

# Coastal Communities Adaptation and Resiliency to Vulnerability: An Analysis of Livelihood Activities in Kenya

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## ABSTRACT

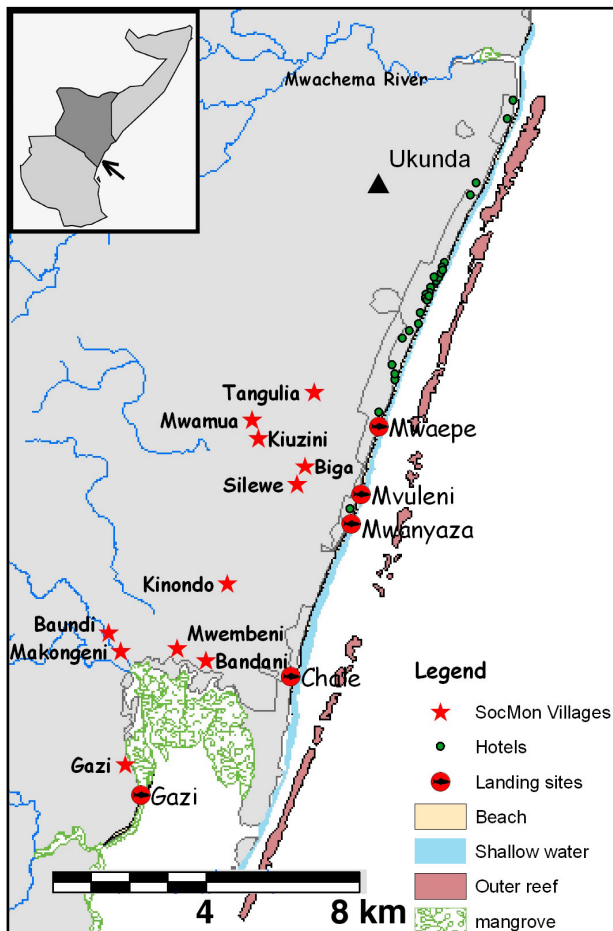
A socio-economic monitoring pilot project was initiated in Eastern Africa in 2002. The goal was to develop a regional socio-economic monitoring process that contributes to improving coastal and fisheries resource management.. Findings for the Diani-Chale area in Kenya are analyzed here, focusing on community livelihood strategies for three villages studied. On average, there were 5 people per household, 1.9 of whom were actively involved in providing food or income. The most important livelihood activities at the household level were small business, farming, tourism, formal employment and casual employment, fishing, sea related tourism, fish trading and other coastal related activities such as mangrove harvesting in decreasing order. Sea-based livelihood activities were undertaken by 33% households. Extractive marine and coastal activities included fishing, mangrove harvesting and crab collection. Non-extractive activities included boat operators, beach operators, diving operators and fish traders. Fishing was the second most common livelihood activity for households in Diani-Chale (32%), while fisheries accounted for 39% of all natural resources dependent activities.

## INTRODUCTION

It is acknowledged worldwide and increasingly in the WIO region that for decision makers to make decisions that will improve resource management, they need a better understanding of the people who live from coastal and marine resources. The socio-economic context in which coastal communities live changes constantly, monitoring is thus an essential tool if management is to be effective in the long run. Existing knowledge must be updated so decision makers can react and adapt to new situations. Although socioeconomic assessments are often carried out in WIO, monitoring is only at its infancy; the socio-economic monitoring pilot project (SEMPP) was the first in the Western Indian Ocean.

The aim of SEMPP was to initiate socio-economic monitoring in pilot sites. Three socio-economic aspects were identified as most important for management by sites and within the region: occupational structure, local resource use patterns, and stakeholders' perceptions and relations. Results presented here relate only to one of these, occupational structure of the communities, focused on what communities do for a living or their livelihood strategies. Following the pilot testing at Diani-Chale

*Obura, D.O., Tamelander, J., & Linden, O. (Eds) (2008). Ten years after bleaching - facing the consequences of climate change in the Indian Ocean. CORDIO Status Report 2008. Coastal Oceans Research and Development in the Indian Ocean/Sida-SAREC. Mombasa. <http://www.cordioea.org>*



**Figure 1.** Map of the Kinondo-Chale reef area from Rivers Mwachema to Gazi showing the approximate locations of the villages of Gazi, Biga and the three sub-villages of Chale i.e. Kinondo, Bandani and Makongeni.

and Msambweni in Kenya, monitoring was initiated at Mtwara (Mnazi Bay Ruvuma Estuary Marine Park) and Tanga coastal zone in Tanzania, following which the full SocMon regional programme, SocMon WIO, was started in 2005.

## METHODOLOGY

The Diani-Chale area is in Kinondo location, of Msambweni Division, Kwale District, approximately

25km south of Mombasa town from the Mwachema River in the north to Gazi Bay in the south. Nine villages were studied during the first round of monitoring, after which three representative villages were selected for ongoing monitoring, Biga, Chale and Gazi (Fig. 1). Chale is made up of 3 sub-villages, Makongeni, Bandani and Kinondo. The area boasts extensive beach based tourism, hotels and other related infrastructure that form a significant part of the local economy. Fishing is the most important activity done by the local community. Coral reefs and other coastal resources in Diani-Chale are considered to be heavily exploited or deteriorating. Competing use of coral reefs and coastal areas including near-shore waters between various resource users often results in conflict among various stakeholders, most notably between the tourism industry and the local community. An attempt by the government to establish marine protected area management was rejected by the community. Current management efforts have shifted focus to community-based management with designation of the area as the Diani-Chale Management Area (ICAM, 2002) and involvement of stakeholders in a participatory management process.

The monitoring project included a long preparation stage during which local leaders and committees were informed about the need for socio-economic monitoring and their support solicited. Field assistants (young men and women) from the community were trained as enumerators to carry out the monitoring in collaboration with project staff. Local community involvement in the socio-economic monitoring is essential for the sustainability of the process. Information was collected using Kiswahili language, which is widely spoken on the Kenyan coast and occasionally the local Digo language where better communication was required.

Data collection was by key informant interviews as well as focus groups. In both cases, informants were carefully selected to be from the village where the monitoring was being carried out, and with age and gender balance among informants. Key informants were asked to systematically list all households in their

**Table 1.** Number of households and their inhabitants in 3 Diani- Chale villages.

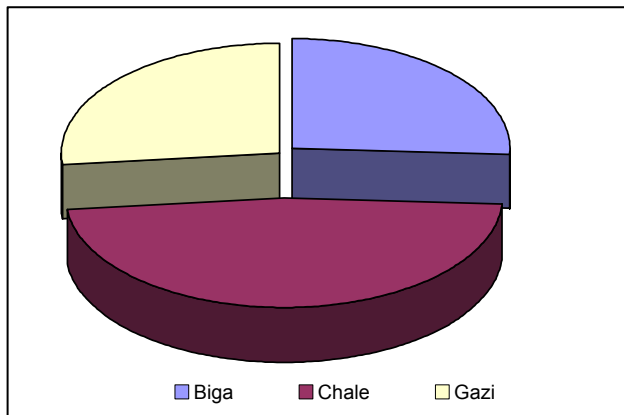
Village	Number of households	Total number of Inhabitants	Inhabitants per household (mean)	Income earners per household (mean)
Biga	102	578	5.70	1.5
Chale	197	1068	5.40	2.3
Gazi	165	817	5.00	1.7
Overall	464	2463	5.37	1.8

village following a mental transect through the village. The communities' occupational structure was determined through information they provided for each household, including number of household members, number of household members contributing to the households' income or food and list of activities carried out by the household for food and for income.

Data presented here is grouped at the site level (Diani-Chale) and village level (3 villages). Occupations were grouped into three categories for analysis; general occupations, natural resource based occupations and marine resource based occupations.

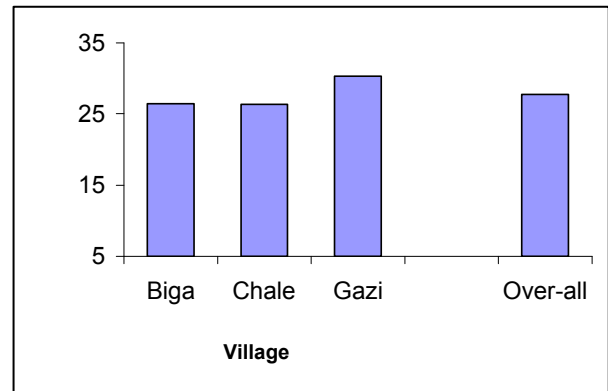
## RESULTS

The three villages in the study area had a total of 464 households with 2463 people (Table 1). On average Biga had the highest number of inhabitants per household, 5.7 followed by Chale and Gazi 5.4 and 5.0 respectively. Chale had the highest number of



**Figure 2.** Households involvement in multiple livelihood activities in Diani-Chale.

active persons per household 2.3, followed by Gazi and Biga, which had 1.7 and 1.5 respectively. Most households involved in multiple livelihood activities in Diani-Chale were in Chale village. A total of 292 households in Diani-Chale area were involved in multiple livelihood activities 167 of which were in



**Figure 3.** Proportions of Female Headed Households in Diani-Chale Area.

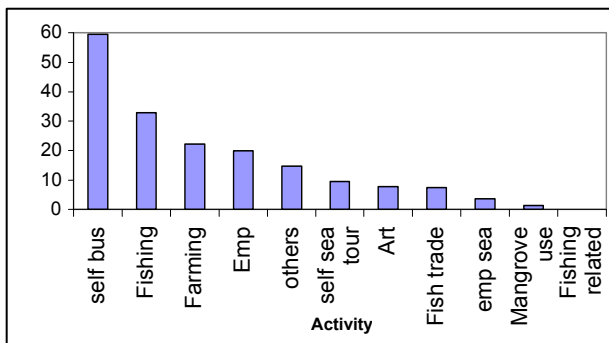
Chale representing 84.8% of the village while in Gazi and Biga, the proportion was 47.3 and 46.1% respectively (Fig. 2).

Females headed about 27.8% households in Diani-Chale area. The highest proportion of female-headed households were in Gazi (30.3%) while Biga and Chale were similar with about 26.5% (Fig. 3)

Thirteen broad classes of occupations were recorded during the surveys (Table 2). The largest proportion of households in the three villages, 60% depended on small business opportunities and other forms of self-employment for their livelihoods (Fig. 4). These include the sale and making of mats, food vendors, charcoal sellers. Over 30% were involved in fishing and 20% of households were also involved in

**Table 2.** Livelihood activities recorded in Diani-Chale.

Main Category	Groups included under category
Fishing	All fishing methods,
Fish trade	Fresh fish trader-local fish, Fresh fish trader-non local fish, Fried Fish Trade,
Fisheries	Fishing, Fish trade, Shell-Collector,
All sea	Fishing, Fisheries, Self sea tour, Employed- sea, Mangrove use.
Self sea tour	Beach-Operator, Beach-Boy, Beach-Operator, Sea Tourism,
Emp sea	Employed in Sea Tourism,
All tour	Self employed in sea tourism, Employed in sea tourism,
All emp	Employed, Employed in sea tourism,
Self bus	Small-Business, Medium-Business, Sale and making of mats, Food vendors, Charcoal sellers.
Farming	Small scale farming, Large scale farming, Farm Trader,
Others	Traditional doctor, Artisans, Casual employees,
Mangrove use	Mangrove Cutter, Mangrove seller,
Natural resource dependent	All sea, Farming



**Figure 4.** General occupations in Diani-Chale at site level (see Table 1 for explanation of occupation abbreviations).

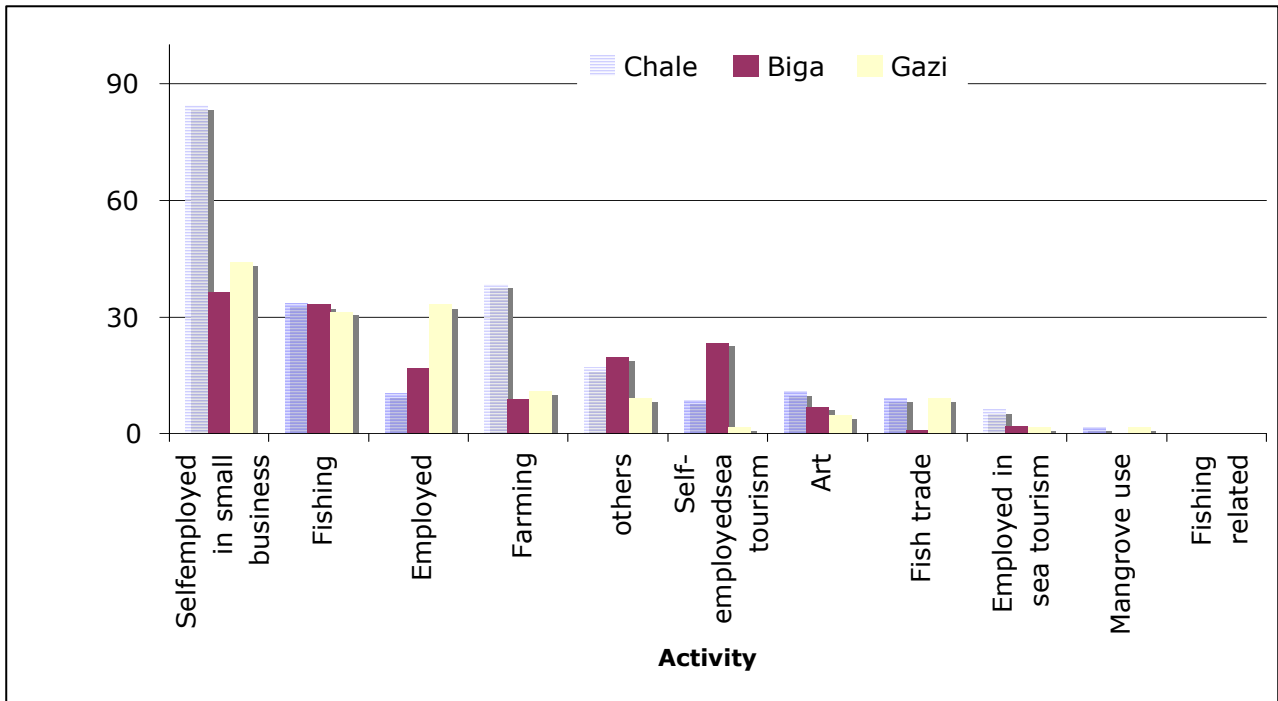
farming. About 19% of households relied on various forms of paid employment including casual employment. The rest of activities were undertaken by less than 10% of households, such as fish trading, 7.3%, sea and coastal related tourism activities such as boat operators, dive assistants, coxswains and beach operators were undertaken in 9.5 % of the households.

Small businesses or self-employment was the most common livelihood activity in all three villages (Fig. 5), supporting 36% of households in Biga, 44 % in

Gazi and 84% in Chale where it was more than twice the proportion supported of any other activities. Fishing was the second most important activity for households in Biga supporting about 33% households, while it ranked third in Chale 33.5% and in Gazi, 31% after farming and employment respectively. Self-employment in sea tourism ranked third in Biga village where it supported more than 23% of households compared to the other 2 villages. Self-employment activities in tourism include boat operators and beach operators.

A minimal number of households were dependent on self-employed sea tourism in Chale and Gazi villages, 8.6% and 1.8% respectively. Similarly employment in sea related tourism activities such as dive assistants, coxswains was below 10% in all three villages, Chale was highest with 6.1%, while Biga and Gazi villages had less than 2%.

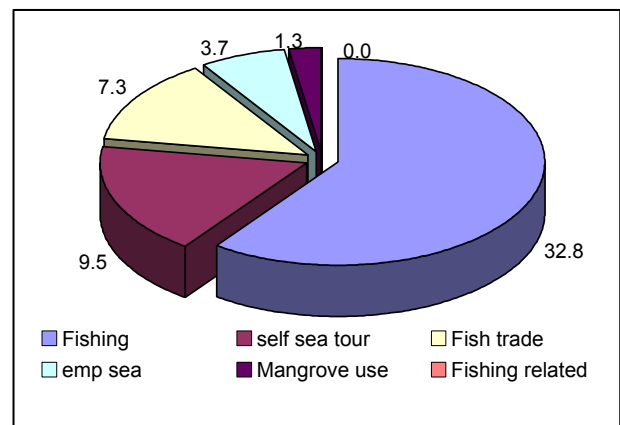
Non-sea related tourism activities such as employment in beach hotels were only encountered in about 2% of the households in Biga, non in Gazi and an insignificant percentage in Chale. Farming supported 38.6% of the households in Chale, the highest proportion among the 3 villages, even slightly



**Figure 5.** General Occupations in Diani Chale at Village level.

exceeding fishing in the village. In Biga and Gazi villages, farming supported much less than 11% of the households. Gazi was the only village with a high proportion of households (above 33%) in either formal employment or casual employment. Less than 17% of the households in Biga and Chale depended on formal and casual employment. The same proportion of households in Gazi and Chale, 9.1% villages, undertook fish trade and much less in Biga, 1%.

Considering only those livelihood activities that depended on natural resources in Diani-Chale area, fisheries were the most important activity (39% of all households) followed by farming (22%) and tourism activities (13%) while households depended on mangrove were only 1.3%. At the village level, fisheries were the most important activity, supporting > 34% of households, in all villages. Farming was second most important in Chale (38%) but ranked third in Biga at only 12%. Tourism was ranked second in Biga at 25.5 % while it was third in Chale (14.7%) and very low in importance in Gazi (1.4%), a



**Figure 6.** Marine resource based activities at site level.

proportion that was lower than mangrove use.

Among marine-based occupations in the Diani-Chale area, fishing was the most important supporting 32.8% households (Fig. 6). Self employed sea based tourism activities and fish trading were 2<sup>nd</sup> and 3<sup>rd</sup> most important although each supported less than 10% of the households, the two combined supported

much fewer households compared to fishing alone.

At the village level fishing was followed closely by self employed sea tourism in Biga (23%) while in Chale, only about 9% of the households depended on self employed sea tourism, a proportion equal to fish trade, 9%. Biga was the only village where self-employed sea tourism contributed towards the livelihoods of such a high proportion of household. Fish trading ranked 2nd in Chale where it supported just over 9% of households. Among Gazi households, fish trade supported about 8% where it was second most important among the marine activities, the rest including mangrove use supported less than 3% of the households each. Chale had the highest dependence on employment in sea-based tourism (6%) a proportion three times that of Biga village. On the contrary dependence on self-employed sea tourism activities was ranked highest in Biga among the three villages.

## DISCUSSION

This monitoring exercise considered all activities that contribute food or income at the household level. Thus it includes activities that are often excluded during regular censuses, such as home-based and household enterprises such as the making of mats, vending food and vegetables, and farming for food. Such activities are often classified as unpaid family work yet they contribute significantly to the household economy and can be developed further to improve livelihoods. Further, women undertake much of this work, their contribution in the economy is very under-reported in regular censuses. This is more so considering that females headed up to 28.2% of households in Diani-Chale. The Kwale District Development Plan of 1997-2001, shows the district has high rates of unemployment. The percentage of economically active population in wage employment in Kwale district is 19.8% (CBS, 1999). 63.8% of the unpaid workers were females and 33.3% of women workers engaged in unpaid family work (CBS, 1999).

The average household size is 5.3 in Kwale district,

with 34.8% of households headed by females (CBS 1999). These figures were very similar to those obtained for Diani Chale area during from this monitoring where the average household size was 5.4 (Table 1) and 27.8% households were female-headed (Fig. 3). Gazi village had more female-headed households in the area, a pointer to their active involvement in livelihood activities . In this study the importance of an activity as a source of livelihood was considered according to how many households undertake it rather than how much income it generates. This is because some activities are less formal in nature and are meant to directly provide food to the household rather than bring income. Consequently activities carried out by women were fairly addressed.

Livelihoods in the Diani-Chale area were largely dependent on natural resources available within the area e.g. fishing and fish trading activities and farming. The close proximity of the sea has greatly influenced the activities the community undertakes (King, 2000). Fishing was the single most widely undertaken marine related activity in this area followed by fish trading. Chale and Gazi villages had the largest proportion of fish traders (Fig. 3).

Close proximity of the 3 Diani-Chale villages to tourism activities is expected to provide income opportunities for the communities (Kwale District Development plan 1997-2001). This expectation was true for Biga village, which is located closest to the active tourist beaches of the Diani-Chale area. However, monitoring shows that whereas informal tourism activities (i.e. boat operating, beach operators and dive operators) accounted for activities in more than 23% of households, formal employment in tourism was depended upon by less than 2% of the households (Fig. 5). This latter figure is a very small proportion for an area with many hotels. Previous studies indicate that one of the causes for the disappointment of the local community about the presence of tourism in the area is the lack of benefits for the community (Rubens, 1996). Tourism development has not directly benefited this

community in the form of formal employment opportunities. This may be an indicator of the lack of vocational skills, required to work in this sector at the local level. While this low level of formal employment is partially compensated for in the informal sector, resentment is felt in the local community.

Gazi village had a higher proportion of households dependent on employment, at 33% than the other villages, at about 20%. The population of Gazi has more people who have immigrated from outside the Diani-Chale area. By contrast, Chale villagers had a higher dependence on farming (33.5%), considerably higher than for Gazi and Biga villages and slightly above fishing in the same village. This is attributable to availability of large areas of undeveloped land that is easily converted to farmland. However, farming in the area is severely affected by the presence of many wild pigs and primates from the adjacent sacred "Kaya Kinondo", which raid crops.

## CONCLUSIONS

Households in Diani-Chale have diverse livelihood options by having household members involved in multiple activities. This helps to subsidize fisheries, and may be a response to the decline in fisheries in the area. The most important of options to fishing were farming and tourism in Chale, beach tourism in Biga, and employment in Gazi. All 3 villages were actively involved in small business enterprises. Fisheries were the most important marine based livelihood option in Diani-Chale, hence fisheries management is critical to sustainability of livelihoods in the area. A more holistic approach to fisheries management over the current sectoral approach is needed for the area, particularly considering the other livelihood activities that households already undertake. Promoting other marine based activities but which have been under-utilized to date will maximise community benefits, including for example sustainable mangrove utilization for Gazi village, and more active involvement in formal sea tourism activities in Biga. Management

should also focus on promoting other highly ranked sources of livelihoods such as small businesses the community undertakes, to make them more profitable.

## REFERENCES

- Bunce, L. Townsley P., Pomeroy R., Pollnac R. (2000). Socio-economic Manual for Coral reef Management.
- Bunce, L. Pomeroy, B. (2003). Socio-Economic Guidelines for Coastal Managers in south East Asia; SOCMON SEA.
- Corbett, J.E.M. (1988). Famine and coping strategies. *World Development* 16: 1099-1112.
- ICAM secretariat (2002). The riches of Diani-Chale; An integrated approach to coastal area management.
- Kimani, P., Obura, D. (2003). Participatory mapping of terrestrial fishery resources, their conservation and management; a case study from Kinondo, Kenya. (Poster presented to 3rd Wiomsa Scientific Symposium, Maputo, and Mozambique 15-18 October 2003.
- King A. (2000). Managing without Institutions; the role of communication networks in governing resource access and control. PhD thesis. Department of Biological Science, University of Warwick.
- CBS (1999). Government of Kenya. Kwale District Development Plan (1997-2001).
- Malleret-King D., Wanyonyi, I., Bunce, L., Pomeroy, B. (2006). Socio-economic monitoring guidelines for coastal managers of the Western Indian Ocean, SocMon WIO. CORDIO East Africa publication. (Version 1). Pp108.

Malleret-King D, King A, Manghubhai S, Tunje J, Muturi J, Mueni E, Ong'ada H (2003). Understanding fisheries associated livelihoods and the constraints to their development in Kenya and Tanzania. (FMSP Project R8196).

McClanahan, T.R. (1997). Effects of fishing and reef structure on East African coral reefs. In Proceedings of The 8th International Coral Reef Symposium, 2 (pp 1533-1538).

McClanahan, T.R., Obura, D. (1994). Status of Kenyan coral reefs. *Coastal Manage.* 23:57-76.

Msumi G, Mgaya Y, Muruke M, Sememesi A (1999). The artisanal fishery in Bagamoyo: A case study of Mbegani waters (In Jiddawi N, Stanley R Eds. (1999) Fisheries Stock assessment in the traditional fishery sector; the information needs. Proceedings of the national workshop on the artisanal fisheries sector, Zanzibar, Tanzania.

Obura D, Wanyonyi I, Mwaura J (2002). Participatory Monitoring of an Artisanal Fishery in Kenya. (In Linden O, Souter D, Wilhemson D, Obura D. Eds. Coral Reef Degradation in the Indian Ocean, Status Report 2002.

Obura, D. (2001). Participatory Monitoring of Shallow Tropical Marine Fisheries By Artisanal Fishers in Diani, Kenya. *Bulletin of Marine Science.* (Special Issue; scientific aspects of coral assessment, monitoring and restoration. 14-16 Fl. Lauderdale, Fl. USA. National Coral reef Institute.

Obura, D, Wanyonyi I. (2000). The local geography of an artisanal fishery in Kenya. (Poster presented to The 9th International Coral Reef Symposium, Bali, Indonesia).

Wanyonyi, I, Obura D, Malleret-King, D. (2003). Linking socio-economic monitoring to management needs. (Poster, ITMEMS conference, Manila, Philippines, February 2003).

Rubens, J. (1996). An analysis of the benefits and costs of marine reserve regulations at Diani, Kenya. M.sc. dissertation. Department of Marine Science and Coastal Management, University of Newcastle.

Wanyonyi, I., Obura, D., Nyaga, W. (2003). Report of the 3rd Diani-Chale Fishers, Exchange Program to Tanga from 12-16 August 2002. CORDIO Reports.