



ASSESSMENT OF OVERFISHING IMPACTS ON COMMUNITY LIVELIHOODS: A CASE OF KUNDUCHI, DAR ES SALAAM REGION, TANZANIA

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Abstract

This research aims at addressing the question of how the availability of fish is affecting the livelihoods of the fishing households in Kunduchi in Dar es Salaam. This paper set forth to analyse the patterns of the catch per unit effort (CPUE), evaluate some of the most important indicators of the livelihood, such as income, food security, and employment, and outline the adaptability of households to living with fewer fishes. Mixed-methods research design was applied, and the both qualitative and quantitative data was gathered with the help of interviews, questionnaires, and document review. The information was presented in the form of tables and subjected descriptive statistics to extract meaningful insights of the survey responses. Findings suggested that CPUE has declined considerably over the previous years implying that there is more pressure on marine stocks and this shows that there may be a problem of overfishing. Most of the households were found to experience net earnings, food insecurity as well as lack of alternative livelihoods, hence the necessity to administer and manage fisheries sustainably, divert the economy, and provide supporting institutions.

Keywords: Catch Per Unit Effort, CPUE, Community Livelihoods, Food Security, Income Dynamic

INTRODUCTION

Millions of the world coastal communities, especially in developing countries, rely on fisheries as the lifeline to income / employment and food security. Small-scale fishing is an important sector of the rural economy and national economy of Tanzania, and not only small-scale fishing, but also the fisheries industry provides a large part of national fish output (FAO, 2020). Kunduchi in Dar es Salaam and other coastal regions have high dependence on marine life to supply the daily food basket and other socio-economic needs.

However, the world fish populations have gone further to deplete as a result of the overfishing, pollution, climate change, and poor regulation of fisheries (FAO, 2024; OECD, 2025). The share of biologically viable fish stocks declined to 62.3 per cent in 2021 which is indication of pressure on the ocean ecosystems (FAO, 2024). Catch Per Unit Effort (CPUE) which is an aspect that measures the health of the stock and fishing effectiveness has been experiencing constant downs especially in areas that are overfished (Pauly et al., 2020). With CPUE trailing down, fishers can make reduced harvests of scrap losses, incurring escalated costs of operation, and diminished economic returns (OECD, 2025).

Economic losses are just the after-effects of decreased fish catches. The problem of fishing families is also associated with loss of food security, lack of job stability, and insufficient access to alternative sources of livelihoods (Bene et al., 2016). Fishers in most instances, respond to this phenomenon through coping mechanisms that include cutting down expenditures in the household, informal trading, or even seasonal migration to search jobs. However, these measures are not enough to overcome sustainability without organized forms of support.

The proposed study aims to analyse the trend in CPUE as well as measure the important livelihood indicators e.g. income, food security and employment; and record how the fishing households at Kunduchi have adapted to the reduced access of fish. In Tanzania, the results seek to provide input into policy debates on sustainable management of coastal resources and poverty reduction in the country.

METHODOLOGY

A mixed-methods research design was adopted, combining both qualitative and quantitative data gathered through questionnaires, semi-structured interviews, documentary reviews, and direct observations for 80 participants intended for this research. Data analysis involved the use of frequency distributions, percentages, and summary tables, with results

interpreted through descriptive and inferential statistical techniques to derive meaningful insights from participant responses. The analysis highlighted a significant decline in Catch Per Unit Effort (CPUE) over recent years, pointing to increased pressure on marine resources and underscoring the issue of overfishing in the study area. The Statistical Package for the Social Sciences (SPSS) version 29.0 was employed for data processing and analysis. Figure 1 illustrates the overall study workflow.

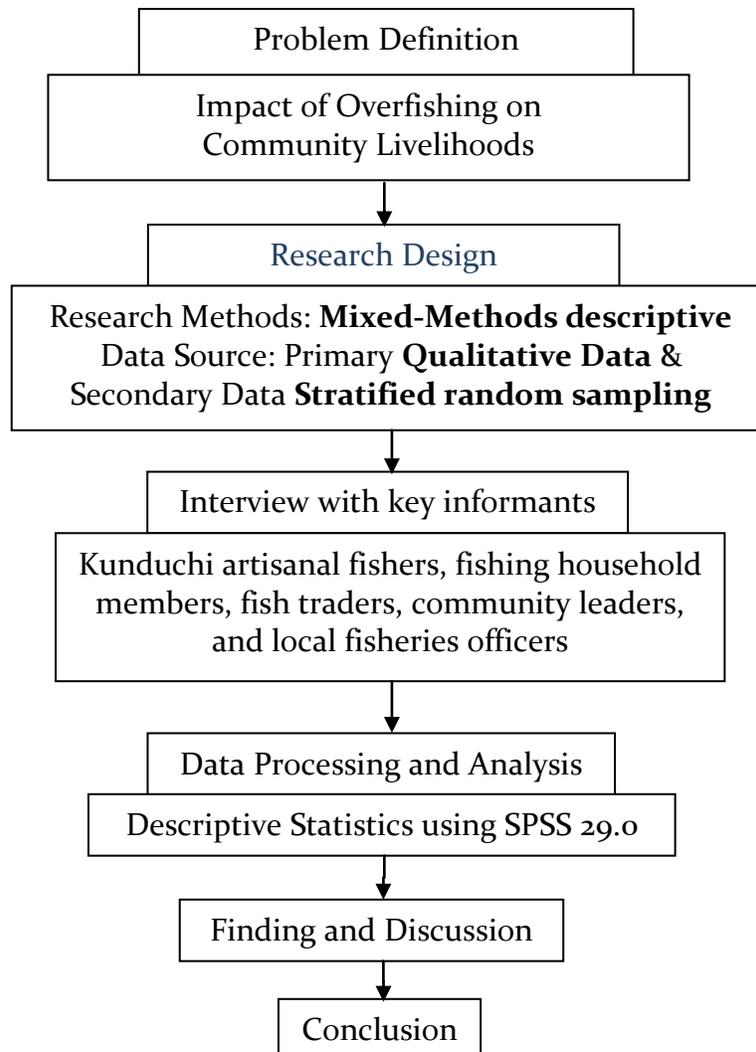


Figure 1: Overall Research Study Workflow

Sampling Techniques

This research employed a purposive and simple random sampling to ensure the findings reflect the reality. The sample allows the findings to reflect the diverse people involved in the project, for instance, artisanal fishers, who rely on daily fishing for their

primary source of income and food, fishing household members, fish traders and processors, community leaders, and local fisheries officers, who are knowledgeable about fisheries management and trends in fish availability. Both probability and non-probability sampling methods were used to collect points of view from a diverse community (Etikan et al 2016).

Sample Size Estimation

Sampling is done based on the population of Kunduchi and ensuring a representative sample. Through Yamane's formula, a 95% confidence interval and simple random sampling, artisanal fishers, fishing household members, fish traders, community leaders, and local fisheries officers in Kunduchi, Dar es Salaam. The mix of methods provides both trustworthy numbers and detailed insights from interviews.

Yamane's Formula (1967)

$$n = \frac{N}{1 + N(e)^2}$$

Where:

- n is the number of individuals or things included in the sample
- N = number of people in the population
- e is the desired precision (often set to 0.05 to achieve 95% confidence)

With this formula, the number of people in the sample can be chosen for the study. For a total population (N) of 100 and a 95% confidence level (precision level e = 0.05), use the Yamane's formula to determine the sample size.

$$\begin{aligned} n &= \frac{100}{1 + 100(0.05)^2} \\ n &= \frac{100}{1 + 100(0.0025)} \\ n &= \frac{100}{1 + 0.25} \\ n &= \frac{100}{1.25} = 80 \\ n &= 80 \end{aligned}$$

Sample Distribution

A way to distribute the sample of 80 participants among the main groups in the Kunduchi fishing community that follows what is common in most coastal fisheries.

Table 1: Sample Distribution

Group	%	Calculation	Approx. Sample Size
Artisanal Fishers	40%	$0.40 \times 80 = 32$	32 respondents
Fish traders	15%	$0.15 \times 80 = 12$	12 respondents
Fishing household members	20%	$0.20 \times 80 = 16$	16 respondents
Community leaders	10%	$0.10 \times 80 = 8$	8 respondents
Local fisheries officers	15%	$0.15 \times 80 = 12$	12 respondents
Total			80 respondents

This breakdown ensures balanced representation from each stakeholder group in the fishing community in Kunduchi Dar es Salaam region. Table 1 indicates the number of respondents based on their experience of fishing in Kunduchi. The table shows a wide range of experience in participants, which is vital as it will help in understanding the diversity of views to the trends of fish catch, effect on livelihood, and adaptations that are taken by the community.

Participants' general information

The presence of the demographic gives quantitative information on the nature and character of the fishing households as well as the stakeholders who use the fisheries resources in Kunduchi, Dar es Salaam during the study. These factors of demography are important to gain an insight into the various experiences and perceptions of complex problems which local fisheries are facing. The information can also assist in determining possible gaps in knowledge as well as in the preparation of findings and advice that are highly related to the socio economic and environmental environment of the fishing community of Kunduchi.

Table 2: Gender Distribution of Respondents

Gender	Frequency	Percentage (%)
Male	60	75
Female	20	25
Total	80	100

Table 2 presents the percentage of males and females. That is, for example, when 60 of 80 respondents are male, this means that 75 percent are male and 25 percent are female.

Table 3: Age Group Distribution of Respondents

Age Group (Years)	Frequency	Percentage (%)
18 - 30	25	31.25
31 - 45	40	50
46+	15	18.75
Total	80	100

Source: Author, 2025

Mean age of participants was 38 years and majority were within the age bracket of 31-45 years (50 per cent).

Table 4: Occupation of Respondents

Occupation	Frequency	Percentage (%)
Fishers	70	87.5
Fish Traders	5	6.25
Other Occupations	5	6.25
Total	80	100

85% identified primarily as fishers, 10% as fish traders, and 5% engaged in other activities such as boat maintenance.

Table 5: Years of Fishing Experience

Statistic	Value
Mean	12 years
Minimum	1 year
Maximum	35 years

Respondents had an average of 12 years of fishing experience, ranging from 1 to 35 years.

Table 6: Household Size

Statistic	Value
Mean	6 members
Minimum	2 members
Maximum	12 members

On average, the size of the household was 6 members, where the maximum size was 12 people in the household.

Table 7: Duration of Involvement in Fishing Activities in Kunduchi

Duration (Years)	Frequency	Percentage (%)
1 - 5	20	25
6 - 10	25	31.25
11+	35	43.75
Total	80	100

Over 50 per cent of respondents are involved in fishing activities within Kunduchi for the past 1-10 years while over 40 per cent had been involved in fishing within Kunduchi for more than 10 years showing the existence of a well-established local fishing community.

FINDINGS AND DISCUSSIONS

The structured questionnaires and the in-depth interviews with the key 80 respondents were used to collect the primary data, whereas the review of the relevant documents, reports, and existing literature helped to collect secondary data. These sources were combined to serve as a strong source of analysing the research aims and coming up with ideas about the livelihoods and adaptive behaviour of fishing communities in Kunduchi, Dar es Salaam.

Overview on trends in catch per unit effort (CPUE)

A common formula to measure the abundance in the stock of a fishery, the efficiency at catching the stock, and the sustainability of the fishery is Catch Per Unit Effort (CPUE). It signifies the amount of catch received per effort unit- be it per hour, per fishing trip or per type of

gear (Tzanatos et al., 2016). Landing trends help fishers get informed of the fish stock levels, possible risks of overfishing, and socio-economic consequences of overexploitation (Andrade et al., 2021). A steadily falling CPUE can be an indicator of the worsened condition of fish resources and the rise of exploitation, which will involve lower catches, loss of revenue, and growth in economic insecurity among the small-scale fishers (Teh et al., 2017).

Table 8: Catch per unit effort (CPUE) trends

Response	Frequency	Percentage (%)
Reduced sharply	67	84
Reduced marginally	8	10
No change	5	6

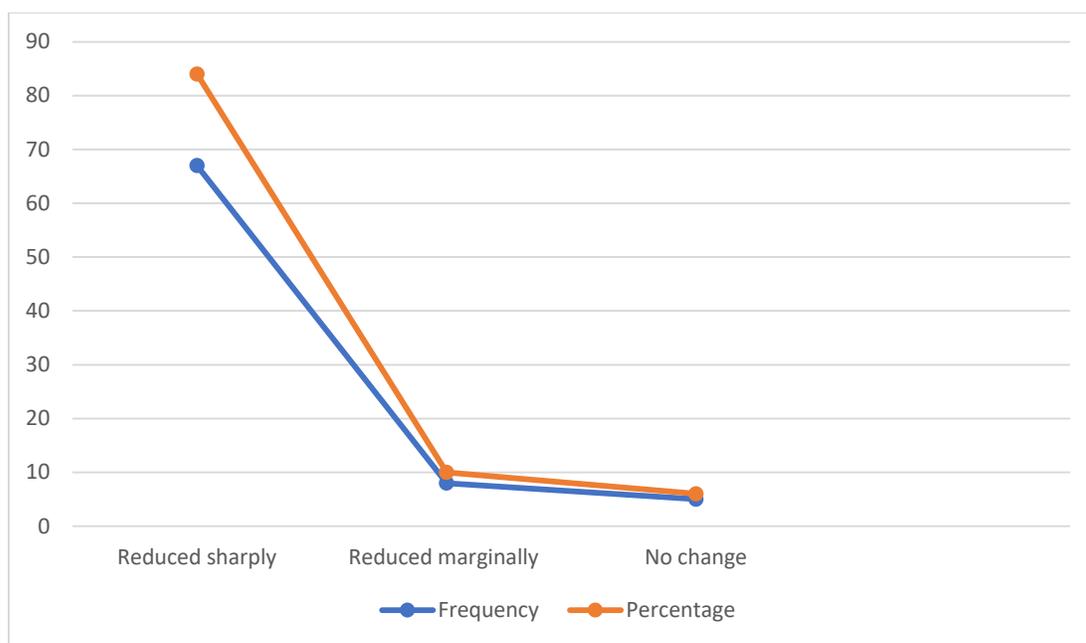


Figure 2: Responses from respondents regarding the catch per unit effort (CPUE) trends

Figure 2 provides some indications that 84 percent of the respondents (67 out of 80) had detected a notable drop in catch per trip 10 percent detected a marginally decrease and 6 percent detected no changes. This was usually severe and during some seasons. Fishers reported that they must work more by spending more time or move further offshore to catch the same share of fish that they once caught in the shallow ocean. This is an indication of a big decline in CPUE over the years.

Fishing gear and boat types currently in use

Most of respondents continue to use traditional wooden boats and simple nets, although some raised about the introduction of motor boats in the recent years. Nevertheless, gear quality has not managed to match up with the stock depreciation of the fish. The only section that reported using more advanced gear was a small percentage comprising mostly of individuals with improved access to finances. There was desperation at play in some of the gear change (e.g. smaller mesh sizes).

Table 9: Fishing gear and boat types currently in use

Gear and boat type	Frequency	Percentage (%)
Traditional gear only	62	78
Motorized boats/updated gear	18	22

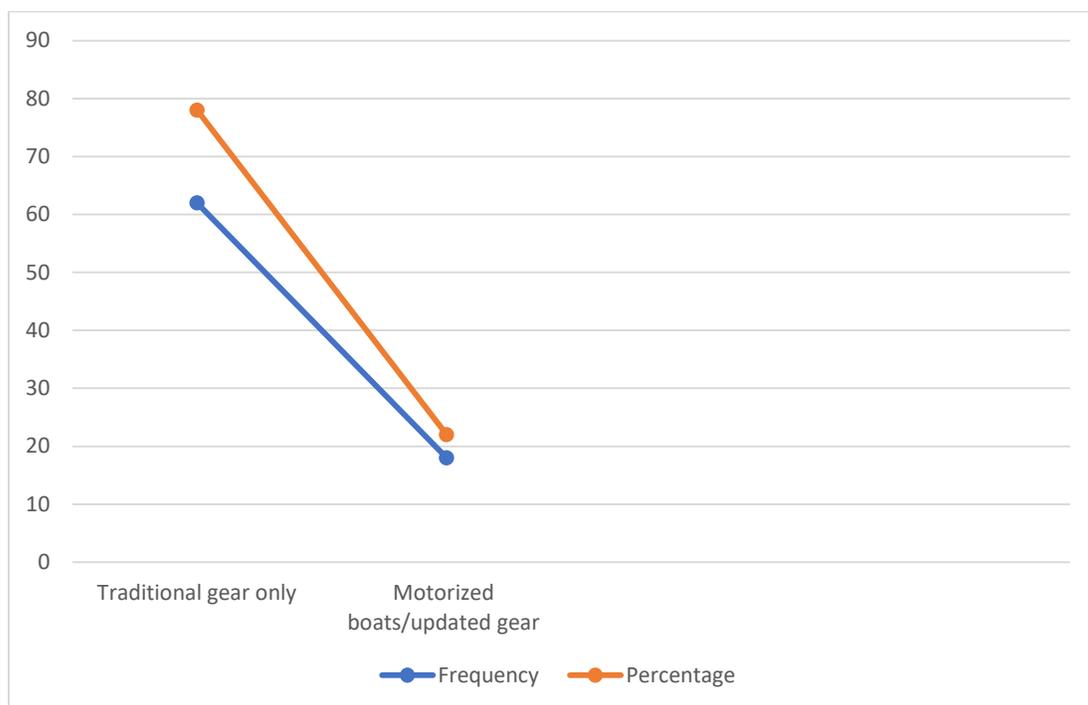


Figure 3: Responses regarding the fishing gear and boat types currently in use

As shown in figure 3, 78 percent of the respondents still use wooden-made boats and simple fishing nets and 22 percent of them responded that they recently have upgraded to motorized boats. With this notwithstanding, the general nature of fishing equipment has not been enhanced as the fish population dwindles. Few participants used more advanced equipment as compared to those participants with improved financial strength. Small gear

adjustments, including the use of smaller mesh, in other instances were merely forced by circumstances and was not actually a sustainable fishing precaution.

The main reasons for changes in fish catch levels

The most popular were the following reasons: overexploitation of fish resources (more fishing), fishing with illegal or harmful techniques (e.g., dynamite fishing), and coastal fishing (destroying the coast), and on climatic changes. Respondents complained about poor implementation of fishing regulations and that local government or the government was not doing their part to conserve marine resource.

Table 10: The main reasons for changes in fish catch levels (multiple mentions were allowed)

Perceived Reason	Frequency	Percentage
Overfishing	58	73
Environmental/climate change	41	51
Destructive/illegal fishing methods	30	38
Pollution (hotels, sewage, plastics)	24	30
Increased number of fishers	33	41

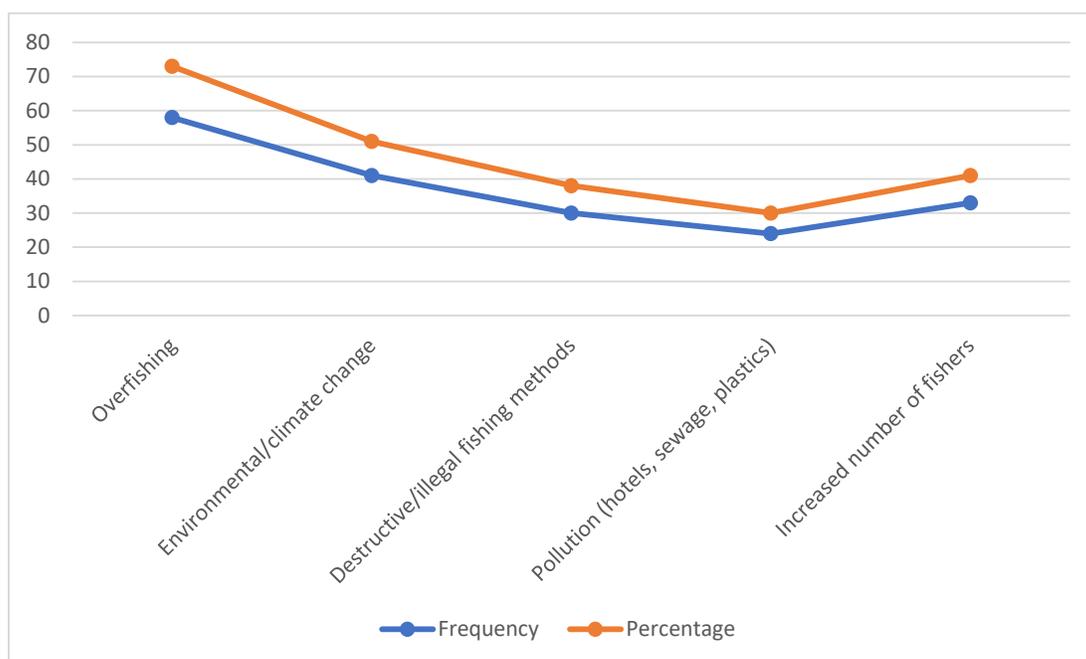


Figure 4: Responses from respondents regarding the main reasons for changes in fish catch levels (multiple mentions were allowed)

The results reported in figure above which allowed the possibility of multiple mentions, demonstrates that the falling level of the fish catches in Kunduchi was realized to be a result of both man-made and environmental factors as perceived by the respondents. Overfishing was cited most with 73 percent of those interviewed citing it as the most common reason with the participants expressing their general concern over degrading marine resources through overfishing.

The biggest concern was environmental and climate change and this was answered by 51 percent of the respondents who cited unpredictable weather and changing of tides and the rise in sea temperatures as some of the factors. Other destructive and illegal fishing activities that use dynamite, small mesh nets were reported by 38 percent participants showing the adverse effect as pure fishing with inefficient methods on the fish stocks. Also, 41 percent of the respondents reported rising population of fishers as another factor contributing to the competition and pressure on resources, whereas 30 percent observed how hotels, sewages, and plastic pollution worsen the marine environment. Taken together, these answers beg the question of why sustainable fisheries management and better protection of fishing limits are not put into place and extended to address the environment.

Measurement of key livelihood indicators among fishing households

The main sources of income in the household

According to the finding, the major livelihood activity among all the participants is fishing. But they had other sources of income like petty trading, or selling food, seaweed cultivation, or casual jobs as reported by more than half of them. This indicates that there was a diversification strategy to deal with the falling fishing income but all of them indicated that these alternative sources were not as reliable or profitable as the income of fishing.

Table 11: The main sources of income in the household (multiple responses were allowed)

Source of income	Frequency	Percentage (%)
Fishing	80	100
Small business (e.g., vending)	26	33
Seaweed farming	9	11
Tourism activities	8	10
Remittances	12	15

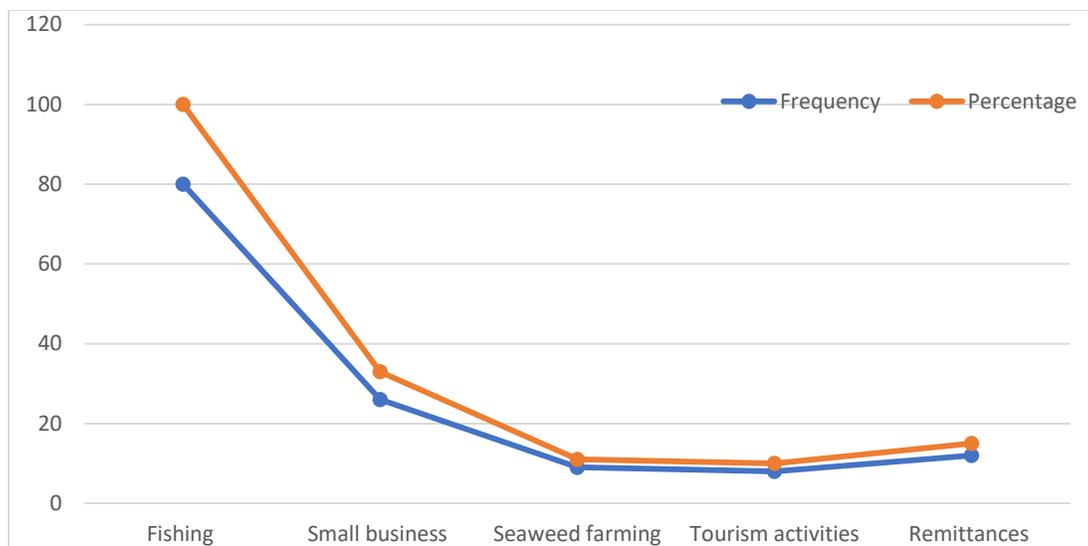


Figure 5: Main sources of income in the household (multiple responses were allowed)

The data from figure 5 illustrates that of all the respondents, fishing is the main source of income where all people 100 percent (80 out of 80) identified it to be their main source of livelihood. This highlights on the high reliance by the community on marine resources as source of livelihood and daily breeze. This is the extent of dependence on one economically vulnerable industry that indicates how much the community is at risk of losing resources such as a drop in fish supply, changes in seasons and environmental-related changes.

Regarding diversification, small businesses by households were mentioned by the 33 percent of the households (26 respondents), and these included food vending, selling of charcoal, or operating kiosks. They are good supplementary sources of income and help when fishing especially at a time when it is not productive. Nevertheless, the comparatively low percentage indicates that not every household can afford diversification due to the lack of either capacity or money.

The use of alternative marine-based livelihoods was also very low with the use of seaweed farming only mention by 11% of respondents (9 households). This is an environmentally neutral sustainable practice which is not used to the full scale and might need some sort of encouragement and stimulation.

The number of participating in the tourism industry-related activities, e.g. boat rides or guiding services, was reported only by 8 participants (10%). The given field of activity has a growth potential since Kunduchi is a coastal place; however, the involvement in this activity is relatively weak now resulting, probably, in the inability to receive training, marketing, or even the infrastructure.

Medium flows, such as remittances, the money sent by the family members living in another place, were mentioned by 15 percent of the respondents. This implies that a section of the families enjoys exogenous income which could cushion them against the effects of income instability experienced in fishing activities. Nevertheless, it equally reveals out-migration which in many occasions is encouraged by local economic downturns.

Status of the household income over the recent years

Most participants reported a decline in income, directly linked to reduced fish catch and increasing competition. A few stated that their income had remained stable only due to supplemental activities, not because of fishing stability. Very few experienced income growths, and those who did often had diversified sources or received remittances.

Table 12: Status of the household income over the recent years

Income Trend	Frequency	Percentage (%)
Decreased	61	76
Remained the same	11	14
Increased	8	10

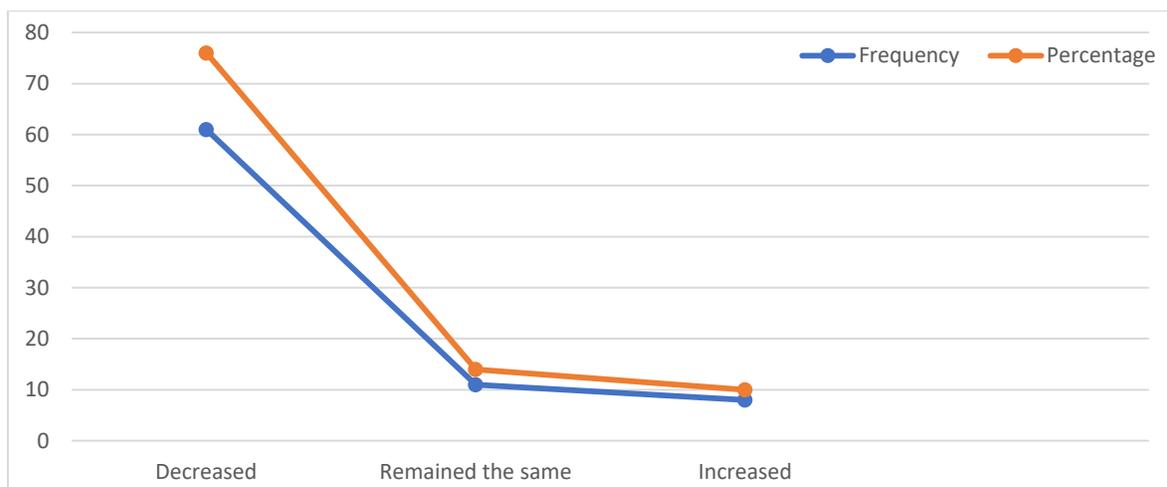


Figure 6: Illustrates the status of the household income over the recent years

As can be seen in figure 6 above, it is evident that the household income of most of the respondents has decreased. Namely, 76 percent (61 out of 80) noted that their revenue is lower per year compared to the previous ones. This sharp decline can be attributed to the enhanced economic pressure on fishing households; a likely factor expected to be caused by decreased

fish, competition, and the cost of operationalizing equipment and fuel. Several respondents have associated this downturn directly to diminishing availability of fish, erratic market prices as well as absence of alternative modes of income generation.

14 percent (11 respondents) stated that their household income has not changed. This category can include the households who have managed to keep their income on the same level, probably shifting the income stream or decreasing the expenses, but did not feel any financial gain.

One in ten (8 respondents) stated that his/her income has grown with time. Such households are probably enjoying additional sources of income like little business, remittances, or those that surround tourism. Their experiences also indicate the possible gains of income diversification and external support but presently, the cases are still few.

Availability of enough family food throughout the year

Many respondents even admitted that there were times of seasonal food saturation, when they run out of food, particularly because of low catch or during bad weather. There were minimal households that argued of undeviating food security throughout the year. This points at the close connection between food availability and fishing outcome.

Table 13: Availability of enough family food throughout the year

Food Security Status	Frequency	Percentage (%)
Often have shortages	49	61
Sometimes have enough	25	31
Always have enough	6	8

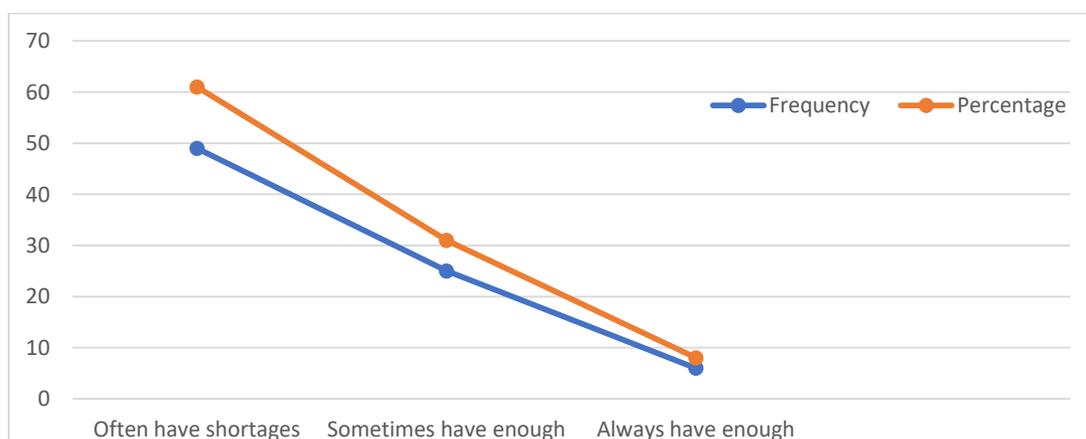


Figure 7: Shows the availability of enough family food throughout the year

Figure 7 data indicates that a considerable number of Kunduchi households consider continuous food insecurity. 49 of 80 respondents (61 percent) replied that they frequently experience shortage of foods. This suggests that most fishing families cannot continually access their minimum food requirements, probably as a result of uncertain or low income in fishing activities and unfavourable lack of sustenance of alternative sources of livelihoods. This degree of food insecurity outlines how unprotected these communities are and how specific solutions should be undertaken.

Others said that they occasionally possess adequate food (31%, 25 respondents), which denotes a kind of disjointed access, which depends on fishing seasons, weather, and availability on the market. Such households may not be food insecure chronically but are always very vulnerable to exogenous shocks like low fishing levels or inflation in food prices.

The percentage of the respondents whose household is always satisfied with food suffers only 8 percent (6 households). Such cases are probably associated with the subset of households with diversified income, a higher level of financial planning, or that have access to some support mechanisms (remittances or community savings groups). Yet, they are a minority in the society.

Change of availability or affordability due to fishing income/catch levels

Many participants reported reduced ability to buy diverse or nutritious food due to unstable or declining income from fishing. Some had shifted to cheaper food items or reduced meal frequency. The affordability of food was strongly tied to daily fish catch performance.

Table 14: Change of availability or affordability due to fishing income/catch levels

Food impact	Frequency	Percentage (%)
Worse	53	66
No change	21	26
Improved	6	8

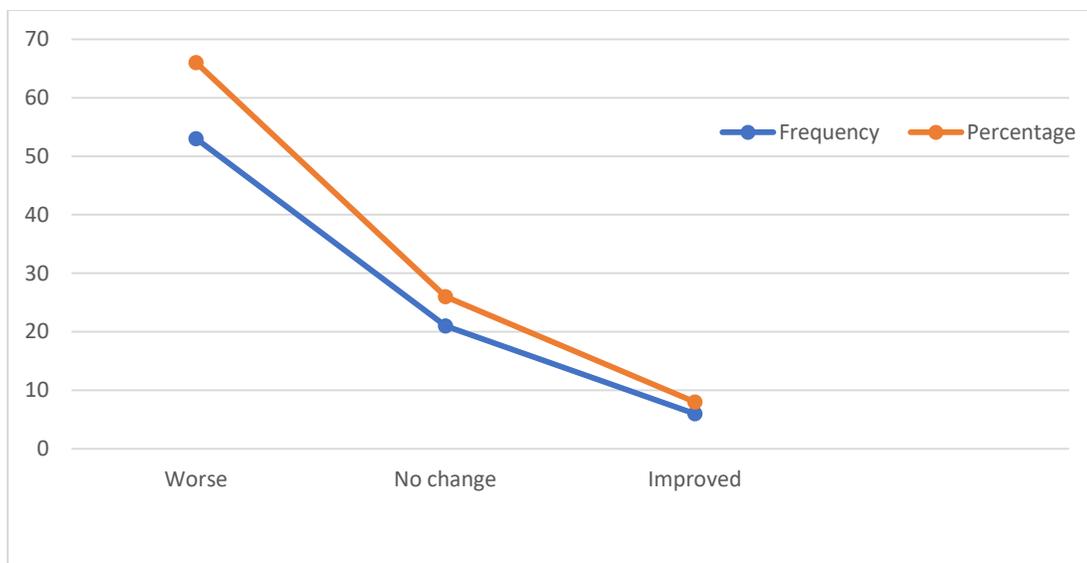


Figure 8: Change of availability or affordability due to fishing income/catch levels

The statistics from figure 8 shows that a reduction in fishing earning has affected the food security of households in Kunduchi in a significant negative manner. Most of them (66 percent respondents (53 respondents out of 80)) answered that their food situation has deteriorated over the past few years. This also comprises the diminished capacity to afford meals consisting of basic foods, the diminished diversity of the diet, and skipping meals. The degraded food situation has been blamed more on the fact that there are decreased fish catches and unstable earnings and households are restricted by the power to purchase foods and have food.

On the contrary, 26 percent of the respondents (21 households) have no significant change in the food situation. Such households might have come up with coping strategies or retained a comparatively steady course of income but they are prone to go under in case the situation in fishing further worsens.

Just 8% (6 respondents) replied that they were better off in food situation most probably because of the diversification of their income and remittances or engagement in other forms of alternative livelihood such as small ventures or tourism. Such households are a small yet significant group that portrays the possible advantages of less reliance on fishing activities.

Engagement of household member in other income-generating activities

Nearly a half (38) affirmed that other members of their house were involved in side ventures dealing with fish selling, vegetables or charcoal selling and some boda-boda

(motorcycle taxi) work. This demonstrates a move to lively hood diversification as a means of survival.

Table 15: Engagement of household member in other income-generating activities

Response	Frequency	Percentage (%)
Yes	38	48
No	42	52

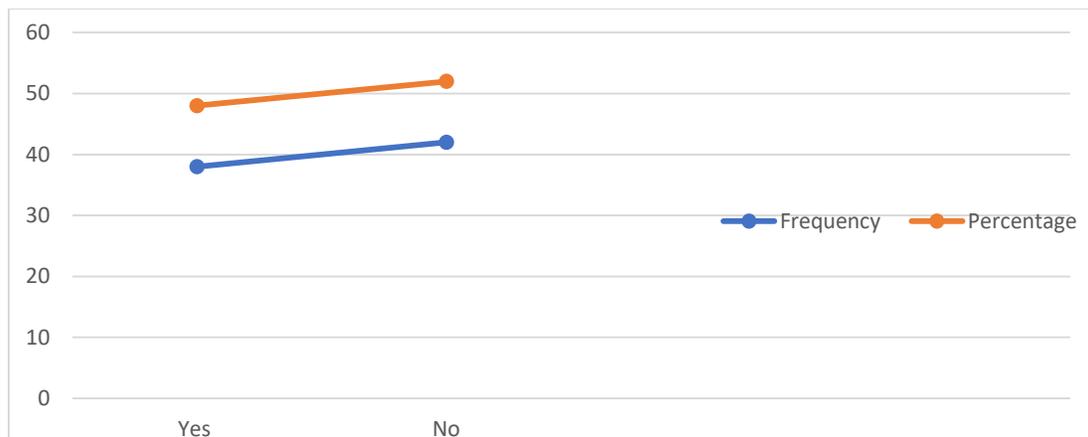


Figure 9: illustrates the engagement of household member in other income-generating activities

The data indicates that 48 percent (38 of the 80) respondents had at least one household member, reporting income generation activity other than fishing, i.e., owning a small business or working on a casual basis. What this implies is that there is an increasing tendency of livelihood diversification to survey in coping with the untabling fish stocks and income security.

But 52% of the respondents (42 households) responded that they could not get any other sources of income implying that most people may still be relying on fishing. This has made them more susceptible to economic and environmental changes, and expanding access to other livelihoods requires assistance.

How households adjust in response to declining fish availability

Changes have made in household due to reduced fish catches

Adaptation strategies included cutting household expenses (42), starting small businesses (21), or shifting to seasonal work like construction (15). Some participants admitted

reducing investments in gear or taking loans to stay afloat. A few mentioned, children dropping out of school due to affordability issues.

Table 16: Changes have made in household due to reduced fish catches
(multiple responses allowed)

Adaptation Strategy	Frequency	Percentage (%)
Reduced household expenses	42	53
Started small business	21	26
Seasonal/migrant work	15	19

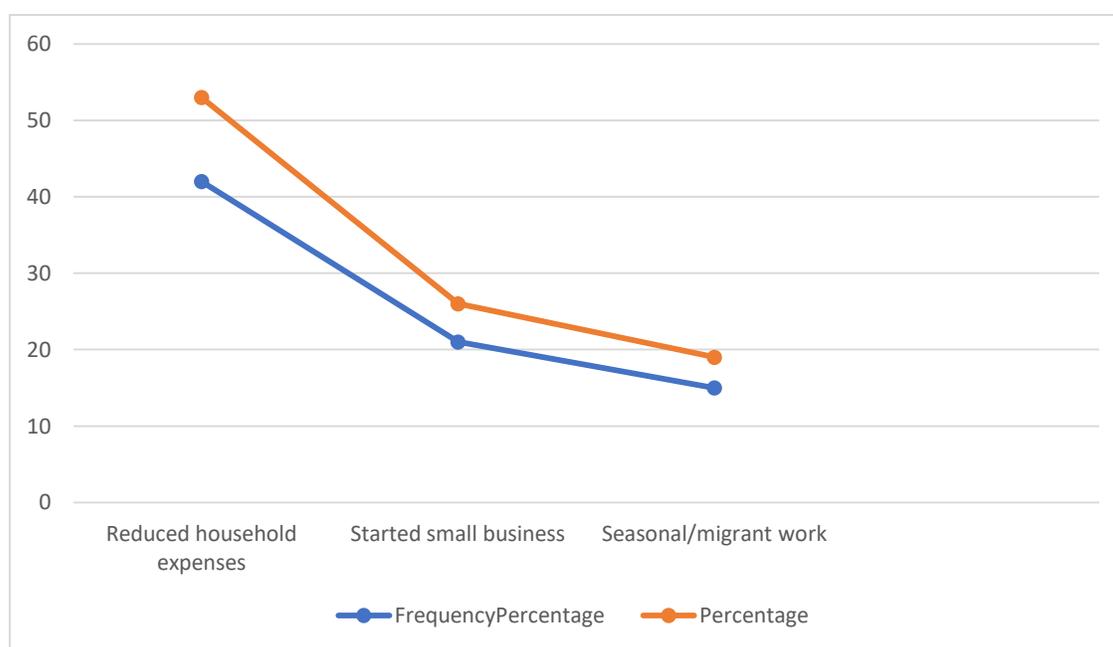


Figure 10: Illustrates the changes have made in household due to reduced fish catches (multiple responses were allowed)

The figure 10 shows that fishing families in Kunduchi have engaged into different measures to adjust the dwindling fish stocks. The most popular answer, taken by 53% (42 respondents), was to minimize the cost spent in households, which demonstrates a direct effect on the level of consumption and living standards.

Also, 26 percentages (21 respondents) have ventured and embarked on small businesses (i.e., vending or trading) or diversifying their sources of income. In the meantime, 19 % (15 respondents) claimed taking seasoned or migrant jobs, normally not involving fishing business, to put food on the table.

These trends point to a rather visible change in the pattern of household behaviour favouring survival and coping solutions, albeit diversification of such nature does not imply a sufficient degree of support that would enhance coping with future shocks in the long-run.

Receipt of any support (government, NGO, community) in adapting to fish catch changes

More than half responded that they did not get any help at all. Only a small proportion mentioned any type of aid, and most was non-formal (for example, savings groups). Respondents stated that training in alternative livelihood, micro finance access and improved fisheries management was required.

Table 17: Receipt of any support (government, NGO, community) in adapting to fish catch changes (Multiple responses were allowed)

Type of Support	Frequency	Percentage (%)
None	63	79
Gear support	7	9
Livelihood training	5	6
Financial support (loans)	3	4
Community savings group	12	15

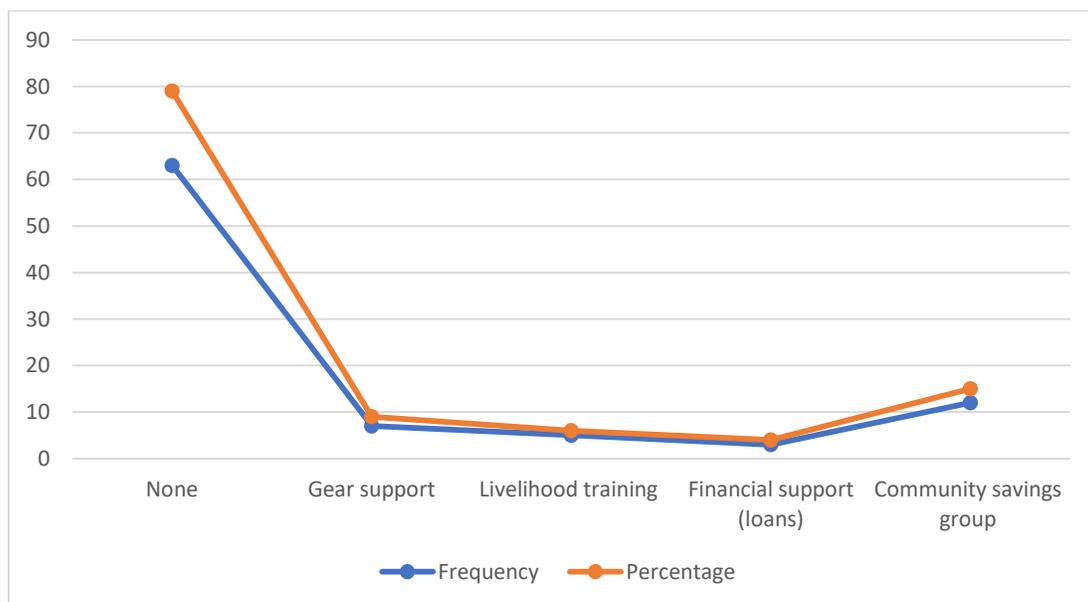


Figure 1: Receipt of any support (government, NGO, community) in adapting to fish catch changes (multiple responses were allowed)

The data above in figure 11 shows that 79% of respondents (63 out of 80) received no support from government, NGOs, or community initiatives to cope with declining fish catches. This reflects a significant gap in external assistance, leaving most households to rely solely on their own means.

Only a small fraction benefited from interventions such as gear support (9%), livelihood training (6%), or financial support (4%). Meanwhile, 15% participated in community savings groups, indicating some grassroots-level coping mechanisms.

Overall, the findings highlight the urgent need for increased institutional support and targeted programmes to help fishing communities adapt and build resilience.

Expectations/suggestions for improving fishing livelihoods in Kunduchi

In order to assist fishing people who, experience the depletion of fish populations, the respondents proposed both kind of interventions like practical and policy-type interventions. These are increased enforcement of laws on illegal fishing activities to preserve aquatic life and offering skills on other sources of income to lessen reliance of fishing. As well, subsidies on fishing gear and fuel to facilitate the costs of running the businesses are demanded and a further access to micro-loans that enable the small business activity and household resilience are required. Lastly, the significance of community-based conservation and co-management programs was highlighted by writers, such that participation by the locals in sustainable utilization of the fishing grounds would be enhanced.

Table 18: Expectations/suggestions for improving fishing livelihoods
in Kunduchi (Multiple responses were allowed)

Suggestion	Frequency	Percentage (%)
Stronger enforcement of fishing laws	42	53
Training in alternative livelihoods	29	36
Access to loans or capital	15	19
Community-based conservation	18	23

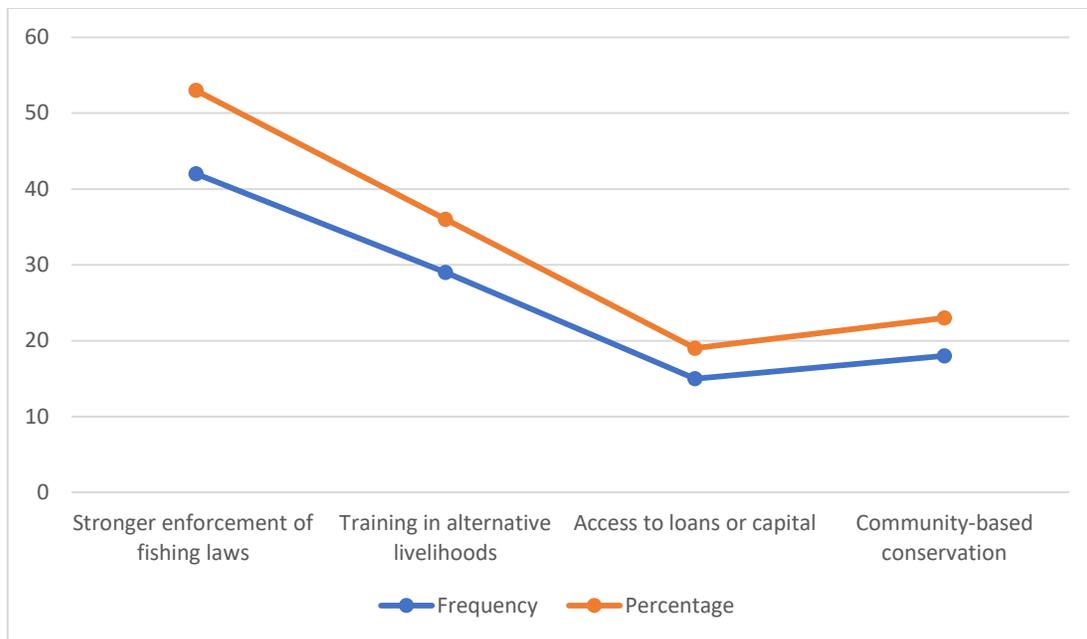


Figure 2: Expectations/suggestions for improving fishing livelihoods in Kunduchi (multiple responses were allowed)

The figure 12 data shows that this is the case as the fishing households at Kunduchi have towering expectations towards livelihood enhancement. The biggest recommendatory answer, given by 53 percent (42 answerers), was harsher enforcement of fishing regulations and this shows the prevalent nature of illegal and non-sustainable activities. The aspect of alternative livelihoods training was suggested by 36% and showing a keen interest on diversification of livelihoods. Moreover, 19% drew attention to the necessity to have an improved access to loans or capital to sustain small businesses or fishing activities. In contrast, the proportion that pointed out the significance of the community-based conservation activities was 23 percent, which means that they were in favour of local participation in resource management. Such recommendations suggest a necessity to find more close-knit solutions that would include regulation, capacity building, financial assistance, and community involvement.

Sharing opinions regarding the challenges or changes in fishing livelihood

Contributors have personal sentiments regarding the declining level of values in the activity of fishing as being a less value compared to the past. Most of them showed concerns about the future generations, the lack of trust toward local leadership, and the need to help them change the way they live to be more reliable in the future. Fear of insecurity and frustration took the centre stage in these concluding remarks.

Table 18: Sharing opinions regarding the challenges or changes in fishing livelihood

Response Theme	Frequency	Percentage (%)
Declining fish stocks and income	47	59
Frustration with poor enforcement of fishing regulations	35	44
High cost of fishing gear and fuel	29	36
Lack of government or NGO support	32	40
Youth losing interest in fishing	18	23
Interest in learning new income-generating skills	21	26
Concerns about pollution and environmental degradation	16	20
Fear for future generations and marine sustainability	25	31

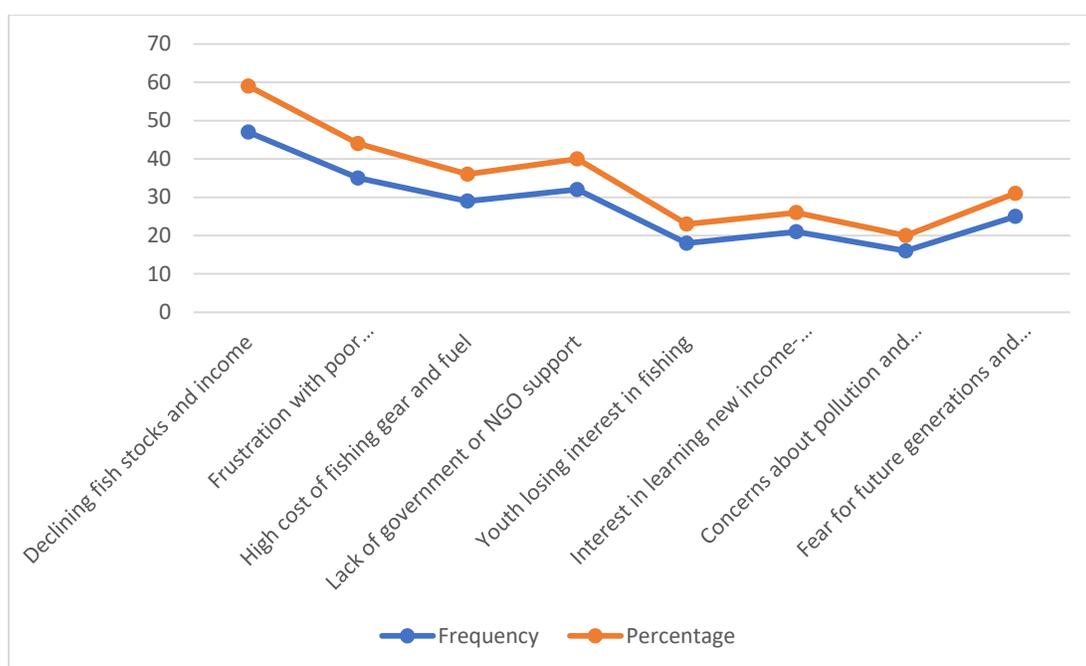


Figure 3: Illustrates the shared opinions by the respondents regarding the challenges or changes in fishing livelihood

Figure 13 data display that in Kunduchi, it is evident that fishing households have well-defined expectations of improving their lives. The popular proposal (cited by 53%, 42 respondents) was to increase enforcement of the fishing laws, which was seen as the

expression of the great concern about illegal, unsustainable practices. The artist was suggested to be trained to do alternative livelihood (36%), which means that a high number show interest in alternative sources of income. Also, 19 percent referred to the necessity of better access to the loans or capital investments to help small businesses or fishing, and 23 percent talked about the community-based conservation activities indicating their support of the local community participation in managing resources. These recommendations indicate toward the fact that there is a necessity to integrate the measures that include regulation, capacity building, financial aid, and community involvement.

CONCLUSION

The research unveils that the fishing communities at Kunduchi are experiencing high economic instability owing to the dwindled fish hauls, few options of sources of income, and ineffective institutions to assist them. These related challenges expose the community to risk and long-term viability without putting in place combative practices. The most important suggestions are to encourage sustainable utilization of the marine resources through ideal community and fisheries management practices and development of more effective fisheries laws. Providing stability to climate and market shocks can be countered by diversifying household incomes (such as aquaculture, eco-tourism, seaweed farming, or small-scale trade). Institutional support such as access to microfinance, extension services and capacity-building activities is needed to empower the communities and facilitate livelihood transitions. It is also important to enhance market access and efficiency in the value chain. Poor infrastructure, bargaining power as well as the reliance on exploitative intermediaries are also challenges that influence profits. By dealing with them by improving the transparency on prices, improving infrastructure, and collaborative models, it will lead to an improvement in economic welfare. The strategies are important not only to Kunduchi, but also to other communities elsewhere that experienced the same situation with Kunduchi.

SCOPE FOR FURTHER STUDIES

Future studies should discuss how the gender roles and contribution of the women and youth to fishing activities and livelihood adjustment strategies are part and parcel in terms of household resilience which is rarely considered in such scenarios. Besides, extended research is required on the water CPUE and status of marine resources to observe environmental trends and comprehend how sustainability in fisheries will shift over decades.

The appropriate study to determine the effectiveness of community-based conservation and co-management models can aid in determining their influence in compliance and resources

recovered as well as benefit to the community. Socioeconomic implications of marine pollution especially plastics waste, sewage and coastal development should also be addressed using further research since they have an impact on fish productive, as well as humans.

Lastly, market access and value chain processes should also be determined with the emphasis on how pricing systems, intermediaries, and infrastructure determine the profitability of small-scale fisheries and the economic welfare of fishing households in Kunduchi and other fishing villages along the coast.

REFERENCES

- Andrade, H. A., Garcia, C. A. B., & Tomás, A. R. G. (2021). Using CPUE to assess fishery status and trends in data-poor contexts. *Fisheries Research*, 240, 105963. <https://doi.org/10.1016/j.fishres.2021.105963>
- Béné, C., Arthur, R., Norbury, H., Allison, E.H., Beveridge, M., Bush, S., ... & Williams, M. (2016). Contribution of fisheries and aquaculture to food security and poverty reduction: assessing the current evidence. *World Development*, 79, 177–196.
- FAO. (2020). *The State of World Fisheries and Aquaculture 2020: Sustainability in Action*. Rome: Food and Agriculture Organization of the United Nations. Available online at https://www.oecd.org/en/publications/oecd-review-of-fisheries-2025_560cd8fc-en.html
- OECD. (2025). *OECD Review of Fisheries 2025*. Organisation for Economic Co-operation and Development.
- Pauly, D., Zeller, D., & Palomares, M. L. (2020). *Sea Around Us: A global database on marine fisheries and ecosystems*. Nature Scientific Data in Tanzania.
- Teh, L. C. L., Teh, L. S. L., & Sumaila, U. R. (2017). Viability of small-scale fisheries under climate change. *Fish and Fisheries*, 18(5), 785–795. <https://doi.org/10.1111/faf.12192>
- Tzanatos, E., Raitos, D. E., Triantafyllou, G., Somarakis, S., & Tsonis, A. A. (2016). Indications of climate effects on Mediterranean fisheries. *Regional Environmental Change*, 16, 211–224. <https://doi.org/10.1007/s10113-014-0720-0>