productivity, which has aided in the development of the community as a whole (USAID, 2017; NIOMR, 2019), Enwa et al (2024) found that the initiative of forming women cooperatives improves the income and livelihood of these farmers.

Policy and Practice

The study has indicated that gender and cultural roles and resources influence household food security and the overall well-being of farming households. To ensure positive changes in gender and the sustainability of aquaculture programs, women's participation should be taken seriously from the design (including being part of the co-designers) and be involved in the identifiable gender work packages. Women need to be specifically equipped with resources and energy-saving tools to reduce the burden of triple work, and their time should be respected for efficient function. However, it is believed that bridging the gender gap through effective policymaking backed up by resources and capacity support for the goals can change the cultural attitude of male subordination, which would lead to sustainable farming. It is also considered that the following recommendations are important for the

framework of policy orientation that would help in redressing the effects of gender and cultural tools on resource allocation in order to support food and nutrition security in a new policy program for aquaculture; the design and implementation of programs from the beginning, support to empower both men and women to participate in achieving gender equality via stakeholder involvement in planning, budgeting, execution, and determining program goals; allocate specific resources to the identified gender worklets, training in the use of energy-efficient tools recognizing the value of women's time and reducing the barriers that perpetuate traditional gender roles in farming. We therefore recommend that women should not be viewed as passive but be fully aware of the programs for effective and efficient execution.

CONCLUSION

Aquaculture is becoming increasingly significant for global food supply due to a decline in capture fishery yields. However, current aquaculture developments and policies have not effectively evaluated gender and cultural dimensions concerning aquaculture development. This review paper aims to co-assess food sustainability dichotomies within the gender dimensions occasioned by social patterning and cultural disproportions in the various stereotypes faced by men and women across the various collocations in aquaculture farming in Nigeria. The paper concludes that effectively determining the causes of these disproportions will contribute to the food security dimension of women who work without gender-related approaches that reduce gender inequalities. Effective personal and policy-level advocacy to sensitize and build the capacity of stakeholders can overcome the challenge of low social recognition if operating to include those stakeholders in aquaculture development schemes. Lessons are drawn from cultures where globalization has not severely disrupted gender divides, and backlash is for urban residents' cultural dispositions causing salubrious aquaculture farming, especially of certain crop outputs.

This analysis contributes to the burgeoning literature on gender-related inequalities occasioned by rural women's participation in agricultural and aquaculture production on one hand and efforts to position women and men in the agricultural and food security narratives at global and regional platforms. It provides veritable evidence-based information that unravels significant relationship links between inadequate technical cooperation and upscaling of optimum aquaculture in areas where there exist strong beliefs that farming is solely for men, especially for sections with higher income portfolios, even within low-income artisanal aquaculture settings. There are risks of social sanctions against any move towards equity for women and young people. In addition, many complex, intertwined, and multidisciplinary barriers prevent women from equitably accessing and participating in food system aptitude-building platforms that can ensure good knowledge and practices.

Recommendations

1. Policies that are gender-sensitive and meet the unique demands and difficulties experienced by women in aquaculture should be developed and put into effect by governments and policymakers. In order to promote women's increased involvement in fish farming, these policies ought to concentrate on enhancing their access to land, credit, and technical resources.
2. Men and women in aquaculture should receive specialized training in topics such as sustainable fish farming methods, water management, and business development. This will increase output and guarantee that both sexes make meaningful contributions to the sustainability of food.
3. Financial institutions ought to develop more accessible and inclusive loan options, especially for women residing in rural areas. The financial obstacles that women encounter when starting and growing their aquaculture farms can be addressed with the use of cooperative financing methods and microfinance programs.
4. Aquaculture development initiatives and interventions ought to take local cultural customs and norms into account. In order to influence attitudes and encourage more women to participate in decision-making roles in aquaculture farming, it can be helpful to include community leaders and raise knowledge of the advantages of gender inclusion.
5. Community awareness campaigns should be a part of initiatives that support gender equality in aquaculture in order to remove the cultural and customary barriers that keep women from fully participating in the industry. Education, media campaigns, and the involvement of male supporters in gender-equality initiatives can all be used to challenge social conventions.

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