

**Promoting Conservation by Strengthening Livelihood of  
Kilifi Creek Community through Sustainable Utilization of  
Fisheries Resources, Kilifi Kenya**

*RSG Kilifi Project Phase II Final Report*



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**KENYA**

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## **List of acronyms and abbreviations**

|               |   |
|---------------|---|
| <b>BMU</b>    | Beach Management Unit                         |
| <b>CRCP</b>   | Coral Reef Conservation Programme             |
| <b>CORDIO</b> | Coral Reef Degradation in the Indian Ocean    |
| <b>KMFRI</b>  | Kenya Marine and Fisheries Research Institute |
| <b>KWSTI</b>  | Kenya Wildlife Service Training Institute     |
| <b>MSY</b>    | Maximum Sustainable Yield                     |
| <b>NMK</b>    | National Museums of Kenya                     |
| <b>RSG</b>    | Rufford Small Grants                          |
| <b>WCS</b>    | Wildlife Conservation Society                 |

## **Abstract**

The success of Phase I of the RSG Kilifi Fisheries Project yielded the needs for a more comprehensive phase II of the project. This commenced in May 2006 when RSG awarded me another £ 5,000 to implement this phase. The main goal of this phase was to promote conservation of fisheries resources by strengthening sustainable fisheries activities in the District. This phase achieved about 75% of its intended objectives. Outstanding of these achievement was the level of capacity it created both at community level through the Beach Management Unit strategy, and technically at institutional and personnel management level of the District Fisheries Office. The execution of the project consumed a total of £ 5,839 (Five thousand eight hundred and thirty nine sterling pounds). Majority of this amount went into financing capacity building and construction of a cold room. However, it became very difficult to apportion the project funds to achieve all the targeted out puts. While more effort was geared to building capacity of resource users and resource managers, it was not possible to complete the cold room and to purchase habitat friendly gears for the gear exchange programme as was earlier earmarked. Derailed academic programmes at KWSTI also impacted significantly on the lifespan of this phase. This was more critical towards the end of the project as a result of political hostility before and after the 2007 general elections. The streamlining of Beach Management Units into the government fisheries management framework is one of the most important and sustainable output of this project. It shall enable continuity of the project activities after the end of the project life. There is still a genuine and urgent need to help the fishermen build their capacity and techniques of post harvest handling of fish and fish products, as a continuous process. This would also strengthen their marketing strategy so as to allow maximum benefits from the fisheries resources. The completion of the cold room shall thus still remain quite relevant and critical for future development of fisheries resources in the District. It is essential to note that The District Fisheries Office has promptly embraced the initiative to strengthen quality assurance and quality addition to their resources and is very keen in streamlining this activity into their framework. However as in any other government agencies, funding shall still remain a key limitation to achieve this.

**Key words:** Beach Management Units, Capacity building, Sustainable fisheries resource management, Co-management, Kilifi Project Phase II

## 1. Background

The fisheries of Kilifi has for a long time been based on ancient hunting and gathering principles. As in many other artisanal fisheries, this does not optimally benefit the local community who primarily depend on the marine resources. To help the community draw optimal livelihood from the small fisheries, an intervention was supported by Rufford Small Grants (RSG) of Whitley Laing Foundation in 2002. This was to help gather fundamental information on how the community use coastal and marine resources. It was also to establish how the communities' activities impact negatively on the natural resources.

The Phase I of the project achieved the following valuable outputs:

- i. Established the status of livelihood (including households) of the Kilifi Coastal Community and their reliance on coastal and marine resources,
- ii. Kind and magnitude of the role plaid by the government agencies in dispensing policy requirements on the sustainable management of the coastal and marine resources,
- iii. Establishment of scale of fisheries activities and ichthyodiversity of the Creek

The success of Phase I of the RSG project yielded critical needs for a more comprehensive Phase II of the project. This however, commenced only in May 2006 when RSG awarded me another £ 5,000 to implement the second phase whose main goal was to promote conservation of fisheries resources by strengthening capacity for sustainable fisheries activities in the District.

### 1.1. Project Site

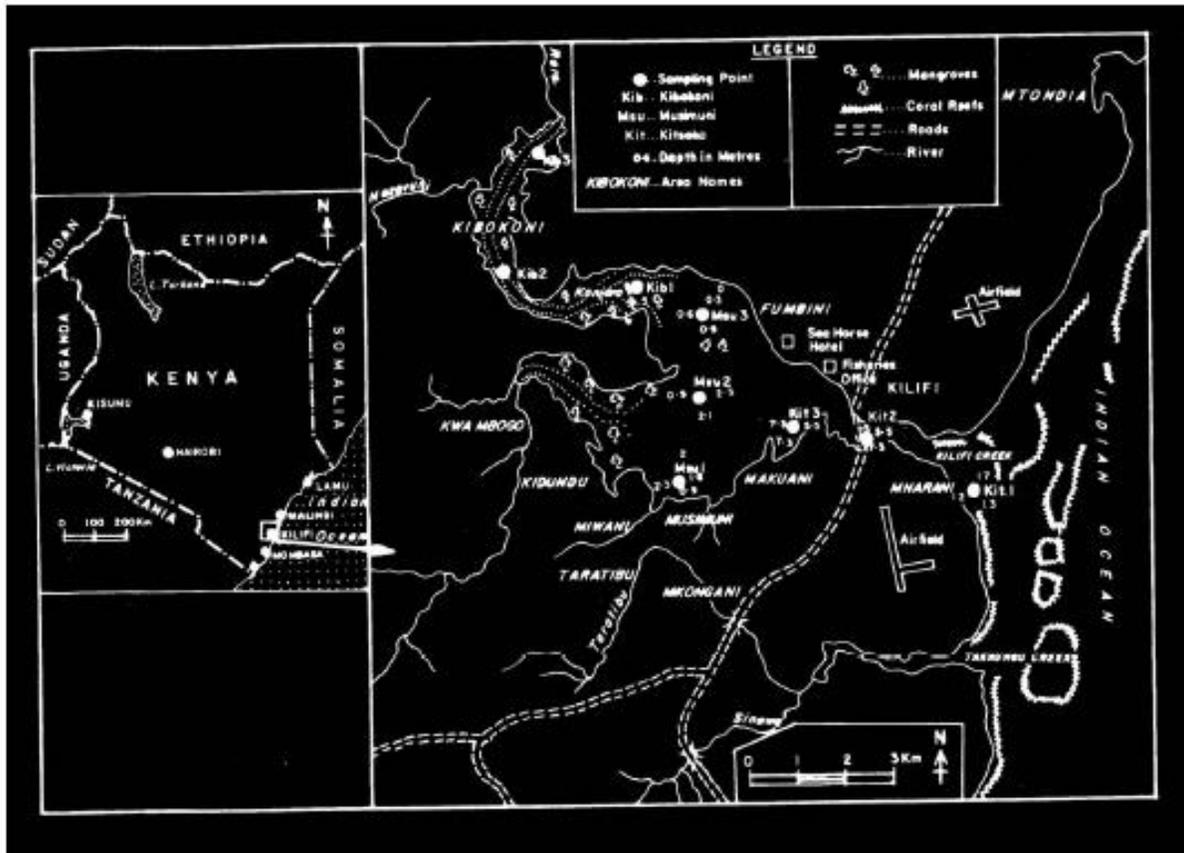
Kilifi District where the Creek is located is one of the coastal Districts (**Fig. 1**) in Kenya. It is however, one of the poorest districts in the country with one of the lowest education levels. The two, synergistically compound consequent poverty levels in the District, an aspect which often restricts the community to over rely on natural resources thereby occasionally depleting some of the resources.

### 1.2. Objectives of the Project

The specific objectives of the Second Phase of the project included:

- i. *Acquisition of ten (10) effective but less destructive fishing gears for each of the 3 organised fishing groups in Kilifi for a gear exchange programme to strengthen local sustainable fishing capacity,*
- ii. *Construction of a small cold room (10 x 10 ft), backed up by 1 medium sized deep freezer for use by each of the 3 organised fishing groups to support effective post harvest handling and marketing of fish and fish products in the District,*

- iii. *Training of at least one local school leaver at Diploma level on Fisheries Management (i.e. Fish stock assessment, fish post harvest technology; fish marketing techniques; fisheries co-management; basic relevant computer packages; project planning & management and principles of business management) to build local capacity to sustainably manage the Creeks fisheries activities.*
- iv. *Undertake at least two periodic surveys on fish stock assessment and ichthyodiversity using the gears to enable streamlining of fisheries statistics for effective management.*



*Fig. 1: A map of Kilifi Creek Project Sites*

## **2. Project outputs**

A number of outputs were realized during the second phase of the Rufford Kilifi Project. However, the gear exchange programme as one of the key outputs of the project did not take off with the main reason being inadequate funds. We prioritised on the other three objectives whose results are as discussed below:

## **2.1. Gear exchange programme**

Use of deleterious fishing gears and techniques was identified in Phase I as one of the major problems of the sustainability of Kilifi Creek fisheries. Phase II of the Rufford Small grants was therefore intended to among other objectives, acquire at least 10 effective but less destructive fishing gears for each of the 3 organised fishing groups in Kilifi. These would be exchanged with the old destructive community fishing gears to reduce level of habitat destruction and consequent reduction of fisheries resources. This however did not take effect. The funds were prioritised for other more critical objectives. This should not however be interpreted to diminish the role the destructive gears have on the fisheries and the conflicts they may create. It is an aspect which require future deliberate attention if the sustainability of the Creek's fisheries is to be realized.

## **2.2. Construction of a small cold room as a post harvest management strategy**

Being a coastal tropical town, high temperatures significantly exacerbate level of enzymatic reactions thereby speeding up rate of spoilage of fish and fish products. This often leads to serious loses either partially or wholly. The fishermen are time and again challenged to either drastically lower prices of their products or just throw away their catches altogether due to loss of quality.

This prompted the need to construct a small cold storage to assist the fishermen keep their catches much longer as they look for better market or negotiate for better prices. This was one of the key objectives of the Phase II of the Rufford funds. As part of the implementation process, the Rufford funds enabled initiation of a small cold room at the Kilifi District Fisheries Office. The construction is at an advanced stage. By the time of finalizing this report, it had however not attained functional status as earlier on projected. In collaboration with fisheries Department, effort is being put to help complete the storage facility. One of the very critical successes on this objective is that the construction and management of the cold room has since been streamlined into the government development structures through a newly initiated performance contract. The District Fisheries Officer has signed a contract to effectively manage the cold room and develop better fish marketing strategies.

## **2.3. Fisheries management and capacity building in Kilifi District Fisheries Office**

As is typical in most government structures in developing economies, capacity is always a compromised option in natural resources managements. In Kilifi District Fisheries Office, where this project was executed, weak capacity or inadequate ability to manage the fisheries is a reality not only in terms of resources but also in terms human resources. Objective 3 was set to identify this and come up with intervention approaches. Though in small scale, this short project effectively managed to strengthen fisheries office capacity both by establishing a functional office as well as developing human capacity.

### ***2.3.1. Office Development***

The project in conjunction with the District Fisheries Officer, identified a suitable already existing space in the Department and renovated as a fisheries data management office. This

was mainly through painting, installation of water systems and reinforcing security doors and windows. The project also managed to install fisheries data management systems which were mainly through acquisition of a desktop computer, a printer plus relevant data management software. This was to streamline fisheries data storage; management and processes to enable relevant information generation which could give highlight on fisheries trajectories in a period of time to facilitate informed decision making processes.

### ***2.3.2. Personnel Development***

As one of the project's primary output, we also managed to recruit one of the local community members-Ms. Esther Mkasi Mrabu- and trained her in Diploma Fisheries and Aquatic Sciences. The aim was to develop her capacity in fisheries management and recruit her to boost management capacity in the Kilifi District Fisheries Office. She has proved her capability by passing all Four Semester exams and is due to graduate on June 5, 2008 with an Upper Credit of 76.6 points. **Annex 1** tries to illustrate her detailed academic performance. During her training period, Esther intermittently visited and worked at the District for field exposure and to practice her fisheries management skills. She was eventually seconded at the District Office for a period of six months not only to help sharpen up her management skills but also to backup the personnel capacity the Department. After graduation, she will be engaged at the Department for the same assignment as she waits to join Moi University for a Degree Programme in Fisheries and Aquatic Sciences. This will further strengthen the capacity of fisheries management in the District. The management skills she acquired from the training will inevitably be spilled over to other colleagues in the District thereby adequately meeting the objective of this second phase of the Project. This will however require terminal evaluation of the project to establish its long term impacts.

### ***2.3.3. Awareness creation***

We also managed to strengthen capacity of the local communities through a number of *Barazas* (informal meetings). Most of this was geared towards creating awareness on various issues of sustainable fisheries resource utilization. This led to the formation of three Beach Management Units (BMU) to correspond to the three gazetted fish landing sites. The main goal of this new fisheries management approach is to enable the fishermen appreciate the fisheries resources and consequently own it and its management to ensure sustained utilization. The objectives of BMU are four fold:

- i. To ensure surveillance especially on the use of destructive fishing techniques. This also contributed significantly in strengthening the monitoring effort of the Fisheries Department which was understaffed and poorly equipped to carry out day and night patrols,
- ii. To join effort and raise their fishing strength by purchasing large fishing gears and stronger vessels which could access offshore fishing grounds especially for migratory pelagic taxa,
- iii. To strengthen bargaining power of fishermen through joint a marketing strategy. The three BMUs adopted the approach of bringing their catches together to be sold as a unit from a central point. In which case they could negotiate for better prices. This invention was often compromised due to lack of storage facilities.

- iv. To ensure adherence to hygienic conditions especially of the landing sites and on transit to market centers. Each BMU had a public health wing to be in charge of health related issues of beaches.

The BMUs were organized to meet regularly (i.e. twice in a month) with the District Fisheries Officers to give feed back and share lessons learnt on the ground. This hugely boosted the management of fisheries resources as a form of informal capacity development. If deployed to the District, Ms. Murabu will help to further strengthen this with skills gained during her training.

### 2.4. Survey of fisheries resources

As also highlighted in the preliminary survey in Phase I, the main stay of fisheries in Kilifi Creek are the Rabbit fishes, Parrotfishes, Wolf-herring, Jacks & Trevallies, Goatfishes and Mulletts (Fig. 2). According to Oyugi (2005), the migratory clupeids are also caught seasonally from the Creek. This was obtained from a two-month survey of commercial fish landing. Even though most of the commercial species were at the entry of the Creek the anchovies penetrated the creek and could easily be caught in the Middle of the Creek much inland. Being migratory, this phenomenon required special management strategy for they could easily be rounded off by ring nets commonly used by the local fishermen.

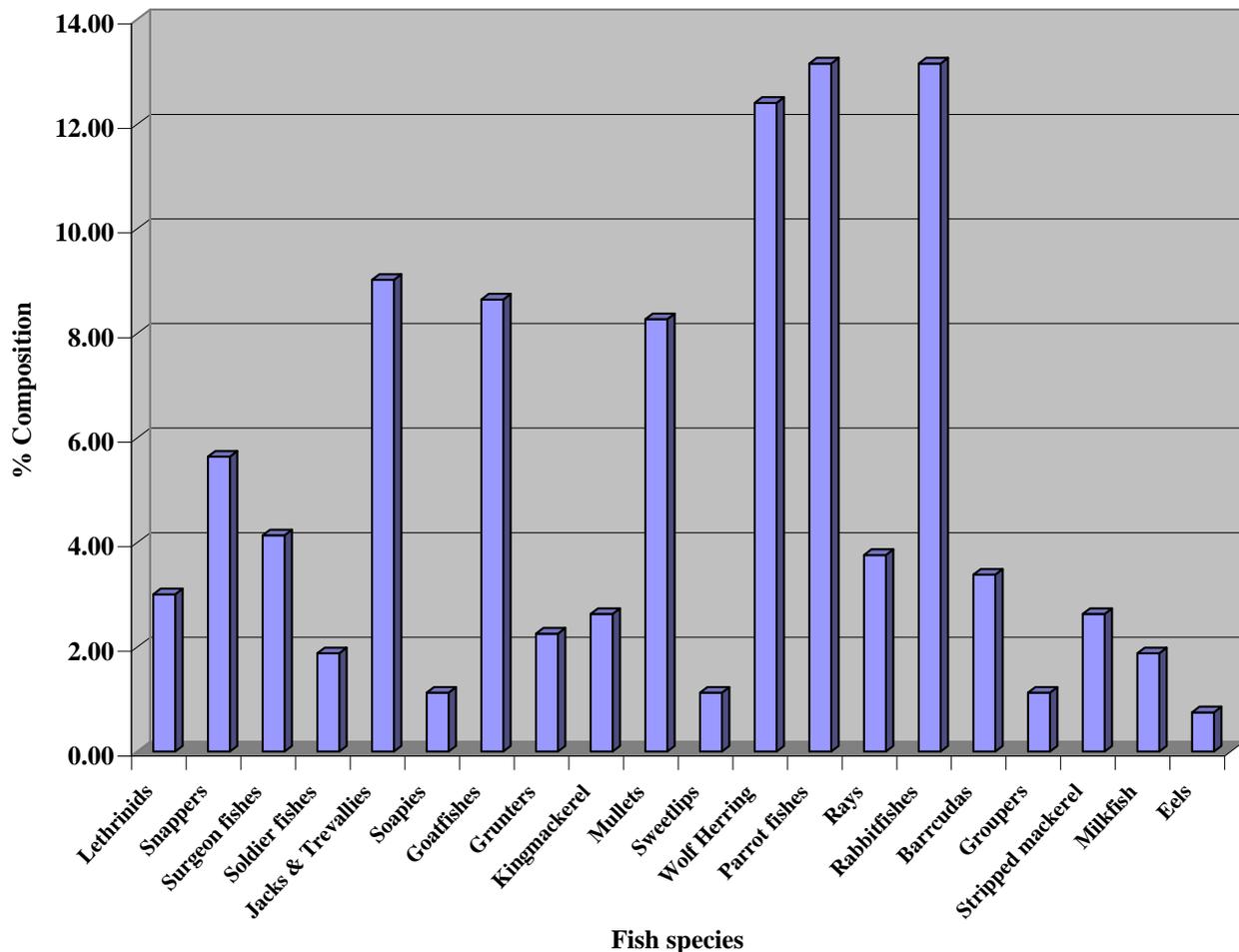
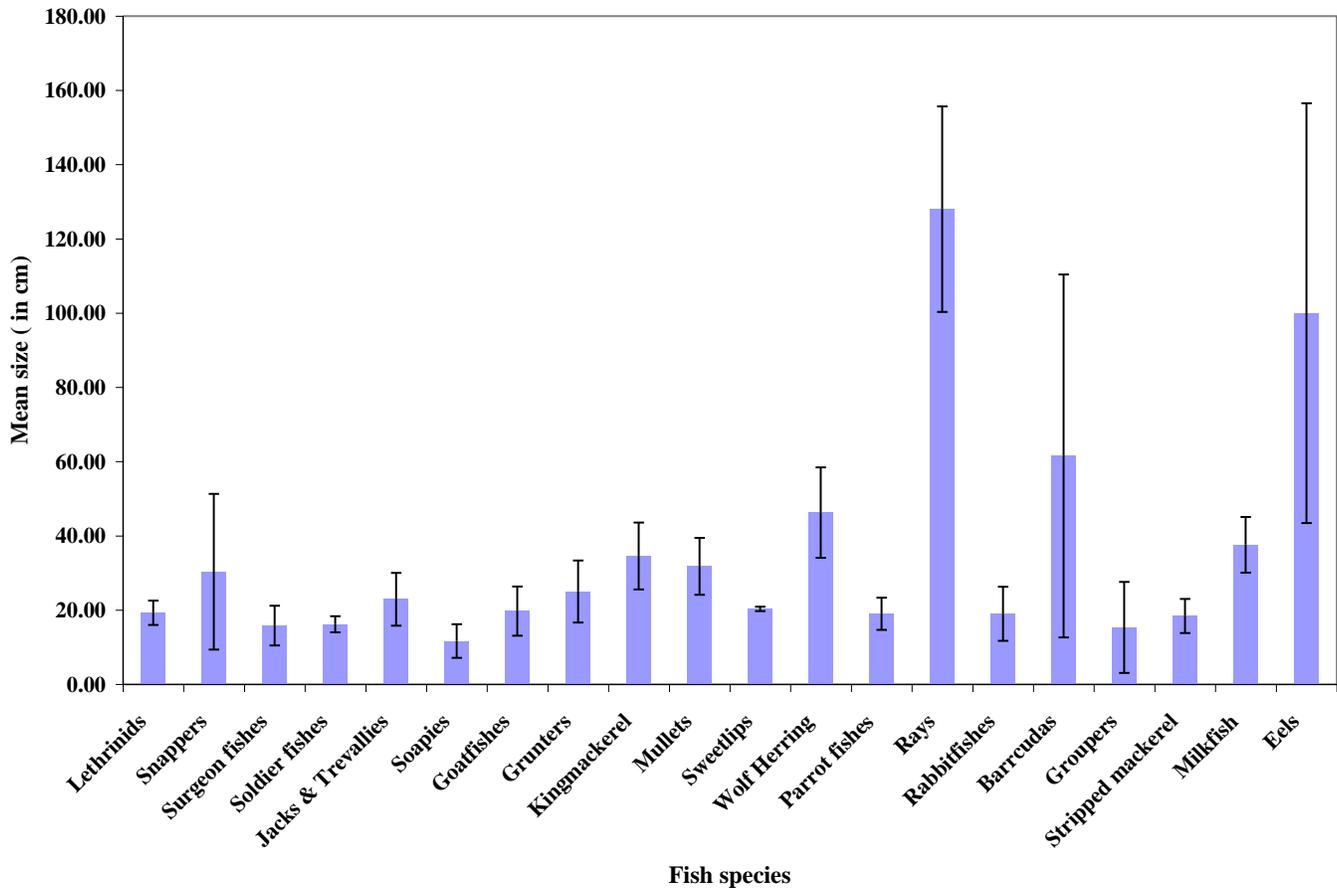


Fig. 2. Commercial Fish Composition of the Kilifi Creek

In terms of biomass (as represented by total lengths) the survey indicated that Rays, Eels, Barracudas, Wolf-herring, King-mackerel, Snappers and Mulletts dominate the commercial fish landings in Kilifi Creek (**Fig. 3**). All of them are though expected to be visitors from the open waters (Oyugi 2005). For the sake of management, it is therefore recommended to consider the open waters when doing a management plan of the Kilifi Creek artisanal fisheries.



**Fig. 3.** Fish landing by biomass in Kilifi Creek

### 2.5. Collaborative fisheries management in Kilifi Creek

As was also indicated in Phase II of the project, fisheries management in Kilifi Creek requires a co-management approach with the main focus on community participation. The other key important Institutions of the Creek’s fisheries include; Fisheries Department (FiD), Kenya Marine and Fisheries Research Institute (KMFRI), Coral Reef Degradation in Indian Ocean (CORDIO), Coral Reef Conservation Programme (CRCP) of the World Conservation Society (WCS), National Museums of Kenya (NMK), all with research and policy alienation. Strong collaboration was particularly forged with KMFRI in the publication and dissemination of the survey findings.

## **2.6. Dissemination of the Project Findings**

A number of publications (reports) have been made from the Kilifi Fisheries Project. Of Critical importance is the level of awareness created on the local community on how they could benefit from a well managed fisheries resources of the Creek. This was achieved through a number of *Barazas* (community meetings) which lead to the creation of the Beach Management Units (BMUs). One peer review paper (Oyugi, 2005) was published in the Western Indian Ocean Journal of Marine Sciences. We have also sent a joint publication with Mr. Jacob Ochiewo (of KMFRI) on the *Contribution of the local community to the management of fisheries resources of Kilifi Creek*. This manuscript has been accepted and is expected from the press by end of the year. They are all geared towards disseminating information about the Creek which was otherwise an unknown but very important fisheries as far as livelihood of local community is concerned.

## **3. Constraints of the project.**

The execution of the project generally went on well, with a number of expected out put being realized. However, it became apparently very difficult to apportion the project funds to achieve all the targeted out puts. While more effort was given to build capacity (both technical and through the informal BMUs), it was not possible to complete the cold room and to purchase habitat friendly gears for the gear exchange programme as was earlier earmarked. The transfer of the former District Fisheries Officer Mr. Wanyoike, who was the co-complementer of Phase I of the Rufford Small Grants, also initially jeopardized the transition to Phase II. This was later on picked up quite well with the new District Fisheries Officer Mr. Nemwel Onchomga.

Derailed academic program as a function of many factors significantly impacted on the lifespan of this project. This was particular towards the end of the project from the upheavals of political shake ups especially in second half the year 2007 and first half of 2008. These inevitably delayed the submission of this report.

## **4. Budget statement**

Out of £ 5,754 budgeted, £ 5, 000 was received from RSG. The execution of the project consumed a total of £ 5,839 (Five thousand eight hundred and thirty nine Sterling pounds). Majority of this amount went into financing capacity building and construction of cold room. It is important to note that even though not budgeted for in the initial proposal, the formation of Beach Management Units by the local fishermen became quite integral in the mobilization of the local community to strengthen the co-management attributes of the Kilifi Fisheries. This resulted into an over-expenditure on the constitution of major stakeholders' group budget line. Accommodation for the student (Ms. Esther Mkasi Mrabu) also became a bit more expensive against the initial budget postulations. Together with the fees and field training expenditures they resulted into over-expenditure on this budget line. At the same, the budget line on gear exchange programme was not spent on. After prioritization, purchase of gears for exchange was put on hold. It will be captured as a critical activity in future interventions (**Table 1**).

**Table 1: Budget Statement**

| <b>Activity</b>   | <b>Total Budget</b> | <b>Expenditure</b>  | <b>Balance</b>      |
|---|---------------------|---------------------|---------------------|
|   | <b>Sterling (£)</b> | <b>Sterling (£)</b> | <b>Sterling (£)</b> |
| 1. Constitution of 3 major stakeholders of Fisheries conservation groups of local community & Initiation of BMUs    | 85                  | 540                 | -455                |
| 2. Establishment of strong linkages with Fisheries Department, KMFRI & Forestry Department                          | 40                  | 74                  | -34                 |
| 3. Acquisition of 10 effective fishing gears for each of the 3 community groups and train them how to use the gears | 145                 | 0                   | 145                 |
| 4. Refurbishment of a 10 x10 ft cold storage facility   | 1,694               | 1480                | 214                 |
| 5. Training of at least 1 local school leaver on fisheries conservation and management programme at Diploma level   | 2,355               | 2800                | -445                |
| 6. Small pilot fish stock assessment as a demonstration of effectiveness and viability of the intervention          | 282                 | 180                 | 102                 |
| 7. Progress report, publications of the project outputs   | 56                  | 60                  | -4                  |
| 8. Monitoring, evaluation & review of the project   | 742                 | 500                 | 242                 |
| 9. Dissemination of project outputs   | 274                 | 120                 | 154                 |
| 10. Overheads   | 81                  | 85                  | -4                  |
| <b>Total</b>  | <b>5,754</b>        | <b>5,839</b>        | <b>-85</b>          |
| <b>Total Budget: £ 5,754; Total Received: £ 5,000; Actual Expenditure: 5,839; Actual Balance: £ -85</b>             |                     |                     |                     |

## 5. Conclusions and way forward

- i. The Second Phase of the RSG managed to achieve about 75% of the intended objectives. Outstanding of which being the level of capacity it created both at community level through the Beach Management Unit strategy, and technically at institutional and personnel management level for the District Fisheries Office,
- ii. The initial stock surveys results are integral in making management decisions. It revealed the top important commercial fish species, which in future shall require deliberate effort to establish their detailed biological and ecological parameters and level of sustainable harvesting by computing their Maximum Sustainable Levels (MSYs),
- iii. The streamlining of Beach Management Units in the government fisheries management framework is a focused and is an sustainable output of this project. The government shall continue embracing and managing the fisheries resources through co-management

strategy. We shall however need to generate leverage funds to support the government efforts to sustain Beach Management Units.

- iv. It is still a glaring and urgent need to help the fishermen through their BMUs to build their capacity and techniques of post harvest handling of fish and fish products, and to strengthen their marketing strategy so as to allow maximum benefits (by way of expanding profit margins). Transport of fish and fish products shall be a critical entry point.
- v. The completion of the cold room shall thus still remain quite relevant and critical. The District Fisheries Office has promptly embraced the initiative and is very keen to streamline the activity into their framework. However as in any other government agencies, funding shall still remain a key limitation to implement this noble idea.

## **6. Acknowledgements**

The successful completion of this project was made possible from Rufford Small Grants. I would like to particularly thank Mr. Josh Cole for his strong effort that enable me access funding for the First and Second Phases of the Kilifi Fisheries Project. I would also like to thank the District Fisheries Officer Mr. Nemwel Onchonga for his huge effort to mobilize the local community and for the Office Space. Special thanks also go to Mr. Jacob Ochiewo of KMFRI for the technical advice on socioeconomic attributes for fishermen in Kilifi District.

## **7. References**

- Oyugi, D.O 2005. Preliminary investigations on the Ichthyodiversity of Kilifi Creek, Kenya. *Western Indian Ocean J. Mar.Sci.* **4** (1): 11-20

## Performance for Ms. Esther Mkasi Mrabu

### FIRST SEMESTER

| Module Code | Module Title   | Hours  | Marks     |
|-------------|--|--------|-----------|
| DFM 101     | Communication Skills                                 | 30 Hrs | 72        |
| DFM 102     | Terrestrial Ecology                                  | 30 Hrs | 82        |
| DFM 103     | Marine and Freshwater Ecology                        | 30 Hrs | 76        |
| DFM 104     | Biology of Finfishes                                 | 60 Hrs | 83        |
| DFM 105     | Introduction to Computer and Applications            | 60 Hrs | 82        |
| DFM 106     | Biology of Aquatic Crustaceans and Molluscs          | 30 Hrs | 80        |
| DFM 107     | Introduction to Fisheries and Aquaculture Management | 30 Hrs | 76        |
| DFM 109     | Field Training                                       | 30 Hrs | 73        |
|             | <b>Mean Cores</b>                                    |        | <b>78</b> |

### SECOND SEMESTER

| Module Code | Module Title                            | Hours  | Marks     |
|-------------|---|--------|-----------|
| DFM 201     | Fisheries Stock Assessment              | 60 Hrs | 85        |
| DFM 202     | Participatory Conservation Management   | 60 Hrs | 69        |
| DFM 203     | Safety and Survival at Sea              | 60 Hrs | 53        |
| DFM 204     | Fisheries law, policies and conventions | 30 Hrs | 68        |
| DFM 205     | Finfish culture                         | 60 Hrs | 81        |
| DFM 206     | Fish Habitat and Wetlands Management    | 30 Hrs | 76        |
| DFM 207     | Field Training                          | 60 Hrs | 74        |
|             | <b>Mean Score</b>                       |        | <b>72</b> |

### THIRD SEMESTER

| Module Code | Module Title                                     | Hours  | Marks |
|-------------|--|--------|-------|
| DFM 301     | Biostatistics and Research Methodology           | 60 Hrs | 89    |
| DFM 302     | Environmental Impact Assessment (E.I.A)          | 30 Hrs | 82    |
| DFM 303     | Culture of Shellfish and other Aquatic Organisms | 60 Hrs | 88    |
| DFM 304     | Fisheries, Tourism and Recreation                | 30 Hrs | 77    |
| DFM 305     | Eco-toxicology                                   | 60 Hrs | 61    |

|         |                              |        |           |
|---------|------------------------------|--------|-----------|
| DFM 306 | Fish Post-Harvest technology | 30 Hrs | 80        |
| DFM 307 | Field Training               | 60 Hrs | 82        |
|         | <b>Mean Score</b>            |        | <b>80</b> |

#### **FOURTH SEMESTER**

| <b>Module Code</b> | <b>Module Title</b>                             | <b>Hours</b> | <b>Marks</b> |
|--------------------|---|--------------|--------------|
| DFM 401            | Natural Resource Economics and Entrepreneurship | 30 Hrs       | 81           |
| DFM 402            | Project Planning and Management                 | 30 Hrs       | 56           |
| DFM 403            | Principles of Management and Administration     | 60 Hrs       | 77           |
| DFM 404            | Fishing Technology                              | 60 Hrs       | 84           |
| DFM 405            | Crocodile Farming                               | 30 Hrs       | 76           |
| DFM 406            | Fisheries Resource Planning and Management      | 30 Hrs       | 76           |
| DFM 407            | Contemporary Issues in Fisheries Management     | 30 Hrs       | 69           |
| DFM 408            | Fisheries Resource Economics and Marketing      | 60 Hrs       | 77           |
| DFM 409            | Field Training                                  | 60 Hrs       | 89           |
| DFM 410            | Field Attachment                                | 6 Months     | 78           |
|                    | <b>Mean Score</b>                               |              | <b>76.3</b>  |

**Mean Overall: 76.57**