



# AWERProcedia Advances in Applied Sciences

Vol 1 (2013) 364-370



1<sup>st</sup> Global Conference on Environmental Studies 2013

## Coastal resource use and management on Kilwa Island, southern Swahili Coast, Tanzania

**Ryo Nakamura** \*, Research Institute for Humanity and Nature (RIHN), 457-4 Motoyamama, Kamigamo, Kita ku, Kyoto 6038047, Japan.

### Suggested Citation:

Nakamura, R. Coastal resource use and management on Kilwa Island, southern Swahili Coast, Tanzania. *AWERProcedia Advances in Applied Sciences*. [Online]. 2013, 1, pp 364-370. Available from: <http://www.world-education-center.org/index.php/paas>. *Proceedings of Global Conference on Environmental Studies (CENVISU-2013)*, 24-27 April 2013, Zeynep Sentito Hotel, Belek – Antalya, Turkey.

Received November 07, 2012; revised January 09, 2013; accepted March 13, 2013.

Selection and peer review under responsibility of Dr. Nehir Varol.

©2013 Academic World Education & Research Center. All rights reserved.

### Abstract

This study analyzed the exploitation and sharing of coastal resources in Swahili maritime society, where many ethnic groups intersect. Bantu people and people of Arab/Persian descent have long coexisted in the use of fishery resources on Kilwa Island in Tanzania. The study area included three ecological sea zones (ecozones): mangrove inland sea, open sea with fringing reef, and intermediate sea. Because of the diversity of sea products in these ecozones, each ethnic group has been able to monopolize its own fisheries, thus reducing intergroup conflict. This has contributed to the maintenance of harmonious multi-ethnic coexistence on the island. A clear understanding on the current status of use/sharing of maritime resources by local people is a necessary component for avoiding social disorder caused by the environmental conservation policy.

Keywords: coastal resource use/management; multi-ethnic coexistence; fishing culture; Kilwa Island;

---

\* ADDRESS FOR CORRESPONDENCE: **Ryo Nakamura**, Research Institute for Humanity and Nature (RIHN), 457-4 Motoyama, Kamigamo, Kita-ku, Kyoto 6038047, Japan, *E-mail address*: [nakamuraryo@chikyu.ac.jp](mailto:nakamuraryo@chikyu.ac.jp) / Tel.: +81-75-707-2499

## 1. Introduction

This study examined the relationship between maritime environments and fisheries particular to Swahili maritime society, in which many ethnic groups have long coexisted. The focus of research was Kilwa Island in Tanzania, a Swahili island famous for its prosperity due to Islamic Indian Ocean trade in the era of the Kilwa Kingdom (13th century). By examining the current status of fishing resource use, this study identified a need for caution in the management of coastal development.

Kilwa, at latitude 9° south, is a small island located a short distance from the southern Swahili coast of Tanzania. The island is 23 km in circumference and 12 km<sup>2</sup> in area, and it supports fewer than 1000 inhabitants. The main livelihoods on Kilwa are fishing and agriculture; people obtain staple foods from agriculture and money from fishing. Kilwa Island flourished as the most influential Islamic Kingdom along the Swahili Coast from the late 12th century to the mid-14th century due to Indian Ocean trade<sup>1</sup>. Today, only stone ruins of the Kilwa Kingdom, which were classified as a UNESCO World Heritage Site in 1981, remain<sup>2</sup>. This small island population is in the midst of social change arising from development, including maintenance of traffic infrastructure, restoration of the Kilwa Kingdom site, maritime environmental conservation, coastal development, and tourism<sup>3</sup>.

## 2. Ecological sea zones and sea products of Kilwa Island

Kilwa Island is bounded on the inland side by an inland sea covered with mangroves (mangrove inland sea) and on the Indian Ocean side by open sea with a fringing reef. The maritime environment of Kilwa Island consists of three ecological sea zones: a mangrove inland sea to the west (ecozone 1), an open sea with fringing reef to the east (ecozone 2), and an intermediate sea between the inland sea and the open sea (ecozone 3) (Nakamura<sup>4</sup> pp48–50) (Figure 1).

Ecozone 1 is separated from the open sea by Kilwa Island and is surrounded by mangroves. The water is calm, with no strong wind or wave action, and it is brackish and shallow. Ecozone 2 is characterized by deep water, rough waves, and strong winds influenced by seasonal monsoons and the East African Coastal Current. Ecozone 3 is characterized by a combination of qualities from ecozones 1 and 2. Closer to the inland sea, the water is shallow and supports mangroves and small coral colonies; closer to the open sea, the water is deeper, but is still protected from strong wind and wave action. There are 66 fishing grounds surrounding Kilwa Island (Figure 1). Thirty of these (45%) are concentrated within the inland sea (ecozone 1); ecozones 2 and 3 each have 18 fishing grounds (27.5%).

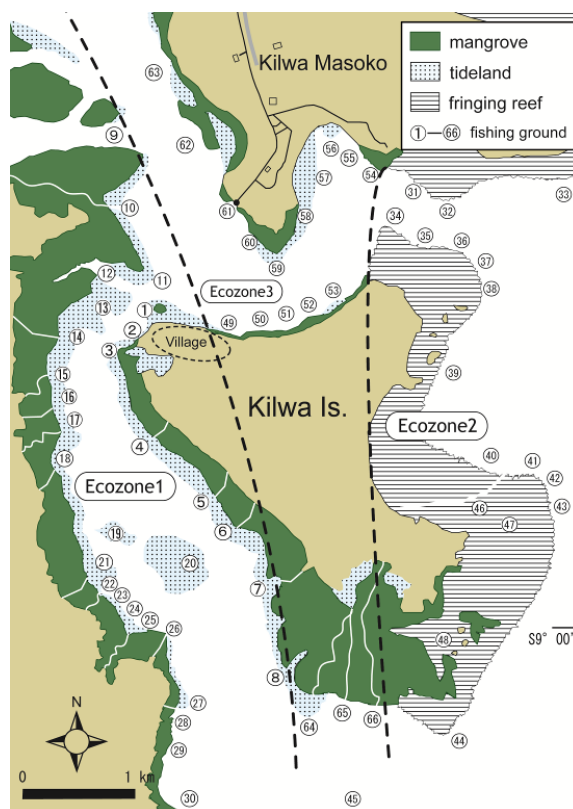


Figure 1. The ecological sea zones and fishing grounds of Kilwa Island (Nakamura <sup>4</sup> p55)

Sea products from ecozone 1 include several varieties of small and medium-sized fish and sea cucumbers (*jongoo maji*: *Holothuria scabra*, *Stichopus*, *Bohadschia atra*, etc.). The mangrove forests support numerous aquatic animals, including prawn (*kamba prounzu*: *Fenneropenaeus indicus*), large mangrove crab (*kaa gobesu*: *Scylla* spp.), and other shellfish (*kombe*: *Anadara erythraeonensis*).

Ecozone 2 supports medium-sized fish in the area around the coral reefs; octopus (*pweza*: *Octopus cyanea*) and giant clams (*gawagawa*: *Tridacna maxima*) live on the coral bed. The coral slope supports lobster (*kamba kochi*: *Panulirus ornatus*) and large fish. The deep water beyond the coral slope is inhabited by benthic fish, including *chewa* (*Cephalophis miniata*) and *pono* (*Scarus sordidus*), and migrant fish such as *jodari* (*Thunnus albacores*) and *kolekole* (*Caranx melampygus*). *Songoro* (*Rachycentron canadum*) can be found in the open sea. The sea products of ecozone 3 include some of those found in ecozones 1 and 2.

### 3. Ethnic and economic composition

Kilwa Island is an Islamic multi-ethnic society, reflecting its long history as an international trading port. The Islamization of the island dates to the Kilwa Kingdom era (mid-10th century AD) <sup>1</sup>, and all inhabitants are devout Muslims (Sunni, al-Shāfi‘ī). A total of 573 individuals from 28 different ethnic groups organized into 101 different households were counted during field research in 2005. (Nakamura <sup>4</sup> pp51–52). However, as Swahili culture is “Afro-Arab mixed blood,” the study divided the ethnic composition into two main groups: the Bantu and people of Arab/Persian descent.

An economic gap exists between the two groups within Kilwa society. Depending on their occupations, some families in both groups are relatively wealthy. These include owners of small shops, Islamic high school teachers, and government employees; those of Arab descent who manage the salt

industry; and Bantu who are traditional medicine men. Families of Arab descent are generally wealthier because they are involved in more complex livelihoods, including fishing (the primary industry of Kilwa), the salt industry (secondary industry), and sea transportation (tertiary industry). Most Bantu people engage in subsistence livelihoods, particularly traditional fishing and agriculture.

The possession of large boats is the main symbol of wealth on Kilwa Island. Seven types of boats are commonly used along the Kilwa coastal region: *mtumbwi* (dugout canoes), *ngalawa* (double-outrigger canoes), *dingi* (dinghies), *mbare* (flat-bottomed boats), *dau* (plank structure keeled boats), *mashua* (plank structure keeled boats with bowsprits), and *boti* (inboard/outboard-engine boats). Among these, *mtumbwi*, *mbare*, *dau*, *mashua*, and *boti* are used on Kilwa Island. Boats can be divided into small and large categories. *Dau*, *mashua*, and *boti* are large boats, which have a keeled plank structure. The *dau* and *mashua* have a Latin rig, and the *boti* uses an inboard or outboard engine. Because of their keels, a long beam located along the V-shaped bottom, large boats can safely sail in the open sea. *Mtumbwi* and *mbare* are small boats without keels. They are suitable for use only in the shallow waters and in narrow mangrove forest creeks.

The cost of building a small boat is relatively low. According to a boat builder on the island, the cost of building a flat-bottomed boat in 2005 was approximately USD 150; the cost of building a *mashua* or a *boti* at that time was approximately USD 1,200. When building a *boti*, additional funds are needed to purchase the engine, which costs as much as building the *boti* itself, i.e., approximately USD 1,200. When one considers that the monthly salary of a subordinate government employee in 2004 was approximately USD 47, acquiring a large boat would be very difficult. Therefore, owners of large boats are generally the wealthiest island residents, namely those of Arab descent who run the salt and sea transportation industries, people who have fixed income as employees, and independent businesspersons such as shop owners.

#### **4. Bantu inland-sea fishery and Arab open-sea fishery**

The Kilwa Island fishing community practiced forty-one fishing methods within three fisheries: gathering, fishhook fishing, and net fishing. More than half of the fishing methods used (21 [51%]) were based on gathering, whereas 15 methods (37%) were forms of net fishing, and five methods (12%) were types of hook fishing. The fisheries practiced in shallow waters were the most diverse, with 18 fishing methods (45%) used in the inland sea, 17 (41%) around the fringing reefs, and five (12%) in the mangrove forest.

Most fishing methods employed small boats such as canoes (59%) and flat-bottomed boats (44%) or were conducted while wading (66%). Relatively few fishing methods used large boats (*dau* [22%], *mashua*, and *boti* [15%]) because such boats are designed for a specific type of fishing, namely gillnet fishing on the open sea. Open-sea net fishing requires substantial investment because of the high cost of the netting and large boat. In contrast, gathering relies on simpler fishing activities that do not require much capital investment in fishing gear. Shellfish gathering on the tideland during the ebb tide, for example, can be practiced without any fishing equipment.

The fisheries of Kilwa Island transitioned from gathering to net fishing as water depth increased. In the mangrove forest, three of the five fishing methods entailed gathering (60%), and the remainder were forms of netting (40%). Bantu fishers without boats or with only small boats practiced gathering. On the fringing reef (coral pool), 11 (65%) of the 17 fishing methods practiced were of the gathering type, again practiced by Bantu fishers. On the inland sea, 14 of the 18 fishing methods involved gathering and nets (39% each), whereas four methods used hook fishing (22%). All forms of fishing in the inland sea were practiced in a balanced way by Bantu fishers. On the intermediate sea, six of the 15 fishing methods used nets (44%), five involved gathering (31%), and four used hooks (25%). Both Bantu and Arab fishers practiced each fishery type in a balanced way. On the open sea, four of the six

fishing methods used nets (67%). The wealthier fishers who possessed large boats practiced gillnet fishing.

The ethnic groups on Kilwa Island are easily categorized into two types of fisheries. Gathering, which involves small boats or collecting while wading in the shallow sea, was found to be practiced by Bantu fishers, whereas net fishing on the open sea was conducted primarily by fishers of Arab descent who possessed large boats (Table 1).

Table 1. The two fishing cultures found on Kilwa Island (Nakamura <sup>4</sup> p62)

<b>Fishermen</b>	<b>Sea</b>	<b>Method</b>	<b>Targets</b>	<b>Boat</b>
Bantu	Shallow waters (Mangrove inland sea, coral pool)	Gathering	Small and medium-sized fish, prawn, sea cucumber, mangrove crab, shellfish, etc.	Wading Small boat
Rich Arab & Bantu	Open sea	Net (gillnet)	Large fish, lobsters	Large boat

## 5. Discussion: Basic ecology and multi-ethnic coexistence on Kilwa Island

Figure 2 shows the association between fisheries and ecological zones around Kilwa Island in 2007. Gathering methods are well suited to the maritime environment of Kilwa Island. Bantu fishers practiced gathering in the mangrove inland sea. Gathering methods represented more than half of all fishing methods observed within the island community, and the number of small boats used for fish gathering represented more than half of all boats used by fishers. Wealthier people, primarily those of Arab descent, whose families controlled the salt industry and who possessed larger boats, practiced net fishing on the open sea. Consequently, the open-sea fishery required larger capital investment in the form of expensive large boats and expensive fishing equipment such as gillnets.

Because of these distinctions between the two main fisheries, two fishing cultures developed on Kilwa: the Bantu fishing culture, which is a gathering-based fishery practiced in shallow water with small boats or by wading, and the Arab fishing culture, which is a net-based fishery practiced on the open sea with large, keeled plank boats. The Bantu fishing culture originated along the Swahili coast, whereas the Arab fishing culture was introduced later through Indian Ocean trade.

People of Bantu and Arab descent were found to coexist peacefully on Kilwa Island and tended to occupy different fishing grounds. Fishermen of Arab descent, possessing large boats, fished on the open sea (ecozone 2) and intermediate sea (ecozone 3), whereas most Bantu fishermen fished in the mangrove inland sea (ecozone 1) and coral pool. Because each ecozone has different sea products, the catches for the two ethnic groups were different. By occupying different ecozones and targeting different species, the two fishing cultures of Kilwa Island have been able to enjoy a harmonious multi-ethnic coexistence with respect to coastal resource use.

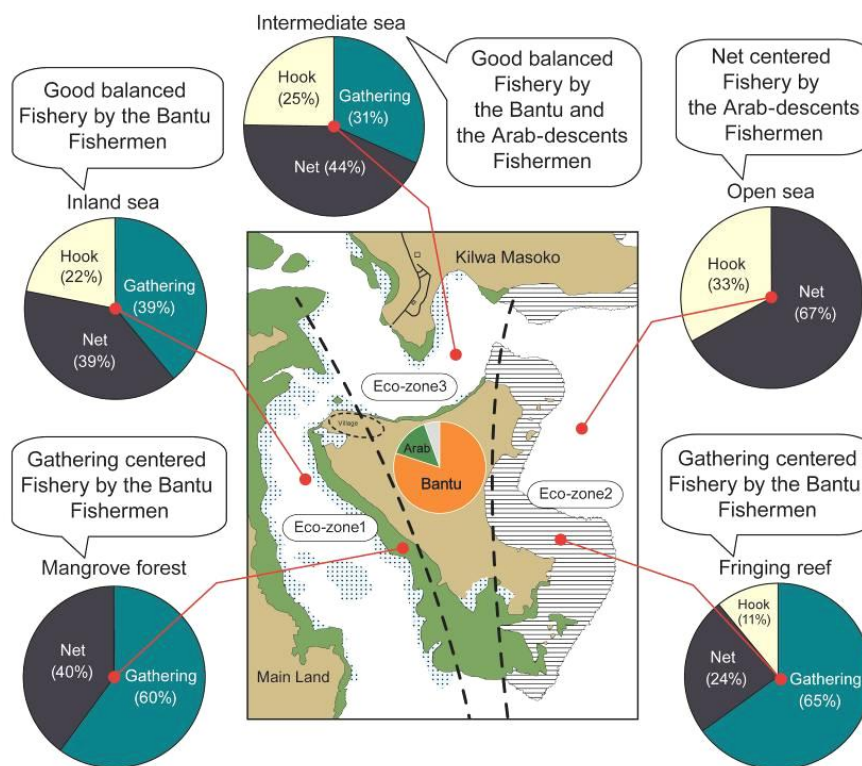


Figure 2. The association between fishing and ecological zones around Kilwa Island (based on Nakamura<sup>4</sup> p64)

## 6. Recommendations: To avoid the social upset caused by coastal development

Maritime resource use on Kilwa Island has recently changed due to coastal development brought about by new policies for the conservation and management of coastal resources. The fishing activities of Bantu fishermen, who generally fish on the mangrove inland sea, have been restricted due to new conservation policies for mangrove environments. The government initiated a new policy prohibiting both seine net (*kavogo*) fishing, which employs small-sized mesh, and sea cucumber gathering. The penalty imposed for illegally gathering sea cucumbers was 30 years imprisonment. The fishery office also confiscated all *kavogo* nets.

To ensure fishing license registration, the fishing equipment, including boats, of unlicensed fishermen was confiscated. As of 2010, there were three licensing fees: an annual fishing license fee of 12,000 TZS, an additional 6,300 TZS fee for businesses (e.g., dried fish trade), and 18,000 TZS for ownership of a boat (1 USD ≈ 1,500 TZS in 2010). Fishermen could expect to pay up to 36,300 TZS per year for their fishing activities.

Bantu fishermen who lost their fishing equipment and livelihood were forced into poverty. However, rich fishermen who fished on the open sea were little influenced by regulation against illegal fishing. As a result, the economic gap between the two ethnic groups widened, and fear for the security of daily life has spread within Kilwa society. Bantu women on Kilwa Island have started to more actively participate in economic activities, including starting fried fish businesses, to help family budgets. The author observed that since 2005, sorcery cases (the use of bad magic arising from

jealousy and envy) were increasing, and shamanism (an anti-sorcery ritual) has burgeoned in Kilwa coastal societies<sup>5</sup>. In 2008, three new shamans were observed on Kilwa Island.

These social disruptions may have been caused by acute changes in social and cultural situations within the Kilwa region caused by coastal development. This study clarified how the changing of traditional resource use caused by the environmental conservation policy gave influences on cultural and economical structures in this region. Conservation and resource management should not lead a social upset, but rather to the improvement of local life. It therefore requires a clear understanding of the existing conditions of resource use, and of management practiced by local people. Cultural and socio-economic studies conducted within this region can be very helpful in understanding these factors.

## Acknowledgements

This paper was based on field research conducted from 2000 to 2012. The Japan Society for the Promotion of Science (JSPS) financially supported research conducted between 2003 and 2012, and the Japan Science Society (JSS) financially supported fieldwork in 2008.

## Reference

- Sutton, J. *Kilwa: A History of the Ancient Swahili town with a Guide to the Monuments of Kilwa Kisiwani and Adjacent Island*, British Institute in East Africa, Nairobi, 2000, pp 1–13.
- Nakamura, R. The Religious Attitude Concerning the Ruins of the Perished Kilwa Kingdom on the Swahili Coast [in Japanese], In: Y. Shimada (ed.) *African Traditional Kingdoms Studies III*. Nagoya University, Nagoya, 2006, pp 313–338.
- Bacuez, P. *Intangible Heritage, Tourism and Raising Awareness on Kilwa Kisiwani and Songo Mnara*, UNESCO office in Dar es Salaam, Dar es Salaam, 2009, pp 23–33.
- Nakamura, R. Multi-ethnic Coexistence in Kilwa Island, Tanzania: The Basic Ecology and Fishing Cultures of a Swahili Maritime Society, *SHIMA: The International Journal of Research into Island Cultures*, 5(1), 2011, pp 44–68.
- Nakamura, R. Spirits in the Swahili Maritime Society: Case of Kilwa Island, Tanzania [in Japanese], In: Y. Shimada (ed.) *Aspects of Shamanism*, Bensey Publishing Inc., Tokyo, 2011, pp 168–192.