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CASE STUDIES OF CHANGES IN THE STRUCTURE OF REEF LAGOON FISHERIES OFF SOUTHERN KENYA

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Abstract. This study analyzes changes occurring within shallow lagoon fisheries on the Kenyan south coast. The data were gathered at two intervals over a span of ten years at four selected sites: Mwaepe, Mvuleni, Chale, and Gazi. The four case studies offer different insights into the approaches of the artisanal fishers in coping with changing social circumstances, which in turn influence the fishers' attitudes and perceptions, as expressed in their growing desire for self-reliance rather than governmental regulation. Fisher groups now advocate the establishment of a Marine Protected Area under local supervision, in contrast to the earlier governmental approach for an MPA which they had opposed. Beach seines and ring nets have both been outlawed by most of the fishers themselves, although enforcement is weak. Ownership of hitherto traditionally managed areas has been traded to the tourist industry, signaling the power of short-term economic gains over religious and traditional attachments. The Beach Management Units – newly established by the government – have not been fully embraced by the fishers. In conclusion, we stress the importance of enhanced education and training in strengthening the self-reliance of the fishing community.

Key words: artisanal fishery, fishery management, stakeholder conflicts, social change, local agreements.

INTRODUCTION

Fisheries are one of the most important human factors influencing marine ecosystem. This is particularly the case in tropical coastal areas, where artisanal fisheries intensively exploit the higher trophic levels of the food web. In many areas, the traditional fishing communities manage to live in balance with the natural resources, although with a tendency to overexploit the largest and the most accessible species (Hempel & Pauly 2002). This has hitherto been based on strong traditions, the dominant role of elders and priests, and other cultural and socio-economic ties controlling population growth, fishing habits, and fish consumption. With the invasion of foreign fishers and fishing fleets, and with cultural and socio-economic changes in the structures of fishing communities – including their population growth – and new stakeholders like tourism, this community-based control of fisheries is fading away. It becomes replaced by attempts at top-down regulation by governmental decrees, introducing gear and catch restrictions as well as protected areas like marine parks with little or no fishing. These regulations have to be based on site-specific research and monitoring.

Fishers and fishing are integral elements of coastal marine ecosystems. No meaningful model of their functioning and their reaction to the various phenomena of global changes in climate, human population, and economies can do without comprehensive knowledge of the changes in fishing. Therefore repeated in-depth studies of fishing communities and their activities are indispensable, but hitherto rather rare. The present paper reports on four case studies on the south coast of Kenya, where these scenarios are more or less currently being played out.

A fringing coral reef frames most of Kenya's coast. It is strongly influenced by the seasonal cycle of monsoon winds. The sandy beach line is dotted by fish landing sites of artisanal fisher groups. In the mid-1990s, about 4000–4500 fishers landed about 6000 to 9000 metric tones per year (UNEP 1998).

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Although there has not been any recent census of the fishers, their number seems to increase, owing to a variety of factors like immigration from up-country populations and from neighboring countries, little alternatives for earning a livelihood, lack of employment, and the free access to the fishery resources.

Cinner *et al.* (2009) and McClanahan (2010) and others have examined the differences in livelihoods, socio-economic characteristics, and knowledge about the sea between fishers and non-fishers living near or far from the marine parks on the Kenyan coast. In another study, Cinner *et al.* (2010) also examined the institutions for community-based management of inshore marine resources within the expanded Western Indian Ocean. Tuda *et al.* (2008) carried out a study in the Diani-Chale-Gazi reef fishery on the southern Kenyan coast to estimate the total fishing effort over tidal to annual periods.

Other studies focused mostly on the impacts of fishing and climate change on the coral reef communities and the exploitable resources. Glaesel (2000) analyzed the state and local resistance to the expansion of environmentally harmful beach seines and ring nets. Earlier, McClanahan *et al.* (1997) had studied the effects of traditional fisheries management on fishing yields and on the coral reef ecosystems of southern Kenya.

The four case studies described in this paper are based on our earlier study (Okeyo 2003, 2010) of the artisanal fisheries, which was carried out in 2003–2005 at nine landing sites and 13 related villages in the Diani-Chale-Gazi-Shimoni region. The main objective of that study was to describe the relatively primitive and highly diverse artisanal lagoon fisheries as part of the local socio-economic system of the coastal communities. The villages differed substantially in their contacts with the tourist centers and with more advanced migrant fishers. The regular visits twice a month provided an opportunity to describe seasonal variations in fishing operations and catches. The fishers operate dugout canoes manned with up to four persons. Fishing takes place in the lagoons and on the reef flat and upper slope. Each fishing trip lasts several hours but less than a day. We found eight traditional gears used here; four of them common to all the sites and four others having been introduced recently in certain sites. Fishers changed gear in accordance with the seasons and the amount of catches changed seasonally. Our total estimation of the annual catch per unit coast line gave 14 t//km. This amount agrees well with the figure by UNEP (1998) of 12-18 tonnes per kilometer per year for the entire Kenyan coastline.

In the coastal communities about one-third of total household income was generated by fishing, not counting the fish taken for local household consumption, which made up most of the supply of animal protein. The elders acted as leaders within the fisher groups, imposing various kinds of restrictions in terms of closed areas and days without fishing. Several traditional resource-use strategies were in place and fishers were aware of them even if they did not observe them. There was widespread use of traditional knowledge in fishing practices and seamanship and in assemblage of both gear and vessels.

Many reports on the fisheries along the south coast of Kenya refer to study periods of between a few months (e.g. Alidina 2005) and a few years (e.g. Ochiewo 2004, Tuda *et al.* 2008, Fulanda *et al.* 2009, Okeyo 2010). However, only a few of them examined long-term comparisons of the changes occurring in the coral reef communities and their relations to ar-

TABLE 1. The ratio of registered to non-registered fishers, number of boats, and catches.

Landing site	BMU-registered	Non-registered	Total no. of fishers	No. of boats	Total catches (kg)
Mwaepe -2010/2011	119	40	159	72	1759
Mwaepe -03/04			95	96	1198
Mvuleni - 10/11	60	40	100	84	1214
Mvuleni - 03/04			95	95	1177
Chale - 10/11	96	36	132	108	1720
Chale - 03/04			260	201	1596
Gazi - 10/11	160	120	280	68	1194
Gazi - 03/04			230	180	6887

tisanal fishing along the Kenyan south coast, (e.g.) McClanahan & Muthiga (1988), McClanahan (1997, 2010), and Obura (2001), which examined the participatory monitoring of the shallow marine fisheries by artisanal fishers in Diani, Kenya.

In 2010–2011, almost a decade after our first study, we felt it worthwhile to repeat part of our studies on the fisheries. We found the development different from one place to the other in terms of number of fishers, boats, and landed catches (Table 1). Furthermore, we noted interesting changes in the attitude and social structure of the fishers (Okeyo 2003). Those changes are highlighted in this paper, each site serving as a specific example.

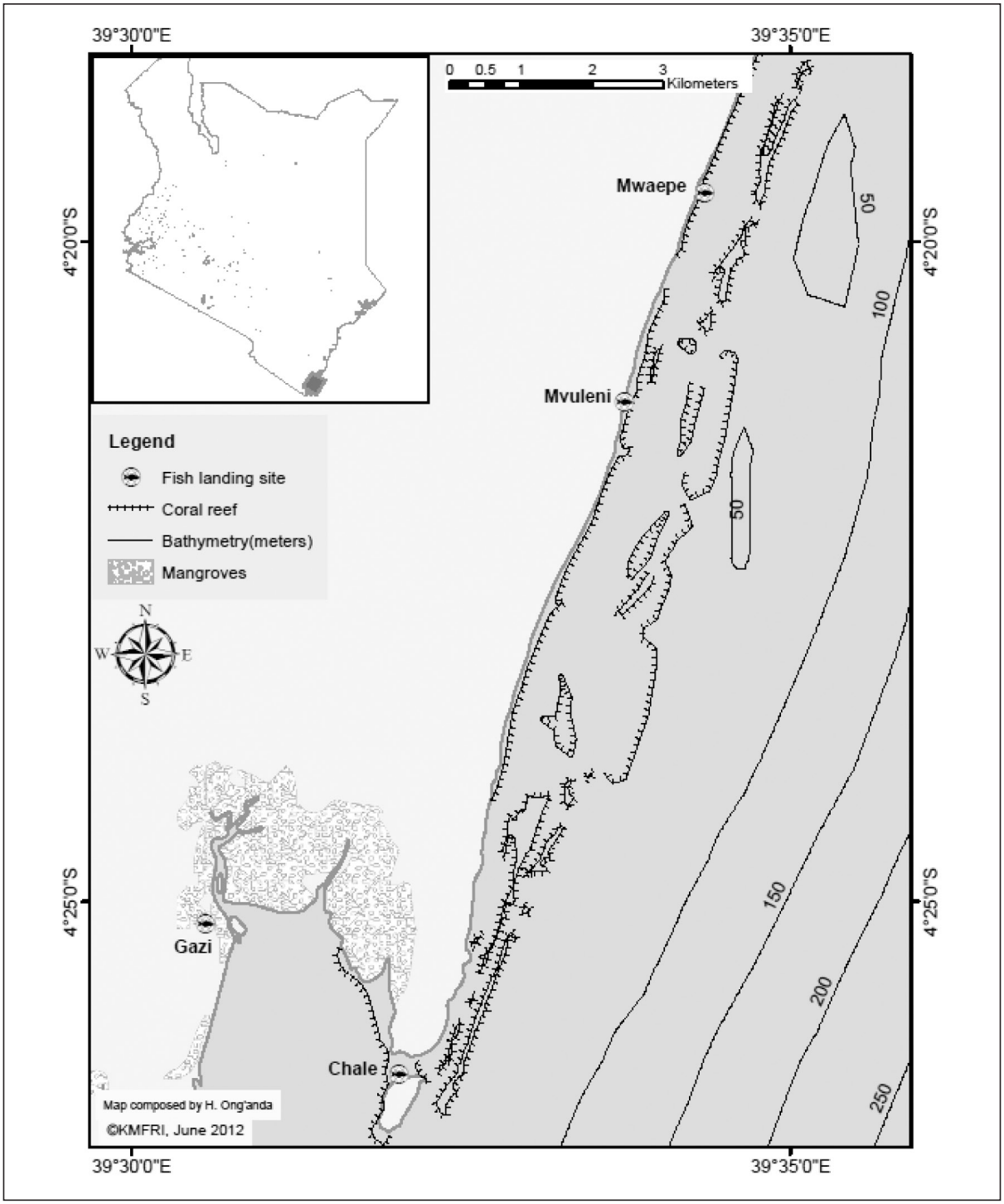

FIG. 1. Map of the study sites along the Kenyan coast; inset is the map of Kenya.

METHODS

During our first study period 2003–2004 we worked in the area covering about fifty kilometers of the coastline from Mwakamba to Mkunguni near the border to Tanzania (Fig. 1). Beforehand (2001–2002), we had mobilized fishers to form joint groups to enhance their capacity to manage fishery resources and to give artisanal fishers a stronger political voice. Through these projects, under the wing of the locally operating NGO Eco Ethics International – Kenya, we built up sufficient trust to enable us to undertake biological and socio-economic studies later on.

After active mobilization of the fishers, at the end of 2002 we selected nine landing sites on the Kenyan south coast. In each of them, fishing was almost exclusively by artisanal fishermen using a limited number of simple gears with all catches being landed at a given site where they could be easily recorded. The sites were situated from north to south in the Diani area (Mwakamba, Tradewinds); Kinondo area (Mwaepe, Mvuleni, Mwanyaza, Mgwani and Chale); Gazi area, with the relatively large Gazi landing site, and the most southerly Shimoni area (Mwaembe and Mkunguni landing sites). Most of selected landing sites were also the subjects of work by other NGOs operating independent of each other.

During initial visits, we briefed fishers at each landing site on the objectives of the study (Fig. 2). After that, each site was visited twice per month for almost two years in 2003 and 2004. During each visit, data collection captured total catches per day, number of fishers per gear (traps, gill nets, beach seines, lines, spears, set nets, cha-cha, and ring nets) per day, number of total boats, in this case the dugout canoes per day, as well as major fish taxa at each site.

Within the same period, detailed studies were carried out on the socio-economic features of 13 fishing villages related to those sites. A full account of those studies at the landing sites and fishing villages is given in Okeyo (2010).

From September 2010 to January 2011 five sites out of the nine original ones were visited again twice a month. An attempt was made to interview the same fishers using the original data capture protocol.

RESULTS

Case study 1: Mwaepe – pro and contra a reserve

Mwaepe is one of the three landing sites close to the tourist town of Ukunda. It is about two km south of

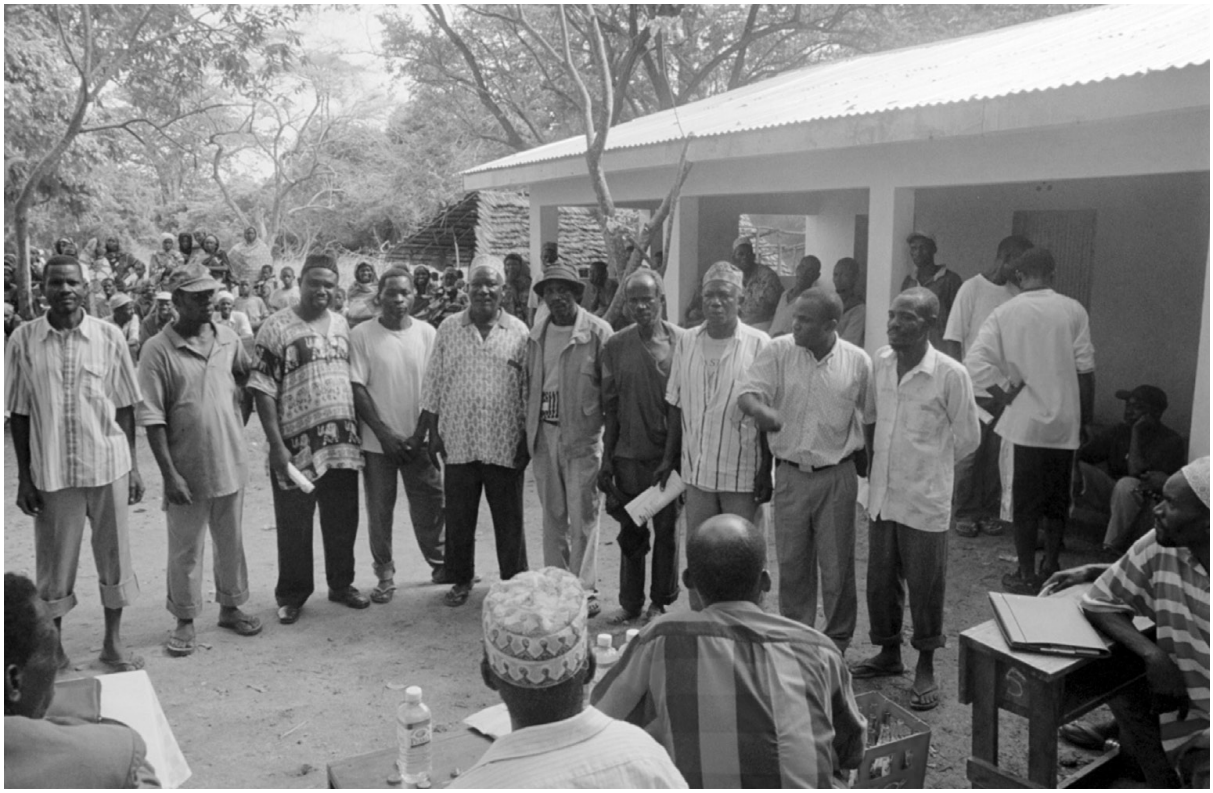

FIG. 2. Involving Chale fishers in mobilization processes.

Ukunda town and bordered on both sites by tourist facilities, mostly villas. During the recent study in 2010–2011, we noticed a newly established small eatery within the landing site. This eatery is well managed by one of the local community members who pays a monthly fee to the beach management unit. It serves African dishes as well as fresh fish. It affords an easy opportunity for visiting tourists to interact with the local fishermen and with community members who come to buy freshly-landed fish.

In the middle of the Mwaepe landing site is a big old baobab tree which has always provided shade for the fishers. Currently, two buildings have recently been put up for the fishermen by a joint venture of the Kenyan government and NGOs. Nowadays, underneath its shade, one of the fish dealers sells cowrie shells and other marine items collected from the shore.

Mwaepe is one of the most developed landing sites on the south coast, in terms of physical facilities. It is connected to electricity and boasts of two pit toilets, overhead shower, gear repairing shade, deep-freeze storage, as well as a store for fish handling and an office for the beach management unit.

At the turn of the century, Kenya had more marine parks than most other coastal states in Africa, devoted mainly to non-consumptive uses like snorkeling, diving, and aesthetic scenery views, primarily for the tourists. Fish-rich areas were selected to be separated as parks "for non-extractive use", with even no fishing for local food consumption permitted. Those parks were to be surrounded by reserves where fishing for local consumption was allowed, but only with certain traditional gear (= gear restrictions). The introduction of those parks had been largely promoted by local tourist hotels, Kenyan elites, and research scientists but was often opposed by the local people.

Mwaepe became the epicenter of opposition to the government plan of 1990 to establish a Marine Protected Area (MPA) within the nearby fishing grounds (Fig. 3). Two years later, when the legal process for the establishment was almost complete, trouble broke out. The local people, especially the artisanal fishers of the Mwaepe landing site, were up in arms as they feared to lose much larger areas to park status. The park service (Kenya Wildlife Service) was unable to guarantee that the protected area would not be expanded. The artisanal fishers also realized that the reserve status might not help get rid of the loathed migrating fishers from Pemba. As a consequence of the fierce local opposition, the government dropped its plans for an MPA in Diani. For many years the fishers rejected any association with the Kenya Wildlife Service or talk of an MPA, and this remained a bone of contention between economic forces and environmentalists on the one side and local communities on the other.

In 2010 word reached the Kenyan south coast fishers, especially at Mwaepe, of a successful locally managed Marine Protected Area at Kuruwitu north of Mombasa. The establishment and operation of that MPA was an elaborate process of community mobilization, donors, and government support. The community had been mobilized by NGOs towards the idea and when it came to soliciting for funds it was easy to garner support as the idea came from the community. A few other non-state actors and local community-based organizations had additionally worked with the Kuruwitu community to refine the idea. This bottom-up approach avoided the acrimony associated with the earlier top-down attempt to locate a similar venture on the south coast. Similar positive experiences about the co-existence of artisanal fishers and "soft" tourism were reported for the Kiunga marine reserve in northern Kenya (Hempel 2007).

During a visit to the community, our interviews showed that Kuruwitu fishers were aware of the long-term benefits of the establishment of a Marine Protected Area. The fishers also pointed out several short-term benefits:

(1) The introduction of tourism in the MPA led to several physical facilities, including guest rooms, engine boats to ferry visitors to fishing grounds, catering facilities. Those provisions meant additional income for the fishers and community of Kuruwitu.

(2) Ownership of the fishing grounds remained in the hands of the fishers and the community.

(3) Education programs funded by donors and the Kenyan government, such as fighting adult illiteracy and training exercises to prepare the fishers and community for managing and sustainably exploiting the protected area for fishing and tourist services. Further, it assisted the community in becoming aware of their rights, increased their ability to negotiate for benefits, and opened other livelihood options like tour guiding and catering.

(4) The good publicity resulting from these helped to advertise the new facilities installed and boosted the morale of the local community, making them proud of themselves as they became the envy of neighboring communities.

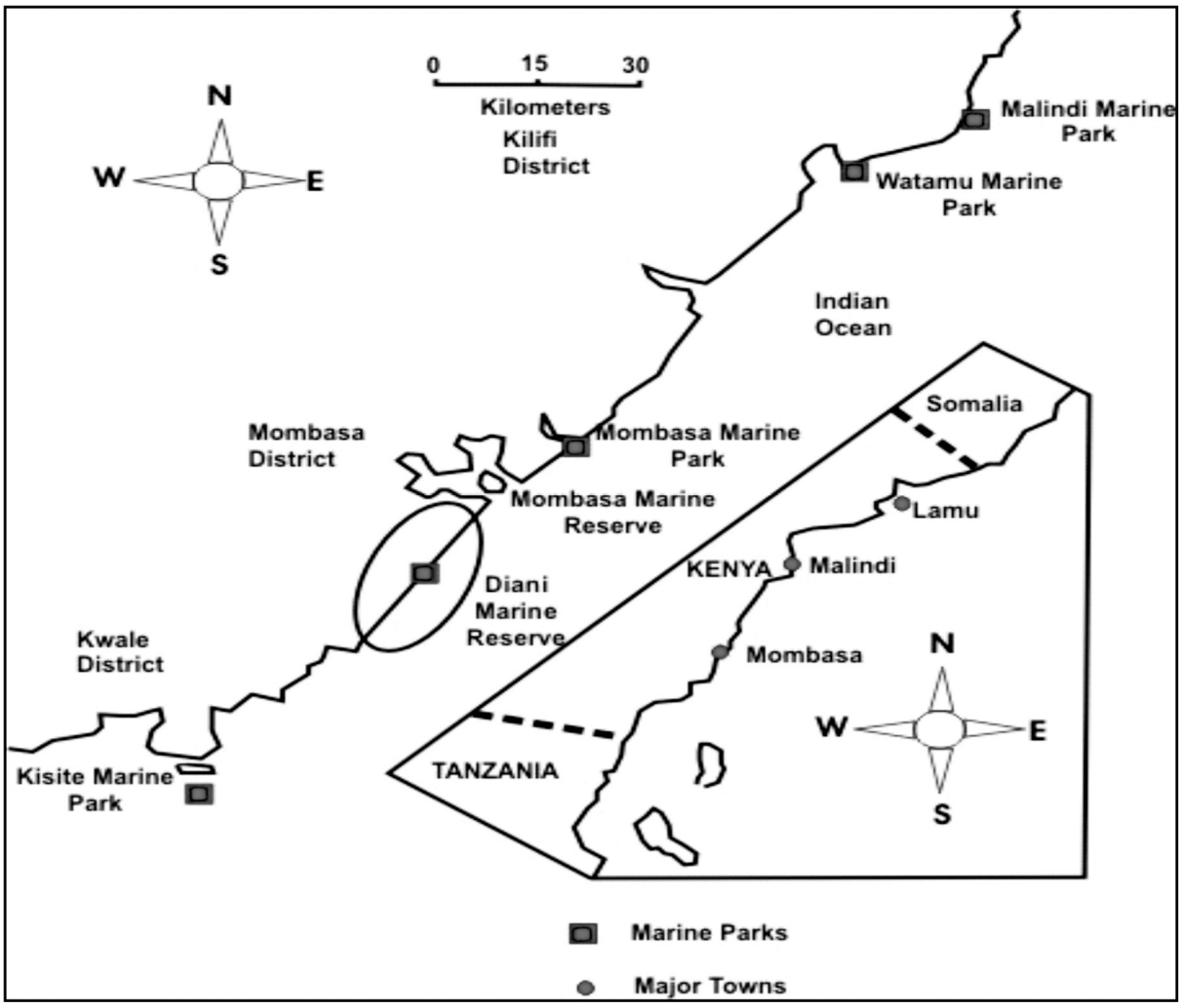

FIG. 3. Map showing the proposed Diani Marine Protected Area; the superimposed map shows the entire Kenya coastline with proposed MPA in Diani on the southern side of Mombasa. Map courtesy of Heidi Glaesel (2000).

In April 2010 the Mwaepe fishers and others from the south coast visited the Kuruwitu area. After discussions and demonstrations by the Kuruwitu people, the Mwaepe fishers expressed a desire for a similar arrangement – something they had been completely against eight years before when our first study was undertaken. They became convinced that such a protected area under local supervision would be more profitable on the south coast than in Kuruwitu. The south coast is known for wider beaches with fine white sand, and is therefore highly favoured by tourists. Indeed, many tourist beach hotels are located there. Moreover, the fishers argued that with the existence of sacred sites in the south there would be additional cultural interests for tourists. South coast fishermen also had already had a long exposure to tourists since they try to ensure a continuous supply of fish to the tourist hotels even during the low fishing periods of April to September.

Case study 2: Mvuleni – the case for the first motorized boat

The Mvuleni landing site is situated near Mwaepe about three kilometers south of Ukunda. During our first study period in 2001–2005 over 90 fishers operated about 95 traditional un-motorized dugout canoes for near-shore fishing. In 2003 however, the local beach management committee acquired piece by piece the materials for an open wooden 20-foot boat powered by a 40 HP Yamaha outborder (Fig. 4). They were financially supported by the Canadian Fund for Local Initiatives (CFLI). In 2003–2005 the boat had been built, and the fishers trained in the basic skills of its maintenance, handling, and in the guiding of tourists.

FIG. 4. The first motorized boat locally assembled by the Mvuleni fishers.

During the period leading to the local building of the boat the following steps had been taken:
- The fishers as well as the neighboring community had been mobilized towards the project, the goals highlighted, and their opinions incorporated.
- A steering committee was elected by the fisher community after an open discussion of the roles and qualities needed in such persons.
- The steering committee had short introductory training on community mobilization, group dynamics, and leadership.
- The members of the steering committee, together with representatives of the supporting local institutions, organized an excursion along the entire coast of Kenya to identify other types of motorized boats. These trips also involved listening to local groups that have similar facilities, concentrating especially on the challenges involved.
- After the visits, members of the steering committee took two days to analyze and discuss their observations and to come up with a way forward that was later presented to all members of the beach landing site at Mvuleni for further discussion and negotiation.
- Upon agreement on the way forward for the acquisition of the boat engine and assembly of the boat, the steering committee set forth to identify qualified persons who could lead the group in the boat-building exercise. Later the committee also bought all the required materials including the engine.
- It took almost a year to build the boat involving either active or passive participation of the fishers. This period helped to instill a sense of ownership and gave room for disagreements to arise and simmer.
- Once the construction process was complete, training on boat maintenance and operation was organized. At this point the fishers were asked to buy safety jackets for themselves and their guest tourists at their own cost. It was made clear that without the jackets the boat could not leave the building yard. The anticipation of almost a year to see their boat in the water was probably sufficient motivation to do everything possible to remove the hurdles. This process further improved cohesiveness in the group.
- Once the boat was sea-going, a minimum in financial training was set up and members of the steering committee registered for this training. Here they were introduced into the basics of book-keeping, basic cash book recording, and simple generation of a profit and loss account. With good book-keeping, the possibility of reducing financial conflicts, which is a major problem in many such groups, was opened up. The training was provided by the supporting local institutions to which our study members belonged.

Considering these elaborate processes, it is little wonder that the group is still intact and the boat well-kept, even with a new coat of paint as observed during the recent study of 2010–2011. Originally the boat was meant to support the fishers by expand-

ing their operations into deeper waters, however in practice it was used by the fishers to ferry tourists to the traditional inshore fishing grounds and to show their traditional fishing techniques.

In the neighboring Mwaepe landing site a similar motorization project had been started a few months later in 2003. However, in Mwaepe they acquired prefabricated fiberglass boats as opposed to the one elaborately assembled at Mvuleni. When we revisited Mwaepe in 2010 none of the motorized boats could be seen. The reasons for the failure perhaps lie in the lack of proper ownership by the fishers and in internal and external financial quarrels.

Case study 3: Gazi – the migrant fishers of Pemba and their ring nets

Gazi fish landing site is located in a shallow bay lined by mangroves. A few meters into the lagoon there is a covering of sea-grass beds with some rock formations occasionally visible during low tides. Small islands not far from the beach shield the Gazi lagoon from strong ocean wind and wave action. The presence of the mangrove forest at the shoreline makes Gazi a regional hot spot for biodiversity. The shallow depth contributes to the Gazi lagoon's productivity due to ample light penetration to the sea bed. The islands, rock formations, and sea-grass beds protect the lagoon from wave action. Due to the unique physical and biological conditions of Gazi beach and lagoon, a village barely 200 meters away from the shoreline has been in existence for many decades. Folklore and inquiries of the Gazi elders indicate that migratory fishermen from Pemba Island in Tanzania settled here in the course of fishing forays into Kenyan coastal waters. Due to their success in artisanal fishing they were able to attract several young women from the neighboring Digo community. Later on, local men moved to the village to join the Pemba fishers. However, the feeling that Pemba fishers were originally foreigners scavenging for fish has never totally left the mindset of the Digo people in Gazi village. This mixing of two ethnicities and somewhat different cultures has also in a way led to the emergence of stronger fishing organization and power.

The high volumes of fish catches at Gazi can mostly be attributed to the use of ring nets (Okeyo 2010), which are not used by fishers at other landing sites. According to McCallahan (1997), Digo fishers already complained about ring nets and beach seines in the 1990s, when fish catches in the entire Kenyan south coast started to dwindle. Both gears exert a high fishing pressure and hence reduction in cpue (catch per unit effort). Beach seines have a physical impact on the sea bed and might damage fragile parts of coral reefs. Ring nets are normally operated pelagically in deeper waters and are less likely to damage benthic communities. From 2000 onwards, fishers agreed to abandon beach seines and ring nets, but some fishers decided to move to other fishing grounds or to hide their catches. In 2006, the Kenyan government regulated the use of ring nets all along the Kenyan coast, banning them in certain years and authorizing their use in others. Sometimes, however, the government officers simply failed to take action against illegal ring net fishing.

During our second study in 2010–2011 the use of ring nets in the Gazi lagoon had already been declared illegal and their use had drastically gone down but had not completely ceased. The governmental regulations, however, have resulted in a severe deterioration in data acquisition. To date, Pemba fishers visit Gazi during certain times of the year, when catches are abundant. The catches taken by them in the lagoon are not landed in Gazi anymore and therefore its data are difficult to obtain.

Case study 4: Chale – generational and ownership conflicts

The Chale landing site is located in a bay with calm waters and has a wider and deeper lagoon than neighboring landing sites. When first visiting Chale in 2001, a well-knit group of fishermen existed there under the leadership of beach committee chairman Mzee Abdalla Boga (Fig. 2). This committee made it easy to reach out to all fishers through the various committee meetings. A sacred beach site existed, reaching about 200 meters into the water, that was revered by most fishers and community members of the neighboring villages.

Access to the sacred site was restricted mostly to the elders and during rituals. Fishers at this landing site observed both Muslim as well as traditional African rites and remained religiously attached to certain protocols, for instance prayers at the sacred site before embarking on a fishing trip. Thus there was proper order during fishers' morning and afternoon assemblies and during operations.

In September 2010 to January 2011 we revisited Chale. The observation period from September to January coincided with the southeast monsoon (locally known as Kusi) and northeast monsoon (Kaskazi), with some emphasis on the latter. During the Kusi period from April through September it is windy and the waters are rough and unfavorable to artisanal fishers

with their small, non-motorized boats. This is followed by an intermediate period "Demani" when the winds tend to get calmer, and finally the calm period "Kaskazi" sets in from October to beginning of March.

To enhance comparison with the observations of 2001–2004 and 2010–2011, interviews were restricted to the old members of the Chale artisanal fishers' fraternity, although the new members were allowed to add to or challenge their opinions. In the repeat study of 2010 and 2011, there was a remarkable change in membership of the fishers at Chale beach landing site. About half of the former fishermen were not active anymore. Current members explained that they had become too old for active fishing and that they now preferred to support the younger members. Most of them thus remained home either tending to their farms or repairing fishing gear and vessels for the younger fishers.

In the period 2001–2004, control of fishing activities was in the hands of the elders, i.e. they made most of the decision, such as where to go fishing or which gear to use, and they settled disputes arising from the fishing enterprise. Further, the young fishers had a preference for spear guns, since they were easy and cheap to acquire. The elderly fishers accused those with spear guns of destructive fishing. Thus many young fishers were little interested in the organization of the mainstream artisanal fishers. In 2010–2011 things had changed and the younger fishers appeared to have coalesced into the mainstream artisanal fishing organization at the landing sites.

There was a striking reduction in the size of the Chale landing site. The ownership had changed, and a tourist tree-top hotel had been built in the center of the original Chale beach landing site. The old fishers explained that core members of the beach landing committee, together with a local politician, had conspired to sell almost the entire landing site to a South African hotel entrepreneur. This area had been initially reserved as community land mostly owing to its connection to the sacred site. The entire area had been entrusted to the fishers through their beach committee.

The disposal of the Chale beach landing site caused social conflicts among the fishers and within the village community. It is said that the politician fleeced the old men of their rightful share and that the beach committee members even disagreed among themselves; hence the outrage felt by the other community members became greater. They petitioned the hotel developer to spare some area around the sacred site. Moreover, the Chale community demanded that the old building for fish handling and storage on the site (Fig. 5), which had been demolished during the construction of the hotel, had to be rebuilt.

FIG. 5. Chale fish banda opening ceremony in 2003; the building was erected during the first phase of the study in 2001-2004 to assist in fish handling and storage for the Chale fish workers.

While this request was granted by the hotel, the animosity and split within the fisher fraternity and the extended Chale community continued for months. We later learnt that some of the elder fishermen who had been involved in the transaction and disproportionate sharing of the returns had stayed away from the landing site when the folly of their action became apparent.

Thus a new Chale fisher's beach committee – currently known as the Chale Beach Management Committee – was installed under new leadership. Normally beach landing sites close to sacred sites were usually headed in a hereditary manner, with the leading elder handing over the leadership mantle to a younger member of his family following several years of training. Further, the chairman of the landing beach committee was also the religious leader of the sacred site. The nomination of new entrants as the chairman of the Chale beach landing committee posed a big challenge to the functions of the sacred site, which hitherto were a preserve of the elders. In the days past, nominations once made would have to be ratified by the spirits through visions to one of the senior elders. The elaborate and sometimes secretive procedures were the foundations of the belief systems and made the elders revered, unique, and able to command respect from all the fishers and the neighboring communities. Important decisions, like the establishment of a new beach committee, should have been made after consultations with elders in the community, who in turn could have consulted the spirit world. As none of these procedures were followed, the functions and roles of the sacred site were left in abeyance, and the new leaders became open to ridicule by those who still believed in the traditions and customs. It remains to be seen how the new leadership will respond to the sacred aspects of the site and adherence to taboos and customs initially important in settling disputes on this site.

The fishers of Chale insisted on literacy as an overriding criterion for the members of the new beach landing committee, and especially of its chairman. To them an illiterate leader would be easy to lead to such unfortunate scenarios like the sale of community land to third parties. Thus the goal-posts shifted; instead of lineage to the leadership family and seniority in age, it became more to do with education and ability to withstand persuasive but bad influences. This was notwithstanding the fact that, among the artisanal fishers, old age remained associated with wisdom and often the ability to communicate with the powerful spirit world.

Changes in fisheries

Basic comparative figures for 2001–2004 and 2010/2011 on fishers and fisheries are given in Table 1. In Mwaepe and Gazi the number of fishers went up, in Mvuleni it remained almost the same. Only in Chale did it decline by half because of the severe reduction in the size of the landing site and the upheavals in the landing site committee. The number of dugout canoes went down in all four landing sites; in Gazi because of the ban on ring nets and beach seines, and particularly in Chale for the reasons just outlined. Changes in the catch per unit effort have not yet been critically analyzed, but there are indications that it has not gone down over the past decade. Seemingly the numbers of canoes have a stronger influence on the exploitation rate than the number of fishers operating them.

DISCUSSION

Participatory involvement of fishers – the case of Mwaepe

The failure by the Kenyan government through its agency the Kenya Wildlife Service to succeed in initiating an MPA within the Diani – Kinondo area exemplifies the lack of early involvement by the community. As rightly stated by Christie *et al.* (2003), top down approaches have frequently proven unsuccessful as marine conservation strategies because they tend to disenfranchise and alienate key stakeholder groups, resulting in opposition, poor compliance, or lack of support. Also in the case of Mwaepe there was no communication mechanism to rebuke or diffuse some of the falsehoods peddled about the establishment of the park. For instance, when the allegation that the park boundaries would be extended to cover a major part of the fishing grounds was doing the rounds, there were no structures to respond adequately in time. These kinds of allegations carried the local people away and they revolted against such proposals.

It is not surprising that two decades later some Mwaepe fishers would express the desire for a somewhat similar venture after visiting a locally managed protected area about 100 kilometres away from them. The Kuruwitu protected area is a reflection of true community involvement, encouraging various agencies and organizations to supply substantial technical and financial support. The establishment of the protected area at Kuruwitu involved an elaborate process of identifying the challenges faced by the community, the discussion and debate of easily

adoptable solutions, negotiations on the agreed options, and finally implementation of the agreed actions. The community thus had enough time to ventilate their anger against the proposed plan of action, and even to refine or alter it. Little wonder that it was easy for the people of Mwaepe and other south coast fishers to be convinced by the Kuruwitu scheme of the benefits of a locally managed conservation area.

Power of a pilot project to influence attitudes and perception

This change in attitudes and perception towards the establishment of a locally managed Marine Protected Area illustrates the power of a successful pilot or demonstration project as a tool to 'sell' a new idea or concept to a community, as well as giving credit to the bottom-up approach. It also shows the importance of adequate community mobilization and trust-building before any attempt to actually establish an MPA. Not least, the importance of having a Marine Protected Area cannot be gainsaid, especially with regard to long-term ecosystem sustainability, beneficial both to the fishers as well as to the non-consumptive users like tourists.

Proper ownership and technical capacity-building required for technological introduction (Mvuleni)

The Mvuleni case study demonstrated the need for a serious involvement of communities at all stages of the introduction of new facilities, such as motorized boats, in order to build a sense of ownership of the facility. Once ownership is attained it becomes difficult for the community to let the facility go to waste or be taken away from them. The ability to manage or maintain depends also on operational information and skills. These two attributes, sense of ownership and technical skills, enabled the boat facility to remain in good condition until today.

Demarcation of certain crucial beaches protected by traditional and religious habits (Chale)

Several workers (Glaesel 1997, 2000; McClanahan *et al.* 1997, Obura 2001, Okeyo 2010) have analyzed the various traditional and religious beliefs of the artisanal fishers of the south coast of Kenya. Although bonds to cultural traditions and religious beliefs among fishers continue to weaken, there is still a widespread will to protect sacred sites used and maintained by traditions and customs. Therefore any attempt to demarcate Marine Protected Areas, along the Kenyan south coast in particular, should have started by profiling the sacred sites (Okeyo 2010). Those sites were already protected by local consensus and had unique features which could be easily used in non-consumptive exploitation, e.g. the sacred rituals and offerings to the sea gods. In addition, their protection would be seen as support and respect towards local beliefs and spirituality.

Effectiveness of local consensus on gear regulations (exclusion of beach seines in Gazi)

In the revisit study, we noted that the remaining beach seine nets in Gazi were no longer in use. This observation highlights the potential of local consensus and agreements as a tool for fishery management, at least as far as gear regulation is concerned. McClanahan (1997) stated that restrictions in the use of beach seines by fishers at the Mvuleni-Mwanyaza landing sites could have been responsible for 40% higher catches at those sites compared with others. The attainment of a local consensus requires availability of information from trusted sources for most resource users, belief in the source of the information and, better still, some demonstration of effectiveness. This is a potential field for collaboration between researchers, fishers, and government fishery officials.

Low levels of acceptance of Beach Management Units (BMUs)

A Beach Management Unit (BMU) is an approach by the Kenyan government to share fisheries responsibility with stakeholders. These include the fishers, fish dealers, government representatives, and other interested parties within the precincts of a given coastal community. The roles of the BMUs have further been elaborated through a national fisheries policy of 2006. Major objectives of BMUs have been further detailed by Cinner *et al.* (2009). The idea of BMUs has not been taken up at many landing sites, and by 2009 only up to 30 BMUs had been put into operation (Cinner *et al.* 2009), at least on paper.

In our 2010/2011 study of four landing sites we learnt that many fishers shy away from registering as members of a BMU (Table 1). The BMU law requires that before a fisherman is registered by his respective BMU he has to be vetted by a government fisheries official. This implies that the fisher must also be licensed by the government. However, many artisanal fishers have no interest being registered by any government authority; they have a personal attachment to fishing (Okeyo 2010). Fishing is their habit and attitude and they see no justification for any government license; the government after all does not register small-scale farmers eking a living out of

the soils. Obviously the request for the registration of each artisanal fisher was implemented without adequate consultation, information dissemination, or agreement with the fishers. Such an approach is similar to the attempt to create a marine park that was rejected by the fishers despite all its good intention.

For various reasons the ratio of fishers registering differs somewhat between the sites (Table 1). It is high in Mwaepe, while in Gazi many fishers remain unregistered, perhaps primarily those coming from Pemba and not having Kenyan identification cards. Identification cards are prerequisites for becoming registered as fisher, and are issued to Kenyan nationals upon reaching 18 years of age. Therefore younger fishers cannot register; this kind of segregation of fishers might be counterproductive as it creates friction between the fishers themselves on one hand, and with the government on the other. Furthermore, unregistered fishers are unwilling to disclose information about their fishing operations and catch.

General conclusions

Some general conclusions might be drawn from the revisits after a decade.

(1) Even within a short stretch of 50 km of rather uniform coastline, the developments vary greatly from one landing site to another. Any monitoring scheme should therefore be based on several sites. Revisiting the same sites at ten-year intervals is a scientifically rewarding exercise.

(2) A growing tourist industry exists alongside the fishers. This has positive effects in creating additional employment and sources of income by selling fresh fish year-round at good prices and by taking tourists to sea. The emphasis on non-consumptive uses of the coral reefs in addition to fishing is increasing in many places along the Kenyan coast. On the other hand tourism causes ownership conflicts at the beaches which had previously been the common property of the fishers.

(3) The growing conservation movement in Kenya, supported by governmental and non-governmental organizations and by sections of the tourist industry, advocates strongly for the creation of Marine Protected Areas, which means restrictions on fisheries exploitation with promises for long-term gains. Fishers have to find their own local way to protective measures.

(4) A weakening of the religious bonds and their taboos was already noted some years ago (McClanahan *et al.* 1997, Alidina 2005, Okeyo 2010). The traditional fishery management, with closed fishing seasons and days, closed sacred areas and gear restrictions, had been enforced by the elders. This is increasingly questioned by the young generation, causing substantial conflicts in the hitherto hierarchical order of the fishers.

(5) Traditional management is being replaced by governmental regulations with low acceptance by the fishers. The introduction of the Beach Management Units is not a panacea, as its requirement to register fishers at the respective landing sites is a bone of contention. There is not enough motivation for the registration, and in cases where fishers are from outside Kenya – the case of the Pemba fishers stand out – there is outright rejection. There is need for this concept to be rethought and to put adequate mechanisms in place to encourage fishers into such management schemes.

(6) The number of fishers tends to increase although the number of boats remains more or less constant. This might mean that the total catch has to be divided among more fishers and has to support a larger population in the fishing village (Hempel 2007). This could have the repercussion that fishers use their boats more intensively and hence increase the pressure on the fish resource.

(7) At all sites we noted an increasing interest in self-reliance and better education. A higher rate of literacy among the fishers is a prerequisite for them to defend their rights and develop their own local management. In the 2003/2004 study only 25% of the fishers were able to read and write (Okeyo 2010). More recent figures are not available. National and international support should be directed to capacity-building at all levels, from primary and vocational education to training in technical and managerial skills (Nauen & Hempel 2011).

(8) The four case studies demonstrate the variety of changes that might take place in the artisanal fisheries along a short stretch of coast which is relatively homogeneous in terms of both human population and marine habitat. Much of the changes have to do with changing attitudes in the fishing communities. Their influence on the exploitation rate of the fish stocks needs further detailed studies of the volume and composition of the landings.

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