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TITLE OF PROJECT

Understanding Fisheries Livelihoods
and Constraints to their Development:
Kenya and Tanzania

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1. Executive Summary

Fishing is a primary livelihood earner for the coastal communities of Kenya and Tanzania, in particular the artisanal fishers who contribute about 90 - 95 % of the fish caught in the marine waters of the two countries. Major livelihoods are derived through utilisation of the fisheries resource for food (provision of nutritional requirement), creation of job opportunities and income generation for the fishing households. East African waters are heterogeneously rich, and the artisanal fishers who depend on this important resource are poor.

The purpose of the project was to develop a better understanding of the fisheries dependent livelihoods, and identify the nature and sources of constraints to their development, so as to recommend measures for improving the livelihoods of the fisheries dependent communities in Kenya and Tanzania. This was achieved through carrying out a three-stage study involving (a) a Review of marine fisheries in Kenya and Tanzania to characterise fisheries and fisheries stakeholders, determine the status of fisheries resources, identify information gaps and select representative areas where further research is needed, (b) Livelihoods appraisals to determine the dependence of coastal communities on fisheries resources, increase understanding of fisheries associated use patterns and local management and investigate the relative wealth of stakeholders and the factors affecting it, and (c) Multi-stakeholder participatory learning and problem census workshops in Kenya and Tanzania to identify constraints and plan development strategies and formation of coalition learning groups at the local community level to act as future development reference groups.

The results have increased the capacity to understand better the marine fisheries-dependent livelihoods in Kenya and Tanzania and identified some constraints to the sustainable development of fisheries-dependent livelihood, particularly the poor groups. Through the participatory research process and the multi-stakeholder participatory learning and problem census workshops, the linkages between stakeholder groups have been strengthened.

The findings of this study have demonstrated the importance of marine fisheries to coastal artisanal communities. Whilst national statistics on this were limited, the field-based activities indicated that fishing was ranked as the primary livelihood activity by most of the study site villages, and that between 30-71% of households depended at least partly on fisheries. Although food security and material style of life indicators did not find significant relationships between households' activities and wealth, they showed fishing households without access to boats are poorer than others, and that fishing dependent households in Kenya are poorer than those in Tanzania. This was also suggested if measured by the percent below the food poverty line indicator (Kenya 59.5%; Tanzania 7 to 33%).

However, fisheries resources are believed to be declining, as observed through depletion of certain species, and decreasing fish sizes. The main threats to the resources include a rapid increase in the number of fishers, compounded by coastal poverty forcing people to fish as a last resort, and also the use of illegal fishing methods, habitat destruction, and marine and land-based pollution. The seasonality of the fishery also affects livelihoods, as fishing activities are limited during the rough seas of the South East monsoon season. During the North East monsoon, more productive fishing grounds offshore can be accessed, but only by those with suitable boats. It was found in this study that the majority of boats are non-motorised, but that the majority of households do not have access to boats in any case.

The constraints to fisheries livelihoods identified during the study include lack of access to capital, poor fisheries resource management, decline of fisheries resources, and habitat destruction. Lack of access to capital constrains fishing activities inshore and sometimes forces fishers to use destructive gears. However, this study advises great caution in suggesting that accessing offshore areas could be a potential solution to release pressure on inshore fishery, further research would be necessary. Lack of capital and access to better markets are exemplified by poor handling facilities, poor infrastructure and high post-harvest losses.

Poor fisheries management has encouraged the use of destructive gear and thus increased pressure on the resource. The decline in the fisheries resources, combined with increases in the number of fishers due to the lack of alternative employment, and the use of illegal gear, has resulted in increased poverty. Habitat destruction, including indiscriminate mangrove harvesting, coral dynamiting, ocean pollution and others, is limiting the regeneration of some fish species and growth thus contributing to resource decline.

This project has increased awareness and understanding of fisheries dependent livelihoods, as well as documented the importance of the fisheries resources to coastal people in Kenya and Tanzania. Furthermore, it has contributed to identifying the core constraints to livelihood development of the most vulnerable people to the loss or mismanagement of fisheries resources.

This increased understanding will contribute to enable decision makers to appreciate the importance of marine fisheries in Kenya and Tanzania as well as target their interventions to mitigate the constraints to the livelihood development of the poor. Suggestions are made to mitigate these constraints, subject to further research, at the management level and on a local technological level. The most crucial of these is to promote an enabling environment for community-based management and self help groups to develop

The project has also strengthened linkages between fisheries institutions and other national administration with the primary stakeholders, and increased capacity to carry out socio-economic and livelihoods research through its participatory and learning approach. This should also contribute to improving livelihoods of the poor through increased communication between stakeholders and managers, and better capacity for the decision makers to get updated information through their own staff.

2. Background

Fishing activities by coastal artisanal fisher communities contribute to the livelihoods of a large percentage of the populations of both Kenya and Tanzania. However, recent studies indicate a disappointing decline in marine catches in the traditional, most frequented fishing sites. This has been attributed to overexploitation of the resource (fishing pressure), the use of destructive fishing methods, habitat destruction, and pollution. Furthermore, although there is little information on the socio-economic status of fisheries stakeholders, existing data suggest that fisheries dependent people are poor.

Some research work has been undertaken on marine fisheries along the coast in both Kenya and Tanzania. However, the reports are scattered in different institutions and not easily accessible, and hence the need for a review under this study. Information on the

status of fisheries resources is limited or unreliable. In Kenya, national statistics on the marine fisheries are collected by the Fisheries Department, but are considered to be unreliable. Site-specific data is also collected by a number of initiatives, including the Coral Reef Conservation Project's long-term ecological and fish catch monitoring projects, the National Council for Science and Technology study of seasonality of fishing, and CORDIO's (Coral Reef Degradation in the Indian Ocean project) participatory fish catch monitoring and resource mapping project. In Tanzania, Fisheries Division conducts regular fisheries information surveys for both inland and marine fisheries, and publishes statistics on eg catches, gears, numbers of fishers and production potential. Smaller, site-specific studies have been conducted, such as those looking at the impacts of fishing on the bio-physical environment (McClanahan & Muthiga, 1988; McClanahan, 1994) in Kenya, or the substantial fisheries related research work focussed around the Rufiji Delta in Tanzania.

Similarly, little information is available on the socio-economic status of fishers, and their dependence on fisheries resources. Again, a number of site-specific socio-economic studies of fishing communities have been conducted. In Kenya, these include studies on the impacts of marine reserves and protected areas on fishing communities (Malleret-King, 2000; Rubens, 1996). Various studies have also looked at management issues, including a study of local traditional management institutions by Glaesel (1997), a collaborative fisheries management project (Horrill, 1998), and the role of communication networks in governing resource access and control (King, 2000; and McClanahan et al, 1996). In Tanzania, recent socio-economic projects have included capacity building in planning and co-management project by the Fisheries Division, a marine affairs project by Institute for Marine Sciences (IMS) which considers public awareness, resource economics, management and sociological issues relating to coastal and marine resources, the 'State of the Coastal Environment' report by Tanzania Coastal Management Programme (TCMP, 2001), and IUCN's Tanga Coastal Zone Conservation and Development Programme, which has established collaborative marine resource management systems.

While the above projects have provided local socio-economic information, the overall picture for both countries is still not well understood. A number of regional organisations and initiatives, including IUCN, WWF and CORDIO (Coral Reef Degradation in the Indian Ocean project), have identified the need for a greater understanding of the livelihoods of people dependent on coastal and marine resources, reflected in their participation of a regional socio-economic monitoring pilot project and spelt out in organisation reports. For example, the Draft Programme Framework for the IUCN *Development of a Partnership Programme for implementing the Jakarta Mandate in the Western Indian Ocean region* programme identifies the need for 'a better understanding of biological and socio-economic fisheries in the region'.

The findings of the DFID FMSP Programme Development visit to Kenya and Tanzania in February 2002, where a range of stakeholders were consulted, including Fisheries Departments, National marine research institutes, NGOs and independent researchers, confirmed the above and identified the following needs:

1. Understanding of the contribution of fisheries to livelihoods
2. Alternative/improved livelihood opportunities for artisanal fishers
3. Socio-economic valuation of aquatic resources
4. Improved data collection methods

The inadequacy of current information and data on the fisheries resources, and on the use of these resources were highlighted during the visit by Fisheries Departments in both Kenya and Tanzania. The extent of dependence on fishing was considered to be severely underestimated in both countries. An example of this is the official government

statistics for the Rufiji district in southern Tanzania, which indicate 400 fishers in the district. However, the Rufiji Environmental Management Project has found that approximately 61% of households fish, indicating that the actual number of people involved in fishing in the district is approximately 3,000.

It is believed that limitations or weaknesses in fisheries management; a lack of understanding or awareness of fisheries-dependent livelihoods and weak linkages between stakeholders in the fisheries sector, particularly between national institutions and primary stakeholders, have contributed to constraints in the livelihood development of poor groups dependent on fisheries. This project thus aimed to respond to the regional need for more adequate information on fisheries resource use and its importance in Tanzania and Kenya. It also sought to identify the constraints to livelihood development of fishing communities, and address where existing knowledge or technologies may be appropriate. Through the participatory and learning approach of the project, linkages between stakeholder groups were strengthened, and understanding and capacity of stakeholders increased.

3. Project Purpose

The purpose of the project was to develop an improved understanding of the importance of marine capture and enhancement fisheries in Kenya and Tanzania within the complex livelihood strategies of the poor, and constraints to their livelihood development, in order to contribute to improvement in their livelihood choices. This was achieved through a review of all currently available information, and site-specific field based studies that provided more in-depth information and enabled ground-truthing of review findings in representative sites.

A comparative analysis of the fieldwork and review information identified the most important fisheries-livelihood problems facing the poor, and suggested where existing technologies and other measures may be appropriate.

4. Research Activities

Activities commenced with a nationwide review of fisheries in Kenya and Tanzania to establish the current status of knowledge on fisheries in livelihoods (Project logframe Activity 1). Using information derived in the review, representative study sites in Kenya and Tanzania were selected (Activity 2), and pre-workshop sensitisation visits and stakeholder analyses conducted at the study sites (Activity 3). Following these, problem census workshops (Activity 4) and detailed livelihoods appraisals (Activity 5) were conducted at the study sites. A comparative analysis (Activity 6) of the review and fieldwork information then drew conclusions on the most important fisheries-livelihoods problems facing the poor, and suggested where existing technologies may be appropriate. Findings were/are going to be disseminated locally and to policy makers (Activity 7).

Further details on these activities are given below. All planned inputs to the project were achieved.

4.1 Review

The first activity carried out (Activity 1) was the production of a review report to classify and profile fisheries and associated livelihoods in Kenya and Tanzania (see Annexes 1.1 and 1.2). The review used existing information to:

- Identify and collating existing information (Sub-activity 1.1);
- Categorise and quantify stakeholders and their dependency on fisheries resources (Sub-activity 1.2);
- Categorise and quantify status, trends and threats of fisheries resources (Sub-activity 1.3);
- Describe the assets and access to capital of fisheries-dependent stakeholders (Sub-activity 1.4);
- Conduct an institutional analysis of the fisheries sector (Sub-activity 1.5);
- Identify information gaps (Sub-activity 1.6).

Methods used to compile the review were a combination of literature searches in libraries, internet and interviews. Visits were made to different relevant Departments including Department of Fisheries in the Ministry of Natural Resources and Tourism, the National Environment Management Council, the Tanzania Fisheries Research Institute, the Tanzania Coastal Management Partnership, the Department of Zoology and Marine Sciences of the University of Dar es Salaam and Mbegani Fisheries Training Institute for Tanzania; and the Department of Fisheries, the Kenya Marine Fisheries Research Institute and the Coral Reef Degradation in the Indian Ocean (CORDIO) for Kenya.

In Kenya, semi-structured interviews in all Kenyan coastal Districts (except Lamu District due to budget constraints and inaccessibility of the District) were also used to complement and update the information gathered through the literature for sub-activities 1.2, 1.4 and 1.5. Interview guides were used to gather information on numbers of fishers, fisheries associated resource use patterns, fishers organisation, fisheries management, and dependence on fisheries. The information was collected mainly at the sub-location level and at the village level when possible. Informants were mainly from the Fisheries Department. When possible, fishers and fisher leaders were also interviewed. Informants were interviewed in 13 different sub-locations and in Mombasa (See more details in Annex 1.2, section 1.2).

In Tanzania, the review was conducted through visits to the above-listed institutions and departments, and discussions with relevant contributors.

4.2 Methodology framework and site selection criteria

Activity 2 related to finalising the methodological framework and site selection criteria (sub-activity 2.1), and then analysing the review information against these criteria to select one representative district in each of Kenya and Tanzania for detailed appraisals and problem census workshops (sub-activity 2.2).

Criteria for the selection of representative study sites were as follows. The sites had to be representative of coastal communities of the targeted countries, and focus on poor communities. The biophysical environment and the fisheries use pattern were also to be representative. Study sites were to be of a manageable size as well as being rural. It was also important that the locations were accessible in order to respond to logistical (workshop and fieldwork) and time constraints. Finally one of the important site selection criteria was that no previous extensive fisheries studies had been carried out at the selected sites (to avoid informant fatigue) and that there was no on-going project or

marine protected area, as these tend to bias information collected and create tensions in the communities.

Qualitative analysis and basic statistical analysis were carried out. Sites with the highest score (all criteria taken into consideration) were then selected (See Annex 1.1, Section 6 and Annex 1.2, Section 1.2). The sites selected were Chumani, Kidundu and Mtondia villages in Kilifi District, Kenya, and Kondo (See Map 1) and Mlingotoni villages in Bagamoyo District, Tanzania (See Map 2).

Study site communities are highlighted by a red circle (Source Annex 1.2, section 7).



Map 2: Study site coastal communities in Bagamoyo District, Tanzania



4.3 Stakeholders analysis and pre-workshop visits

Activities 3, 4 and 5 relate to detailed case study work conducted at the representative sites in each of Kenya and Tanzania. Activity 3 was a stakeholder analysis to inform subsequent project workshops (Activity 4) and livelihoods appraisals (Activity 5). It also involved pre-workshop visioning exercises with village members (Section 4.3.3).

4.3.1. Village level site-selection

Case study villages selected on the basis of the review were visited to confirm whether they responded to the research needs (sub-activity 3.1). The project team, composed of the country project leaders, fisheries Assistant and the leading socio-economist, introduced themselves, the project purposes, and the workshop process. Permission to carry out the study was also requested from village leaders. Village leaders were also asked to suggest key informants who will help the team in the socio-economic research (see Annex 2, section 1.3).

4.3.2. Stakeholder analysis, sensitisation and training

Stakeholder analysis, sensitisation and training were conducted at the study sites prior to the workshops and livelihoods appraisals (sub-activity 3.2). Initial sensitisation was conducted to inform stakeholders of the aims of the project. Stakeholder analysis was conducted in order to identify the different stakeholders groups, from which to select appropriate participants to represent the interests of their groups in the problem census workshops. Stakeholder analysis was conducted through observation, semi structured and informal interviews, and results presented in a table to inform the workshop process.

Community representatives were recruited to assist with the livelihood appraisals (see section 5), which also involved fisheries personnel and the national socio-economist. Two-day training was provided to Fisheries Assistants and other fisheries personnel, and to the socio-economist. The training was informal and concentrated on the use of socio-economic information in fisheries management, and the different methods to collect such data. A fieldwork practice was done.

Community members were given training on administering a questionnaire, the aim of the research and the use of such research to increase issue awareness among communities and managers were discussed.

4.3.3. Pre-workshop visioning

The pre-workshop visioning exercise (sub-activity 3.3) for the Multi-stakeholder Participatory Learning Approach workshops (see Section 4.4) was accomplished through visiting each village selected to take part prior to the workshop. While at the village members of various age groups (young, middle age and old) were requested to sit together and prepare two vision maps (sketches) of their own village, one depicting the situation as it was some 30 years ago and the other to show the present situation. On the maps they were asked to show important natural resources and infrastructure that are utilized for their livelihoods. Important areas for the fish resource and the habitats that support the resource had to be shown. Changes would be noted by comparing the two maps. Other important resources to be shown were settlement areas, utilities, community centres (religious sites), schools, roads, hotels, etc. This process was necessary to shorten the workshop time, as no time was available for field visits to go back to the villages to do the visioning after the workshop started. Using these maps the participants from each village then developed the future vision maps showing their

perception on how they would want the situation changed to improve their livelihoods and what resources they would need to achieve their future plans.

For more details on the section above, refer to Annex 2, section 1.3.

4.4 Using Multi-stakeholder Participatory Learning Approach

The Multi-stakeholder Participatory Learning Approach was used in the visioning and problem census workshop. The approach was introduced in East Africa by the International Support Group (ISG) in 1999. ISG is an international non-profit making professional NGO that supports the coming together of a wide range of stakeholders for the purpose of developing learning approaches to complex organisational change associated with local collaborative management of natural resources, decentralisation of government services and liberalisation of extension support. Through the participatory learning approach the multi-stakeholders go through a process of learning using instruments, which have been developed (Lightfoot, et al 2001) to facilitate the learning about:

- Communities' future vision on management of their natural resources and opportunities for their realisation;
- Partnerships and alliances needed if the communities are to realize their visions;
- Negotiations to build partnerships and alliances for action; and
- Reflection on Management of the natural resources and partnership behaviour and performance.

These are achieved through a pre-workshop visioning exercise, and a multi-stakeholder participatory learning workshop. Multi-stakeholder participatory learning workshops conducted for small-scale farmers in Kenya and Tanzania resulted in local community empowerment, and a rich learning experience (Lightfoot et al 2000; Shao et al 2001).

The pre-workshop visioning and the multi-stakeholder participatory learning and problem census workshops were conducted as described in Section 4.3.3 and 4.4.1.

For more details on section 4.4, refer to Annex 3.1 and 3.2.

4.4.1. Problem census workshops

The multi-stakeholder participatory learning and problem census workshops (Activity 4) introduced the learning approach and facilitated the participating artisanal fishers and service providers in:

- Understanding the ecology and status of marine capture fisheries in the selected site,
- Understanding the meaning and importance of the multi-stakeholder participatory learning approach to empower communities to realise and plan development of their livelihood activities to ensure sustainable utilization of the available natural resources,
- Understanding the importance of fisheries within complex livelihood strategies of the poor,
- Ranking of factors influencing livelihood choices,
- Identification of constraints to fisheries dependent livelihoods,
- Identification of changes and actions to realise future visions, and
- Formation of Multi-sector Fisheries Reference Groups.

Proceedings of these workshops are given in Annexes 3.1 and 3.2.

4.5 Livelihood and Institutional appraisals

The livelihood appraisals (Activity 5, see Annex 2) aimed to:

- Describe the relationship between fishers and their resources (sub-activity 5.1);
- Describe links between livelihood strategies and relative socio-economic status, and identify the most vulnerable groups to loss or mismanagement of fisheries resources (sub-activity 5.2);
- Identify site-specific formal and informal management systems and institutions (sub-activity 5.3);
- Determine dependence on fisheries resources (sub-activity 5.4).

Participatory methods as well as household surveys were used to gather information for the livelihood appraisals. Community members and personnel of local institutions were trained and involved in the research.

4.5.1. Participatory approach

Participatory approaches were used for sub-activities 5.1, and elements of 5.2, 5.3 and 5.4. The participatory approaches used, based on methodologies developed in participatory rural appraisal (PRA) context, included semi-structured and informal interviews, as well as focus groups (Bunce *et al.*, 2000, Slocum *et al.*, 1995, Chambers 1992, 1994)

Semi-structured and informal interviews (See Annex 2, Appendix 1 for interview guides) were used to determine the communities' dependence on fisheries resources. To investigate the dependence on fisheries resources, key informants helped determine the communities' occupational structure (for each of the communities' households, the informants listed all their activities whether carried out for income or for subsistence). Data gathered on occupational structure (See Berkes *et al.* 2001) showed the level of dependence of households on fisheries resources.

Three to six key informants in each village were interviewed by the research team to develop the occupational structure of each village. These were middle aged to older men and women, of different background and who knew the communities well.

User based focus groups (fishers grouped according fishing gear/type, fish fryers, sea weed farmers) and semi-structured interviews (fresh fish traders, boat makers, ice sellers) were used to investigate:

- The relationship between fishers and their resources, and fisheries-dependent livelihoods;
- Site-specific formal and informal management systems and institutions;
- The constraints to sustainable fisheries-dependent livelihood development.

Focus groups were composed of 6 to 8 participants of different ages. In total 23 focus group meetings were carried out (10 in the Tanzanian sites and 13 in the Kenyan sites). Participants to the focus group were randomly selected within their user groups using the occupational structure households' list as a sampling frame. Training was provided (see 4.3.2) to leading socio-economists and to fisheries assistants for them to carry out the focus group meetings.

Tables and basic statistics were used to analyse the data.

4.5.2. Household surveys

Household surveys were used for sub-activity 5.2 and elements of 5.4. A questionnaire (See Annex 2 Appendix 2) was used to identify the poorer user groups by investigating the links between livelihood activities and relative socio-economic status. Results of the household surveys were also used to provide more detailed information on dependence on fisheries resources (particularly dependence on fish as a source of food).

Wealth was investigated using food security (based on food coping and food surplus accumulation strategies) and material style of life indicators (Berkes *et al.*, 2001, Polnac and Crawford, 2000). The food security indices reflected the households' situation in the short term, and material style of life, based on assets ownership, reflected the situation of the households in the longer term.

Key informants identified and ranked wealth criteria (how assets and food related strategies reflected households' wealth/poverty). Material Style of Life (MSL) items included assets such as housing material (roofing, walls), livestock and transport ownership. Each item was given a score reflecting its rank. Food coping strategies included changes in diet, skipping meals, borrowing. A frequency scale was determined. Frequency of use of each food related strategy was weighted by its severity rank. Cumulative scores were then calculated (MSL score plus food security score). The higher the scores, the wealthier the household.

The first part of the questionnaire related to household characteristics and MSL data. The second part concentrated on fisheries dependent households (fishing systems, other activities).

Training was provided to the interviewers (a man and a woman from each community). They tested it, problems were discussed and the questionnaire was amended and finalised. They were administered in Swahili in Tanzania and in mixed English/Swahili in Kenya, this was the preference of the interviewers.

40 to 60 households were randomly sampled in each community using the occupational structure's list as the sampling frame.

ANOVA, t-test and Pearson correlations were used to investigate factors, which could influence MSL and food security scores. Factors considered were location, main source of income, and main source of food and type of fisheries related activity. For fishing households boat use, boat ownership and gear used were considered.

4.6 Comparative analysis

The comparative analysis (Activity 6, see Annex 4) used the information gathered in the previous research activities (reviews, livelihoods appraisals and workshops) in order to

- Identify the most important fisheries-livelihood problems facing the poor; and
- Suggest where existing technologies may be appropriate to overcome these constraints.

Summary tables were used to draw out and compare results of the different research components. Overall conclusions were drawn on the nature of:

- The fisheries resources, status and trends;
- Livelihoods dependence on fisheries, and related constraints;

- Resource governance, and related constraints to livelihood development

The opportunities for improved livelihood development were analysed, and potential for the use of existing technologies highlighted. Suggestions were made on the basis of the research findings, secondary information relating to on going projects, FMSP project summaries review and internet browsing. Key information gaps were highlighted.

4.7 Dissemination of Project outputs and methodologies

Dissemination of project methodologies and outputs formed activity 7, through three sub-activities. Firstly, at the project commencement, a communications matrix was developed in order to identify the appropriate formats for disseminating to the different target groups (sub-activity 7.1, see Annex 5).

Sub-activity 7.2 related to promoting project methodologies through field-based activities. Fieldwork methodologies were promoted through training (sub-activity 3.2), but also through participation. Fisheries Department personnel were involved throughout the research (review, livelihood appraisal and workshops). The artisanal fishers and others participating in the multi-stakeholder learning and problem census workshops followed the participatory learning approach and shared experiences on their fishing and related activities. The approach to the dissemination of project methodologies was "learning by doing".

Dissemination of project outputs (sub-activity 7.3) will occur through partial or whole projects reports to national and international organisations in English. Oral and written presentations and small summary reports translated into Swahili will be targeted for the participating fisher communities through the reference groups formed during the workshops. The methods for dissemination of outputs are summarised below for the different levels and stages.

4.7.1. Local level stakeholders

At local level, the target stakeholders include artisanal fisher groups (BMUs, VEMCs, CBOs, etc.), Fisheries District Officers, CBOs and NGOs working in fisheries at district level. (coastal districts). The means of dissemination will be the workshop proceedings reports in English and Swahili where relevant, and final reports of the findings. Some dissemination at this level has already taken place through involvement of certain stakeholders throughout the project implementation (Livelihood Appraisals and Problem Census Workshops). If additional resources are available, or can be provided by Fisheries Departments, future reflection visits would support and advise the feedback workshops at the participating villages.

4.7.2. National level

National level target stakeholders include:

Tanzania: Fisheries Department - Ministry of Natural Resources and Tourism
Department of Fisheries and Sea Products (Ministry of Agriculture, Natural Resources, Environment and Co-operatives (Zanzibar), National Environment Management Council (NEMC), University of Dar Es Salaam, Institute of Marine Sciences, Tanzania Fisheries Research Institute (TAFIRI), Tanzania Coastal Management Partnership (TCMP),

Private fishing and processing companies . Others are Care International (Tanzania) and Office of the Vice President.

Kenya: Fisheries Department (Ministry of Natural Resources), Kenya Marine Fisheries Research Institute, Coastal Development Authority, Kenya Wildlife Service, Office of the President

In both Kenya and Tanzania, the means of dissemination to national level stakeholders will be final reports of the findings, and policy briefs (to be developed following conclusion of the project).

Some dissemination at this level has taken place through training and involvement of personnel during participation in research, participatory learning workshops and preparation of the final (technical) report.

4.7.3. Regional/International levels

Regional and wider level target institutions include WIOMSA, SEACAM, IUCN, CORDIO, RFIS and WWF. Methods of dissemination will be final reports of the findings, and policy briefs (to be developed following conclusion of the project). Data collected will also be used to contribute to CORDIO's pilot Socio-Economic Monitoring Programme.

Outputs will also feed into the wider policy debate through contributing to DFID's Policy Research Programme, Rural Livelihoods Department, "Lessons learnt for regional fisheries policy from microscale fisheries research".

5. Outputs

5.1 Summary of results

5.1.1. Output 1: Classification and profile of fisheries and associated livelihoods

This output related to Activities 1 (Review) and 2 (Site selection). The review reports are given in Annex 1.1 for Tanzania, and Annex 1.2 for Kenya.

5.1.1.1. *Summary review findings*

The principal findings from the reviews indicated coastal fishing activities in Tanzania and Kenya are mostly small scale and artisanal. The main gears used are traps, handlines, spearguns, spear, tidal weirs, gill nets. Fishing boats are mostly non-motorised, locally-made dug out and outrigger canoes. The majority of the catch is composed of demersal species fished nearshore, but prawns are also exploited in specific areas.

The ecosystem, climate, oceanographic characteristics and current patterns highly affect the type of fisheries and their productivity. For example, some of the most productive fisheries are linked to large estuaries where commercial fisheries operate. Seasonality is also important, with restricted access to fisheries resources during the south-east monsoon period.

Artisanal fishers and fish traders (fish fryers) form the major marine fisheries stakeholders and contribute about 90 – 95 % of the fish production. They depend on the

resource for food (provision of nutritional requirements), creation of job opportunities and income generation.

It was suggested by the review that fisheries dependent people are poor. National surveys (GK, 2000; MNR&T/JICA, 2002; National Bureau of Statistics, Tanzania, 2002) showed that coastal districts are poorer on average than other areas. In Tanzania, between 7 and 33 % of households in the coastal regions live below the food poverty line (19% nationally). In Kenya, 59.5% people live in food poverty in the Coastal Province (50.6% nationally). Fishing dependent households are one of the poorer groups (Shimoni area, Malleret-King 2000), fishers are found to have very low income (south Coast: McClanahan and Mangi, 2001). However, Tanzanian fishing households are wealthier than farming groups in term of income.

It was found in the review that coastal population in Tanzania depended on fish for 60% of their protein intake (MNR&T/JICA 2002). Very little quantitative information was available in the literature on the dependence on fisheries resources.

However, it is apparent from the literature that fisheries are overexploited. The number of fishers has been increasing over the last 10 years while production (fish catch) is decreasing.

Fisheries resource management is the responsibility of a variety of institutions which include Fisheries Department/Divisions, Research Institutes, Wildlife and Environmental related organisations, international organisations, NGOs. However there is a lack of coordination between these institutions which contributes to the lack of management of the resources. Furthermore, it was apparent through the review that there are very few management initiatives at the local level, and traditional management systems, if any, have disappeared. Efforts have been made by the Fisheries Departments/Divison, whose resources are too scarce to carry out their mandate, to devolve power at the local level to improve management. However this is a recent move, and has not yet been successfully implemented.

The reviews suggested that the constraints to fisheries associated livelihood development related to poor and inefficient fishing gear and vessels, lack of capital, limited access to better markets coupled with poor handling facilities, poor infrastructure and high post-harvest losses, and weak management.

The major information gaps identified through the review related to fisheries statistics (reliable catch data is lacking), to fisheries stakeholders socio-economic status and to the dependence on coastal and marine resources.

5.1.1.2. Site selection

Field studies were used to complement and ground truth the review findings. Representative study sites were selected according to criteria defined at the beginning of the project. The criteria included:

- Poverty: the studied communities should be poor as the project aims at targeting the poor
- Representative biophysical environment and resource use patterns
- Manageable and representative demographic size (no urban areas)
- Accessibility: This relates to logistics for research and workshop – cost, availability of transport, availability of facilities for the workshop

- Information should be available about the area but previous work at site should be minimal (no previous extensive studies, no on-going research work at sites)
- There should be no on-going project or established Marine Protected Area at the site.

6 villages in two Districts, Kilifi in Kenya and Bagamoyo in Tanzania, qualified on the basis of the above criteria and made it possible to carry out the study successfully (Table 1 summarises the characteristics of selected villages).

Table 1: Characteristics of the selected sites.

Country	Village	Approx. Size (households)	Location	Dependence	Access	Ecosystem	Gear used
Kenya	Chumani	150	Kilifi District (North Coast)	High	Very Easy	Barrier reef, lagoon	Spear guns, gill nets, hand lines
	Kidundu	104		Very High	Medium	Creek, estuary	Cast nets, hand line
	Mtondia	214		Medium	Very Easy	Barrier reef, lagoon	Spear guns, seine nets, hand lines
Tanzania	Kondo	222	Bagamoyo District (South Coast)	Very high	Easy	Coral reef, lagoon, mangrove	Beach seines, spear, hand lines, gill nets, cast nets/ring nets
	Mlingotini	540		Very High	Easy	Coral reef, lagoon mangrove	Beach seines, spear, hand lines, gill nets, cast nets/ring nets
	Dunda	2415		High	Very Easy	Coral reefs	Beach seine, Spear, gill nets, hand lines, cast nets, fish traps.

* Note that Dunda was used as a study site in the multi-stakeholder learning problem census workshops, but not in the livelihoods appraisals.

Findings of the field studies supported and complemented the review results.

5.1.2. Output 2: Livelihood and institutional appraisals, and problem census workshops

This output related to Activities 3 (Stakeholder analysis and pre-workshop visits), 4 (conduct problem census workshops) and 5 (conduct livelihood /institutional appraisals). Reports are given in Annex 2 (Livelihood Appraisal Analysis), and Annexes 3.1 and 3.2 (Proceedings of the multi-stakeholders participatory learning/problem census workshops for Kenya and Tanzania respectively).

The principal findings from the reviews and fieldwork on stakeholder analyses, pre-workshop visits, problem census workshops and livelihood /institutional appraisals are summarised below.

5.1.2.1. Stakeholder analysis

Quick stakeholders (local level) analyses were carried out in all sites (Activity 3) to inform the problem census workshop process. The results are summarised in the tables below:

Table 2: Stakeholder analysis, Kenyan sites

Stakeholders		Type	Gender/Origins
Primary stakeholders	Fishers (men)	Nets Hand lines/long lines Beach seines Spear guns/spear Traps (very few)	Men, local except for: Handlines: 20 fishers from South coast of Kenya during kaskazi Beach seines: some migrants from Pemba
		Tidal weirs Cast nets	Men, local. Gears are only found in Kilifi Creek
Secondary stakeholders in villages	Fish traders	Fish fryers (women)	Women
		Fish traders Octopus traders/agents for octopus dealers	Men Men, local and from urban area (Kilifi)
	Boat repairer/makers		Men, local
Secondary stakeholders in Kilifi	Trap makers	Malema maker	
	Fishmongers	5 Fish shops buying and selling mainly in Kilifi	One dealer also provides fishers with cool boxes for octopus
		Fish shop buying from Kilifi and further north on the Coast and selling in Kilifi and in Mombasa	
Secondary stakeholders in Mombasa	Ice blocks seller		
	Large companies	Processing octopus	Mombasa/ Foreigner
		Fileting	Company in Mombasa

Table 3: Stakeholders analysis, Tanzanian sites.

Stakeholders		Type	Gender/Origin/other comments
Primary stakeholders	Fishers	Nets Hand lines Beach seines Spear guns/spear Traps (madema) Uzioo Prawn nets Diving Dynamite	Men, local
	Sea weed	Seaweed farmers	Men and women, only in one area
Secondary stakeholders in villages	Boat owner		Man
	Fish traders/processors	Fish fryers and dryers	Women and men in one village (Dunda), only women in other villages
		Smoked fish traders Fresh fish traders selling outside of the village Fresh fish traders selling in streets Sea cucumber dealers	Men, local and from other villages
	Boat repairer/makers		Men, one migrant from Zanzibar
	Trap makers	Malema maker	Man, local, only 1

	Ice seller		Only 1, local
Other stakeholders	Organisation	Fisheries development Institute	
Secondary stakeholders in Dar	Large companies	Sea weed marketing company	Dar es Salaam

The main stakeholders are fishers and fish traders. Fisheries are a male dominated domain. This was further complemented by the livelihood appraisals (Annex 2) and census workshops (Annexes 3.1. and 3.2).

The stakeholder analysis identified the workshop participants. This was followed by the pre-workshop visits to sensitise the Fisheries Officers and other District Officials on the purpose of the workshop, and train the Fisheries Officers to support facilitation of the pre-workshop visioning and workshop conduct/procedure. This was followed by visits to the participating villages to conduct the pre-workshop visioning exercise.

The outputs from the pre-workshop visioning were maps showing the status of the fisheries and other natural resources in the past (20 years and beyond) and the present situation (Annexes 3.1 and 3.2), illustrating and emphasising the past trend of the marine fisheries resource and associated habitats.

5.1.2.2. Multi-stakeholder Participatory Learning and Problem Census Workshops

The pre-workshop sensitisation process and visioning exercises were conducted as described in the previous section.

The two three-day workshops were fully participatory and sharing of experiences, involving plenary and group discussions. Participants drew their own expectations at the beginning of the workshop, which were matched with the workshop objectives and formed the reference points at each stage for successful workshop outcomes. Facilitators gave detailed instructions before each session and allowed the participants maximum time to discuss and present their findings and suggestions. Learning by doing was a key feature of the workshop. At the end of the workshop, Reference Learning Groups were formed. The outputs of the workshops are summarised below and detailed in Annexes 3.1 and 3.2.

Stakeholders

The main stakeholders were the artisanal fishers and the District/Divisional/ Village Fisheries Officers. Others included fish traders, boat builders/repairers, net menders, community-based organisations and the Department of Agriculture. In both countries, fisheries activities are pre-dominantly male oriented. Women are mainly involved in fried/dried fish trading, shoreline small fish species catching using bed nets and 'kangas' and shell collection. In Tanzania, seaweed farming, which is on the increase, is mostly undertaken by women.

The stakeholders who attended the workshops were:

- The Fisheries Division (Tanzania), Department of Fisheries (Kenya – Coast Province) and District Fisheries Officers;
- Fisheries affiliated/collaborating institutions. Mbegani Fisheries Training Institute (Tanzania); Marine Conservation Department (Kenya);
- Artisanal fisher groups and other fisheries-dependent stakeholders (eg, fish traders, boat builders).

Other stakeholders who did not attend the workshops were:

- Tanzania: Tanzania Fisheries Research Institute (TAFIRI); Institute of Marine science; and the University of Dar es Salaam.
- Kenya: Kenya Fisheries Research Institute (KMFRI); KDDP, CBNP, NEMA, Green Com, Plan International, Action Aid, Plan Kenya, Forestry.

Fisheries resources, trends and threats

The most important fisheries resources for the artisanal fishers at the study locations in Kenya and Tanzania are finfish (rabbit fish, scavengers, sardines and jacks); crustaceae (prawns, crabs, shrimps and lobsters); and molluscs (oysters, octopus, and squids). In Tanzania, seaweed is becoming an important marine resource. The main gears used include basket traps, fence traps, gill nets, shark nets, sardine nets, cast nets, beach seines, spears and handlines. Vessels used are dug out canoes, out rigger canoes and dhows. Powered large boats (outboard or inbuilt engines) are owned by the richer fishers or rented. In Tanzania, fewer planked canoes owned by the richer fishers. Boats and gears are shared, rented or individually owned. Gear choice is dependent on the economic status of the fishers, although they would prefer to catch the larger fish using powered boats and large mesh.

Fish production in both countries was reported as declining in catch volumes, size of fish caught and depletion of some of the fish species.

There was increased concern over overexploitation/increased fishing pressure and the deterioration/destruction of the fish habitats (mangroves, coral reefs and sea water polluted) in both countries, and in Tanzania seaweed farms being destroyed by beach seining.

Fisheries stakeholders, status and dependence on fisheries

It was found from the workshops that artisanal fishers regard themselves as being poor. Their activities are seasonally affected, with low catches during the south-east monsoon period, when seas are usually very rough.

During the workshops the stakeholders (artisanal fishers and others) learned and shared experiences on the importance of marine fisheries to their livelihoods, strategies that determine their livelihoods and ranked the factors influencing their livelihood choices. The outputs from the livelihood ranking exercise for the participating villages are summarised in Table 4 and Table 5, and details discussed in Annexes 3.1 and 3.2.

Table 4: Dependence on fisheries and other activities for livelihoods, Kilifi workshop, Kenya

Village/Priority	1	2	3	4
Mtondia	Stone quarrying	Fishing	Farming	Small businesses
Kidundu	Fishing	Fish trading	Farming/Livestock keeping	Mangrove harvesting
Chumani	Fishing	Farming	Stone quarrying	Coconut by-products **
Women **	Farming	Fish frying & selling	Cooking & selling food	Weaving using coconut leaves

** All villages combined.

** Mats, furniture, palm wine.

Table 5: Dependence on fisheries and other activities for livelihoods, Bagamoyo workshop, Tanzania

Village/Priority	1	2	3	4	5
Dunda	Fishing	Farming	Small businesses	Boat building	Food supply (Mama lishe)*
Kondo	Farming	Fishing	Small businesses	Charcoal making	Livestock keeping
Mlingotini	Fishing	Farming	Small businesses	Fish selling	Food supply (Mama lishe)*
Women **	Farming	- Food supply (Mama lishe) - Fish frying & trading	- Dress making - Baking and selling burns/donuts		

** All villages combined.

* Covering for women activities

From the two tables above, the workshops indicated that, in each of Kenya and Tanzania, fishing was considered the most important livelihood activity in two of the three villages, and the second most activity in the third village. However, it was not an important activity for the women's group.

Fish trading was not considered the most important activity in any village, but was second priority for one village and the women's group in Kenya, and second priority for the women's group, and fourth priority for one village in Tanzania.

Other resources important for livelihoods of coastal fisher communities include farming land, limestone rock (fossil corals), mangroves, coconut trees, food crops (preparation of food for fishers) and livestock.

Management of fisheries resources at the national and local level

Workshop participants were asked to prepare future vision plans, indicating their desired future status of fisheries resources, and identifying what actions needed to be taken, and by whom, in order to achieve these.

District Fisheries Departments were seen as key in improving management, but necessary improvements in the services that they offer were identified. In Kenya, these related to improved licensing processes, increased devolvement of management responsibility from district level to Beach Management Committees, increased advisory and education roles, for example sensitising fishing communities on the importance of registration through licensing, or increased advisory role relating to private and public credit facilities for fisheries development. In Tanzania, highlighted improvements to services included increased involvement of communities in fisheries management, education and extension services on appropriate fishing methods and safety issues, and increased implementation of fisheries legislation.

Locally-based fisheries management initiatives were not considered to working particularly effectively. In Kenya, Beach Management Committees (BMCs) were perceived as being responsible for preventing illegal/ destructive gear use, but were not yet working due to conflict within members, mistrust between district extension staff and BMC managers and lack of resources. In Tanzania, the Village Environment Management Committees (VEMCs) are the main local authority, responsible for management of all aspects of the environment including village hygiene, safe water, soil erosion and conservation of all natural resources in their jurisdiction. Their fisheries activities include patrolling for illegal gear use and habitat destruction (mangroves, coral reefs, seawater pollution and dynamite fishing). Beach Management Units (BMUs), similar to the BMCs in Kenya, are yet to be formed on the Tanzania coast. When formed

they will need to be integrated within the VEMCs to avoid role conflicts and duplication. Community based groups in Kenya and Tanzania are considered to be scarce.

Major constraints to fisheries livelihoods development

The constraints identified during the problem census workshops included illegal fishing (dynamiting, misuse of small sized nets and spear guns), coral mining for lime making, habitat degradation and pollution. These constraints are threatening the regeneration and survival of the fisheries resource.

For artisanal fishers themselves, the most serious problem is lack of access to capital, which forces them to use illegal and inferior fishing gear, and confines them to near shore fishing grounds which are already overexploited. This constraint is related to poverty. In addition all workshop participants agreed that modern fishing skills are lacking, and therefore there is a need to equip fishers with adequate skills through training and extension so as to improve their catches. Lack of alternative opportunities to livelihoods is another serious problem among fisher communities, resulting in an increased number of fishers. In Tanzania, women seaweed farmers complained of destruction of seaweed farms by beach seine fishers. Bad weather is a problem for fishers, particularly during the south-east monsoon period. During this time, alternative activities are required, but, as mentioned, alternatives can be limited.

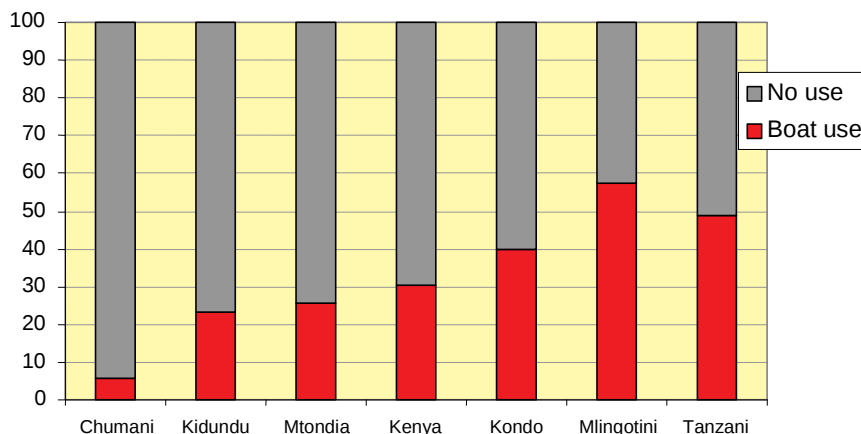
5.1.2.3. Livelihood/Institutional appraisals

Results from the livelihoods appraisals (Activity 5) are summarised below, but more details are provided in Annex 2.

Fisheries resources, trends and threats

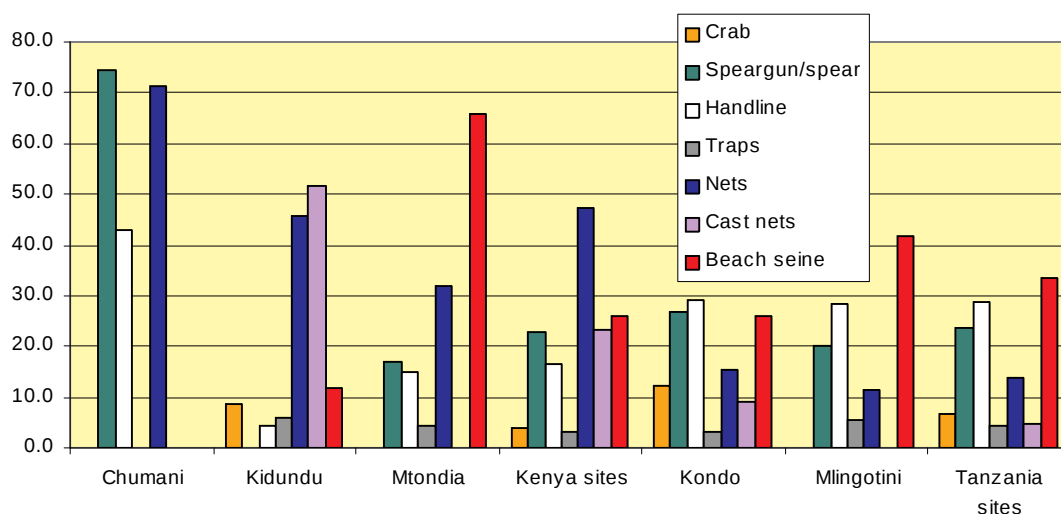
Fishers are mostly artisanal in Kenya and Tanzania. Boats used are mainly dug out and outrigger canoes, and a large percentage of fishers were found not to use boats, particularly in the Kenyan sites (Figure 1).

Figure 1: Proportion of fishers using boats in the study sites (source: livelihood appraisal, Annex 2)



Gears used include nets (gill nets, cast nets, beach seines), spear/spearguns/collection, traps and handlines (see Figure 2). One of the major findings of the livelihood appraisal is that beach seines were one of the most widely spread gear despite its illegal status.

Figure 2: Percentage fishing households using each gear (source: livelihood appraisal, Annex 2)



Artisanal fishing is affected by seasonality, with catches being lower during the southern monsoon, when the seas are rough and the wind strong. During this period, fishing occurs mainly in inshore areas. Small, non-powered boats often constrain fishers to inshore areas all year round. Demersal fish are the main targets of the fishers (rabbit fish, scavengers, parrot fish etc). Pelagics such as tuna or jacks are exploited only during the calm season. Other marine organisms such as octopus, lobster, prawns and sea cucumber are also heavily exploited. Table 6 summarises the characteristics of fishing (see Annex 2 for further details).

Table 6: Timing, location, species targeted and catch per gear

Gear	Area	Timing	Species	Daily catch per fisher
Crab stick	Mud flats, mangrove areas	Both seasons Day. Low tide.	Crab	2-5 kgs No marked seasonal difference
Diving: spear gun, spear/stick, lobster pot	SM: Inshore, rocky areas, sea grass. NM: Outer reef	Both season (better north monsoon) Day and night. Low tide.	Octopus, lobster, sea cucumber, rock cod, reef fish and parrots.	NM: 5-10Kgs SM: 0.25-3kgs
Handline	SM: Inshore NM: Offshore if they have boats, deep sea.	Both season. Day and night. Low or High tide.	Reef fish Pelagics: tuna	1-5 Kg. 10 Kg (migrant fishers, go deep sea)
Traps	Mud flats, sandy areas. Inshore.	Both season. Day. Low tide.	Prawns, lethrinids, juvenile reef fish, catfish	2-5 kgs (change according to season)
Gill nets (2.5 to 5 inch net)	SM: Inshore (sea grass, sandy area) NM: Deep sea and channels.	Used both season. Night and day. Used at low tide.	Reef and herbivorous demersal fish Pelagics: ray, jacks Squid	5-20 Kg (marked change according to season)
Cast net	Shallow areas, muddy, sandy bottom. Deeper waters in DS.	Both season, but higher season in Tanzania during the North monsoon. Day and night. Low tide.	Sardines, prawns, dagaa.	1-3 Kg in season
Beach seine	Inshore shallow areas. Sandy bottom. Channels.	Both season. Day. Low tide.	Dagaa (small fry) mainly in Tanzania Sardines, all types of reef fish/ herbivorous fish. Usually small size.	5-25Kg (no marked difference according to season)

NM = north-eastern monsoon

SM = south-eastern monsoon

Gear choice is often the results of economic constraints. A large number of fishers do not use boats, but do use spear guns and beach seines. These are considered the easiest fisheries to get into, as there is no need for expensive equipment. Beach seines are owned by rich individuals who hire them out. Boats and gear are often shared, or hired.

Information and data collected on the fisheries resources indicates declining catches in the areas most frequented by the artisanal fishers. Declining catch trends have been identified by previous studies (see reviews, Annexes 1.1 and 1.2) and this was confirmed during the livelihood appraisals and workshops (all focus groups mentioned that the size and quantity of fish had reduced).

Fisheries stakeholders, status and dependence on fisheries

The main fisheries stakeholders are fishers, and fish traders (particularly fish fryers). Other stakeholders include seaweed farmers in Tanzania, and boat builders. Ice sellers were also identified as stakeholders, but are very few in number and ice selling is a minor activity for them (although essential to reduce post harvest losses).

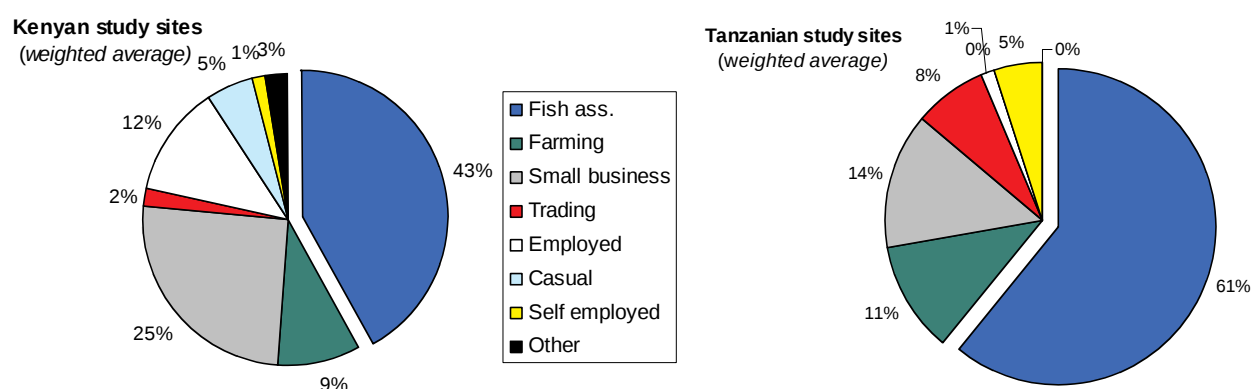
Little information on fisheries dependence was found from the reviews (Annexes 1.1. and 1.2.), but through the livelihood appraisals it was possible to determine that, in the study locations, between 23 - 70% households fished, and between 10 - 25% were

involved in fish frying, suggesting that these are two major fisheries livelihoods activities in coastal Kenya and Tanzania. Fresh fish selling, especially in cities like Dar es Salaam, Tanga and Mtwara, is equally important in Tanzania.

Fisheries dependent activities are male dominated. Fish fryers are mainly women and some women are involved in fishing (crab, prawns but also with nets in some areas of the north coast of Kenya).

The livelihood appraisals enabled the dependence on fisheries resources to be determined at the representative sites. Community dependence is high, with between 30% to 71% of households depending at least partly on fisheries for their living in the various sites studied Figure 3 shows the activities identified as most important in terms of income (percentage households). The proportions reflect the weighted averages for each country (see below).

Figure 3: Percentage of households depending mainly on fisheries associated activities (including fishing, fish trading, boat building)



Although no fisheries dependent households depended solely on fisheries for their livelihood (farming and small business were also part of the livelihood strategy), 68% of the surveyed fishing households in Kenya and 87% in Tanzania considered fishing as their main source of income, and up to 56% of households in Tanzania (only 8% in Kenya) depended solely on fishing for their income.

Fisheries were found to be an important food provider for both fisheries dependent households and the wider community (See Table 7).

Table 7: Percentage of households eating fish or other marine products at least once a week (source: livelihood appraisals, Annex 2)

Location	Fishing dependent households	Other fisheries dependent households	Non fisheries dependent households
Kenya sites	88.7	92.7	74.3
Tanzania sites	75.6	50	50.6

Loss or mismanagement of fisheries resources would particularly affect fishing dependent people, who would lose their main source of income (for 56% of households in Tanzania, their only source of income). The depletion of the resources would also affect the wider community as a high percentage consumes fish (one of the least expensive source of animal protein).

With regard to fisheries stakeholders' economic status, the main results of the livelihood appraisals showed that:

- Fisheries-dependent households, in particular fishing households were significantly wealthier in the short and the long term on average in the Tanzanian sites than in the Kenyan sites.
- Fishers using boats were more food secure than those not using boats (which could explain why Tanzanian fishers would be wealthier than Kenyan ones, as a significantly higher proportion of Tanzanian fishers used boats).
- Out of fishers using boats, fishers not owning boats were poorest, then owners of dug out canoes were poorer than out rigger canoes.
- It is suggested that use of beach seines could indicate higher food security at the community level.

A summary of significant results are presented in Table 8.

Table 8: Factors affecting wealth and households coming out poorer/sign of the relationship

	MSL	FCS	FS	Wealth score
Country (all households)	Kenya	ns	Kenya	Kenya
Country (Fishing households)	Kenya	Kenya	Kenya	Kenya
Boat use	No use	ns	No use	ns
Boat ownership	None, canoe	ns	ns	ns
Beach seine	ns	ns	+	ns

Ns: non-significant., MSL: Material Style of Life index, FCS: Food Coping Strategy index, FS: Food Surplus index (see Annex 4).

Management of fisheries resources at the national and local level

Resource management is understood to be the responsibility of formal national institutions such as the Fisheries Department, although Fisheries Departments are trying to increase community empowerment by establishing Beach Management Committees (BMC) in Kenya and Beach Management Units (BMU) in Tanzania. These institutions are based on traditional systems (beach leaders). In the case of Tanzania, the BMUs have only been formed in the Lake Zone (around Lake Victoria) and efforts are underway to establish the same along the coast and elsewhere. There is little or no traditional management. Informal management relates to health, safety and hygiene, rather than resource management.

Stakeholders in Kenya identified the BMCs as important in preventing illegal gear use. In the Tanzanian sites, Beach Management Units were not mentioned, but Village Environmental Management Committees (VEMCs) were considered to have a role in fisheries management similar to the BMCs in Kenya. The VEMCs have a wider scope, as they are also responsible for overseeing environmental protection on farmland and settlement areas. However it came out that neither the BMCs or VEMCs are functioning well.

In the livelihood appraisals, as well as in the reviews (Annexes 1.1. and 1.2) and workshops (Annexes 3.1.and 3.2), fisheries management was found to be poor. According to fishers and other stakeholders, formal institutions are not able to carry out their mandate.

Due to mistrust and lack of initiative, very few self-help or community-based groups exist, which contributes to the poor management of the resources.

Major constraints to livelihood development of fisheries dependent people

The major constraints to livelihood development identified through the livelihood appraisals are all inter-related, and constitute a poverty cycle. The main constraints identified were:

- Lack of access to credit: The most important fisheries livelihood problems facing the poor include poor and inefficient fishing gear and vessels, lack of capital, access to better markets exemplified by poor handling facilities, poor infrastructure and high post-harvest losses. Lack of capital prevents fishers from accessing more sea worthy boats and more effective sustainable gear, and keeps them constrained to fishing mostly inshore. The lack of capital also forces some fishers to enter destructive fisheries such as beach seines (this was found for the Kenyan and Tanzanian sites), as no investment is necessary to enter.
- Poor fisheries management: This has enabled the use of destructive gear to spread, and thus increases pressure on the resources.
- Decline in fisheries resources: the increase in the number of fishermen, due to the lack of alternative employment, and the use of illegal gear has increased poverty.

Due to over fishing (increase in number of fishers) and illegal gear used, the pressure on the resource is high. It is increased by the lack of access to capital, constraining activities to inshore areas. Decreases in catches increase poverty, which triggers an increase in illegal fishing methods etc. This cycle is maintained by the lack of management, which contributes to the use of illegal gear. However, although fishers believe that offshore fishing might be the solution to most of the constraints they have identified, this idea cannot be supported unless further research is undertaken (see section 5.2.2.

5.1.3. Output 3: Local capacity increased, and stakeholder linkages strengthened

Local capacity to collect socio-economic information was increased through training and participation in the research during the livelihood appraisal phase (see Annex 2,section 1.3). Informal training sessions were provided to Fisheries Department and Division staff in both countries on the use of socio-economic information in fisheries management on data collection methods. Community members were trained on administering questionnaires. This refers to sub-activity 3.2.

Participatory Learning Reference Groups were formed at the end of each workshop to ensure the learning process continued within communities post-workshop. This is expected to stimulate empowerment and planning for development right from the grassroots level. It is expected the District Fisheries Officers in the participating districts

will strengthen these groups by using them in extension and conservation programmes, and link them to national levels. Support for Post Workshop Visits by the consultants would help to ensure that the Reference Groups remain active.

5.2 Summary findings on constraints and opportunities

The findings of the reviews and field-based activities were compared and drawn together in the Comparative Analysis (Activity 6, see Annex 4), which identified the most important fisheries livelihoods problems facing the poor, where interventions (appropriate technologies or other) could help mitigate these problems.

5.2.1. Findings on constraints facing the poor

The main outputs of the Comparative Analysis are presented below. Further details can be found in Annex 4, sections 3 to 5.

Findings of the three research components generally were convergent and complementary. Higher level of details were provided by the workshops and the livelihood appraisals for most of the themes investigated, except for resource governance and ecosystems for which more comprehensive analysis came out of the review. Most in-depth analysis and quantitative information was provided by the livelihood appraisal. Besides identifying constraints to livelihood development of fisheries dependent people, this research has provided new knowledge on the level of dependence on fisheries resources of coastal communities, the distribution of gear and boat use, factors affecting wealth at the local level, fisheries related differences between Tanzania and Kenya, and on changes perceived by the communities in the last 30 years. This research also has contributed to increase the knowledge on causes for the lack of resource management at the local level.

Coastal people represent 13.3% and 9% of the population of Tanzania and Kenya respectively (see Annex 1.1 and 1.2). The coastal population is highly dependent on fisheries resources for food and income. The research findings suggest that on average 68% of coastal households in Tanzania, and 43% in Kenya depend on fisheries related activities for their livelihood (see Annex 2, section 2).

However, fisheries dependent people are poor, and fishing households are particularly vulnerable to loss or mismanagement of the resources. Opportunities to move out of fishing are often very scarce in both countries, whereas a wider choice of activities is provided in urban areas or inland.

Fisheries management has failed so far due to the lack of enforcement capacity, poor resources, and a lack of coordination between institutions involved. Fisheries Department/Division are making efforts in order to give more power to the local level to improve management capacity, but these are not fruitful yet. The lack of local-based initiatives and non-existent informal management systems, coupled with the lack of formal management has contributed to overexploitation of the resources, particularly inshore.

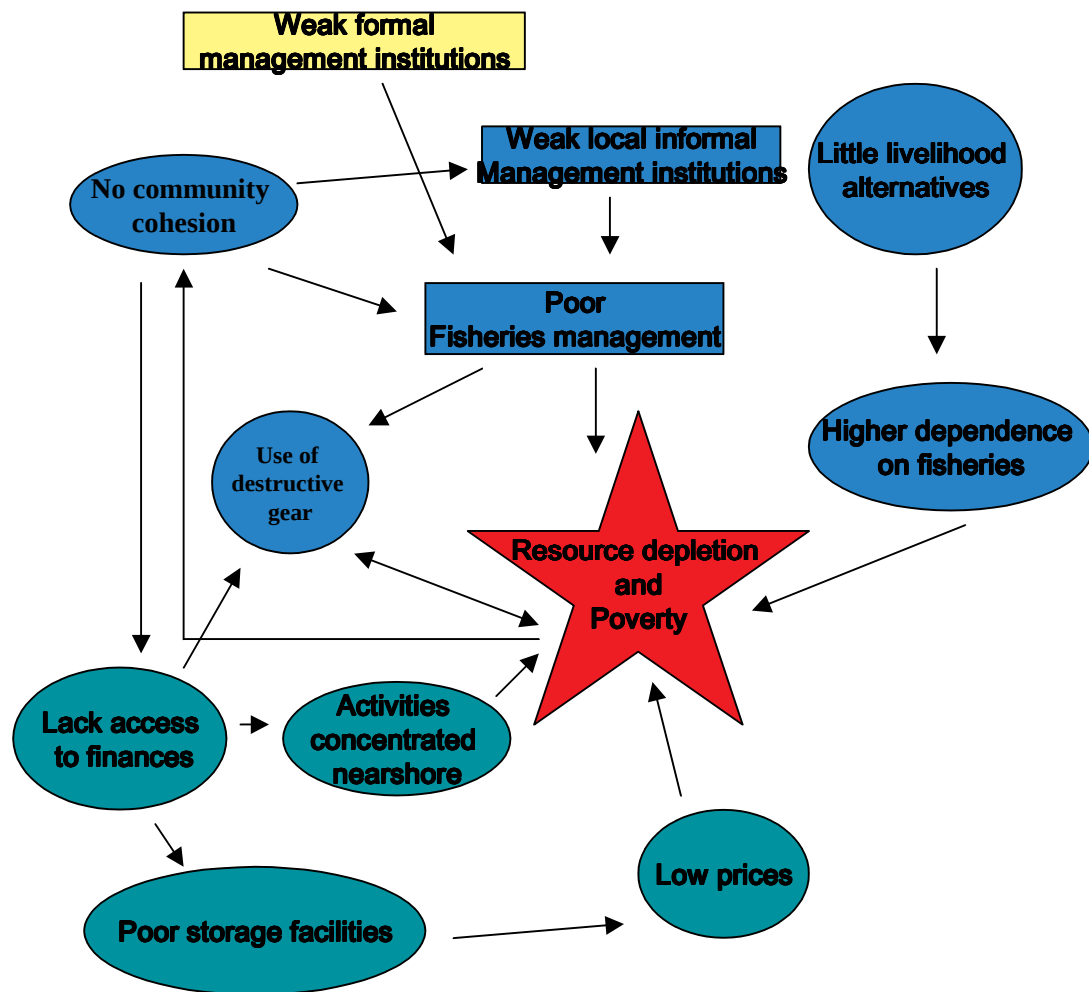
The major constraints to improved fisheries livelihoods are perceived as:

- Lack of/weak management;
- Resource depletion, due to poor management, population growth, environmental factors, lack of alternative livelihood opportunities;
- Lack access to credit.

One of the underlying causes of the constraints mentioned above was found to be distrust amongst community members, preventing community based groups or initiatives to function successfully.

Figure 4 below summarises the constraints on livelihood development of fisheries dependent people and the way they interact with each other perpetuating poverty.

Figure 4: Fisheries associated livelihood: poverty cycle.



5.2.2. Opportunities for improved livelihood development

On the basis of the research findings pulled together in the comparative analysis, opportunities for mitigating the constraints identified were highlighted.

Livelihood opportunities are few in coastal Kenya and Tanzania. Farming and small businesses including the production and trading of ready foods, wood, charcoal, palm wine making, thatch. Stone quarrying, lime production, salt production were also identified as other livelihood activities undertaken by coastal communities. At the household level, these activities already often complement fisheries associated activities. Some of these activities are associated with conservation issues such as lime making in Tanzania where live coral is used, wood trading and charcoal making which are contributing to the destruction of habitats. Employment is scarce unless large urban areas or tourism development are in close proximity. Farming could be diversified, value added products could be promoted but more research would be necessary to identify how other livelihoods could provide an alternative to or increase their contribution to the income/subsistence of fisheries associated activities.

Within the fisheries realm, suggestions include the following:

- **Reducing pressure on the inshore resources, through increasing access to offshore resources and increasing yields**

Most obviously perceived by fishers, to release pressure on the inshore, overexploited resources is to increase access to offshore resources (for example, through access to more seaworthy boats). However, this option needs to be considered with great caution. The gap in knowledge about the potential of offshore resources means that there is no information on whether the resources could cope with a shift in the fishery. Furthermore, cost-benefit investigations need to be carried out to determine whether the cost of buying and maintaining more sea worthy boats would be compensated for by an increase in income. Research needs to be carried out on which types of boats could be appropriate, appropriate technology and/or improvement of traditional boats. Finally, further investigation needs to be made on whether improved gear would be used inshore and the impact if so.

Another suggestion is to enhance the fishery through the establishment of Fish Aggregating Devices or stock enhancement. More information would be necessary to investigate the potential and feasibility of this, including a cost benefit analysis of setting up low cost FADs in appropriate offshore locations (not far offshore) to be easily accessed by currently used boats. Similarly, more research would be needed to investigate stock enhancement practices and their adaptability in East Africa.

- **Reducing post harvest losses**

Reducing post harvest losses by improving fish storage and handling facilities, and promoting value added products would enhance fisher-dependent livelihoods. Again, more knowledge would be necessary on the potential markets for higher value fish products in the region, and the feasibility of developing valued added products.

- **Improving fisheries management**

Poor fisheries management has been identified as a main constraint to livelihood development, through the lack of enforcement of illegal and destructive fishing methods. Management could be improved through supporting and promoting co-management and

community management initiatives. Governments need to invest more in co-management approaches. Examples have been set in Tanga, for example by IUCN in Tanzania, and efforts are being made through the establishment of Beach Management Committees (Kenya) and Beach Management Units (Tanzania). More support is required for these initiatives, and constraints to their functioning need to be investigated. Actions to increase the involvement of the private sector in management should also be carried out.

- **Promoting an enabling environment for community based initiatives**

Crucial to all of the above suggestions would be to promote an enabling environment for community-based management and self help groups to develop, through supporting and promoting self help groups and community based management initiatives. This will serve two purposes; it would increase access to credit and thus access to better fishing and/or storing equipment, and it would improve management. The causes for the lack of community unity and lack of trust among community members in coastal areas need to be investigated further. At the same time, training interventions/workshops at the village level on organisational skills are required. A support unit providing help and advice for community groups development could also be set up.

6. Contribution of Outputs

6.1 Contribution to DFID's developmental goals

As highlighted in section 2 of this document, it is believed that limitations or weaknesses in fisheries management, a lack of understanding or awareness of fisheries-dependent livelihoods, and weak linkages between stakeholders in the fisheries sector, particularly between national institutions and primary stakeholders have all contributed to constrain the livelihood development of poor groups dependent on fisheries.

This project has increased awareness and understanding of fisheries dependent livelihoods, as well as documented the importance of the fisheries resources to coastal people in Kenya and Tanzania. Furthermore, it has contributed to identifying the core constraints to livelihood development of the most vulnerable people to the loss or mismanagement of fisheries resources.

This increased understanding will enable decision makers to appreciate the importance of marine fisheries in Kenya and Tanzania, as well as target their interventions to mitigate the constraints to the livelihood development of the poor. Suggestions are made to mitigate these constraints at the management level, and on a local technological level.

Furthermore, by adopting a participatory and learning approach through the census workshops, and, by involving national institutions and community members in the research, the project has contributed to build capacity to carry out socio-economic research and strengthened linkages between fisheries institutions and other national administration with the primary stakeholders. This again should contribute to improving livelihoods of the poor through increased communication between stakeholders and managers, and better capacity for the decision makers to get updated information through their own staff.

Increased awareness, increased linkages and better understanding will help managers take appropriate decisions to improve the livelihoods of poor people through sustainably enhanced production.

6.2 Uptake promotion pathways

Fieldwork methodologies were promoted through training (sub-activity 3.2), but also through participation. Fisheries Department personnel were involved throughout the research (review, livelihood appraisal and workshops). The artisanal fishers and others participating in the multi-stakeholder learning and problem census workshops followed the participatory learning approach and shared experiences on their fishing and related activities. The approach to the dissemination of project methodologies was "learning by doing".

Project outputs will be disseminated through partial or whole projects reports to national and international organisations in English. Oral and written presentations and small summary reports translated into Swahili will be targeted for the participating fisher communities through the reference groups formed during the workshops (See dissemination matrix, Annex 5).

For more details on dissemination of project outputs and methodologies, see section 4.6 of this report.

6.3 Follow-up action/research required

On the basis of the suggestions made to contribute to improving the fisheries dependent livelihoods, further actions/research are required (see section 5.2 of this report and Annex 4, section 6).

In order to reduce pressure on inshore resources, further research needs to be carried out on:

- The potential of offshore resources, through surveying commercial fishing companies operating offshore, deep sea fishing operators, Research Institutes etc;
- The cost-benefits of accessing more capital intensive fishing equipment;
- The potential and feasibility, including a cost benefit analysis, of setting up low cost FADs in appropriate offshore locations to be easily accessed by currently used boats (the findings of FMSP project R8249 would be relevant here);
- The potential of adapting stock enhancement techniques to the East African context.

To reduce post harvest losses, further studies are needed on:

- The potential markets for higher value fish products in the region, including the requirement and feasibility of developing value added;
- The means of strengthening fisher-marketing groups for better price bargaining and negotiations for access to capital and credit facilities.

To improve fisheries management, the following actions and research are required:

- Governments need to invest more in co-management approaches;
- Support for the establishment of Beach Management Committees (Kenya) and Beach Management Units (Tanzania) needs to be increased;

- The constraints to the BMUs and BMCs functioning effectively needs further investigation;
- Means to increase the involvement of the private sector in fisheries management needs further investigation.

To improve fisheries livelihoods and enable all the above it is necessary to:

- Promote an enabling environment for community based-initiatives to develop. This will serve two purposes; it will increase access to credit and thus access to better fishing and storing equipment, and it will improve management;
- Research further the causes for the lack of community unity;
- Support training interventions/workshops on organisational skills at the village level;
- Establish a support unit providing help and advice for community groups;
- Further research the income contribution to fishing fishing household provided by men and women (e.g from sea-weed farming). Do women have control over that additional income for its use in areas such as health and education?

6.4 Publications

6.4.1. Workshops/seminars

The following workshop were held during the course of the project:

- Multi-stakeholder learning workshop, Kilifi District, Kenya, 13-15 November 2002;
- Multi-stakeholder learning workshop, Bagamoyo District, Tanzania, 11-13 December 2002.

Community meetings to present research findings in Kilifi and Bagamoyo areas are expected to take place after the end of the project.

6.4.2. Internal reports

The following internal reports were produced:

- Review of marine fisheries resources for Kenya;
- Review of marine fisheries resources for Tanzania;
- Livelihood Appraisal analysis;
- Proceedings of multi-stakeholder participatory Learning/problem census workshop for Kilifi District, Kenya (English Version);
- Proceedings of multi-stakeholder participatory Learning/problem census workshop for Bagamoyo District, Tanzania (English Version);
- Comparative Analysis
- Information Dissemination Matrix
- Final Technical Report

Swahili versions of the proceedings of the Kilifi and Bagamoyo workshops will be produced.

6.4.3. Publications

No publications in peer-reviewed journals have arisen from this project. However, the above listed internal reports will be disseminated to the different target audiences according to the dissemination strategy detailed in section 4.7.

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Annexes

Annex 1.1: Review of marine fisheries resources for Tanzania

Annex 1.2: Review of marine fisheries resources for Kenya;

Annex 2: Livelihood Appraisal Analysis

Annex 3.1: Proceedings of multi-stakeholder participatory Learning/problem census workshop for Kilifi District, Kenya, 13-15 November 2002

Annex 3.2: Proceedings of multi-stakeholder participatory Learning/problem census workshop for Bagamoyo District, Tanzania, 11-13 December 2002

Annex 4: Comparative Analysis

Annex 5 : Dissemination matrix