Zanzibar

Impact of Marine Protected Areas (MPAs) and Other Effective Area-Based Conservation Measures (OECMs) on Small-scale Fisheries: **A Case study of the Hatuchoki Tundauwa Community-Based Marine Conservation Initiative on Pemba Island**

Written by
Rosemarie Mwaipopo,
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Jokha Mohamed

International Collective in Support of Fishworkers
ICSF

Fiberglass fishing craft at landing site at Tundauwa, Pemba Island in Zanzibar, by Hamid W. Hamid

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August 2025

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Published by:
International Collective in Support of Fishworkers (ICSF) Trust
No:22, First Floor, Venkatrathinam Nagar, Adyar, Chennai 600 020, India
Tel: 91-44-24451216 / 24451217
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Front Cover:
Tundauwa fisher with fishing gear at the landing site on Pemba Island in Zanzibar,
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ISBN 978-93-80802-43-5

MPA

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Introduction

Zanzibar is a semi-autonomous archipelago that is part of the United Republic of Tanzania (URT) and consists of two major islands, Unguja and Pemba, along with about 50 small islets located between 35 to 60 km off the coastline. With a coastline stretching to 880 km, Zanzibar has an estimated 4,000 square kilometres (sq km) of fishing grounds for artisanal fisheries (RGZ Fisheries Policy, 2022). The URT framework gives the Revolutionary Government of Zanzibar (RGZ) exclusive mandate over fisheries management in its territorial waters, which extends 12 nautical miles, and its internal waters, westward to the equidistant line between mainland Tanzania and Zanzibar. Under the RGZ, the Department of Fisheries and Aquaculture Development, which operates under the Ministry of Blue Economy and Fisheries (MoBEF), is the agency overseeing fisheries activities in Zanzibar's territorial and internal waters, while the Deep-Sea Fishing Authority (DSFA) is responsible for Exclusive Economic Zone (EEZ) management. Deep-sea fishing operations require licenses issued by the URT government.

Capture fisheries in Zanzibar is chiefly composed of small-scale artisanal fishing units operating in the inshore waters of both Unguja and Pemba islands, where the primary fishing grounds are located in diverse habitats such as coral reefs, mangrove creeks, seagrass beds, and sand banks. According to the RGZ's Fisheries Policy (2022), the fisheries sector provides employment to more than 78,000 people (the representation of women was pegged at 17.4 per cent), accounting for 8.5 per cent of Zanzibar's total labour force. A Fisheries Frame Survey conducted in 2020 estimated that there were 50,218 small-scale fishers in Zanzibar (86 per cent of whom were men and 29 per cent, or 14,566 individuals, were foot fishers), using traditional fishing gear. There was a total of 7,919 fishing craft, of which between 39-43 per cent were motorised. The survey also noted that 12,782 people are indirectly involved in fishing-related activities, including boat building, gear repair, fish selling, fish processing and marketing (RGZ Fisheries Policy, 2022)..

The fisheries sector is a critical contributor to food security, being the primary source of animal protein in the diet of Zanzibar's population. A Household Survey conducted in 2018 indicated a high dependency ratio in fishing communities, with 36.9 per cent of fishermen having seven dependents per household. The annual per capita fish consumption in Zanzibar ranges between 20 kg and 25 kg, significantly higher in relation to the African average of 9.4 kg per capita per year. The sector is significant to Zanzibar's economic development, accounting for 5.1 per cent of its GDP in 2021 (RGZ Fisheries Policy, 2022). This share grew to 5.7 per cent in 2024 (up from a five-year low mark of 4.1 per cent in 2023), according to the Statistical Abstract 2024 released by the Office of the Chief Government Statistician (OCGS) of Zanzibar. The OCGS revealed that the quantity of fisheries production in 2024 was 78,943 tonnes, a 1.4 per cent decrease compared to the 80,085 tonnes

recorded in 2023. However, the value of fish catch in 2024 amounted to TZS 618.18 billion (as of August 2025, 1 TZS = 0.00038 USD), an increase of 8.6 per cent from the TZS 569 billion recorded in 2023. Both the quantum of production and its value represent sizeable increases from benchmarks in 2020, when the sector's production was recorded at 38,107 tonnes with a value of TZS 205.3 billion (equivalent to USD 89 million at the time).

The FAO lists a total of 235 formal landing sites in Zanzibar, of which 109 (49 per cent) are in Unguja and 126 (57 per cent) in Pemba. A large majority of the landing sites, 199 (85 per cent), are located within Marine Conservation Areas (MCAs), whereas only 36 (15 per cent) are situated elsewhere. As recorded in the 2020 fisheries survey, Zanzibar had a total of 30 fish landing sites used by local fishers that were dedicated to collect catch and effort information. Of these, 12 were located in Pemba (RGZ Fisheries Master Plan, 2022).

In both islands, fishing activities are conducted along the entire coastlines, typically within a few kilometers from shore and in water depth below 200 meters. Operations in inshore fisheries are small-scale, employing traditional fishing gear and craft, which include outrigger canoes to catch near-shore species such as snappers, emperors, rabbit fish and groupers. Dhows and bigger boats are common in the offshore fishery and use long-line, purse seine and drifting gillnets to target significant larger fish such as marlin, kingfish, sailfish and tuna and the small and medium pelagic species in deeper waters (RGZ Fisheries Master Plan 2023-2038). Fishing activities also occur at shallower depths (100 meters), especially in the north of Unguja, where drift gillnets and line fishing are used to target large pelagics. In addition to inshore seagrass and coral reef habitats, fishers also operate along the intertidal zones, collecting sea cucumbers, shells and octopus by hand or using a stick during low spring tides (RGZ Fisheries Master Plan 2023-2038).

While artisanal activities characterise Zanzibar's capture fisheries, seaweed farming dominates its aquaculture sector, involving more than 23,654 farmers (80 per cent of whom are women) who generate annual outputs in excess of 14,000 tonnes (RGZ Fisheries Master Plan 2023-2028). In 2024, seaweed was among Zanzibar's chief cash crops, exporting 19,716 tonnes, representing an increase of 18.4 per cent compared to the 16,653 tonnes exported in 2023 (OCGS Statistical Abstract 2024). However, the value of seaweed produced was TZS 16.1 billion, a decrease of 2.2 per cent from the TZS 16.5 billion valuation in 2023. Nonetheless, both total seaweed exports and their earnings doubled their benchmarks from 2020, when 8,784.6 tonnes were exported at a value of TZS 5.47 billion (OCGS Statistical Abstract 2024). Commercial seaweed cultivation (of red algae) has been practiced in Zanzibar for the past three decades, emerging over that span as a viable source of livelihood and income especially for women in coastal communities—and birthing a cottage industry that is organized into registered associations and produces and sells a range of seaweed-based products, including soaps, oil, balms, sweets and drinks. Other species farmed include milkfish, crabs and sea cucumbers.

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1.1 Marine Conservation Areas: Policy, legal and institutional framework

Both Zanzibar's 2022 fisheries policy and its Fisheries Master Plan 2023-2038 identify a number of concerns and threats facing the sector, including overfishing and illegal, unreported and unregulated (IUU) fishing practices, which harm marine ecosystems; inadequate fishing gears; limited support from financial institutions; post-harvest loss, poorly developed infrastructure within landing sites; poorly developed cold storage chain facilities and practices; and climate change impacts and environmental degradation. In addition to the listed anthropogenic pressures, the reports note that awareness about modern fishing technology is limited among fishers. Poor compliance with environmental sustainability measures is attributed to several factors, such as limited knowledge about the RGZ Fisheries Act, 2010 (No. 7 of 2010) and the Fisheries Regulations of 1993 (RGZ ZN-PoA-SSF, 2023). However, this can be debated because of the work conducted by District Fisheries Offices and the Shehia Fisheries Committees (SFCs), which are reported to have promoted awareness raising on destructive fisheries including community-based conservation of coastal and marine resources.

One of the ways that the RGZ has taken to address the challenge of developing fisheries while working to safeguard biodiversity and ecosystem viability has been to establish a network of MCAs across Zanzibar. These are marine management areas that are zoned for multiple uses and characterised by shared governance approaches between the authorities and the local communities. The MCAs are rooted, defined and outlined under the Marine Conservation Unit Regulations of 2014, which (together with the Fisheries Act, 2010) place them under the direct jurisdiction of the MoBEF's Department of Fisheries Development. For the islands of Unguja and Pemba specifically, the above documents enshrine community participation as a requisite for successful conservation of marine resources.

At the Third United Nations Ocean Conference (UNOC3) in June 2025, the MoBEF announced the designation of two new marine protected areas spanning more than 1,300 sq km in the waters off Pemba Island (WCS, 2025). The creation of the North-East Pemba Conservation Area and the South-East Pemba Conservation Area is aimed at protecting climate-resilient coral reefs, seagrass beds, mangrove forests, and the coastal habitats

Table 1. List of MCAs in Zanzibar

Marine Conservation Area	Year of Establishment	Area (square kilometer)
Pemba Channel Conservation Area (PECCA)	2005	825.8
Menai Bay Conservation Area (MBCA)	1997	717.5
Mnemba Island Marine Conservation Area (MIMCA)	2002	337.3
Tumbatu Marine Conservation Area (TUMCA)	2014	162.9
Changu-Bawe Marine Conservation Area (CHABAMCA)	2014	118.2

Source: Zanzibar Fisheries Policy 2022

of threatened sharks and rays. As important is the manner of their formation: the two MPAs are reportedly the result of community consultation processes with some 43 villages. Consensus was arrived at through dialogue between fisheries authorities, NGOs, local small-scale fishers, Shehia leaders, women, and youth. This co-development approach is reportedly continuing in the formulation of zoning rules for the MPAs. These will reportedly include Locally Managed Marine Areas (LMMAs) and coral reef restoration zones, and additional measures that will protect vulnerable species (WCS, 2025).

The establishment of Shehia Fisheries Committees (SFCs) by the RGZ 2014 Fisheries regulations and the SFC Operating Regulations further strengthened the responsibility of communities and their structures to promote co-management in the fisheries. As highlighted in the Fisheries Policy (2022), SFCs—the Shehia, or ward, being the lowest local government unit (LGU) in the governance structure established by the RGZ—play a vital role in enhancing the capacities of communities in fisheries resource management (RGZ Fisheries Policy, 2022).

The RGZ's fisheries regulations also describe certain measures that facilitate and support conservation of marine resources. These regulations count periodic closures as among the community-based fisheries conservation mechanisms. The Fisheries Act of 2010 outlines provisions for the establishment of closed periods in fisheries management, defining a "closed period" as any period during which, in relation to any species or kind of fish, fish product or aquatic flora, such fish, fish product or aquatic flora, as the case may be, may not be captured, killed, injured, gathered or collected by any means whatsoever (RGZ, 2010). Such provisions reflect the measures taken by the community conservation initiative in the village of Tundauwa on Pemba Island, which is managed by a local Community-based Organization (CBO), the Hatuchoki Tundauwa Co-operative.

The Zanzibar National Plan of Action (ZNPoA) for the implementation of the Voluntary Guidelines for Securing Sustainable Small-scale Fisheries in the Context of Food Security and Poverty Eradication (the SSF Guidelines) formulated in 2023 furthers the commitment to a participatory and collaborative management approach between various fisheries stakeholders. The ZNPoA-SSF emphasises the active involvement of local fishers, Local Government Authorities (LGAs), non-governmental organizations (NGOs), CBOs, public institutions, private sector institutions, development partners, and environment champions towards achieving more effective and sustainable marine conservation efforts.

The ZNPoA-SSF also analyses the management challenges facing the small-scale fisheries sub-sector in Zanzibar, highlighting the following priority areas: the lack of effective co-management arrangements; poor governance and management capacity; inadequate monitoring, surveillance and control (MCS) regimes; the absence of a proper platform to advocate for opportunities for women fishers in small-scale fisheries; the lack of sustainable finance systems to support co-managements arrangements; limited knowledge and innovation regarding value addition and entrepreneurship within the sub-sector; and inadequate access to capital, financing and markets (RGZ ZNPoA-SSF, 2023).

This case study presents the experience of Tundauwa's community-based resource conservation initiative as an example of effective area-based conservation and management (OECM) towards protecting small-scale fishers and biodiversity. This OECM, which involves instituting periodic closures for fishing, has been credited with improving the fisheries and livelihoods of the practicing community in the village, situated within the Kilindi Shehia (Kilindi ward) in the Chakechake district of the Kusini Pemba region on Pemba Island.

1.2 Local livelihoods

The Tundauwa community practices a mixed livelihood method, including small-scale (artisanal) fishing and small-scale agriculture. The local fisheries support a wide range of marine resources. Tundauwa lies adjacent to a resource-rich reef fishery area, especially around the Mwamba Mkuu reef, upon which the community is dependent for local livelihoods. The main species include tuna, snappers, octopus, squid, sea cucumbers, oysters and other shell fish species (kombe and chaza). Periodic fishing camps (dago) are also established in Tundauwa especially during peak fishing seasons.

Aquaculture is also practiced in Tundauwa, where a few households engage in seaweed farming. The women of the village mostly engage in small-scale farming, growing cassava, rice and bananas throughout the agricultural seasons. Several villagers have observed the potential for developing sea-cucumber farming, drawing from its abundance in the current wild harvesting in the area. As of the case study period, there is one sea cucumber farm, measuring 8x8 m, in the village that is operated by Tundauwa community members, the establishment of which was supported by a private individual. During a field visit to the site, however, community members expressed that this potential had not been sufficiently exploited. They noted that tapping into sea cucumber farming would have supplemented efforts to sustain fishery closure measures through the provision of an alternative source of livelihood.

1.3 Methodology

The objective of this case study is to analyse the effectiveness of multiple-use Marine Management Parks as a form of Marine Protected Area (MPA), and/or OECM as conservation and management tools in protecting biodiversity. It must be noted here that, in the Zanzibar context, the International Union for Conservation of Nature (IUCN) considers the terms, MPAs and MCAs, as being interchangeable (IUCN, 2020). Specifically, the case study involved field visits to examine whether the Hatuchoki Tundauwa OECM initiative had been successful in reducing the overall fishing capacity and effort, and controlling destructive fishing. Prior to the site inspections, the case study conducted a literature review to research national policy and legal frameworks and how they provide for community engagement in MPAs/OECMs. Related to this was an examination of the support that the conservation initiative receives from other sources.

Through Key Informant Interviews (KIIs), this case study also assessed how the initiative has managed to improve the livelihoods of the communities dependent on those fisheries, or whether OECM regulations have led to loss of livelihoods. Hence, the perception of a range of stakeholders regarding the conservation initiative were sought to get their views on the effectiveness of the initiative as a tool.

1.4 The site

The Hatuchoki Tundauwa conservation area was specifically selected from amongst several other community-based marine area conservation initiatives in Pemba due to the following aspects: (i) during the case study period, it was the only community-based initiative that was initiated and run without any outside material support—unlike other conservation areas such as Fundo, Kangani and Makoongwe, which were relatively suc-

cessful community-led protection initiatives in the Pemba Channel Conservation area (PECCA) region, but which were heavily supported by conservation NGOs; and (ii) because of its unique governance arrangement of having a locally-initiated CBO—known as the 'Kamati ya Hifadhi ya Hatuchoki Tundauwa', or Hatuchoki Tundauwa conservation committee, officially registered in 2021, that spearheaded conservation activities and managed the benefits that accrued from these efforts.

The Hatuchoki Tundauwa conservation area is a formally declared community-based marine conservation zone that was initiated in 2018. It occupies an area of approximately 1.5 sq km with its location aimed at supporting the protection of marine resources around the Mwamba Mkuu reef. The area is the traditional fishing grounds of the local population of Tundauwa fishing village and other communities within and beyond Kilindi Shehia, and is a prominent fish breeding area. The area is relied upon for livelihood upkeep by the wider Kilindi Shehia community, of which Tundauwa village is a part. According to the 2022 National Census, the population of Kilindi Shehia was 5,343 people (2,563 males and 2,780 females) in 936 households. This figure represented a significant increase from the 3,947 people recorded in the 2012 National Census. The rapid population growth over the span of a decade is associated with increasing human impacts on the coastal and marine ecosystem in the area.

The Hatuchoki Tundauwa conservation area is one of several successful community-led marine resource protection initiatives currently practiced within the PECCA conservation area. PECCA was established in 2005 and is located along the northern part of Pemba Island. It is one of the five (see Table 1) marine conservation areas of Zanzibar, and the largest in size, covering an area of 825.8 sq km (RGZ, 2022). According to its General Management Plan (GMP, which provides the framework for MCA activities), PECCA was established with the purpose "to conserve the biological diversity and other natural and cultural values of the PECCA in the long term, while providing recreational, social and economic benefits for the present and future generation". The social and ecological value of PECCA region is significantly high—the area has a number of critical habitats within its ecosystem, including seagrass beds, nearshore shallow water coral reef communities and mangrove forests. Unregulated human activity in fishing or coral mining was also causing damage to the ecosystem. Intensive fishing was also practiced mainly in the peak fishing periods, such as Kusi (June-September), during which several places, including Muwambe, Makoongwe and Tundauwa, hosted dago fishers (RGZ, 2021).

According to the National Population Census of 2022, the PECCA area had about 160,636 people within 32 Shehias (wards), and had 34 SFCs (two wards had two SFCs each because of their size and geographic layout). The people and communities' capacities to engage in marine conservation has largely been enhanced by PECCA's activities some of which include empowering local communities to protect their fisheries for their own livelihood advancement and the fisheries. To this end, PECCA also supports the communities (including Tundauwa) within its conservation area with periodic education on observing compliance to responsible fishing and other related aspects of conservation (RGZ, 2021).

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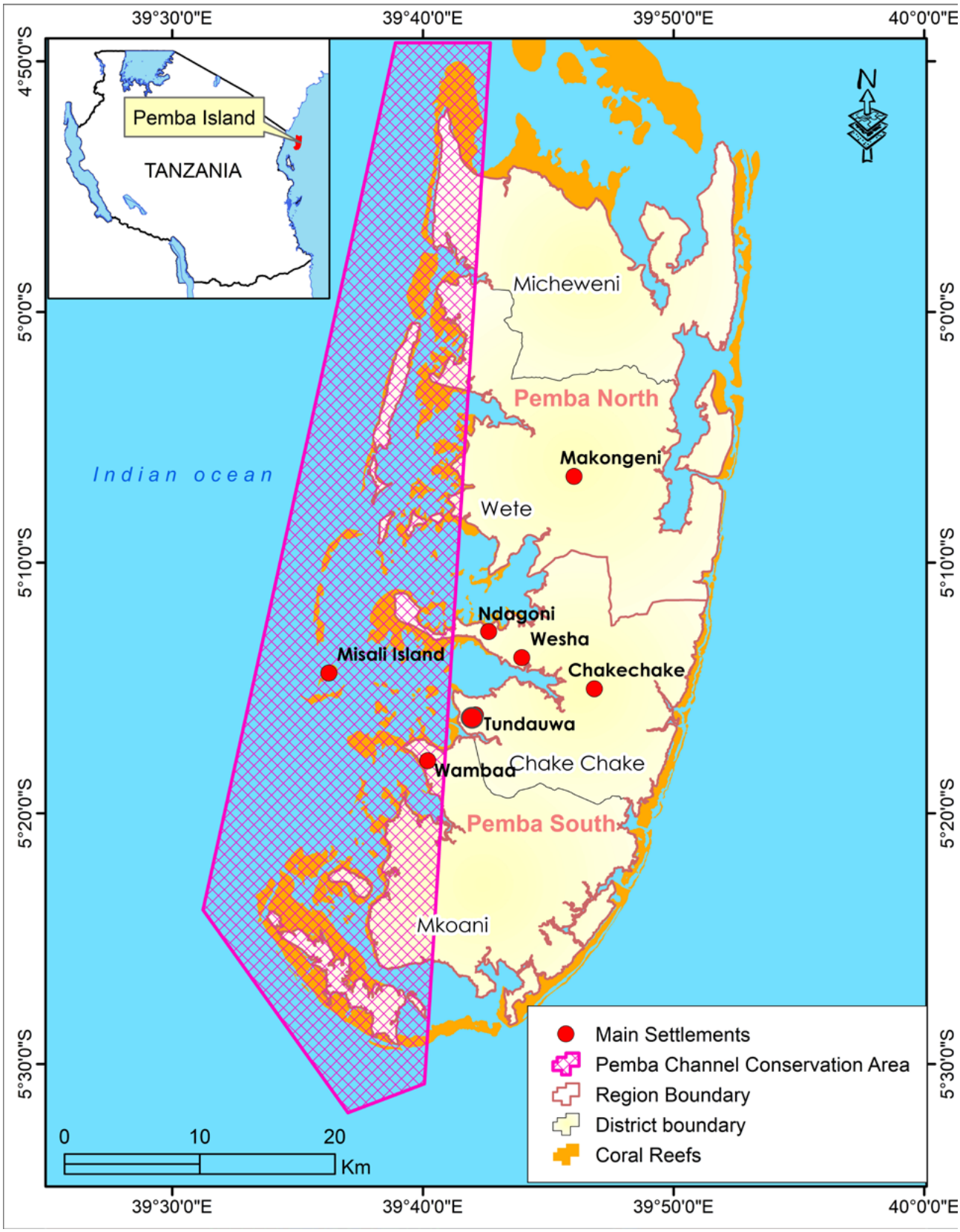


Figure 1. Map of Pemba Island, showing location of Tundauwa village.
Source: Adapted from map published in the PECCA GMP, 2020; customised to highlight sites, locations and features relevant to the case study

2. Process of declaration and management

2.1 Hatuchoki Tundauwa conservation initiative: set-up and governance

The decision to institute periodic closures of the fisheries at Tundauwa village followed the community's acknowledgment in 2018 that the reef fisheries that their lives and livelihoods were heavily dependent-upon had severely deteriorated. The sea grass had been degraded, and destructive fishing practices in gleaning (uchokoaji) using spears and sticks was noted as having played a role in destroying the reef. Destructive gear in fishing, drag nets (nyavu za kukokota) and dynamite were also used. Concomitant to the destruction of the reef, the rate of tuna and snapper (changu) catches had also dropped significantly, as did the availability of average-sized octopus.

Through awareness campaigns implemented by Chakechake district fisheries authorities and PECCA officials on the benefits of marine conservation through periodic closures, some community members became convinced of its potential. The villagers of Tundauwa were also impressed by some of the community initiatives within the PECCA region, including the Fundo, Kangani and Makoongwe community-based marine conservation areas that had been successful in practicing periodic fishing closures. This provided the impetus for Tundauwa to also attempt similar measures. A related objective to the primary intention to protect the fisheries was the need to enhance community livelihoods, which had seriously declined due to the poor catches being experienced at the time.

A series of community meetings supported by the District Fisheries Office and PECCA were then held, through which community members arrived at a consensus regarding the best ways to revive the fisheries—opting to institute periodic fishing closure arrangements. After the conservation area was declared, it was officially inaugurated by the-then

Chakechake District Commissioner Rashid Khalid. All concerned district offices are made aware of the closure arrangement and are periodically informed and updated about the status and progress on closure arrangements and the attendant benefits accrued by the community of Tundauwa. Fishers from the neighbouring Wambaa, Gelema and Ndagoni villages are also permitted to access the conservation area during opening days, as long as their identities are verified.

In order to ensure the effective management of closure arrangements, the Hatuchoki Tundauwa Cooperative was established and registered in 2021. Its overall responsibility is to spearhead and enforce conservation measures. This cooperative is a separate, albeit related, entity from the Kilindi SFC; the latter was established, and functions, in accordance with RGZ fisheries regulations. The Secretary of the Kilindi SFC claimed that they purposefully named their Tundauwa cooperative 'Hatuchoki', which literally translates to 'we do not tire', to communicate the message that they will not grow weary of spearheading the protection of their fisheries. The Sheha (the head of the ward) of Kilindi and two of his deputies, who together form the shehia's administrative government, are members of the conservation committee of Hatuchoki Tundauwa.

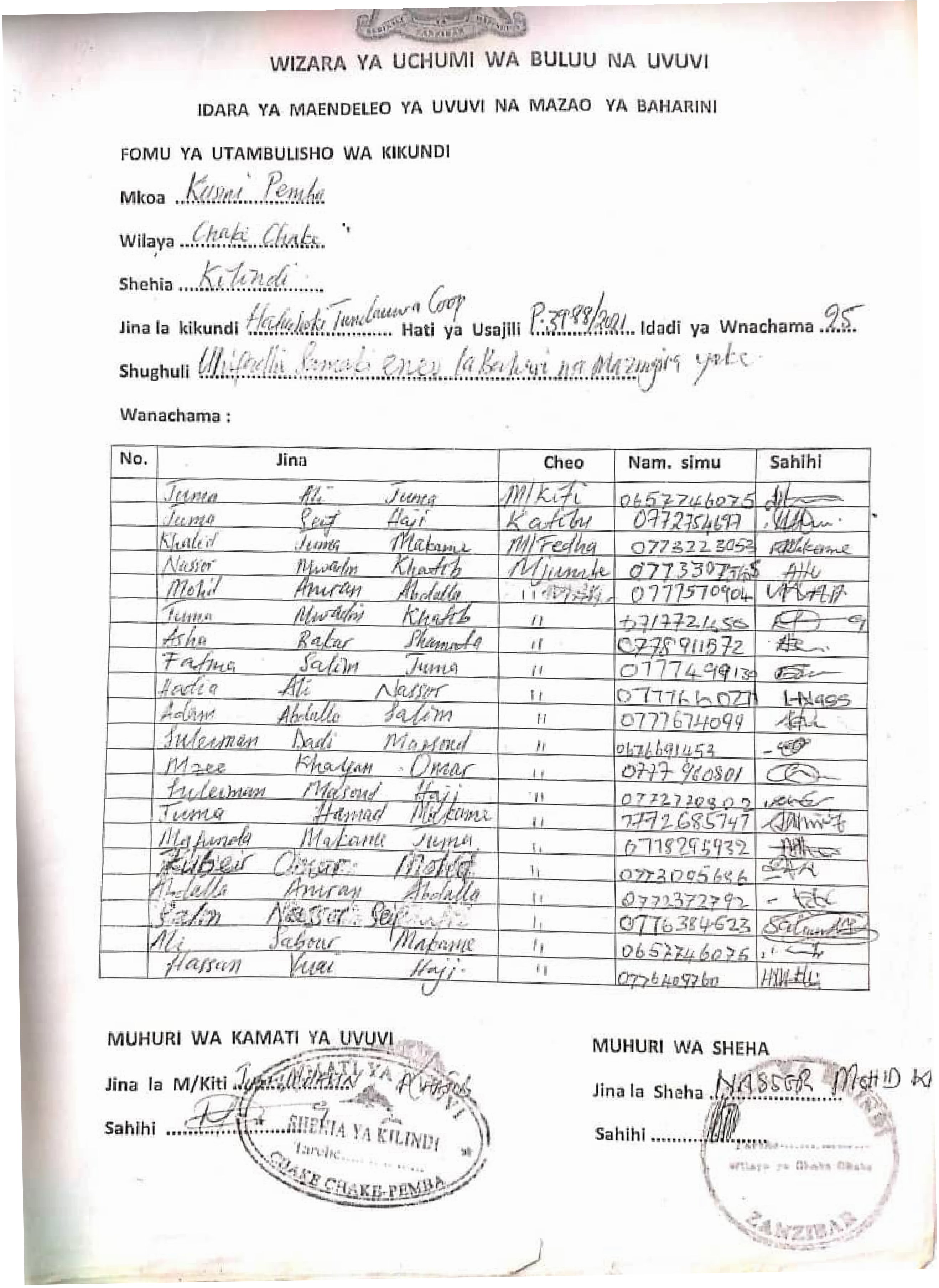
Before the formal registration of the CBO, the community drew up the Hatuchoki Tundauwa Cooperative By-laws to guide the conservation practice, led by the Kamati ya Hifadhi, which were then officially approved and registered by the Chakechake district administration. The CBO's Secretary explained that the drafting of the by-laws significantly raised community compliance to the desired closed periods of fishing in the designated area. The specific area demarcated for conservation was also defined in these by-laws, guiding the conservation practice as highlighted by the following extract:

> *'Eneo La Hifadhi'* (Conservation area):
> *Kuanzia Kobweni kwa kaskazini kuelekea kusini hadi kwa Majuki kwa Mzungu. Ndani ya maboya kuelekea mikandaani upande wa mashariki, nje ya hifadhi ni ncha ya boya la kaskazini hadi boya la kusini.* (Sheria ndogo ndogo za Hifadhi, Hatuchoki Tundauwa Kilindi Shehia records, May 2025).

This passage, drawn from the Hatuchoki Tundauwa Kilindi Shehia records, can be be translated as:

> The area under conservation extends from Kobweni in the north, towards the south up to Majuki kwa Mzungu... to the east along 'mikandaani' (a mangrove belt). The passage also marks the zone as being bordered by buoys.

This demarcation, as written down in the Cooperative's By-Laws, is supported by GPS measurements, which are also used as benchmarks for compliance and, on the flip side of the coin, as reference points to raise concerns about suspected noncompliance by unruly fishers. The conservation area is illustrated in Figure 3, which also highlights the surrounding topographical and coastline features.



WIZARA YA UCHUMI WA BULUU NA UVUVI

IDARA YA MAENDELEO YA UVUVI NA MAZAO YA BAHARINI

FOMU YA UTAMBULISHO WA KIKUNDI

Mkoa Kusini Pemba

Wilaya Chake Chake

Shehia Kilindi

Jina la kikundi Hatuchoki Tundauwa Coop Hati ya Usajili P.3988/2021 Idadi ya Wnachama 25

Shughuli Uhifadhi Samaki eneo la Bahari na Mazingira yake.

Wanachama :

No.	Jina	Cheo	Nam. simu	Sahihi
	Juma Ali Juma	M/Kiti	0657746075	
	Juma Seif Haji	Katibu	0772754697	
	Khalid Juma Makame	M/Fedha	0773223052	
	Nassor Mwadini Khatib	Mjumbe	0773307763	
	Mohd Amran Abdalla	"	0777570904	
	Juma Mwadini Khatib	"	0717772450	
	Asha Bakar Shamote	"	0778911572	
	Fatma Salim Juma	"	0777499130	
	Hadia Ali Nassor	"	0777660271	
	Adam Abdalla Salim	"	0777674099	
	Suleiman Dadi Massoud	"	0676691453	
	Mzee Khalfan Omar	"	0777960801	
	Suleiman Masoud Haji	"	0772720802	
	Juma Hamad Makame	"	772685747	
	Mafunda Makame Juma	"	0718295932	
	Zubeir Omar Mohd	"	0773095686	
	Abdalla Amran Abdalla	"	0773372792	
	Salim Nassor Seif	"	0776384623	
	Ali Sabour Makame	"	0657746075	
	Hassan Vuai Haji	"	0776409760	

MUHURI WA KAMATI YA UVUVI

Jina la M/Kiti Juma Ali Juma

Sahihi

SHEHIA YA KILINDI
CHAKE CHAKE-PEMBA

MUHURI WA SHEHA

Jina la Sheha NASSOR MOHD K

Sahihi

Wilaya ya Chake Chake
ZANZIBAR

Figure 2. Hatuchoki Tundauwa Cooperative founder members and registration form, 2021

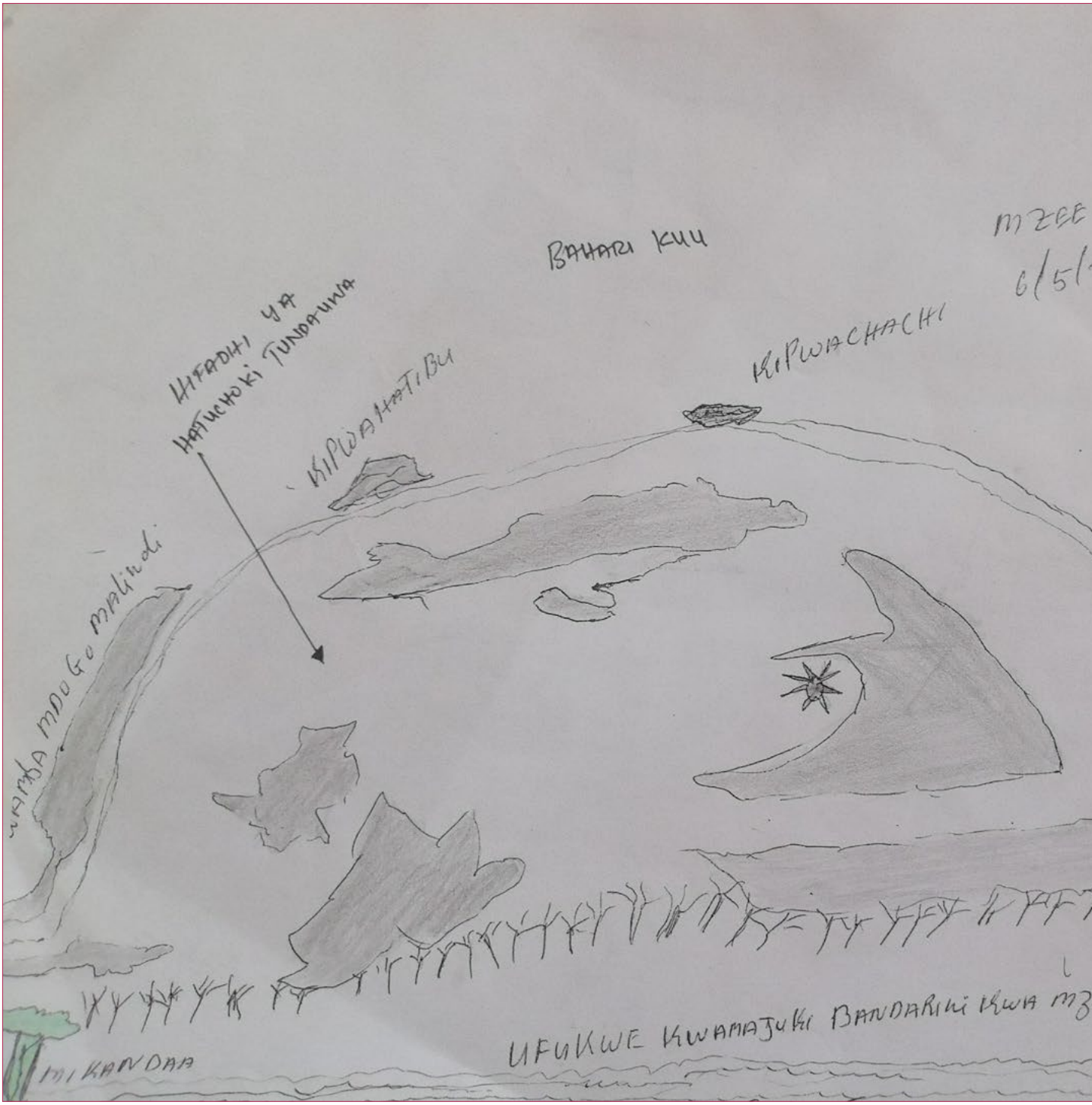
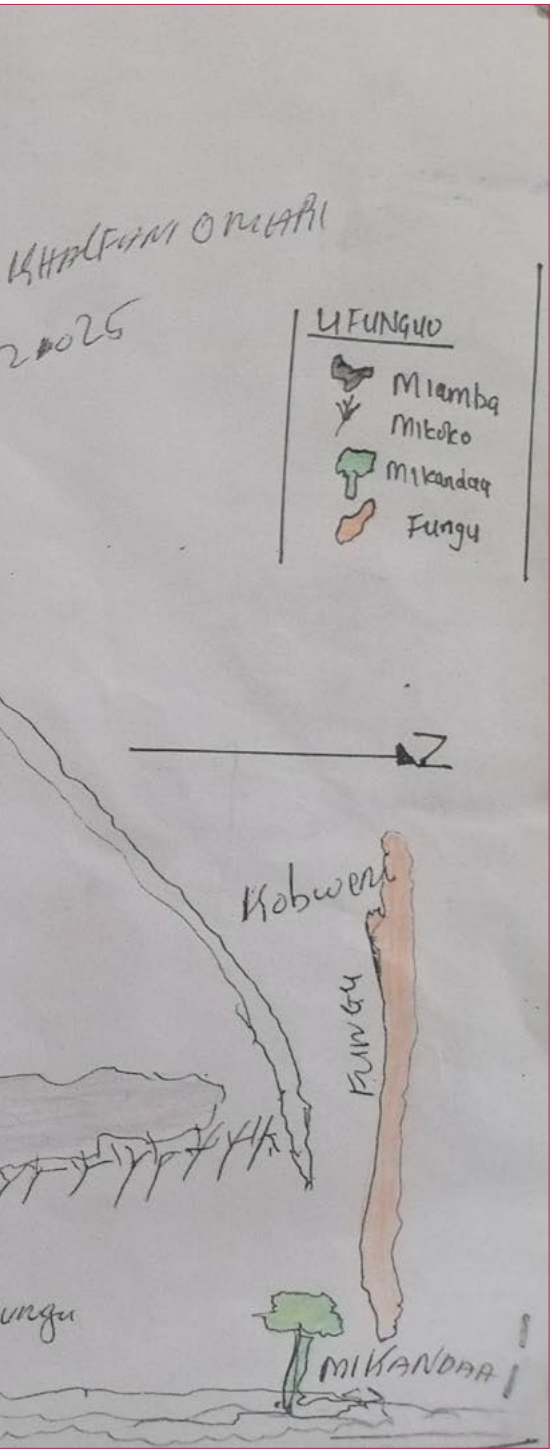


Figure 3. Local artist's impression of the Hatuchoki Tundauwa Conservation area, by Mzee Khalfani Omari, Tundauwa, dated 6/5/2025

As presented in the legend (Ufunguo) accompanying Figure 3, the area demarcated for conservation is bordered by the coral reefs, Mwamba Mdogo Malindi, Kipwa Hatibu, Kipwa Chachi, and a sandbar (Fungu Kobweni) on the north, which together form a boundary from the open sea (bahari kuu) and identify the extent of the zone of conservation. Mwamba mkuu reef is located in the middle of the conservation area. The coastline harbours mangroves (mikoko) and a tree belt of mikandaa, *(Ceriops tagal,* commonly known as the spurred mangrove*)*, which is one of the species of the mangrove family. The fish landing site on the beach (ufukwe) is known as Bandarini kwa Mzungu.



It is also important to note that Tundauwa's community conservation system of periodic closures of fishing activities within a defined area follows a long-standing tradition practiced by the coastal communities of Pemba island. The objective of such practices has always been to rejuvenate their fisheries. A 2010 study (Masalu et al, 2010) reported on the existence of traditional management strategies that communities in Zanzibar (Unguja and Pemba) employed to protect the marine environment. The documented strategies included:

i. Taboos and beliefs restricting access to certain areas (referring to reefs) during certain periods

ii. Closed seasons, usually enforced by elders who determine and enforce the restrictions

iii. Restrictions on fishing gear

Viewed in this light, Hatuchoki Tundauwa's experience can thus be understood as extending a tradition that had been practiced in several communities throughout the islands' history, but which had been eroded due to socio-cultural transformations and economic hardships that forced people to resort to poor choices in fishing. Species-specific community-based marine conservation also has a history rooted in the cultures of the people and guided by certain norms and prohibitions informing community compliance (Drury O'Neill et al, 2024 and Masalu et al, 2010). More recently, there has been significant support towards promoting community-based periodic octopus fishing closures in both the mainland and Zanzibar (Silas et al, 2022). The Hatuchoki Tundauwa initiative, however, involves closing the entire fisheries in the specified area.

Community elders are among the key players in the running of, and decisions made by, the Hatuchoki Tundauwa CBO because of their knowledge and familiarity (built on a foundation of traditional information and long-term memory) of environmental processes and change. During a field visit in April 2025, a community member, who is a local fisher, noted that 'Wazee wana ujuzi na ushawishi mkubwa kama jamii inabaki kuwaheshimu" (Lit: The elders have immense knowledge and influence, if the community continues to respect them). In this case, it can be understood that the socio-cultural context in Tundauwa village was key to reaching community consensus on measures towards the periodic closures of the fisheries.

2.2 Closing and opening: governance and by-laws

The closure period lasts between three to six months depending on how the marine environment is assessed. The Kamati ya Hifadhi, responsible for overseeing the closure, periodically evaluates the condition of the fisheries as the closed period progresses. Following such assessments, the closure period can be cut short if the need arises. During the field visit, one of the initiative's leaders claimed that the elders may assess if there is abundant fish stock after a closing period of two months, based on a traditional understanding of the migratory patterns of certain fish species that typically return to the area after a three-month period. But, as the Secretary of the Kamati explained, "since we have created a protective environment for the fish, which attracts them to the area, there may be abundant fish of certain species within the protected area in a shorter period. Hence, the Kamati is advised to cut short the closing period to allow people to fish, even if it is not within the approved time frame". Building in such flexibility in the decision-making process over fishery closing and opening times is a good indicator of the importance of locally-informed ownership in marine resource conservation initiatives.

The conservation by-laws (see Table 2) allow for the opening period to last from a period of three or more days, and, in practice, opening days have lasted for a week since the conservation initiative was established. According to community arrangements, the Kamati fishes for the first four days, two days are used for collecting octopus and two days for catching finfish. The remaining three days are for all other community members and visiting fishers from the neighbouring villages. This arrangement was specifically designed so that the Kamati could generate some income to go towards community projects and community welfare initiatives. One such effort is the on-going construction of the Tundauwa primary school.

Table 2. Extracts from Hatuchoki Tundauwa conservation by-laws (2021)

SHERIA NDOGO NDOGO ZA HIFADHI (Tundauwa)	Conservation by-laws (Tundauwa)-translated
UFUNGUZI NA WA ENEO LA HIFADHI	OPENING OF CONSERVATION AREA
i. Hifadhi itafungwa si chini ya miezi mitatu (3) na si zaidi ya miezi sita (6) kulingana na hall itakayojitokeza	i. The conservation area will be closed for not less than three months and not more than six months, depending on the prevailing conditions in the fisheries
ii. Hifadhi itafunguliwa kwa muda wa siku tatu (3) au zaidi kulingana na hali itakayojitokeza	ii. The conservation area will be opened for a period of three days or more depending on the fishery conditions
iii. Wakati wa kufungua wavuvi wa kurambaza kwa miguu chochote watakachopata hawatakua na mgao wa aina yoyote wakivua Samaki, Kome, Pweza Ngizi nk	iii. During the opening period, trolling and foot fishers will not be subjected to any quota to redistribute their catches or proceeds when they fish for fin fish, octopus, squid or oysters
iv. Wavuvi wa mishipi na wao hawatakuwa na mgao wa aina yoyote	iv. Hand line (hook and line) fishers will also not be subjected to any distribution of their catches and proceeds
v. Wavuvi wa kuzamia, Nyavu, Dema, Wavuvi wa Zulumati hawa wote watakachovua watagawana sawa kwa sawa na Hifadhi	v. All fishers who dive (using spear guns or harpoons), those with mono-filament or gill nets, basket traps, who use long-line gear will have to divide their catch in equal portions with the Kamati ya Hifadhi
vi. Ni kosa kwa mtu yeyote kwenda kuvua au kutega mtego bila ya kutoa taarifa kwa uongozi na kuorodheshwa wakati hifadhi imefunguliwa	vi. It is an offense for any person to go fishing or to set a trap without permission from the authorities, or to be registered while the area is closed (for fishing)
vii. Wavuvi baada ya mavuvi ya siku watalazimika kuripoti kwa kamati, na nikosa kutoripoti isipokuwa wavuvi wa kurambaza kwa miguu na mishipi tu hawatolazimika kuripoti	vii. Fishers are obliged to report to the Kamati ya Hifadhi after every fishing day. It is an offense to not report. Trolling and foot fishers and hand line fishers are exempted from the reporting requirement

The Tundauwa by-laws reflect the conditions and regulations stipulated in Clause 9 of the RGZ Fisheries Act of 2010, which gives the Director of Fisheries powers to establish: (a) closed seasons for designated areas, species of fish or methods of fishing; (b) prohibit fishing areas for all or designated species of fish or methods of fishing; (c) limit the methods and gear, including mesh sizes of nets or basket traps, that may be used for fishing; and (d) establish marine parks, sanctuaries for any purpose (RGZ, 2020).

2.3 Impact of the conservation effort

The Tundauwa fisheries conservation initiative has been credited with the generation of numerous benefits beyond the fisheries. Community members in the neighbouring villages of Wesha and Ndagoni referred to Hatuchoki Tundauwa as a dedicated fisheries protection system that has benefitted its community members. The periodic closure arrangement at Tundauwa has been in place for the past seven years, that is, since 2018, and has not faltered even once over that period. Villagers testified that the fisheries have improved significantly, and finfish and octopus catches have increased. Currently (as of the case study period), the collection of octopus was said to have reached up to 150 kg a day, and the availability of fish has improved. Fishers may get large-sized finfish species such as snappers (changu) or parrot fish (pono), which can weigh between 3-4 kg a piece. Community members also attest to improved catches around the closure area, Mwamba Mkuu reef, during opening days. One individual claimed that "a person may earn between TZS 70,000 and 200,000 over the opening days, which is not common in other fishing areas accessible to the community". In the evenings of opening days, school-going children also participate in catching octopus. The income they earn goes towards meeting their school needs.

The positive impact of the closure system is thus generally felt across the community, and, since the protected area is small in size in comparison to the waters that can be accessed for daily fishing, community members do not feel deprived during closed periods. The relatively manageable spatial scale was thus an advantage to the community marine conservation initiative. The improved fishery conditions also benefitted the elderly and women gleaners. Community elders, especially the male elders, have become fully appreciative of the closure system because they have observed improved catches around the inter-tidal zones, which have been their traditional access areas. Women were also appreciative of the arrangement, expressing how the periodic closures have made a difference in their income levels. One of them explained that:

> "It depends, there are periods where the opening days are quite lucrative but not in all periods... sometimes we may just get TZS 40,000-50,000 on the opening days, but in some periods a woman can earn more than TZS 200,000 over the three-day opening period, depending on luck and skills... because women fish for multiple products... which can be in plenty... the same woman can get sea cucumbers, squid, oysters and sell them all... so the periodic closure system has some benefits."

The conservation efforts have also enabled the development of community projects, which have been funded through proceeds from fishing during opening days. One of the by-laws compel net-fishers and trolling fishers (wavuvi wa nyavu na dhulmati) and those using basket traps (madema) to share half of their proceeds with the Kamati ya Hifadhi. This system has enabled the committee to spearhead the construction of Tundauwa Pri-

mary school, which has saved young children from walking a distance of about 3 kms to go to the nearest school at Kilindi. The head teacher of the school explained that "members of the Kamati ya Hifadhi considered that access to schooling was one of the biggest challenges that the village experienced and the absence of a school in the village and the long distance to school had discouraged many parents. Therefore, the CBO of Hatuchoki Tundauwa consulted the Kilindi Sheha in 2018, requested for an ideal plot of land, and spearheaded the construction of the school by providing the initial funds for materials. The CBO has continued to cover much of the costs for infrastructure development".

As of the case study period, the school had three classrooms with more being added to the existing structure. At a community meeting about the progress of the conservation initiative held on July 25, 2025, it was reported that, since its inception, the community has earned TZS 20,880,000.00, of which TZS 8,057,000.00 was invested in school construction, and TZS 1,910,000.00 given to needy families in the community. The rest was used, or is saved, for the Hifadhi's running expenses (Kamati ya Hifadhi, Hatuchoki Tundauwa, 25/7/2025). Although additional support was received from the government and a few political leaders, the Hatuchoki Tundauwa Kamati is still credited as being the initiator of the school construction project. The CBO is also supporting the education needs of children from needy families.

Tundauwa Primary School, highlighting ongoing construction (as on May 6, 2025) to add classrooms, by Rosemarie Mwaipopo

2.4 Challenges to the conservation effort

Notwithstanding the OECM's positive outcomes, there are several challenges, both anthropogenic and environmental, facing the Hatuchoki Tundauwa initiative. A significant concern is related to the unauthorised influx of fishers from outside the defined list of beneficiaries during opening days, which has been attributed as a key reason for reduced catches experienced by local people. One of the community leaders complained that "some people disregard the fact that local people have sacrificed a lot to protect their livelihoods". This is, however, a common concern shared by coastal communities that practice closures as a measure of resource conservation—due to their limitation in controlling incursions by other parties across the loosely-defined closure boundaries.

The periodic breaches of closure regulations are handled by a 'Security Committee' (Kamati ya Ulinzi), which has 11 members and maintains constant surveillance and patrolling of the area. However, a lack of efficient patrol boats have limited monitoring and enforcement efforts, which has been taken advantage of by non-compliant fishers. But this has not deterred the zeal of Tundauwa members to protect their area, an effort that has been acknowledged by neighbouring villages. Despite its resource deficit, the security committee seldom seeks outside support (as other communities have) such as from para-military groups, including the Kikosi Maalum cha Kuzuia Magendo (KMKM), to combat illegal fishing and other non-compliant activities in the protected area. The KMKM is equipped to confront violators of marine conservation, filling the enforcement gaps especially in those locations where the policing efforts of local communities are challenged due to the vastness of conservation areas, agility of violators and inadequate equipment.

As of the case study period, the most recent incident of unauthorised fishers violating conservation rules was in May 2025, where three fishers from the north of the village—who had set up a fishers camp (dago)—were apprehended who had set a fishers camp (dago) and were apprehended as they fished in the designated conservation area. Although they were punished through the imposition of a fine of TZS 50,000 each, the fishers pleaded for leniency and were jointly fined TZS 100,000. The

money from such fines are used by the Kamati to finance community projects such the ongoing primary school construction. Nevertheless, such episodes underscore the limitations faced by Tundauwa in terms of lacking effective means for adequate protection of its marine resources and highlight the need for material support in terms of equipment such as efficient patrol vessels. In 2023, the village received one boat from projects under the Blue Economy initiative that was acquired on a loan of TZS 26 million. This vessel is currently being used as a patrol boat to monitor their fisheries.

Shortcomings in efficient and timely information dissemination and sharing of the details regarding closing periods have led to a few violations of by-laws by some community members, who attempt to attempt to make their case on the grounds that they had not been adequately informed about closing times. Women, in particular, have raised complaints about not receiving timely and accurate information on closure and opening periods. This grievance was however attributed to the purported non-attendance by most women at community meetings discussing closure developments. Other challenges arise from climate change effects, such as heavy and prolonged rainfall, which destroys fish breeding sites along the Mwamba Mkuu reef area. It was reported that strong winds between June and July 2025 had derailed plans for opening the Hatuchoki Tundauwa closure due to safety concerns.

The adverse impacts of climate change, resulting from sea-level rise, ocean warming, coastal erosion and saltwater incursion, among other related challenges, have the potential to stall the progress made by Tundauwa and other fisher communities, whose fishery resources are vulnerable, and coastal ecosystems are fragile (in particular, coral reefs that are 'bleached' by the rising ocean surface temperatures; and retreating mangrove cover due to dieback) and which possess limited technological innovation to mitigate the effects of such threats (RGZ Fisheries Master Plan, 2022). In addition, there is a great possibility that such harmful impacts on the distribution and productivity of marine species exacerbate concerns about the sustainability of fisheries and aquaculture, and by extension the livelihood of fisher communities (RGZ Fisheries Master Plan, 2022).

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Conclusion

The experience of the Hatuchoki Tundauwa marine conservation initiative in Pemba, Zanzibar, illustrates that community-led periodic closures of the fisheries is a conservation tool that can be considered as a buffer against the uncertainty and variability of the ever changing circumstances in the coastal fisheries in Tanzania, the East African region and beyond. One of the advantages of this particular OECM initiative is its impact on the capacity of communities to effectively manage marine resources within specific geographical scales, using an approach that takes into account the ground realities—considering not only the livelihoods of the fishing communities, but also the sustainability of the ecology and natural resources of their areas.

Another important lesson highlighted by this OECM initiative is how self-initiated community governance structures such as the Hatuchoki Tundauwa cooperative can be a more effective and sustainable system for fisheries conservation because of the self-commitment needed to making the system work. This system was also able to ensure that the economic and social benefits accruing from conservation successes are realised by all members of the community in accordance with its own patterns of benefit sharing. The socio-cultural context of the community—with its respect for traditional knowledge—was also understood as having been favourable to this approach. Their strong sense of local ownership of the process and its resources, coupled with longstanding practices of seeking advice from community elders placed in leadership positions, allowed for the generation of common understanding and general consensus. The limitation of such systems, however, is that their success is reliant on the commitment and capacity of local management and community compliance.

The experience of Tundauwa village presents the case for promoting small-scale area-based marine conservation initiatives as one among the best (with due consideration to the context and specificities of proposed implementation sites) available options for sustainable conservation measures. This is because they minimise the frustration communities may feel in accessing their traditional livelihood strategies. In addition, promoting community governance structures that are self-sustaining is a better option to the alternative: top-down State-led conservation interventions, which can nevertheless be viewed as necessary depending on the ecosystem needs. In the case of Zanzibar, the stated rationale of the Fisheries policy is to prevent detrimental social, economic and environmental impacts, while aspiring to strengthen community capacity to manage coastal and marine resources through the co-management approach.

The Hatuchoki Tunduawa initiative can also benefit from some of the proposed interventions of the ZNPoA-SSF (RGZ, 2023) which include the need for ongoing government in-

volvement and commitment to continuously strengthen the capacity of the Shehia Fisheries Committees, Co-management groups (CMG) and other community organizations in order to "effectively operationalise and manage their resources, including management, spatial planning and provision of equipment". One suggested pathway for this intervention is the establishment and implementation of Standard Operation Procedures (SOPs) for co-management clusters or groups. As is evinced in Tunduawa village, such efforts are aimed at instilling in the community a sense of ownership and an understanding of the importance of effective management of local resources. In addition to the formation of dedicated and knowledgeable MCS teams, the plan of action proposes the establishment of platforms, such as fishers cooperatives, a women fishworker network and women gender desks within the MoBEF and its departments. As well, the ZNPoA-SSF suggests specific 'Targeted Education Awareness' campaigns and capacity-building initiatives for communities in the fisheries sector, focusing on value addition and livelihood development (RGZ, 2023).

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Fish landing site at Tundauwa, Pemba Island in Zanzibar, by Hamid W. Hamid

This case study on the impact of an **Other Effective Area-Based Conservation Measure (OECM)** on the fisheries and fishing community of Tundaua village on **Zanzibar's Pemba Island** highlights the important, but often overlooked, role of community engagement and ownership over initiatives to foster sustainable fisheries resources and safeguarding coastal ecology and marine biodiversity.

The Hatuchoki Tundauwa community-based marine conservation initiative, which involves instituting periodic closures for fishing, has been credited with improving the livelihoods and resources available to the practicing community. It is one of several successful community-led initiatives with the Pemba Channel Conservation Area (PECCA), which is part of Zanzibar's extensive Marine Conservation Area (MCA) network that is aimed at mitigating the impacts of anthropogenic activities and climate changed-related effects on the highly biodiverse waters around the Zanzibar archipelago.

While listing the positive outcomes from the Tundawa OECM, the case study also underscores the need for capacity-building, access to resources and financial support, efficient and adaptive management and enforcement mechanisms, and continued collaboration between local government units and community-based organizations to ensure enduring success of marine management areas over the long term.

ISBN 978-93-80802-43-5

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