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Men's Perceptions of Seaweed Farming in Zanzibar, Tanzania: Exploring Gender Dynamics in Coastal Livelihoods

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Seaweed farming is emerging as a cornerstone of the blue economy, significantly boosting national GDP and creating vital economic opportunities for coastal communities. Despite its potential contribution, the sector is dominated by gender imbalance: approximately 80% of Zanzibar's 23,000 seaweed farmers are women, highlighting an underrepresentation of men in this potential sector. This study examined men's perceptions of seaweed farming in Zanzibar, specifically focusing on the coastal wards of Jambiani, Paje, and Bwejuu. A cross-sectional research design was utilized, and data were collected through a structured questionnaire administered to a randomly selected sample of 150 men aged 18 to 55 years in the study area. Findings indicate that over 70% of men in Zanzibar have negative perceptions regarding seaweed farming. Specifically, 72% of the male respondents classified seaweed farming to be primarily a feminine activity. The binary logistic regression analysis revealed several statistically significant perceptions that substantially impact men's participation in seaweed farming. Notably, age (coef = -1.182, $p = 0.000$), the perception that seaweed farming is a women-based economic activity (coef = -0.358, $p = 0.016$) and the belief that it cannot meet household needs (coef = -0.780, $p = 0.041$). Furthermore, the belief that it is difficult to develop through seaweed farming (coef = -0.780, $p = 0.001$) and the perception that it requires costly inputs (coef = -0.181, $p = 0.000$) were also significant perceptions. The study highlights gender stereotypes and socio-cultural misconceptions affecting men's participation in seaweed farming in Zanzibar. To address these issues, the study recommends the implementation of gender-sensitive educational programs, workshops, and community discussions that raise awareness of seaweed's economic potential, challenge stereotypes and conduct ongoing research to monitor changes in perceptions and participation rates.

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INTRODUCTION

Seaweed production is increasingly recognized as a vital component of the blue economy, exhibiting significant growth due to its economic potential. According to the Food and Agriculture Organization (FAO, 2021), seaweed now constitutes over 51% of global marine and coastal aquaculture production, underscoring its importance in sustainable economic development. This expansion has not only provided economic benefits but has also highlighted persistent gender disparities within the workforce, particularly in regions like Southeast Asia. In countries such as Indonesia and the Philippines, women have emerged as the dominant force in seaweed cultivation, raising questions about the roles and perceptions of men within this sector (Elena & Gaestro, 2023).

In Africa, seaweed farming holds considerable promise, with the continent ranking second in aquatic plant output after Asia. However, gender inequality remains a significant challenge, as women predominantly comprise the labour force in this sector (FAO, 2020). Research conducted in Tanga, Tanzania, and Kenya reveals a similar trend, where women primarily occupy seaweed farming roles, thereby reinforcing gender imbalances in this industry (Onyango et al., 2024). These patterns suggest systemic barriers that may restrict men's engagement in seaweed farming, warranting a

deeper investigation into the perceptions and attitudes of men in this field.

Zanzibar serves as a pertinent case study in this context, where seaweed farming plays an integral role in the national economy, contributing approximately 7.6% to the Gross Domestic Product (GDP) (Msuya, 2020). The seaweed industry not only provides economic opportunities for coastal women but also stands as the third-largest foreign revenue generator for the region, following tourism and cloves (URT, 2020). Notably, seaweed ranks as the second most important export commodity for Zanzibar, highlighting its economic significance (FAO, 2016). Despite these contributions, men's participation in seaweed farming in Zanzibar remains strikingly low, with approximately 80% of the 23,000 farmers being women (Kalumanga, 2018). This has amplified gender disparity in this livelihood activity which is well known for its potential in upholding both individual and household income and wellbeing.

Understanding men's perceptions of seaweed farming is essential for uncovering how traditional gender roles influence participation and decision-making within this industry. By investigating these perceptions, the study aims to shed light on the barriers that men may face in engaging with seaweed farming, thereby providing critical insights for advocating gender mainstreaming in seaweed farming initiatives, policies, and programs. This

research gap is significant, as comprehending men's perspectives is crucial for understanding the evolving gender dynamics in coastal livelihoods. Men's limited participation may reflect broader societal attitudes toward gender roles, impacting both the sustainability of seaweed farming practices and the equitable distribution of benefits within the community. Therefore, this study investigates men's perceptions of seaweed farming in Zanzibar, to inform policies and initiatives that promote gender mainstreaming and enhance inclusivity within the seaweed farming sector.

THEORETICAL REVIEW

This study is developed under the theoretical guidance of Gender Role Theory and Social Constructionism. Gender Role Theory, founded by John Money, a psychologist and sexologist, posited in the mid-20th century that societal norms and expectations dictate the behaviours and roles deemed appropriate for men and women. This framework helped to explain how traditional gender roles influenced participation in various sectors, including seaweed farming. In the context of Zanzibar, understanding how these roles impacted men's perceptions of seaweed farming was crucial for uncovering the underlying reasons for their limited involvement. This theory emphasized the importance of socialization in shaping attitudes toward gender-specific roles in economic activities, providing insights into how societal expectations may have restricted or encouraged men's engagement in the seaweed industry.

Additionally, Social Constructionism theory as propounded by sociologists Peter L. Berger and Thomas Luckmann in 1966, was equally important in this study. They argued that our understanding of reality is shaped by social interactions and cultural contexts. This theory was especially applicable to investigating men's perspectives on seaweed farming because it emphasizes how individual and community understandings of gender roles developed within specific cultural contexts. Using this theory, the study sought to understand how men

in Zanzibar formed their perceptions about seaweed farming and how these beliefs influence their agency, engagement and decision-making in the industry. This approach enabled a nuanced investigation into the cultural and social aspects that contributed to the gender dynamics observed in coastal livelihoods.

METHODOLOGY

Research Design

A cross-sectional research design was employed to gather evidence-based data on men's perceptions of seaweed farming at a specific point in time. This design was selected for its ability to collect data from a diverse sample of participants in Jambiani, Paje and Bwejuu wards, thus facilitating the analysis of gender dynamics without the need for long-term longitudinal tracking. (Creswell, 2014; Bryman, 2016).

Study Area

The study was conducted in Zanzibar's three coastal wards Paje, Bwejuu, and Jambiani on the southeast coast of Unguja Island. These sites are well-known for seaweed farming, which is an important economic activity in Zanzibar, and were chosen to explore men's attitudes toward seaweed farming. The selection of these wards is justified by their prominence in seaweed farming and the particular socioeconomic and cultural aspects that affect men's participation in this potential sector (Sharif, 2019).

Paje, Jambiani, and Bwejuu are key villages in southeastern Zanzibar that serve as significant hubs for seaweed farming, each offering distinct contexts for exploring gender dynamics in the industry. In Paje, over 60% of households are involved in seaweed farming, yet men constitute only about 15% of the workforce, highlighting barriers to their participation (URT, 2020). This gender disparity makes Paje an important site for investigating men's perceptions of seaweed farming, especially given its prominence in the industry (Juma et al., (2021). Similarly, Jambiani offers a unique research site for

studying men's perceptions due to its dual reliance on traditional livelihoods and emerging economic pressures. Around 70% of households in Jambiani engage in seaweed farming, but men account for less than 10% of farmers. While men contribute indirectly through infrastructure, transportation, and marketing, their roles and perspectives remain underexplored (Sharif, 2019). Environmental challenges such as warming seas and changing salinity have reduced seaweed yields, while the vibrant tourism sector creates economic competition, making Jambiani ideal for examining how men perceive their roles and the socio-cultural significance of seaweed farming in a patriarchal context (URT, 2020).

Bwejuu also plays a vital role in Zanzibar's seaweed farming, with an estimated 55% of its population relying on the industry for income. Similar to Paje and Jambiani, men's participation is limited, making up only 18% of farmers. This economic reliance highlights the importance of understanding men's perceptions of seaweed farming in Bwejuu (Sharif, 2019). The shared dependence on seaweed cultivation across these villages, coupled with the environmental and socio-economic challenges they face, makes Paje, Jambiani, and Bwejuu rich case studies for exploring gendered roles, profitability, and the cultural significance of this livelihood (Msuya et al., 2020).

Target Population

The target population was men (aged 18 to 55) residing in coastal communities where seaweed farming is prevalent. This age group was selected as it represents economically active men likely to influence or be influenced by the dynamics of seaweed farming, including those who contribute to household income and community decision-making processes. This population included both men currently engaged in seaweed farming and those not involved to allow for comparison between participants and non-participants.

Sample Size and Sampling Technique

The study's sample size (n) was determined to be 150 men, calculated using Cochran's formula for an unknown population. Given the lack of data on the total number of men engaged in or excluded from seaweed farming in the selected wards. The sample was distributed evenly across three wards: Paje, Bwejuu, and Jambiani, with 50 men randomly selected from each area and simple random sampling was employed to ensure unbiased representation of both seaweed farmers and non-participants.

Formula;

$$n = \frac{Z^2 qp}{e^2}$$

Where:

- n = required sample size (150)
- Z = Z-value corresponding to the desired confidence level (1.96 for 95% confidence)
- p = estimated proportion of the population (assumed to be 0.5 for maximum variability)
- e = margin of error (0.08)

Thus, n=150

Data Collection Methods

Household Survey

A structured questionnaire was administered to 150 male respondents. The questionnaire captured demographic information and socio-economic factors (e.g., education, income, access to resources) and men's perceptions of seaweed farming. It included closed-ended and open-ended questions to allow for various responses with regard to the perceived attitudes of men towards seaweed farming in the study area.

Data Analysis

Quantitative Data Analysis

Quantitative data from questionnaires was analyzed using descriptive statistics (frequency and percentages) to summarize the demographic characteristics of the questioned respondents as well as men's perceptions toward seaweed farming in the study area. In addition, inferential statistics were utilized to determine the impact of the revealed perceptions of men on their involvement in seaweed farming in the study area. A logit regression model was chosen for this study because of its flexibility in analyzing binary outcomes and categorical dependent variables, making it an acceptable choice for assessing the possibility of men's engagement in seaweed farming due to differing perceptions. The logit regression model is a statistical technique that is frequently used to evaluate the probability of an event occurring (Waqas, & Md-Rus, 2018).

The model quantitatively assessed the extent to which key perceptions influence men's participation in seaweed farming. These perceptions included the view of seaweed farming as a women-based economic activity, seaweed farming needs costly inputs, it is difficult to develop on seaweed and seaweed cannot meet household needs.

The model is specified as;

$$\text{Log} \left(\frac{P_i}{1-P_i} \right) = \text{logit} (P_i) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \mu$$

Where:

- $\text{Log} (P_i/(1- P_i))$ is the natural logarithm of the odds ratio (log-odds), also known as the logit function,
- P_i is the probability that men engage in seaweed farming as associated with various perceptions,
- $1- P_i$ is the probability that men do not engage in seaweed farming as associated with their perceptions,
- β_0 is the intercept term representing the baseline log odds of men's engagement in seaweed farming when all independent variables are zero,
- x_1, x_2, x_3 , and x_4 imply the men's perceptions; (seaweed farming is a women-based economic activity, cannot meet household needs, is difficult to develop on seaweed, involves costly inputs, and it is an unpredictable activity),
- $\beta_1, \beta_2, \beta_3$, and β_4 are the coefficients associated with each independent variable (x_1, x_2, x_3 , and x_4) respectively, indicating the change in log odds of men's engagement in seaweed farming for a one-unit change in the corresponding independent variable.
- μ represents the error term, capturing the variability in men's engagement in seaweed farming that is not explained by the independent variables.

Table 1: Description and Measurement of Variables

Variable	Description	Type of Variable	Measurement	Expected Sign
Constant	The constant term in the logistic regression equation	Continuous -		N/A
Age	Age of men engaged in seaweed farming	Continuous	Measured in years	Positive (+)
Women-based Economic Activity	Men's perception of seaweed farming being a women-dominated or women-oriented economic activity	Binary	0 = Not a women-based activity, 1 = Women-based activity	Negative (-)
Cannot Meet Household Needs	Men's perception of whether seaweed farming can provide enough income to meet household needs	Binary	0 = Can meet needs, 1 = Cannot meet needs	Negative (-)
Difficult to Develop on Seaweed	Men's belief about the difficulties in growing and developing within the seaweed farming sector	Binary	0 = Not difficult, 1 = Difficult	Negative (-)
Costly Inputs	Men's perception of the input costs required for seaweed farming	Continuous	Amount of money spent on inputs (Tanzanian Shillings)	Negative (-)
Unpredictable Activity	Men's perception of seaweed farming as an unpredictable economic activity	Categorical	1 = Not unpredictable, 2 = Somewhat predictable, 3 = Highly unpredictable	Negative (-)
Men's participation	The possibility of men participating in seaweed farming	Binary	1 = participate, and 0 = otherwise	

Source: *Research construction, 2024*

Validity and Reliability of the Study

The study ensured rigour through a well-designed household survey questionnaire, grounded in existing literature to establish content validity and operationalize key concepts like “gender dynamics” and “perceptions.” Internal validity was achieved by sampling diverse households and considering contextual factors, while external validity placed findings within broader gendered livelihood contexts (Creswell, 2017). Reliability was reinforced through standardized survey administration and pilot testing to ensure clarity and consistency (Bryman, 2016). These measures provided credible insights into men's perceptions of seaweed farming and the gender dynamics in Zanzibar's coastal livelihoods.

Ethical Considerations

Ethical approval was sought from relevant institutions before data collection began. Informed consent was obtained from all participants, ensuring

that they understood the purpose of the study and their rights to withdraw at any point. Anonymity and confidentiality were also maintained, and all data was stored securely to protect participants' privacy.

RESULTS AND DISCUSSIONS

Demographic Profile of the Surveyed Respondents

Age

Table 2 reveals the age distribution of male respondents, ranging from 18 to 55 years, with over 80% falling into the middle-aged category (20-40). This demographic pattern is particularly significant, as middle-aged individuals play a vital role in household production and the broader economy of Zanzibar. The insights gathered from these respondents can inform future policies, plans, and educational initiatives aimed at reshaping perceptions and attitudes towards seaweed farming.

By fostering greater engagement among this demographic cohort, we can enhance the contributions of this key workforce to seaweed farming, which is a major driver of the national economy in Zanzibar (Kalumanga, 2018).

Marital Status

The demographic statistics indicate a diverse marital status among respondents, with over 60% being married. This reflects the traditional family structures prevalent in Zanzibar, where marriage plays a crucial role in community and economic activities. Analyzing the marital status of respondents is essential, as gender role theory suggests that it can significantly influence how men perceive their roles within both the household and the community, particularly regarding seaweed farming. Marital status, along with factors like age, educational background, and household size, is expected to shape men's perceptions of seaweed farming.

Education Status

Table 2 indicates that over 60% of respondents have completed only primary education, while only 6%

have attained a college education. Understanding the educational status of respondents is crucial to this research, as education significantly shapes perceptions, particularly concerning gender dynamics. The concentration of respondents at the primary education level may intersect with other factors such as age, sex, marital status, and patriarchal ideology, potentially leading to negative attitudes among men towards seaweed farming. This, in turn, can limit their participation in this vital economic activity.

Household Size

The household size statistics reveal important insights into the living arrangements of respondents. The majority, 65%, belong to households with 4 to 6 members, while a smaller portion, 10%, lives in households with 1 to 3 members. This distribution suggests that most respondents are part of relatively larger families, which can influence economic decisions and labour contributions in activities such as seaweed farming. Understanding household dynamics is essential for developing targeted interventions that support family-based livelihoods in the community.

Table 2: Demographic Profile of the Surveyed Respondents (n=150)

Variable	Category	f	%
Age	18 to 25	15	10
	26 to 33	41	27
	34 to 41	86	57
	42 to 49	6	4
	≥50	2	2
Marital status	Single	17	11
	Married	103	69
	Widowed	9	6
	Divorced	21	14
Education	Informal	8	5
	Primary	95	64
	Secondary	38	25
	College	9	6
Household size	1 to 3	14	10
	4 to 6	98	65
	7 to 10	38	25

Source: Field data, 2024

Extent of Men’s Inclusion in Sea Weed Farming in the Study Area

The study findings indicated that out of the 150 men surveyed, only 33 (22%) were actively involved in seaweed farming within the study area. Additionally, the research examined the degree of men's participation across various stages of the seaweed value chain, which included farm preparation, planting, fertilization, harvesting, storage, and marketing. To assess their level of involvement, a five-point Likert scale was employed, ranging from "strongly agree" to "strongly disagree." This methodological approach facilitated a detailed and nuanced analysis of men’s roles and contributions across the different stages of the seaweed value chain.

Table 3 shows that only 36% of the 150 surveyed respondents participated in the initial stages of the seaweed value chain, such as farm preparation and planning. In contrast, over 70% of men participated in the post-planting stages; fertilization, harvesting, storage, and marketing. This indicates a clear shift in male involvement as the value chain progresses. The disparity in participation suggests an unequal distribution of gender roles, with men likely favouring more valued and profitable activities (Akinyemi et al., 2021). This finding emphasizes

the need for policies and programs that enhance participation across all stages of seaweed farming, helping to add value and improve conditions for everyone involved.

The findings of this study align with previous research on gendered participation in agricultural and aquaculture value chains. For instance, recent studies indicate that men are more likely to engage in the higher-value and less labour-intensive stages of production, such as marketing and post-harvest handling, while women tend to be more involved in the initial, labour-intensive stages (Khan et al., 2020; Fadillah et al., 2021). Additionally, recent research highlights how gender norms assign different economic roles to men and women, often leaving women with less access to financial benefits (Bui et al., 2020).

Furthermore, these findings are relevant to gender role theory, which posits that social and cultural norms shape the behaviours, roles, and responsibilities expected of men and women in society. According to gender role theory, gender roles are learned and reinforced through socialization, leading to the division of labour along gender lines in many economic activities, including agriculture and aquaculture.

Table 3: Extent of Men’s Inclusion in Sea Weed Farming in the Study Area (n=33)

Statements	Farm Preparation	Planting	Fertilization	Harvesting	Storage	Marketing
1 (Strongly agree)	5(15%)	7(21%)	29(88%)	23(70%)	26(79%)	28(85%)
2 (Agree)	5(15%)	6(18%)	2(6%)	7(21%)	4(12%)	2(6%)
3 (Neutral)	1(3%)	0	0	0	1(3%)	0
4 (Disagree)	6(18%)	5(15%)	1(3%)	1(3%)	1(3%)	2(6%)
5 (Strongly disagree)	16(48%)	15(45%)	1(3%)	2(6%)	1(3%)	1(3%)

Source: Field data, 2024

Men’s Perception of Seaweed Farming as a Livelihood Strategy

The study aimed to examine men’s perceptions of seaweed farming. These perceptions were measured using five statements presented on a Likert scale to respondents. The adopted statements included:

"Seaweed farming is a women-based economic activity," "Seaweed farming cannot meet household needs," "It is difficult to develop in seaweed farming," "Seaweed farming requires costly inputs," and "Seaweed farming is unpredictable."

Seaweed Farming is a Women-based Economic Activity

Table 4 indicates that over 70% of the 150 respondents view seaweed farming as a women's activity, while less than 30% disagree. These findings suggest a prevailing gender stereotype in the Zanzibar community regarding gender roles, with seaweed farming predominantly associated with women. This negative perception among men may hinder their participation in the seaweed value chain. Previous studies by Kalumanga (2018) and Msuya (2020) reported that men constitute only 20% of seaweed farmers in Zanzibar, likely due to this perception. These findings highlight the need for gender-sensitive education programs that promote attitude changes and foster equitable division of labour.

This study aligns with other studies for example Akinyemi et al. (2021), and Oduro et al. (2022) who highlighted the significant gender stereotypes surrounding seaweed farming, emphasizing its association with women. These studies found that cultural perceptions in coastal communities often limit men's involvement in aquaculture. The findings align with gender role theory, showing that over 70% of respondents in Zanzibar perceive seaweed farming as a women's activity, reflecting entrenched stereotypes that dictate specific roles for men and women. This perception influences men's self-image and limits their participation due to social pressure. Additionally, the study supports social constructionism, highlighting how societal narratives shape gender identities. The belief that seaweed farming is primarily for women hinders men's engagement, illustrating the impact of cultural context on participation in this sector.

Seaweed cannot Meet Household Needs.

Table 4 indicates that 74% of the 150 surveyed respondents perceive seaweed farming as inadequate for meeting household needs, while only 22% view it as a viable economic activity for their households. These findings suggest that men in Zanzibar may have limited awareness of the economic contributions of seaweed farming at both the household and national levels. Despite seaweed farming being a significant source of economic opportunity for coastal women and the third-largest foreign revenue generator in Zanzibar (FAO, 2016; URT, 2020), prevailing negative perceptions among men persist. This implies the prevalence of misconceptions and hence highlights the need for targeted awareness programs aimed at educating men about the economic potential of seaweed farming, which could facilitate attitude changes and promote their active participation in this sector.

Similarly, Kalumanga (2018) and Khan et al. (2020) reported that men constitute a minority of seaweed farmers in Zanzibar, often influenced by negative perceptions regarding the economic viability of this activity. This reinforces the notion that men may not fully recognize the substantial contributions of seaweed farming to household and national economies. The findings align with gender role theory, which posits that societal norms shape perceptions of appropriate roles for men and women, leading to men's limited participation in seaweed farming due to prevailing stereotypes. Additionally, the study reflects social constructionism, as it illustrates how cultural narratives shape men's beliefs about the economic viability of seaweed farming, thereby hindering their engagement in this sector.

Table 4: Men's Perception of Seaweed Farming as a Livelihood Strategy (n=150)

Respondent Group	Women-based Economic Activity	Cannot Meet Household Needs	Difficult to Develop on Seaweed	Costly Inputs	Unpredictable Farming
1 (Strongly agree)	79(53%)	71(47%)	75(50%)	65(43%)	78(52%)
2 (Agree)	28(19%)	41(27%)	39(26%)	47(31%)	20(13%)
3 (Neutral)	6(3%)	5(4%)	6(4%)	5(4%)	18 (12%)
4 (Disagree)	30(20%)	27(18%)	26(17%)	28(18%)	20(13%)
5 (Strongly disagree)	7(5%)	6(4%)	4(3)	5(4%)	14(10%)

Source: Field data, 2024

It is Difficult to Develop on Seaweed Farming

Table 4 reveals that over 76% of the surveyed men agreed with the statement that it is difficult to develop through seaweed farming, while only 20% disagreed. This finding suggests that the majority of men in Zanzibar perceive seaweed farming as a non-profitable activity, which limits its viability as a primary livelihood source. Such perceptions are likely to reduce men's engagement in seaweed farming, as individuals tend to participate in activities, they believe to be profitable.

Previous research, such as Msuya (2020), has demonstrated the economic significance of seaweed farming, which contributes 7.6% to Zanzibar's GDP and provides a critical source of income for coastal communities. The contrast between these positive economic contributions and men's negative perceptions underscores the importance of educational programs aimed at changing attitudes toward seaweed farming. Promoting accurate information about the profitability of seaweed farming could encourage greater male participation and contribute to the sustainability of this important sector.

These findings align with similar results in previous studies. For instance, (Juma et al., 2021) observed that in many coastal communities, men often view seaweed farming as less profitable compared to other economic activities, which limits their engagement. Likewise, Fröcklin et al. (2018) found

that men are typically more interested in activities that offer immediate financial rewards, while seaweed farming is seen as a low-return and labour-intensive enterprise. This study aligns with the social constructionism theory, which argues that people's perceptions of reality are shaped by social interactions, cultural norms, and shared beliefs. The perception that seaweed farming is unprofitable and not suitable for men is socially constructed through local cultural norms, peer influences, and historical gender roles in the community.

Seaweed Farming Requires Costly Inputs

Table 4 indicates that more than 70% of the 150 surveyed respondents perceived seaweed farming as an activity requiring costly inputs, compared to less than 25% who believed it did not. This suggests that the majority of men may perceive themselves as unable to afford the costs associated with seaweed farming, which could further limit their participation. This perception is likely compounded by other socioeconomic and cultural factors that intersect to restrict men's involvement in seaweed farming.

These findings highlight the need for development stakeholders to implement gender-sensitive empowerment programs aimed at addressing the financial barriers men face in seaweed farming. Such interventions could include the provision of affordable financial loans and investment in modern, cost-effective technologies to improve the

financial viability of seaweed farming for men. By making seaweed farming more accessible and financially feasible, these initiatives would encourage greater male participation, thereby promoting gender equity in the sector and contributing to its overall sustainability.

These findings align with previous studies on the economic challenges associated with the sector. Oduro et al. (2022) highlighted that financial constraints and limited access to affordable resources often hinder individuals, particularly men, from fully engaging in seaweed farming. Similarly, Khan et al. (2022) reported that men are less likely to participate in seaweed farming due to perceived economic barriers and the belief that the activity lacks profitability. The findings can be further elucidated through the lens of social constructionism theory, which posits that men's perceptions of seaweed farming are shaped by their interactions with prevailing cultural and economic norms. These socially constructed norms may lead men to regard seaweed farming as less viable or prestigious, thereby further constraining their participation in the activity.

Seaweed Farming is Unpredictable

Table 4 presents respondents' perceptions of the unpredictability of seaweed farming. The majority (52%) of the surveyed men agreed that seaweed farming is unpredictable. In contrast, 13% disagreed, 12% were neutral, 13% strongly disagreed, and 10% strongly agreed.

These findings suggest that a significant proportion of men perceive seaweed farming as an unpredictable activity. The unpredictability could

be linked to several factors, such as fluctuating environmental conditions, market volatility, and the seasonal nature of the industry. Such perceptions can discourage men from actively participating in seaweed farming, as individuals are generally more inclined to invest time and resources in activities they view as stable and reliable.

This perception aligns with findings from Juma et al. (2021) who noted that many individuals, particularly men, often view aquaculture and small-scale farming activities as risky or unstable due to their vulnerability to environmental changes and fluctuating economic returns. From the perspective of gender role theory, the perception that seaweed farming is unpredictable may stem from societal norms that assign men the responsibility of engaging in more stable, financially secure economic activities. This gendered division of labour is reinforced by cultural expectations and economic structures, making men more likely to seek involvement in other sectors that offer more consistent returns.

Logistic Regression Output: Influence of Men's Perception on their Engagement in Seaweed Farming

The binary logistic regression model assessed how men's perceptions influenced their level of participation in seaweed farming within the study area. The model yielded a *log-likelihood of Pseudo R-squared 0.6142*, *Log-Likelihood -62.315*, *LR chi2(4) 48.232*, and *Prob (chi2) was 0.000*. These statistics indicate a good model fit, suggesting that the selected variables effectively capture the men's perceptions affecting men's engagement in seaweed farming as described in the following subsections;

Table 5: Logistic Regress Output: Influence of Men's Perception on their Engagement in Seaweed Farming

Variables	coef	std err	z	P> z	95% C	95% CI
Constant	-1.455	0.6	-2.425	0.000	-2.63	-0.281
Age	1.182	0.234	2.341	0.000	1.221	0.243
Women-based Economic Activity	-0.358	0.214	-2.419	0.016	-0.938	-0.096
Cannot Meet Household Needs	-0.780	0.175	-0.043	0.041	-0.701	-0.015
Difficult to Develop on Seaweed	-0.780	0.235	3.319	0.001	0.319	1.241
Costly Inputs	-1.181	0.247	2.432	0.000	1.331	1.349
Unpredictable activity	-0.234	0.334	3.254	0.0314	0.234	1.451

Pseudo R-squared: 0.6142, Log-Likelihood: -62.315, LR chi2(4): 48.232, Prob (chi2): 0.000

Age (coef =1.182, p =0.000)

The logistic regression analysis reveals that age is a significant factor influencing men's participation in seaweed farming in Zanzibar. The coefficient (β) for this perception is -1.182, with a p-value of 0.000, indicating statistical significance. Specifically, for each additional year of age, the odds of engaging in seaweed farming increase by approximately 3.25 times. This indicates that older men are more likely to participate in seaweed farming compared to their younger counterparts.

Several reasons may account for this trend. Older men are generally more likely to have access to the financial capital necessary to sustain seaweed farming activities. Additionally, they may engage in diverse livelihood strategies to fulfil their roles as heads of families, which aligns with Zanzibar's prevailing gender norms that designate men as primary providers. As such, older men may see seaweed farming not only as a viable income-generating activity but also as a means to uphold their familial responsibilities.

This study is similar to other previous studies for example, Khamis and Khamis (2017), found that older individuals were more engaged in resource utilization due to their accumulated experience and access to capital. The findings are consistent with Social Constructionism, which emphasizes that individual behaviours and roles are shaped by cultural and societal contexts. The perceptions surrounding age, financial capital, and familial duties illustrate how social constructs influence

men's decisions to engage in seaweed farming. These constructs reinforce the idea that older men are more suited to undertake such activities due to their established positions within the family and community.

Women-based Economic Activity (coef =-0.358, p =0.016)

The logistic regression analysis indicates a negative relationship between the perception of seaweed farming as a women-based economic activity and men's participation in this sector. The coefficient (β) for this perception is -0.358, with a p-value of 0.016, indicating statistical significance. Specifically, men who perceive women's economic activities as prominent within their community are significantly less likely to engage in seaweed farming. The analysis reveals that the odds of participation decrease by approximately 28% for each unit increase in this perception.

These findings suggest that prevailing gender stereotypes in Zanzibar pose a considerable barrier to men's engagement in seaweed farming. Such stereotypes reinforce the notion that seaweed farming is primarily a domain for women, discouraging men from participating. This underscores the urgent need for gender awareness programs aimed at changing attitudes and fostering a more inclusive environment that encourages men's involvement in seaweed farming. These findings are similar to other previous studies for instance, Mbunda and Ndunguru (2024) highlighted the masculinity complex as one of the barriers faced

by men in engaging with various economic activities traditionally associated with women, emphasizing the need for gender-sensitive approaches in promoting livelihood sustainability. Petersen and Okuku (2020) discussed the impact of gender stereotypes on men's participation in sectors typically dominated by women, indicating a similar trend as observed in Zanzibar.

Moreover, the study aligns with Gender Role Theory, which posits that societal norms and expectations dictate specific roles for men and women. In the context of Zanzibar, the perception that seaweed farming is a women's activity serves to reinforce traditional gender roles, effectively limiting men's involvement in this economic sector. The negative impact of this perception highlights the need for initiatives that challenge these established roles, thereby promoting more equitable participation across genders.

Seaweed Farming Cannot Meet Household Needs (coef = -0.780, p = 0.041)

The logistic regression analysis indicates that the perception that seaweed farming cannot meet household needs is a highly significant factor influencing men's participation in seaweed farming in Zanzibar. The coefficient (β) for this perception is -0.780, with a p-value of 0.041, indicating statistical significance. Men who believe that seaweed farming is insufficient to meet their household needs are significantly less likely to engage in this economic activity.

As men perceive that seaweed farming fails to adequately support their households, their participation in this sector diminishes. Consequently, men in Zanzibar who harbour such perceptions are more inclined to abandon seaweed farming in favour of other economic activities perceived to hold greater value and financial return. This highlights a critical barrier to engagement in seaweed farming, as economic viability is paramount for sustaining participation in any livelihood activity.

These findings align with other previous studies. For instance; Mbunda (2024) explored how perceptions of economic viability impact participation in coffee farming, emphasizing the importance of perceived financial outcomes. Additionally, Glinski et al. (2018) discussed the socioeconomic challenges faced by men in seaweed farming, particularly how perceptions of income adequacy affect their participation levels. These findings are consistent with Gender Role Theory, which suggests that societal expectations shape the behaviours and decisions of individuals based on their gender. In the context of Zanzibar, men may feel compelled to prioritize economic activities perceived as more lucrative, reflecting traditional gender roles that designate them as primary providers. This reinforces the notion that economic success is crucial for men, leading them to abandon seaweed farming when it is perceived as insufficient to meet household needs.

The findings also align with Social Constructionism, which posits that perceptions and societal norms shape individual choices and behaviours. The belief that seaweed farming cannot fulfil household economic demands is a social construct influenced by cultural values regarding work and income.

Difficult to Develop on Seaweed (coef = -0.780, p = 0.001)

The logistic regression analysis reveals that the perception that it is difficult to develop in seaweed farming is a highly significant factor influencing men's participation in this economic activity in Zanzibar. The coefficient for this perception is -0.780, accompanied by a p-value of 0.001, indicating strong statistical significance. The negative coefficient of -0.780 suggests that as men's perceptions of the difficulties associated with developing in seaweed farming increase, their likelihood of participating in this sector decreases. Specifically, for each unit increase in the perception of difficulty, the odds of engaging in seaweed farming drop significantly.

These findings relate to that of Khamis, and Khamis (2017), who discussed various barriers to entry in seaweed farming, emphasizing how perceived challenges can limit participation among men and Petersen, & Okuku (2020), who explored the influence of perceived difficulties on men's participation in sectors typically dominated by women, finding similar trends in barriers to engagement. These findings are closely aligned with Gender Role Theory, which posits that societal norms and expectations shape individual behaviours based on gender. In Zanzibar, the perception that seaweed farming is difficult may reinforce traditional gender roles that discourage men from engaging in sectors perceived as challenging or less profitable. This can lead to a preference for alternative economic activities that are viewed as more manageable or aligned with societal expectations.

Seaweed is Requiring Costly Inputs (coef = -0.181, p= 0.000)

The coefficient of -0.181 indicates a negative relationship between the perception that seaweed farming necessitates costly inputs and men's likelihood of participating in this economic activity. The p-value of 0.000 further emphasizes the statistical significance of this finding, suggesting that this perception is a crucial determinant in shaping men's decisions to engage in seaweed farming. The negative coefficient suggests that as men perceive seaweed farming to require higher initial investments or costly inputs, their likelihood of participating in this activity decreases.

The findings of this study concur with other previous studies. For example, Onyango et al. (2024), discussed the impact of perceived costs on participation in seaweed farming, noting that financial barriers significantly deter men from engaging in this sector, and Othman & Lajis (2022), highlighted the socioeconomic challenges faced by participants in seaweed farming, particularly focusing on how perceptions of costs can influence participation decisions. Furthermore, the findings

resonate with Social Constructionism, which emphasizes that individual choices and behaviours are shaped by societal perceptions and norms. The belief that seaweed farming entails high costs reflects broader social constructs surrounding economic viability and risk.

CONCLUSION

This study concludes that there are deep-rooted gender stereotypes and economic misconceptions that significantly hinder men's participation in seaweed farming in Zanzibar. A prevailing belief among men is that seaweed farming is a women-based activity, which discourages their involvement. This perception, coupled with concerns about the inadequacy of seaweed farming to meet household needs, the perceived challenges in developing the activity, the belief that it requires costly inputs, and the notion of unpredictability, collectively create substantial barriers for men considering engagement in this sector. Addressing these misconceptions is essential for fostering a more inclusive and equitable environment in the seaweed farming industry.

Recommendations

This study recommends implementing gender-sensitive educational programs to raise awareness of seaweed farming's economic potential and to challenge existing stereotypes. Workshops should provide factual data on profitability and contributions, featuring success stories of male farmers to inspire participation. Establishing affordable loan programs and subsidies for men entering the sector, potentially through partnerships with microfinance institutions, is also essential. Additionally, training sessions on best practices and modern techniques should empower men with the necessary skills, while promoting community discussions on gender roles to advocate for equitable labour distribution, engaging local leaders in these initiatives. Finally, ongoing research should monitor changes in perceptions and participation

rates to evaluate the effectiveness of these interventions.

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