Progress report for the sea cucumber (*Holothuria scabra)* project in Mafia Island, Tanzania

Project title: Community-Based Conservation of High Value Endangered sea cucumber (*Holothuria scabra*) and it's habitats in Mafia Island, Tanzania

ID: 43989-1

Project team leader: Yussuf Yussuf

Project activities conducted from December 2024 to April 2025 at Mafia, Island

i. Social survey

The team conducted social surveys to evaluate the awareness of local communities regarding the current conservation status of *H. scabra* and their habitats (mangrove and seagrasses), assess their understanding on the ecological roles played by the species in sustaining the marine ecosystem and the socio-economic impact of dwindling sea cucumber stock and the total moratorium imposed by the government since 2006. In each of the 4 villages (Chunguluma, Tumbuju, Kilwa road and Jojo), Twenty-five (25) villagers (fishermen, farmers, gleaners and tree loggers) were interviewed making a total of 100 respondents (**Figure 1: a-d**). Additionally, 1 fisheries officer, 1 officer from marine park, 1 Beach Management Unit officer and 1 private sea cucumber farmer were interviewed as Key Informants to supplement information from personal interviews. Focus group discussions (FGD) were also conducted at each village to identify and clarify shared knowledge among members of communities including agreed reasons for dwindling of sea cucumber stock, habitat degradation and possible ways that should be done to bring back the stock and habitat to its background level. This information would otherwise be difficult to obtain with a series of individual interviews. Through FGD, group members have identified key stockholders, their roles and responsibility toward achieving sustainable management and conservation of the species and its associated habitats.

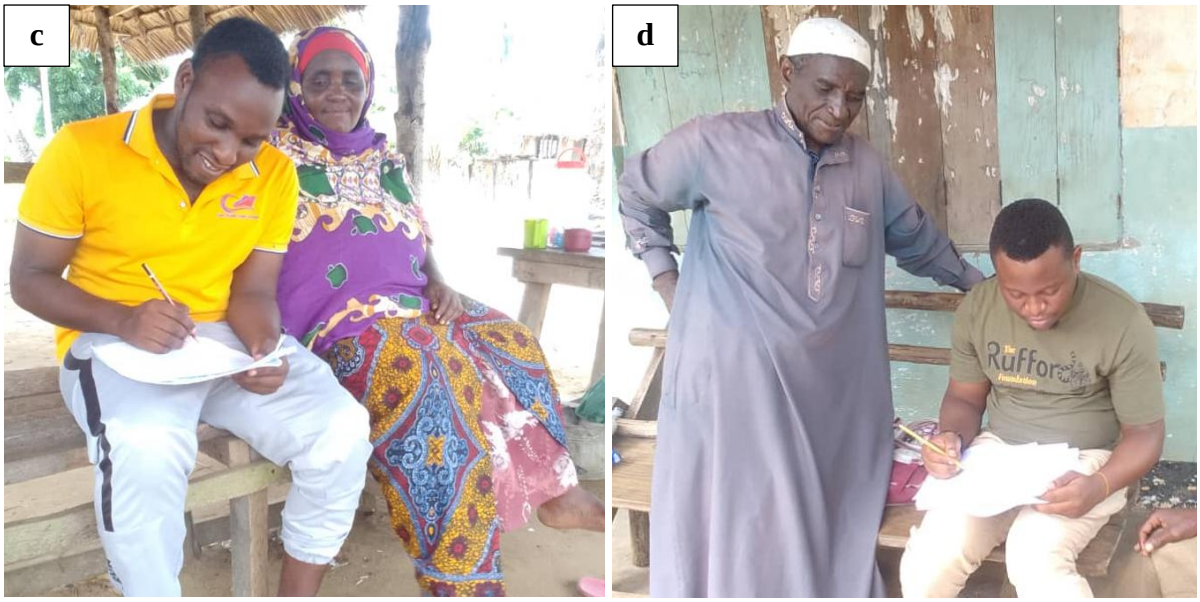

Figure 1 (a- d): Social surveys with fishers, gleaners, seaweed farmers and loggers in the project area.

Key Findings from social survey

Various information was gathered during the social survey from the project sites (coastal communities from four villages) including demographic detail (sex, age, marital status, and level of education of the respondents). The overall demographics characteristics of the respondents are detailed in the table 1. The demographic information mainly sexes and level of education from each village are presented in figure 2 and 3 respectively. The survey also collected information on the trend of sea cucumber availability over the last 5-20 years. Over 65% of all respondent agreed that the resource has been facing a serious problem of declining over the last 5-20 years in the area (Figure 4). However, over 20% of the respondents have indicated that the resource has not changed while 15% of the respondents believed that the resource has increased due to the current prohibition of sea cucumber fishery in the area (Figure 4). None of the respondents from Jojo village (Figure 5) believed that sea cucumber resource has increased over the last 5-20 years which was agreed by all members during a Focus Group Discussion (FGD) from all four villages. The respondents have indicated a number of reasons that could have contributed to the decline of sea cucumber stock in the area which include; overshing, destructive fishing methods, climate change, illegal collection of the resources, increase of coastal populations (fishers), lack of enforcement of existing law and regulation, lack of alternative livelihood among coastal communities, lack of education, pollution and destruction breeding area of sea cucumber. Moreover, over 85% of the respondents (Figure 6) were aware of the conservation status of sea cucumber especially *Holothuria scabra* and they understand the current prohibition placed on the resource. However, they have indicated that less has been done to enforce the total moratorium implemented by the government hence illegal collection are still a big problem in the project area.

Regarding the status of potential habitat of sea cucumber over the past years, more than 50% and 30% of the respondents have indicated that, the mangrove forest and seagrass meadows

has been reduced respectively (Figures 7- 9). More than 50% of the respondents believe that, there was no change on the status of seagrass meadows. However, during FGD they have all agreed that seagrass meadows have been impacted on the project sites. The majority of the respondents (>60% for mangrove and 49% for seagrass) were not aware of the roles played by mangrove and seagrass on the survival and availability of sea cucumber on the project sites (Figure 10 & 11). Similarly, >70% of the respondents were not aware of the ecological roles played by sea cucumber especially *H. scabra* and impact that might occur when they are significantly removed from the ecosystem. A number of factors have been outlined as the main causes of seagrass and mangrove degradation in the project area including; infrastructure development such road across the mangrove forest, deforestation of mangrove for domestic use, and pollution from aquaculture facility (prawns faming). Others includes climate change, unsustainable fishing practices (beach seining), increase in fishing activities along the intertidal area due to increase population and boat anchoring. Additionally, they have provided a number of options for improving the current status of sea cucumber and their potential habitats in the project area including; provision of conservation education among members of coastal community on the ecological importance of sea cucumber and the role played by these major marine ecosystem (mangrove and seagrasses) on sea cucumber availability. Other suggestions include presence of alternative livelihoods such as sea cucumber farming, enforcement of the rules and regulations, and provision of modern fishing equipment for off-shore fishing. The data on the social survey are currently further analyzed and manuscript preparation for more detailed information on the current resource status is ongoing.

Table 1: Demographic characteristics of the respondents when the data were pooled together from all four villages.

Variables	Categories	n	%
Sex	Male	87	76.3
	Female	25	21.9
Education level	Primary	34	29.8
	Secondary	62	54.4
	College	10	8.8
Madrasa education	Yes	74	64.9
	No	38	33.3
Marital status	Single	12	10.5
	Married	73	64.0
	Widowed	14	12.3
	Divorced	11	9.6
Village	Jojo	30	26.3
	Kilwa road	30	26.3
	Chunguruma	30	26.3
	Tumbuju	22	19.3

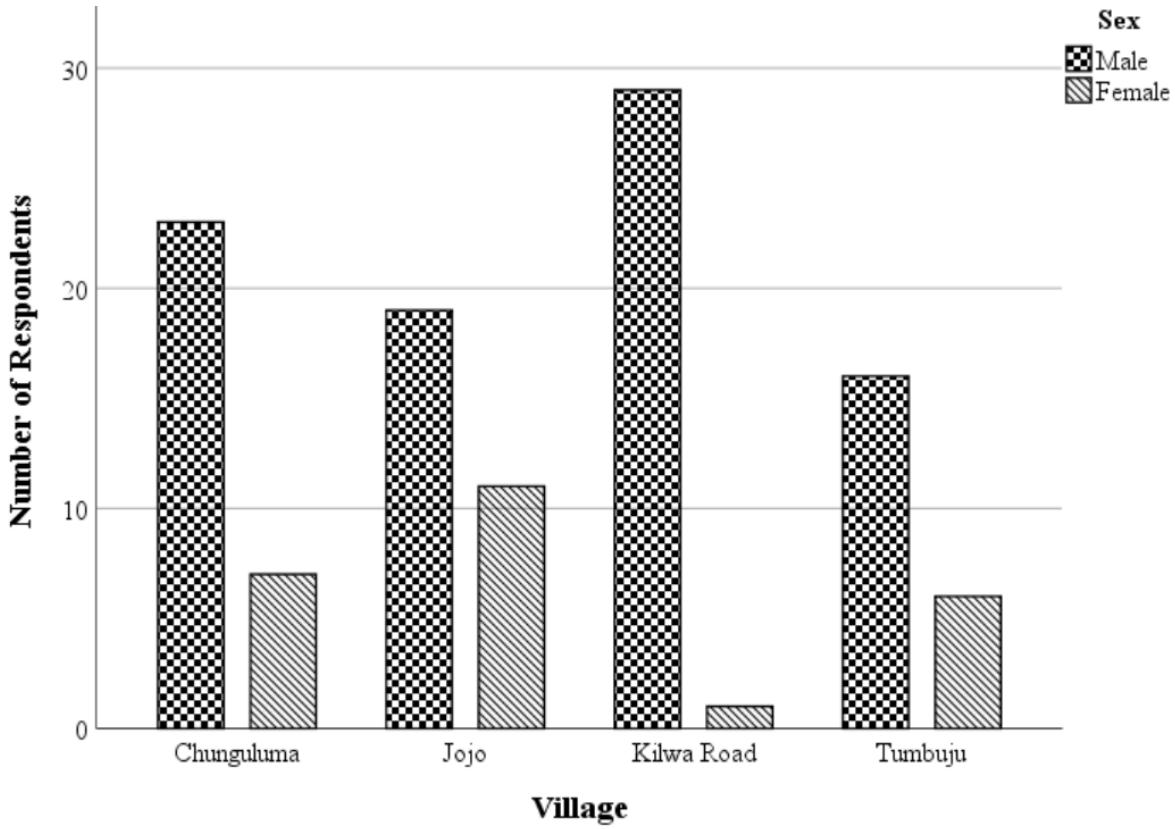

Figure 2: Sex of the respondents from each of the four studied villages

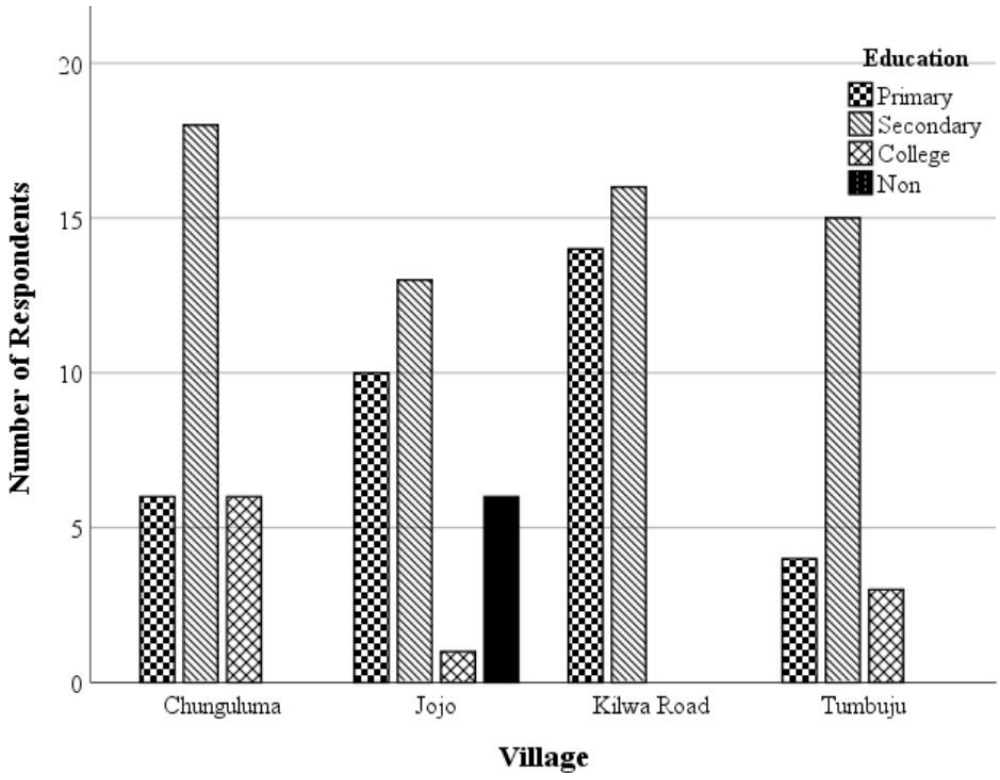

Figure 3: Level of education of the respondent from each of the four studied villages

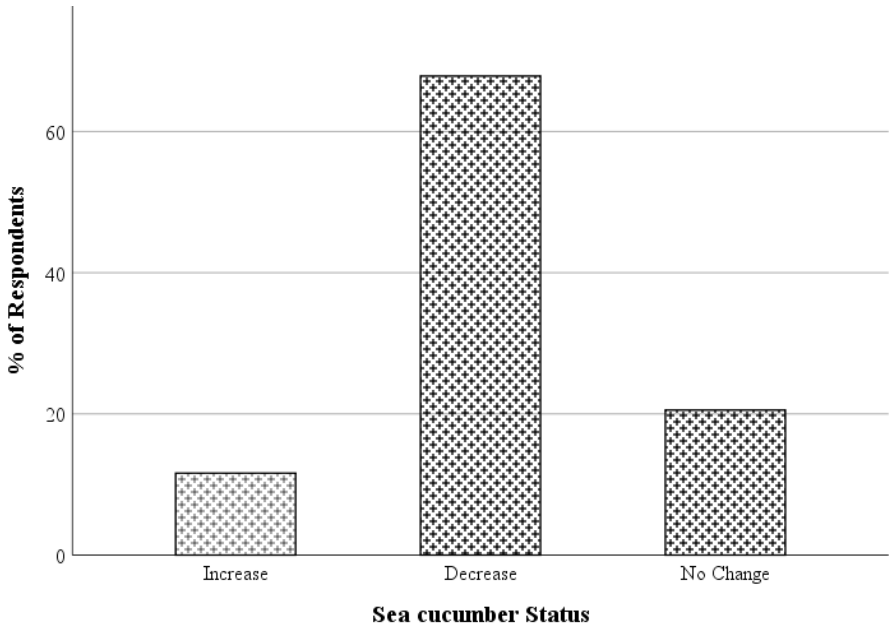

Figure 4: Overall respond on sea cucumber trend over the last 5-20 years

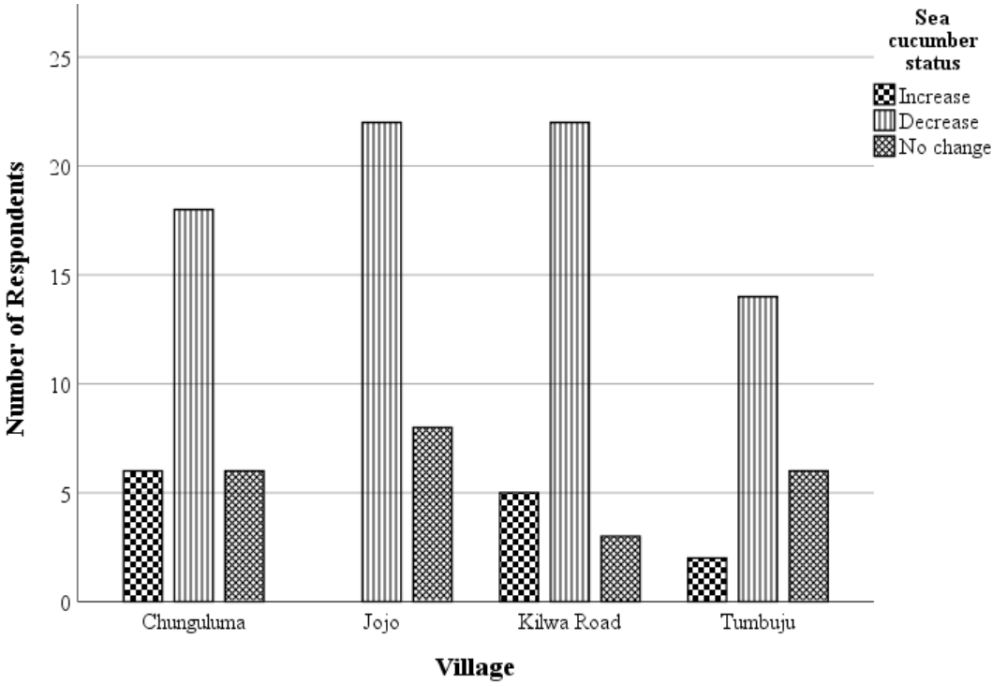

Figure 5: Responds on sea cucumber trend over the last 5-20 years from each of the four studied villages

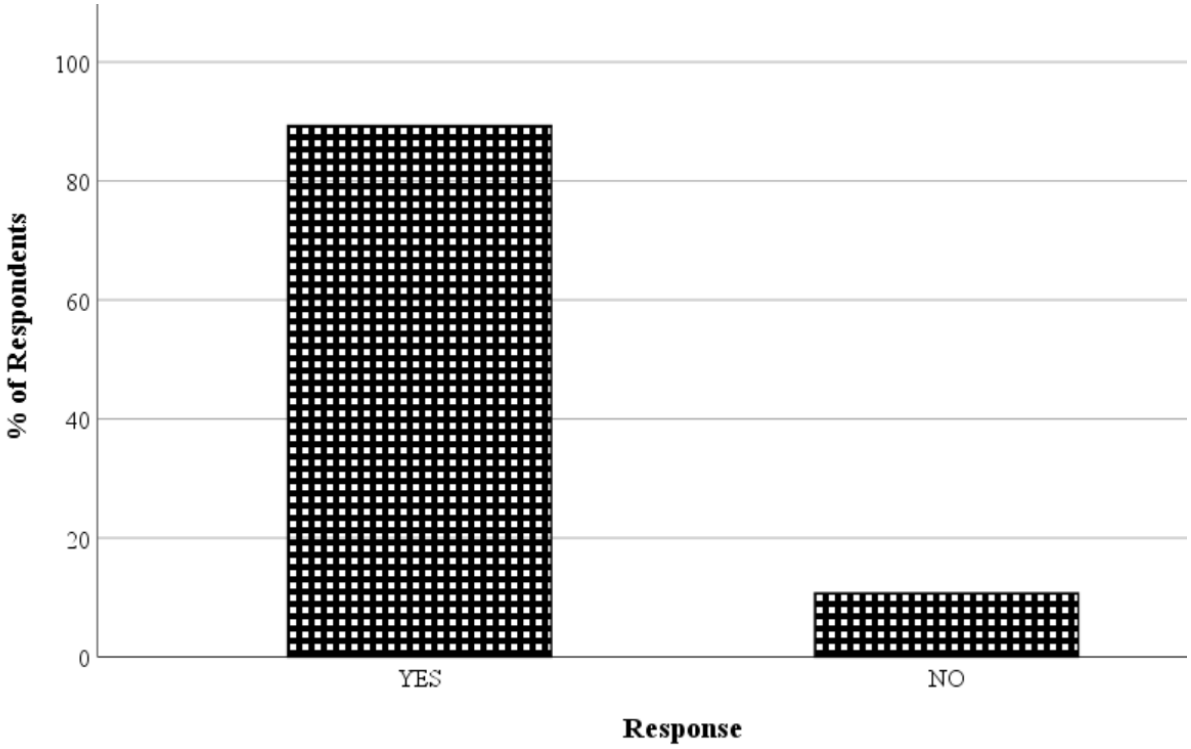

Figure 6: Awareness on the conservation status of Sea cucumber *(Holothuria scabra)* when the data were pooled together from all four villages

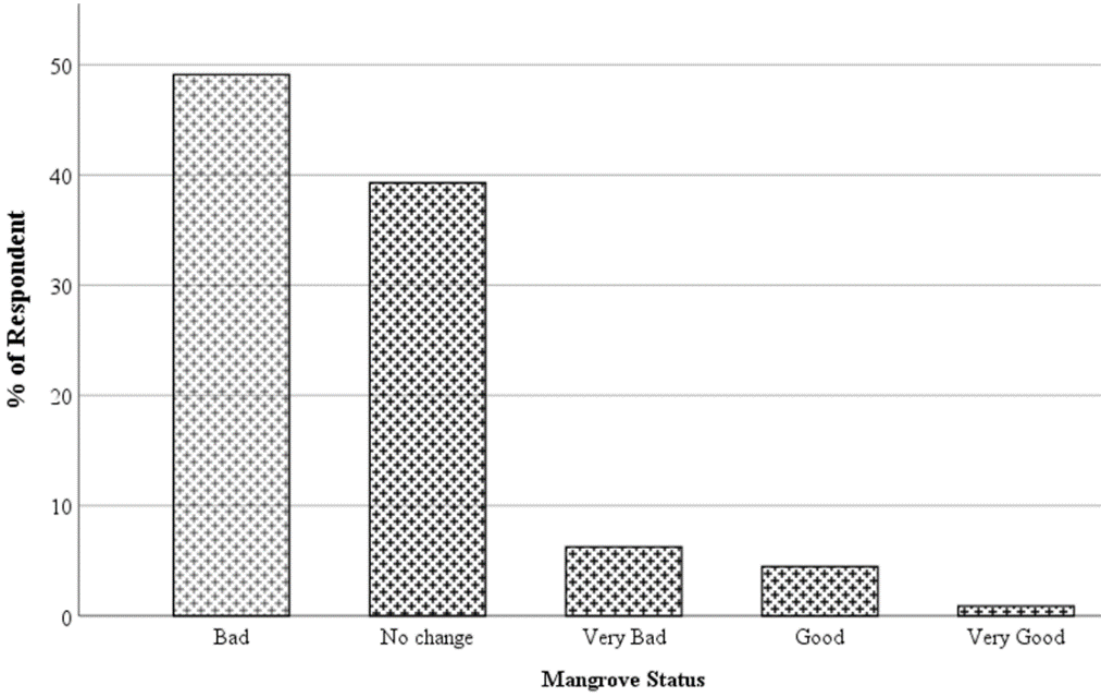

Figure 7: Awareness on the status of Mangrove forest over the past 5-20years when all data were pooled together from all four villages

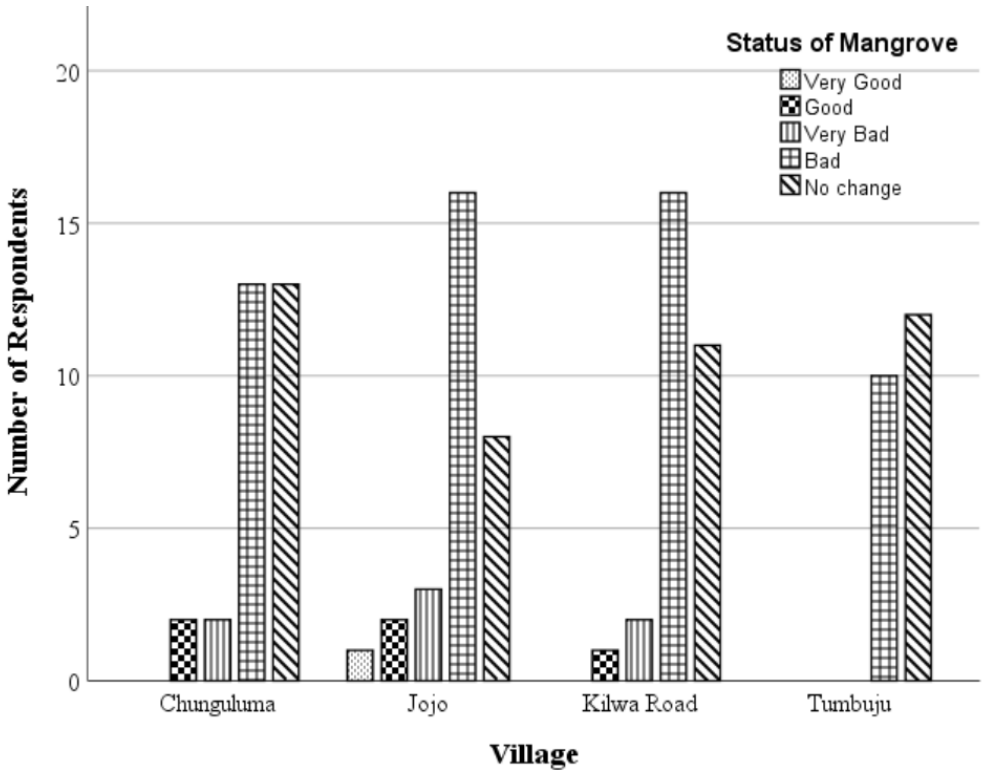

Figure 8: Awareness on the status of Mangrove forest over the past 5-20years for each of the four village.

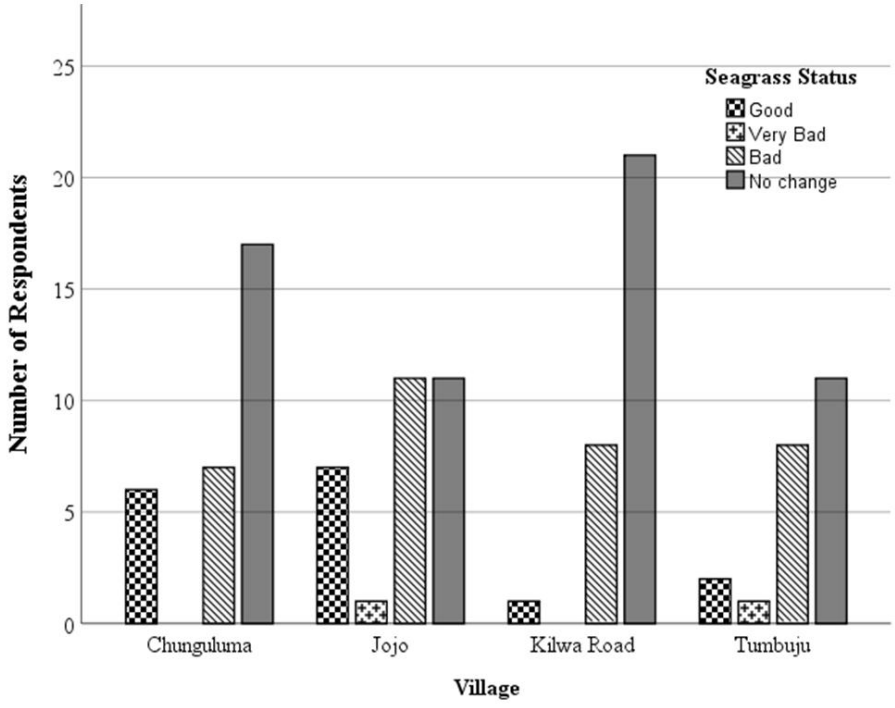

Figure 9: Awareness on the status of seagrass meadows over the past 5-20years for each of the four village.

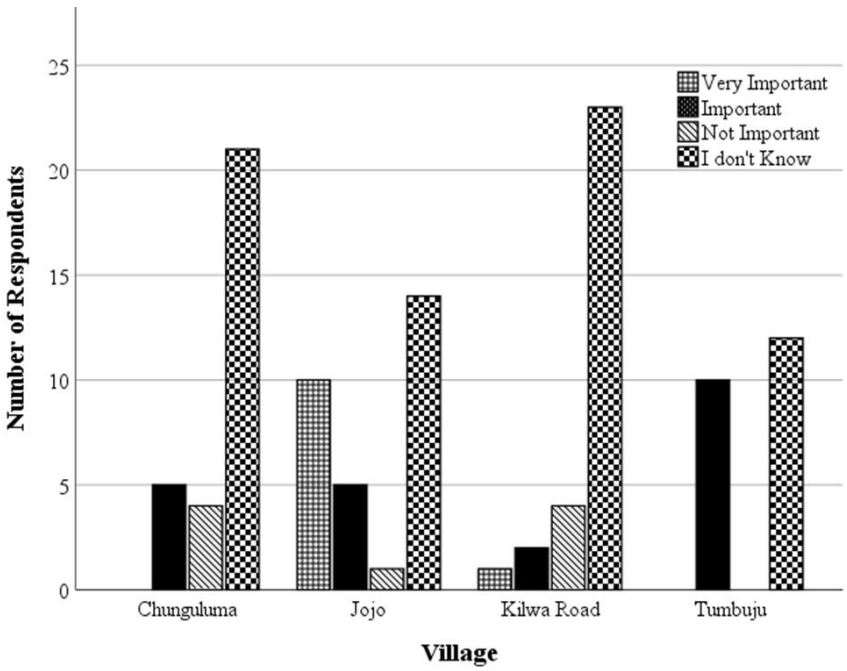

Figure 10: Importance of mangrove forest on survival and availability of sea cucumber in the area for each of the four village.

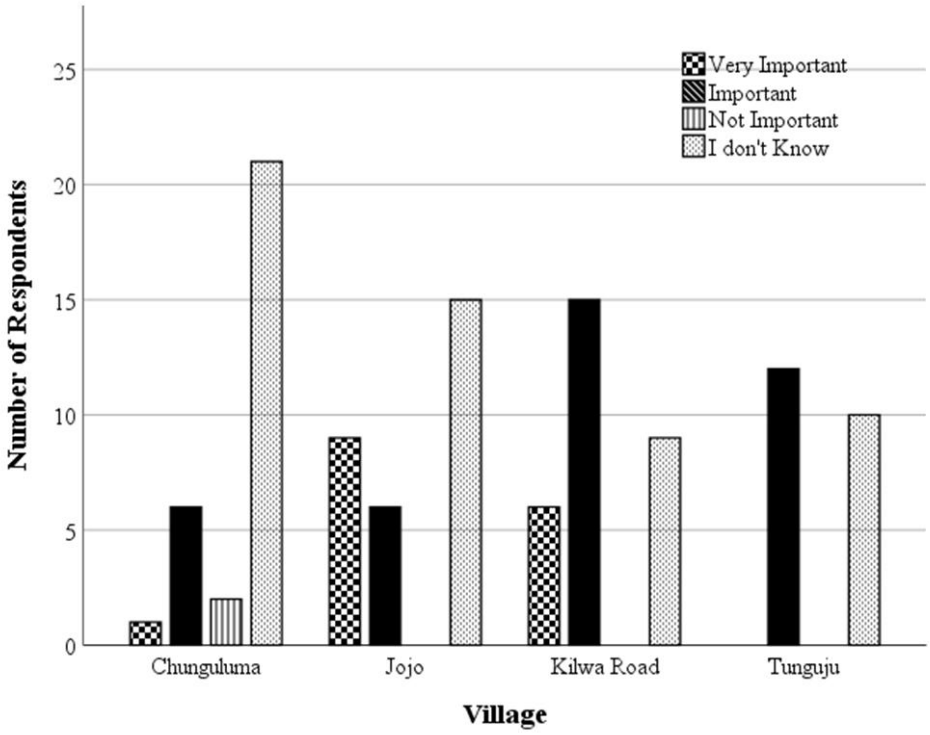

Figure 11: Importance of seagrass meadows on survival and availability of sea cucumber in the area for each of the four village.

ii. Training and awareness raising to key stakeholders in the project site- Mafia

The team provided conservation education to key stakeholders such as local fishermen, seaweed farmers, gleaners, tree loggers, tourist operators, Beach Management Unit (BMU) representatives, and local government leaders in effort to rescue the population of *H. scabra* and its sensitive habitat in Mafia island. One training session was conducted on each of the selected villages and was prepared in such a way that it equipped the participants with both theoretical and practical skills to enable them to participate in conservation of *H. scabra* and the coastal ecosystem (Figure 12: a- f). Also, both improved local and modern conservation techniques were provided to villages' environmental and fisheries committees for sustainable protection of *H. scabra* and the vulnerable marine ecosystems. After sessions, participants were given opportunity to group themselves and discuss major challenges and their solutions to improve conservation of *H. scabra* species and its habitat (Figure 13: a- d). Afterwards, each group appointed one member to present their findings (Figure 14: a- d). The sessions were conducted using participatory approach where participants were encouraged to share their opinions as well as asking questions regarding conservation of *H. scabra* and its habitats. Members of the community got an opportunity to physically observe the studied sea cucumber species (*H. scabra*), identify its local name and agreed that the species has been severely depleted. Degraded sea grass and mangrove area from each village were visited, the most affected species of mangrove were identified and the possible reason for being more impacted were outlined.

Figure 12 (a- f): Conservation education provided to various key stakeholders in the project area.

Figure 13 (a- d): Members discussing challenges and solutions to improve conservation of *H. scabra* species and its habitat.

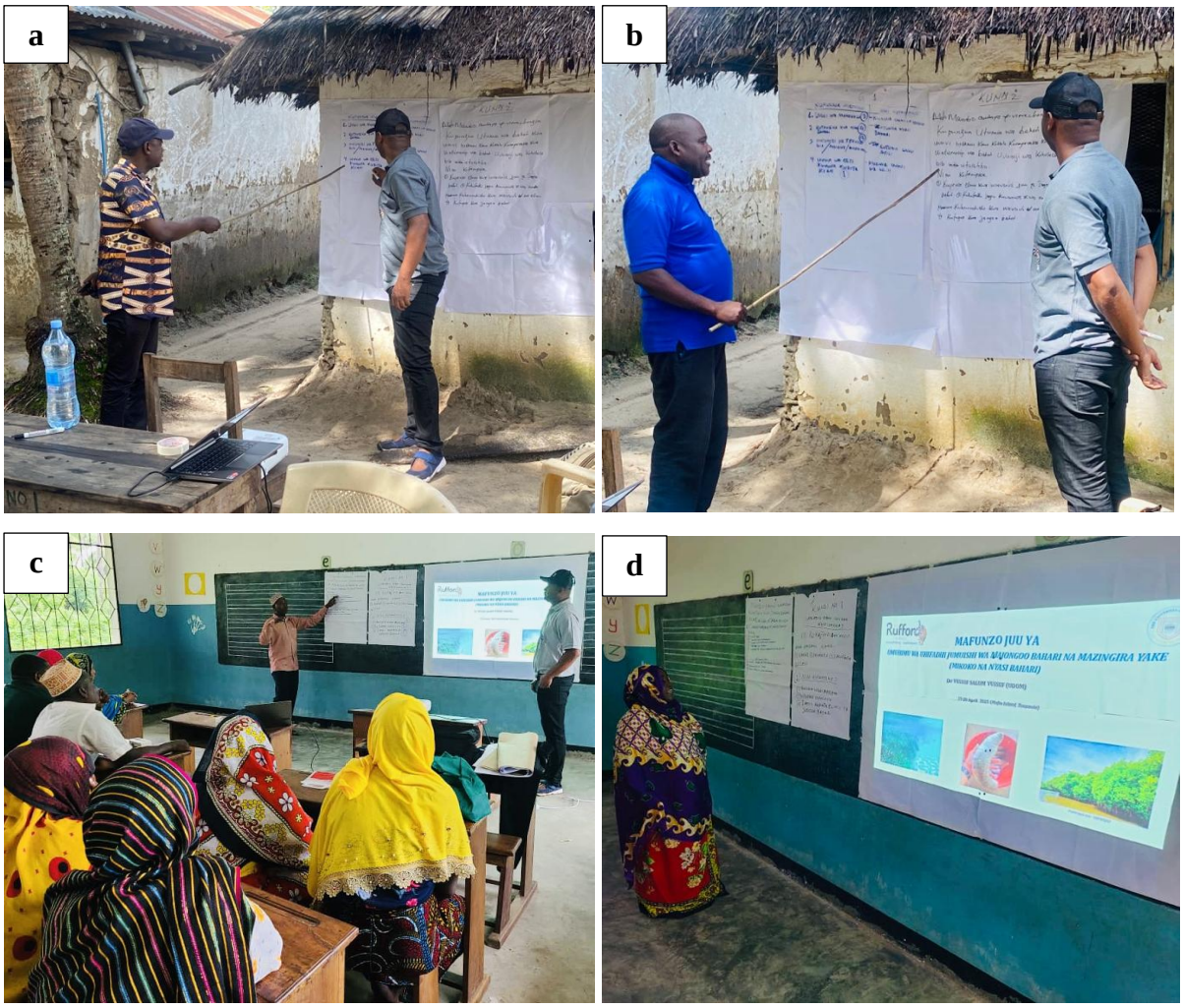

Figure 14 (a- d): Members presenting their groups' findings after thorough discussion.

iii. Mangroves and seagrasses restoration

In effort to restore the degraded coastal habitat, the project continues to re-plant various mangrove species including *Brugueira gymnorhiza*, *Rhizophora mucronata* and *Aviccenia marina* which are cleared the most (Figure 15: a- b). Additionally, most degraded sea grasses meadows are being restored by planting a diverse species of sea grasses adjacent to mangroves in order to increase the connectivity of these ecosystem (Figure 16: a- b). This activity is important as it will help to restore mangrove and sea grasses ecosystems which play great role in controlling coastal erosion, carbon sequestration, and protect diverse marine biodiversity.

Figure 15 (a- b): Restoration of most degraded areas of mangrove forest in the project area.

Figure 16 (a- b): Restoration of most degraded sea grass meadows in the project area.

Ongoing project activity

Restoration of selected mangroves and sea grass ecosystems is in progress.