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Technical Report

TECHNICAL COOPERATION PROGRAMME



SUPPORT TO SMALL-SCALE RURAL AQUACULTURE IN WESTERN KENYA

KENYA

TECHNICAL REPORT:  
MEETING SMALL-SCALE FISH FARMERS' NEEDS  
*Factoring Socio-Economic Aspects into the Third Phase of the Project  
Small-Scale Fish Farming in the Lake Basin*

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome, 1996

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*Factoring Socio-Economic Aspects into the Third Phase of the Project  
Small-Scale Fish Farming in the Lake Basin*

Report prepared for the Government of Kenya

by

the Food and Agriculture Organization of the United Nations

based on the work of

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome, 1996

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## **Executive summary and recommendations**

1. A major activity of the preparatory period for the third phase of the "Small Scale Fish Farming in the Lake Basin" - project is the conduct of socio-economic investigations in order to redefine the project strategy to better target the ultimate beneficiaries, small scale fish farmers.
2. The present report is to provide guidance in the assembly of adequate socio-economic information on the target group and to ensure small scale fish farmers' participation in the planning of project activities. It also identifies possible parameters for routine monitoring during the consolidation phase.
3. After ten years of assistance by the project, implemented by FAO and LBDA with funding by BSF and UNDP, fish farming is being established in the project area, and playing an increasingly important role in the supply of animal protein in people's diets.
4. The project document for a consolidation phase, prepared on the basis of findings of the Technical Review Mission, has been rejected for BADC funding by a Belgian Government project appraisal group because of the lack of sufficient feasibility studies and indicators. A continued support by BSF has been proposed.
5. To comply with BSF criteria, the project document needs to be revised. It was recommended to allow for a 6 to 12 months preparatory phase, during which adequate information on the target group and farming systems can be gathered to reorient the project in the consolidation phase towards sustainability of the interventions.
6. The BSF policies are directed to assure the survival of people menaced by hunger, malnutrition and under-development in regions of the Third World where the highest mortality rates due to these causes are registered.
7. The BSF approach is based on a two-pronged strategy: a short term crash programme, and long term development efforts to increase productivity and improve social services.
8. In Western Kenya, BSF intervened through the Farmer's Groups and Community Support Project. Key focus has been beneficiary participation in the planning and implementation process. It is also a key element in IFAD's Special Programme for Africa, to which approach BSF is supportive.
9. Chronic malnutrition and poverty, high child mortality, and high population density with a subsequent scarcity of land, form the main justifications for a continued participation of BSF in the development of small scale fish farming in the region.
10. Fish and fish farming have a role to play in alleviating malnutrition. Fish contributes to food security by improving people's diets and by generating income for the rural poor. There is an evident fish eating tradition in the project area and fish farming has an impact on the availability of disposable incomes which is yet to be assessed. The project has aimed to increase production in food and income, and to diversify between crops.
11. The approach of the project so far has been technology driven, but it has been demonstrated that those projects that are based on delivery of technical inputs have poor sustainability. The intervention strategy of the project needs to be

- reviewed towards the socio-economic setting of small scale fish farming. Action oriented investigations to be conducted in the preparatory phase are to generate adequate knowledge on specific variables to formulate action programmes for the consolidation phase.
12. Factors of importance are: socio-economic characteristics of farmers; the importance of fish in people's diets and for the household's income; social levelling mechanisms and intra-household allocation of resources; and fish farmers' motivations and priorities.
  13. Participation of fish farmers in the planning and development of adequate action programmes is essential if sustainability of the intervention is to be attained. A dynamic interaction between target group and project is needed. Resource-poor community members as well as key-farmers have an important role in this process.
  14. The study programme proposed contains three elements: a formal questionnaire survey, participatory rural appraisal, and specific topic investigations.
  15. It is recommended that impact assessment and baseline study are combined in the conduct of a single cross-sectional household survey that will compare the living standards and income generation and expenditures of project beneficiaries with those of a control group of non-fish farming households that live under similar socio-economic and environmental conditions. Variables to be assessed are presented in the programme element. To assess the sustainability of the project's impact, it is recommended to repeat the study at the end of the consolidation phase and possibly again three years after completion of the project.
  16. PRA has been proposed to obtain a thorough understanding of the fish farmer's household objectives and needs, and the opportunities and constraints. It is also proposed to initiate a process of a two-way flow of information between project and target group and to ensure fish farmers participation in the planning of action programmes. PRA techniques as well as issues to be addressed are presented in the programme element.
  17. Three specific topic investigations have been recommended. First, an assessment of privatization or commercialization of fry production centres and feed production, and the consequences thereof for extension services. Secondly, a micro-level financial cost-benefit analysis as an indicator for farm performance. Thirdly, a study on marketing conditions and structure.
  18. For monitoring the progress of the project, meaningful qualitative indicators have been recommended. These include: pond maintenance; information exchange and fingerling supply between farmers; market dynamics; and key fish farmers records.
  19. Implementation frameworks for each of the programme elements have been recommended. The frameworks suggest subsequent logical steps for the conduct of the programme elements, as well as a tentative time frame. Considerations on modalities of implementation, composition of study teams, and training and instruction requirements are also presented. For the implementation of continuous progress monitoring, it has been recommended to make use of monthly debriefing sessions with technical officers. It is anticipated that the

- implementation of the impact study and PRA programmes will take forty weeks, and that specific topics investigations may be conducted in parallel.
20. Inputs required for the implementation of the proposed programme are presented in a tentative budget. It is considered that, in view of the heavy socio-economic component during this phase of the project and the technical backgrounds of LBDA project staff and of the national project coordinator, it may be preferable to have a CTA socio-economist, in which case international consultancy services may not be required. Both options are estimated to have equal budgetary consequences. It is suggested that assistance of national graduate trainees/associate professional officers may be requested, although the implementation may not be dependent on their availability. Upgrading of computer facilities in the project is recommended.

### **Context**

Since 1985, the Government of Kenya, through the Lake Basin Development Authority (LBDA), has been assisted by activities of FAO projects in introducing fish farming in Western Kenya. Reduction of supply from capture fisheries, due to changes in the fisheries of Lake Victoria and environmental changes, caused the population in the region to face protein insufficiency, which was aggravated by a high and increasing population density. This was even more true for markets in the interior of this region, distant from Lake Victoria, due to a poor physical infrastructure and lack of appropriate transportation means. The projects have been financially supported by UNDP and the Belgian Survival Fund (BSF) and again more recently, by FAO's TCP resources.

It has been mentioned on various occasions that, after ten years of assistance, fish farming is being established in the project region, and is playing an increasingly important role in the supply of animal protein in people's diets. In view of the quantitative achievements of the project, BSF emphasized that the extension of the second phase, by 15 months until end 1994, would be the last intervention on her part. However, the Third Kenya/Belgium Joint Commission of 20-21 June 1994, proposed to continue the project in order to ensure the viability and the sustainability of the action. In this third phase of the project, emphasis should be laid on the development of fish culture as an economic activity, with the principal aim of creating profitable enterprises. A joint GOK/FAO/UNDP/BADC Technical Review Mission was fielded in February 1995 to evaluate past activities and formulate a new project document for the third phase. The document submitted for BADC funding was largely based on the recommendations of this mission.

A Belgian Government project appraisal group, representing relevant services in the Ministry of Foreign Affairs, met on 11 January 1996 to review the project document. The group observed that formulation of a project phase to develop small enterprises had been hampered by the lack of factors and studies, that would prove the feasibility of such a project. In particular, the group mentioned:

- there are few farms with fish culture as the main activity;
- there is a lack of quantitative and reliable data on production, production costs, and profitability of the operations;
- the rate of repayment to the revolving fund is low;
- there is little capacity for private enterprises to produce fingerlings and to specialize in fingerling production;



- a network of fingerling producers and distributors is not yet established.

Although the group recognized the fact that the project has developed effectively a basis for rural aquaculture and the activities accelerated during the last three years of implementation, it concluded that funding through BADC would not be justified. However, the group recommended co-funding by BSF for a third and last consolidation phase, with the following objectives:

- to establish a capacity based on a core group of around one hundred small associations of fish farmers, that would allow for maintaining and developing aquaculture in an autonomous manner. This capacity would include production knowledge and sufficient fingerling production at the farmer level, production and distribution of fish feeds at acceptable prices, and farmer to farmer extension services through the core group;
- to develop extensive fish farming into a more profitable activity so that it would be less marginal in the farming system as a whole;
- to continue to promote rural aquaculture as a tool to improve food security for an increasing number of small scale farmers.

In its consideration of justification of further intervention, the group recommended participation by BSF because:

- the region is densely populated with consequent high pressure on land. Poverty and malnutrition are high. Against this background and given the fact that the project aims at product diversification, with incomes from aquaculture to assure improvement of the nutritional status, the action would be justified. Beneficiaries should be the small scale farmers.
- the cost-benefit ratio between project inputs and production increase is weak but improvement is anticipated in view of the fact that aquaculture is now established and introduction of new technologies in rural areas generally take time. A consolidation phase is therefore justified. New strategies are required to improve the cost-efficiency ratio.
- women's participation in aquaculture is high and they could be key partners in intensifying efforts for higher incomes and improved diets for children.

However, the group also reviewed the project document on its compliance with BSF criteria and found it incompatible with the principles of BSF. The focus of BSF is on contribution to efficient and sustainable improvement of the well-being of food-insecure peoples. It was felt that the project document in its present format puts too much emphasis on institutional development and it was recommended that the project strategy should be redefined and reformulated to target the ultimate beneficiaries, small scale fish farmers.

For this purpose, FAO has been requested to reformulate the document following the indications provided by the group. The third phase would be divided into two periods, with a total duration of 3 years. A first period of 6 to 12 months is for redefining project strategy, following a participatory approach in planning the project activities, with small scale farmers and associations. The strategy should comply with the three objectives formulated by the group. The socio-economic studies, as proposed in the project document, should be implemented. Arrangements should be made with LBDA in order to allow for privatization of the system and its instruments for aquaculture promotion, but with reasonable control from LBDA. This period should conclude in a proposal for the

consolidation phase. The proposal for this second period of 2 to 2.5 years should be evaluated by a tripartite mission. The three objectives mentioned should be the guiding principles of this phase. Objectives should be quantified and a permanent monitoring system should be in place. At the end of the project, rural aquaculture should rely fully on the capacities of the core group of fish farmers associations, so that activities can proceed in an autonomous manner. In reformulating the document, the active participation of women should be considered.

Upon acceptance of these recommendations, FAO is requested to submit a brief proposal for the first period of 6 to 12 months. A major activity of the first period is the conduct of socio-economic investigations in order to redefine the project strategy to target the ultimate beneficiaries. The present report is to provide guidance in the assembly of adequate socio-economic information on the target group, during the implementation of the first period, and to ensure small scale fish farmers' participation in the planning of project activities, in accordance with BSF principles. The report also intends to identify parameters for routine monitoring during the consolidation phase.

For this purpose, the report will go briefly into BSF's approach and its strategy in Western Kenya, followed by a review of the project strategy in its addressing of socio-economic aspects of fish farming. It will then make an attempt to identify the socio-economic information needed for the implementation of the consolidation phase and to address the needs of the target group, and parameters for project progress monitoring. The section following this will go into a programme for the assembly of the information and to obtain participation of fish farmers in the planning of project activities. The report will conclude with recommendations for the implementation of the programme.

### *Constraints*

The absence of a team leader has seriously hampered the compliance with the terms of reference for this mission (see Attachment II), as the consultant was expected to collaborate and discuss socio-economic matters with the team leader. Furthermore, the National Project Co-ordinator (NPC), who had been with the project in the implementation of the second phase, had been replaced shortly before arrival of the mission. However, an excellent working relationship was established with the NPC and interim and other project staff, and full support for the consultancy was provided by LBDA project staff and the FAO Representation in Nairobi. The cooperation of other relevant organizations, the LBDA field staff and the fish farmers is very much appreciated.

The terms of reference for this consultancy mention the design of a programme for the assembly by national experts of existing socio-economic data and information within 2 months. However, from review of the project document and the comments by the project appraisal group, as well as discussions with relevant parties at the beginning of the consultancy, it became apparent both at FAO headquarters and in Nairobi that it was the intention to have a proposed programme for socio-economic investigations during the project's preparatory period of 6 to 12 months. The programme proposed in this report is based on that assumption.

## **Meeting the BSF approach - fish for food security**

### *BSF policies*

The Belgian Survival Fund was established in 1983 in response to an 80 Nobel Prize winners' appeal in their Manifest Against Death through Hunger and Under-development, The Fund has as its objective "to assure the survival of peoples menaced by hunger, malnutrition and under-development in regions of the Third World where the highest mortality rates due to these causes are registered" (BADC/IFAD 1993). The Belgian Government approached four UN agencies - IFAD, WHO, UNICEF, and UNDP - to combine efforts in achieving BSF's objectives. IFAD was given the co-ordinator's role because its mandate was the most in line with BSF requirements. Presently, roughly more than one third of BSF funds are channelled through IFAD, one third through Belgian NGO's, and one third goes to the Special Programme for Africa.

BSF funded activities target the poorest parts of Africa: the Horn, including Eritrea, Ethiopia, Kenya, Somalia, Uganda and Tanzania. Within these countries, efforts were concentrated in some of the poorest sub-regions, that required special attention because of civil war or an influx of refugees from a nearby civil war, because of drought or the lack of agricultural inputs, because of a high rate of population growth and consequent mounting pressure on the land, or because of pockets of chronically high levels of malnutrition.

The BSF approach is based on a two-pronged strategy: the first part is a short term crash programme for inputs distribution to permit the destitute and drought-afflicted peoples, refugees, returnees and displaced people, to regain their production capacity; the second part of the strategy consists of long term development efforts to increase productivity and improve social services. Areas with the highest rate of mortality and incidence of absolute poverty were the prime target. Among the types of activities under this second strategy were: improved distribution of agricultural inputs and credit; promotion of alternative livelihoods by creating off-farm income-generating activities for small farmers, pastoralists, women and the landless; and assistance to governments to increase their institutional capacity to reach the poor. The assistance to the development of small scale fish farming in Western Kenya must be seen in the light of these types of activities.

### *BSF strategy in Western Kenya*

A population growth rate as high as 3.9 percent, 77 percent of the land area being arid to semi-arid, and only 18 percent with a medium to high agricultural potential, were factors decisive for BSF intervention in Kenya. Especially the situation in Nyanza province was assessed to be quite precarious, with a high child mortality rate of 21.6 percent. The incidence of women-headed households were also the country's highest. It was observed that many children died of intestinal disorders and childhood diseases.

Under the BSF-IFAD arrangement, the fund intervened in Siaya District through the Farmer's Groups and Community Support Project. The project approach was based on full participation of the community on changing the attitude of local authorities, encouraging them to support those activities which were perceived by the people and the community as priorities. Through training and credit programmes, extension services and distribution of inputs, the project achieved its major objectives. The project has had substantial impacts on inputs supply, incomes, food availability, people's health and water supply. In the second phase of the project, the experience in Siaya District was transferred to seven other districts.

Key focus in the above project has been beneficiary participation in planning, implementation and evaluation. In the BSF concept, beneficiary participation in the planning and implementation process is fostered through the system of development committees at the village up to the district level. Beneficiaries were trained and oriented to assume full responsibility for their own development. Beneficiary participation is also a key element in IFAD's Special Programme for Sub-Saharan African Countries Affected by Drought and desertification (SPA). BSF is supportive to SPA projects because of their approach. SPA projects focus on environmental rehabilitation, enhancement of community and household food security, assistance to rural women to raise productivity and increase their incomes, a participatory approach to ensure sustainability in the post-project period, assisting in reintegration of special vulnerable groups, and economic recovery programmes for the rural poor.

#### *Fish for food security*

Chronic malnutrition and poverty, high child mortality, and high population density with a subsequent scarcity of land in Western Kenya, form the main justifications for a continued participation of BSF in the development of small scale fish farming in the region. Undoubtedly, fish and fish farming activities can play an important role in alleviating malnutrition. The contribution of fish and fish products to food security is two-fold: improvement of people's diets and income-generating for the rural poor.

#### Fish as food

Fish is not an important source of calories, except for the oil of fatty fish, and in that respect, does not compete with other staple foods, such as rice, maize, cassava, beans, etc. However, fish and fish products are very rich in animal proteins. In developing countries, fish contributes 19 percent to animal protein intake and just over 4 percent to total protein intake (FAO 1995). High quality protein is essential for growth and health, and thus forms a valuable ingredient in a balanced diet. Fish is a source of essential fatty acids which are required by children in particular. It is also a relatively inexpensive source of essential micronutrients, such as calcium, iodine and vitamins, which are vital for nutrition and generally not found in staple foods.

In the project area, there is an evident fish eating tradition, due to the vicinity of Lake Victoria. Furthermore, the recent "Eat more fish" publicity campaign has had significant impact on consumption habits of those people until recently excluded from access to fish. Although the issue has not been properly assessed, interior markets seem to be open for an increased supply of fish and fish products. Fish can therefore be considered to be an increasingly important component in the daily diet of the rural population. However, the importance that fish makes in people's diets in relation to other food items, is yet to be assessed.

#### Fish as income

Fish, as a commodity, can make an important contribution to the economic well-being of fish farmers. It provides access to disposable incomes that can be utilized to obtain a balanced diet. Through economic interactions, it also provides incomes to those engaged in fish processing and trade.

There may be various reasons to grow fish as a cash crop: profitability of the activity; lack of realistic alternatives; diversification of production; etc. It has been observed in the project area that farmers tend to diversify between cash and subsistence crops in order to avoid dependency for income and food supply on one crop only.

The characteristics of the farms visited in the region range from subsistence to semi-commercial, both in scale and in their approach to fish culture. Often, in income generating terms, the activity may be considered secondary after more traditional cash crops, such as maize and cotton. On other occasions, fish may be grown for supplementary feeding, but harvest surpluses always seem to be cashed, either directly on-farm or in the local market. It is important to assess the impact of fish farming on the availability of disposable incomes and how these are utilized, in order to appraise the contribution of the activity to people's economic well-being.

#### *BSF and the project*

In line with the principles of BSF, the project has aimed to increase production in food and income, and to diversify between crops to reduce dependency on a few crops thereby spreading farmers' risks, BSF has therefore co-funded the project with UNDP for the past ten years, with the exception of two intervals when the project was supported entirely through the FAO Technical Cooperation Programme (TCP). From being secondary donor, in the course of time, BSF became FAO/LBDA's major partner in the implementation of the project. With it came a stronger involvement in evaluation and formulation activities, and the last evaluation mission, on whose recommendations the project document of GCP/KEN/060/BEL was based, was under leadership of the Belgian representative.

BADC funding was proposed in order to steer the project towards commercialization of fish farming. Although the project had achieved its objectives, in BSF's view a follow-up phase was deemed to be necessary to sustain the activities implemented by the project. However, with the recommendations of the project appraisal group for renewed BSF funding, the project's approach needs to be reoriented to better reach the ultimate beneficiaries, small scale fish farmers.

## **Re-orientation of the project's approach**

### *Focussing on the socio-economic context of small scale fish farming*

Over the past ten years, the project set out to introduce fish culture as a rural economic activity. In its drive for improved availability of fish and increased incomes for the rural population, the project focused on the introduction and dissemination of fish farming technologies for freshwater finfish (tilapia and *Clarias*) with considerable support services being provided by LBDA. These new technologies attempted to reverse the trend of decreasing fish supply to the local population due to decreasing production for the local market by Lake Victoria fisheries. They would also make fish available to markets distant from traditional fish production areas.

In 1995, the Technical Review Mission concluded that, after ten years of assistance, fish farming was being established in Western Kenya and that significant progress was made towards developing a self-sustaining, profitable industry. The Mission observed that thousands of farmers constructed ponds which were supplied with fingerlings from seven fry production centres and from several private fingerling producers and that fish farmers were not only growing fish as a protein source, but were also more interested in the profits and increases in income. However, the mission also concluded that sustainability of the action was not ensured. It observed that there has never been a socio-economic study on the impact of the activities nor has there been a marketing study.

Generally, fish farming project implementation involves the choice between two policies: (i) try to reach the resource poor, or (ii) focus on technology development. The approach of the project has been technology driven and it has been demonstrated that those projects which are based on delivery of technical inputs have poor sustainability (Harrison 1994). In his socio-economic analysis of aquaculture in East Africa, Kumar (1996) observed that the present state of aquaculture is facing the problem of lack of sustainability due to primarily social, cultural, psychological and economic aspects. These factors have emerged as constraints mainly because they were ignored in the planning and introduction of the programme. Inadequate understanding of the ground realities and conditions at the farmer level may impede further aquaculture development efforts. It has been recognized that socio-economic factors play an important role in the pace of development and that understanding these factors and incorporating them in the development of extension methodologies is vitally important (Sen 1995).

It becomes evident that, if attaining sustainability of fish farming activities in the project area is the main objective, the intervention strategy of the project needs to be reviewed. Adequate fish farming promotion and consolidation policies should be viewed in the context of the socio-economic and cultural setting of small scale fish farming. Knowledge on specific variables that condition this setting has to be obtained through action oriented investigations. The objectives of the studies, to be conducted in the first year of the third phase of the project, is to generate adequate knowledge to formulate action programmes for the consolidation phase.

### *Factors of importance*

Understanding the socio-economic characteristics of farmers is essential in order to answer the question as to whether they are likely to adopt and sustain fish farming in their efforts to ensure food security and income generation. These characteristics may include age, education, household size, household decision making, income, access to land and credit, etc.

The importance of fish in people's diets and of fish farming for the household's income generation are determining factors in the assessment of sustainability of the activity. This needs to be assessed through analysing the nutritional characteristics at the household level, as well as characteristics of the farming system. Protein sources and intake are important factors for assessing the nutritional value of fish. Fish farming itself needs to be viewed in the context of the integrated and multi-crop systems that are being practiced. It has been observed that small scale farmers tend to diversify farming practices by cultivating several cash and subsistence crops in order to spread risks. For many fish farmers, fish as a cash crop is often secondary to other traditional or more profitable crops. However, in combination with livestock, poultry, wet rice culture, etc., fish farming offers economic opportunities between harvests and for integrated farming practices. It is important to assess primary and secondary occupations of the farmers as well as different crops cultivated, their interrelationships and their relative shares in the household's income.

Equally important are community levelling mechanisms and intra-household allocation of resources (Sen 1995). Levelling mechanisms are social pressures and obligations that may limit individuals in advancing economically beyond their defined social roles in a community. Gender is an important factor determining allocation of resources within a household. Where fish farming is more cash oriented, the decision to take up fish farming is often made by the household head, more often than not male, whereas women are more often responsible for the nutritional well-being of the household. The division of labour within a household has serious implications for extension services in addressing the needs of the target group.

Fish farmers' motivations and priorities are not the least important factors determining the sustainability of fish farming practices in the project area. They will also influence the probability of fish farmers likelihood of adopting such practices to maximize on profitability or as a means to supplement incomes and to spread risks. The decision to invest capital, time and labour in fish farming is based on what farmers consider to be the comparative advantages of fish culture. Factors that influence this decision may be diverse economic opportunities, effective marketing channels, and perceived scarcities. In the project region, where population density is high and land scarce, land used for fish farming may have alternative uses. Potentials for increased incomes are therefore carefully weighed against other possibilities. Fish farming is therefore more likely to be successful and sustainable in high potential areas. It may also occur that idle land, not suitable for cultivating other crops, is found suitable for fish farming. The comparative advantage of fish farming will then become clear. In maximizing economies of scale, the farmers' attitudes towards shared ownership and associations and cooperatives are important issues. It has been observed that farming practices in the project area are highly individual and shared ownership of assets very uncommon. An assessment of farmers' motivations to associate with others, and to what extent, is important to determine a proper intervention strategy.

#### *Fish farmers \* participation*

Sustainability of the intervention is not likely to be attained without the participation of fish farmers in the planning and development of adequate action programmes. Farmers' motivation and priorities, their problems and requirements are yet to be properly assessed. The farmers' perception of successful aquaculture may differ substantially from the donor's or government's perception of a successful aquaculture project. Increased production and incomes, better nutrition, employment opportunities may be the guiding objectives for the project, whereas farmers may decide to enter into fish

farming for other reasons. In order for the intervention to be sustainable, it is indispensable that the farmers' motivations and priorities are reflected in the project's approach and activities. A dynamic interaction, with two way communication between target group and project is needed.

It has been demonstrated that the impact of fish production on household food security and income is generally higher for the least productive farmers, and that women play an active part in pond management although they would not be pond owners (Harrison 1994). Yet, interaction between project and farmers generally takes place through more visible and vocal farmers that tend to have better access to resources and have a respected reputation within the community and hence training and extension are directed towards such male pond owners. To ensure that resource-poor members of the community do participate in the planning of action programmes, it is important to gain access to a broad cross-section of the community (Noble 1994).

However, it has also been observed that key-farmers (those with access to resources and respected among fellow-farmers) play an important role as role models and leaders in disseminating information on fish farm techniques to other farmers. Thus, spin-off effects in encouraging other farmers to take up fish farming may be substantial, although this has never been investigated. The organization of field days, where fish farmers in the area gather at the farm of one of the key-farmers, is highly appreciated. The extent of the information exchange that takes place and the mechanisms involved, needs to be studied.



## Socio-economic studies, and project progress monitoring

The socio-economic factors influencing fish farming and therefore determining relevant intervention strategies, need to be assessed using appropriate methodologies for effective generation of adequate information and to stimulate farmers' participation in the planning process. The study programme, set out below, contains three elements: a formal questionnaire survey; participatory rural appraisal; and specific topic investigations.

### *Impact and baseline study*

The need to assess the impact of more than ten years of project intervention has been stressed on various occasions by evaluation and formulation missions. The Technical Review Mission recommended the conduct of a socio-economic baseline study that would characterize the farming systems where fish farming is practised, emphasizing the importance of fish farming at the farm level and at the regional level. Such a study would identify the expansion potential, mainly in the field of incomes generation.

Thus this study programme element combines the proposed impact and baseline studies, since it is anticipated that an impact study would generate sufficient quantitative baseline information. Three possible strategies for assessing the effects of specific project interventions have been discussed (Leendertse et al 1994).

The first strategy entails conducting a baseline household survey of pre-project conditions and then conducting further surveys to measure longitudinal changes in the incomes and living conditions of the target population during and after the project. Although baseline surveys provide useful initial information on the socio-economic and demographic characteristics of the target group as well as information of the project area and environment to make it possible to design specific project interventions, there are serious disadvantages in using baseline survey data for project impact assessment. The objectives and activities as well as the target group of development projects are not static but undergo changes as the project is being implemented and at the same time its interactions with its environment also change. This strategy does not consider changes in living conditions and incomes that can not be attributed to project interventions. Furthermore, a baseline survey of specific households conducted prior to or at the beginning of a project might become obsolete in the light of changes and project revisions which take place later on.

A second strategy for impact assessment is to conduct a single, cross-sectional household survey at the end of a project or a few years after its completion which asks objective and subjective questions about changes in respondents' incomes and living standards. The objective questions can gather data for a comparison of the incomes and expenditures of project beneficiaries with other population groups. In addition, respondents can be asked to evaluate change.

A third strategy is to seek the views of local experts, government officials and leaders through in-depth or informal surveys. The data gathered may be biased and evaluators will have to interpret the information after interviewing a cross-section of the key informants.

It is proposed that, for the purpose of this programme element, the second strategy should be followed, keeping in mind that the view of key-informants need to be considered in the interpretation of the data. No baseline study was carried out at the beginning of the project and therefore no reference data exist. However, it is expected

that this impact study will generate useful information that can assist in planning project activities in the consolidation phase and serve as reference data later on.

The survey will compare the living standards, income generation and expenditures of project beneficiaries with those of a control group of non-fish farming households that live under similar socio-economic and environmental conditions but have not benefitted from the project. Both groups of households will be studied on their demographic and nutritional status, for which household size and composition, eating habits and children's weight, height and vaccination records are important indicators. In assessing the nutritional status, the importance of fish in people's diets and its contribution to protein intake will be investigated. In the context of multi-crop or integrated farming, the importance of fish farming in the household's income will be assessed by estimating the production and revenues from different crops and livestock, as well as other income generating activities within the household. It will also be important to appraise primary and secondary occupations, not only in terms of income but also in terms of time dedicated to these occupations. In comparing the two groups of households, it should be possible to tentatively assess the impact of fish farming on the relative household living conditions, for which housing conditions, and productive and non-productive assets ownership may be indicators. It is also important to compare information on consumption and expenditure patterns.

In order to obtain quantitative information on the target group, a general profile of the fish farmer based on social characteristics may be extracted from information on sex, age structure, education level, marital status, ethnicity, religion, etc. It is also considered important to assess the role and position of the fish farmer within the household, for which decision making patterns and assignment of household tasks could serve as indicators.

The beneficiaries' appreciation of project performance in terms of assistance and benefits received and efficiency of the project assistance may be assessed by rating the project performance on the modes of intervention the project has employed over the last ten years. These interventions may include technical advice, credit supply in cash and kind, field days organization, etc.

To assess the sustainability of the project's impact and to make use of the information that will become available, consideration should be given to repeat the study at the end of the consolidation phase, possibly after a three year interval after completion of the project. Necessary provisions for this will have to be made in the project proposal for the next phase.

#### *Participatory Rural Appraisal (PRA)*

Participatory rural appraisal (PRA) is often perceived as an efficient and effective response to costly and time-consuming formal surveys (Upton and Dixon 1994). In this context, it is viewed as a method to acquire information through a variety of tools in a systematic and semi-structured manner by a multi-disciplinary team. Generally, it is recognized that PRA requires the active participation of local people. However, there is more to it than just participation. PRA, characterized by close communication and in-depth discussions with the farmers, can be complementary to other methodologies, in the sense that it generates information that cannot be obtained otherwise and it is therefore widely used for the identification of appropriate technologies and development interventions. Other than an information acquisition method, PRA also involves dynamic interaction with farmers and it can therefore be instrumental in initiating processes that are inherently flexible and adaptable.

The interventions of the project, if they are to be sustainable, must be based on a thorough understanding of the fish farmer's household objectives and needs, and the opportunities and constraints. In addition to a review of published statistics and other secondary material, the analysis of the farming system includes informal field surveys based on discussions with the target group. To ensure the participation of the fish farmers in planning of project interventions in the consolidation phase, a two-way flow of information is essential. Supplemented by the formal questionnaire survey, this process will lead directly to the formulation of project activities.

In PRA, a small multi-disciplinary team applies a variety of informal methods, amongst which some of the best-known are semi-structured interviews, group discussions, mapping and modelling, and scoring. In semi-structured interviews, the PRA team and a group of key informants describe local situations and jointly analyze key issues. Apart from generating information, group interviews enhance general discussions with and amongst farmers. Farmers are in a position to sketch useful maps of resource type, land use and access, market availability, etc. Farmers can also prepare models of bio-resources and other flows in their farming systems. Through scoring, farmers assist in assessing the impact of the project by multi-criteria ranking of project interventions and assistance. Information acquisition and analysis take place concurrently during field work in an inter-disciplinary manner. One important feature of PRA is the accelerated learning process, with the accent on flexibly orienting the discussion as understanding grows of the issues involved.

To initiate this process, an assessment of farmers' motivation to take up fish farming and the priorities involved is essential. In the discussions, problems confronted by the farmers and specific requirements for fish farming need to be addressed. This is important for a thorough understanding of the mechanisms in integrated and multi-crop farming. In this context, farmers may be asked to elaborate on different land uses and availability and uses of bio-resources. For a proper perception of the farming system, alternative productive activities, their interrelationships, and their estimated contribution in food and income to the household, needs to be assessed.

Topics of specific interest for the next phase of the project are the farmers' attitudes towards individual and shared ownership, and their appreciation of associations with other farmers and cooperatives. Lessons may be learned from the experiences with other cooperatives that are already in existence, such as those for cotton, tea, or coffee.

It has been observed that the effects of small scale fish farming will be experienced differently by different household members. Generally, women are considered responsible for the household's nutritional well-being, whereas men tend to be more interested in the commercial aspects of fish farming. It is therefore important to gain an insight in intra-household issues, such as gender roles and household decision making processes. In this context, it is essential to assess the access to resources and (informal) credit for the household as a whole and for individual household members. The PRA team may wish to consider the importance of timing and location of meetings, as well as the composition of the team, in order to reach the target group.

Of specific interest to the project concerning extension services and information dissemination, are the dynamics within the fish farming community regarding information exchange between fish farmers and possible spin-off effects to other farmers. It has been observed that information from fellow farmers may be an important motivation for farmers to take up fish farming. Equally important for sustainability of the project

interventions are the mechanisms for fingerlings supply and feeds production and distribution.

In this context and to assess the impact of the project, the rate of dependency of fish farmers on inputs and technical advice from the LBDA fish culture and fry production centres may be addressed. The fishfarmers may also be requested to rank the project's activities and its performance on a scoring table.

#### *Specific topics*

#### Privatization or commercialization of fry production centres and of feed production, and its consequences for extension services

In the current set-up, the fry production centres are not likely to be able to sustain their activities and extension services. In fact, it was noticed at visits to the centres during this interim period that activities were suspended because of the lack of operational funds. Although the centres had been handed over to LBDA, no provisions had been made to allow for continued fingerling production activities or for extensionists to travel. This experience is not unique for aquaculture development programmes that have been supported through external funding. Government involvement in fingerling production and extension activities is often hampered by the lack of sufficient human and financial resources. In Madagascar, privatization of fingerling production has been successfully introduced and efforts are made to privatize extension services, based on the assumption that private fingerling producers have an interest in an efficient extension system (van den Berg 1994). In the project area, farmer to farmer fingerling supply has been encouraged, so that the role of the centres could become limited to quality maintenance. An increased fingerling production by farmers and information exchange has been observed.

Two alternative scenarios need to be assessed for their feasibility and the consequences they would have for the extension services: privatization of the farms, which would possibly be to the detriment of extension services that would then have to be taken over; or commercialization of the activities and ensuring the support of extension and technical officers through profits made by the farms, and profit sharing with the farm manager.

#### Cost-benefit analysis

The Technical Review Mission recommended that support be provided to interested farmers in the building up of fish farm enterprises. It stated that, in order to obtain a regular monthly income, fish farmers should have several ponds of 300-500 m<sup>2</sup>. However, the mission also observed that there has never been a cost-benefit analysis (CBA). CBA can be applied to measure the impact of an investment on three levels: financial, economic and social CBA (Kuyvenhove and Mennes 1988). For the purpose of this study, the micro-level financial analysis is applied and can be viewed as an indicator of farm performance. The analysis uses discounting to reduce a series of annual cash flows to a single measure of present value (Upton and Dixon 1994).

In the framework of integrated farming or multi-crop farming, the CBA of fish farming can only be seen as a partial analysis. The analysis of total farm cost-benefit ratio needs to take into account the other crops and their interrelationships. It has also been observed that indicators of economic efficiency may be problematic as individuals within farming families often give varying estimates of cash output for the farm (Noble 1994). The analysis therefore requires that all household members are consulted. Problems may also occur in estimating cash values for farm products and activities which do not

normally involve cash (family labour, recycled bio-resources, home consumption, etc.). Simple methods of valuation, which are meaningful to farmers need to be identified.

#### Marketing conditions and structure

There is a general impression that there is sufficient demand in interior markets, and even close to the lake, especially in times of scarcity of captured fish, for a substantial increase in production of cultured fish. However, in Nandi, where population density is relatively low and fish farmers tend to be settlers from other districts, signs have been observed that local markets tend to be satisfied, especially during times when harvesting of cultured fish is carried out by too many farmers at the same time or when there is high production from the lake.

In this connection, it was noted by the Technical Review Mission that markets for cultured fish have never been properly assessed.

The marketing conditions and structure study will focus on understanding the market for cultured fish in the project area. The structure of outlets and distribution channels will be assessed and supply and demand mechanisms studied. It will also analyze price fluctuations over time and differences between markets. The marketing infrastructure will also be assessed.

Existing information on markets and outlets may be contained in project documents and other published material. The study will therefore commence with a literature review. This information may guide the socio-economist in the setting-up of the marketing study. It is then recommended that market mechanisms be analyzed in different local markets at different distances from the lake to assess the market absorption capacity and supply structures. Other distribution channels (on-farm, retailers, market traders, etc.) also need to be studied. A detailed study work plan and approach will be formulated by the socio-economist, who may require consultancy services for the implementation of the study, in consultation with the NPC.

#### *Progress monitoring*

In the initial phase of the project, project management did set up a database to monitor the impact of project activities on quantifiable indicators, such as numbers of fish farmers, operational ponds, surface area, production, feeds, etc. However, after some time the project failed to maintain the database. Furthermore, the quality of data entered and thus the information the database provided, has been open to question. At a later stage, the database was reactivated but to no durable effect. It has been stressed that these types of statistics indicate very little because of questionable data reliability, as well as unclear relationship to objectives such as food security (Harrison 1994). To monitor the project's progress, it is therefore imperative to identify other indicators that would allow project management to evaluate the activities in relation to its objectives.

More meaningful qualitative indicators have been recommended. It has been observed that several ponds tend to be neglected when project assistance is suspended. Therefore the indicator that fish farming practices have become established, should be visible maintenance of ponds as well as availability of cultured fish in local markets.

To assess the effectiveness of farmer to farmer extension services and self supporting production practices, the interaction between farmers in terms of information exchange and fingerling supply, needs to be closely monitored. The quality of fingerlings will be guaranteed through regular control checks and corrective action by the LBDA centres.

Market dynamics will be monitored through regular reporting on price developments of feeds and cultured fish in local markets. Quantitative turn over in markets can be assessed by random visits to local markets at regular (monthly) intervals.

It has been observed that key fish farmers tend to keep accurate records of inputs and sales, as well as the quantity of fish used for home consumption. These records may become valuable sources of information to monitor the development of farm performance.

## Implementation

The socio-economic study programme, as drawn up in this report, will be implemented under the overall supervision of the CTA, in close collaboration with the NPC. For each of the programme elements, an implementation framework will be established, for which the modalities need to be specified.

### *Impact and baseline study*

This programme element will be implemented under the overall responsibility of the project's socio-economist, who will also take responsibility for reporting on the results of the study and recommendations, based on his/her interpretations.

The conduct of this programme element involves several logical steps (an implementation strategy has been outlined in the project document). A tentative time frame of activities is presented in table 1. It is recommended that as a first step, all available information on socio-economic aspects in the project area will be reviewed. This information may be contained in project documents as well as in reports and documentation of other projects and organizations (2 weeks). The information extracted will set the stage for the study of the topics mentioned above. It will also provide guidance in the design of a questionnaire, which will contain the questions to be addressed to respondents, grouped in relevant sections to allow for easy recording of the answers, as well as in data coding. A manual will guide the enumerators through the various sections of the questionnaire. It is advisable that five enumerators with experience in similar studies will be approached, who will be trained by the socio-economist for the purpose of this study (total 3 weeks).

It is important that a representative sample will be drawn randomly, on the basis of local farmers lists, from project beneficiaries and non-beneficiaries. In view of the costs and duration of the study, as well as the anticipated output, it is estimated that a total sample of 500 potential respondents be approached. Following a detailed sampling strategy, based on localisations, stratifications and fish farming practices, an appeal will be made through the extensive network of LBDA extensionists, who will also be instrumental in contacting the sampled respondents (1 week). After the enumerators' training and instruction, and establishing the sampled population, the questionnaire will be tested in the field in non-selected locations, and subsequently adapted (1 week).

Five experienced enumerators, under the supervision and guidance of the socio-economist will collect the data in the field. The duration per interview should not exceed 30 minutes, which is realistic in view of the amount and type of information to be gathered. Including travel time (dispersed farmers and random sampling will inflate the travel time needed) and introductions to village authorities and respondents, it is anticipated that 5 interviews per day per enumerator is the maximum to be attained. Consequently, 20 working days, or 4 weeks, will be needed to reach the sampled population. During data collection, the socio-economist is expected to design a codebook and codeforms for easy processing of the data, as well as input screens that will have the same format as the codeforms (total 2 weeks).

The actual data coding on the forms will be done by the enumerators. It follows from experience that per day, a maximum of 20 interviews per enumerator can be coded. Coding will therefore take 1 week. On the assumption that two computers will be available for data inputting, and 40 interviews can be processed per day, inputting will take 7 working days. Together with coding and input instructions, and a standard check and rectifications, the total estimated duration will be 4 weeks.

The socio-economist may need four weeks to process and analyze the data according to the requirements of the information to be furnished. The analysis will include descriptive analyses (distribution of frequencies, basic statistics) and interpreting analyses (cross-tabulations, classifications, multi-variance analyses). The report (3 weeks) will contain an introduction to the study, with a description of the methodology and approach, presentation of the results of the analysis and interpretations, and recommendations for the project proposal for the consolidation phase.

### Considerations

It has been noted that extensive experience in the conduct of socio-economic baseline studies exists in the socio-economics department of Kenya Marine Fisheries Research Institute (KMFRI) - Kisumu branch. Technical officers in that department have been found available to participate in the implementation of the impact and baseline study. However, modalities for collaboration will have to be defined.

The demographic and nutritional information to be gathered and analyzed will necessitate the assistance of a nutritionist/demographer. It is foreseen that a national consultant will be recruited for this purpose.

### *PRA*

By nature, PRA is a multi-disciplinary exercise. However, the project's socio-economist will be overall responsible for its implementation and for reporting on the results and recommendations. It is anticipated that the socio-economist will be assisted by a PRA expert.

Although the process is necessarily flexible and adaptable, the structured approach in conducting PRA makes it possible to programme subsequent steps. Table 1 presents a tentative time frame of activities. Secondary data can provide useful background information and it is recommended that initially, all available information be reviewed. This may coincide with the documentation review for the impact and baseline study (2 weeks). The checklist and manual, to be designed for the purpose of this programme element, will provide guidance to the team members (2 weeks). For the preparation of the manual and checklist, the team leaders may consider undertaking introductory visits to potential sites. During these visits, key stakeholders and informants may be identified.

The composition of the multi-disciplinary PRA team and a proper training in PRA techniques, as well as clear instructions and conformation of the inputs of the individual team members, are of utmost importance. Formation of the team and training sessions will take 2 weeks. Subsequently, location and timing of the meetings with fish farmers will be determined (1 week). The actual meetings with the fish farmers is estimated to take 3 weeks. During these sessions, the tools as described above will be applied. Analysing of the discussions and outputs will be done in the field by the team, and findings will be reported to the team leaders. The socio-economist and the PRA expert will then analyze the results and formulate action programmes and recommendations (2 weeks). Some recall visits will be undertaken randomly to the various locations, after which new meetings will be organized with the participants and key informants, to discuss and adapt the action programmes (3 weeks).

In the final report, the socio-economist is expected to summarize the results of the analysis and, supplemented by information from the impact and baseline study, formulate detailed action programmes to be incorporated in the project document for the consolidation phase.



## Considerations

Project staff are not experienced in PRA techniques. On the other hand, it has been noticed that several organizations have implemented PRA exercises in the project area, particularly NGOs that are experienced in community development and target group participation in development planning. CARE Kenya and OSIENALA have been approached and it was found that they are willing to participate in the implementation of the PRA for the purpose of this project. However, modalities of collaboration will have to be determined.

District technical officers and extensionists of LBDA are considered well-trained and have close contacts with activities at the fish farm level. Use should be made of their extensive network for the implementation of the PRA. It is foreseen that LBDA technical staff will be trained in PRA techniques, for which CARE Kenya has expressed willingness to cooperate, which is of utmost importance not only for the purpose of the study, but also to provide a professional basis to the approaches used by them in their day-to-day contact with the fish farmers.

### *Specific topics*

The project's socio-economist will have overall supervision for the implementation of this programme element as well. However, for the technical conduct of the investigations, he/she may have to rely on inputs from national consultants. Liaison with the socio-economics department of KMFRI, where experience in marketing studies exists, is recommended.

It is anticipated that the specific topic studies will be implemented in parallel to the other programme elements. Detailed work plans for the implementation needs to be established by the socio-economist in consultation with the NPC and other parties.

### *Progress monitoring*

It has been common practice in the second phase of the project that technical officers debrief to project management monthly on the activities in their districts. These debriefing sessions may become instrumental in monitoring the project's progress based on the indicators mentioned above. The technical officers, being trained in techniques of participatory appraisal for the implementation of the PRA, may collect relevant information through random visits to farms and markets and report on the progress made in their districts to project management. Project management may then compile monthly progress reports, to be consolidated in the six-monthly progress reports to FAO, based on these inputs from technical officers. Standard report outlines may need to be designed.

Table 1: Tentative time frame

Impact and baseline study

week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
activity																						
existing data review	■	■																				
design questionnaire and manual			■	■																		
sampling				■																		
formation of survey team					■																	
instruction and training					■																	
testing and adapting questionnaire						■	■															
design codebook and forms								■														
design input screens									■													
data collection								■	■	■	■											
data coding and input											■	■	■	■								
standard check														■								
data processing and analysis															■	■	■	■				
report writing																				■	■	■

PRA

week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
<i>activity</i>																			
existing data review	■	■																	
design checklist and manual			■	■															
sites visits				■	■														
formation of PRA team					■														
instruction and training					■														
identify key stakeholders						■													
select locations						■													
organize group discussions							■	■	■										
analyze information									■	■									
recall visits											■								
discussion action programmes												■	■	■					
report writing																■	■	■	■

The total duration of the impact study and PRA programmes would thus be forty weeks. Some overlap in activities may be expected, whereas the specific topic investigations may be conducted in parallel. It is therefore estimated that action programmes be formulated and included in a revised proposal for the consolidation phase within one year from the start of the third phase.

The project document for the consolidation phase is subject to review by a tripartite (Government of Kenya, FAO and BSF) mission. It is recommended that, simultaneously, the results of the study programme be discussed and the proposed strategies be examined in a workshop, gathering representatives from all parties involved (participants in the programme, stakeholders), as well as other relevant and interested institutions (projects, donors, universities, NGOs). A provision has been made in the budget for the study programme.

### Risks

Different partner organizations have been identified and found willing to collaborate in the implementation of the study programme. However, formal institutional arrangements may hamper the adequate and flexible implementation of the programme. Adequate modalities of collaboration between the organizations involved will have to be established.

Project vehicles used by the project have been transferred to LBDA as they had depreciated, and are now in use for other purposes. This may cause transport problems to the project as the study programme involves frequent travel in the project area. Transport facilities have to be ensured before implementation of the programme.

The current state of computers and software in the project may not be adequate for proper analysis and reporting during the study programme. An efficient and effective upgrade of the computing and printing facilities is recommended (see inputs).

## Inputs<sup>1 2</sup>

B/L	DESCRIPTION	US\$
11.01	Socio-economist (CTA/Consultant, 6 w/m) <sup>3</sup>	72 000
17.01	National expert (full time, 12 w/m)	15 000
17.51	National consultants (5 w/m) <sup>4</sup>	10 000
20.00	Survey team (per diems) <sup>5</sup>	8 000
	Enumerators (per diems)	8 000
	PRA team (per diems)	8 000
30.00	NGO participation <sup>6</sup>	20 000
40.00	General Operating Expenses	20 000
50.00	Supplies and Materials (fuel,maintenance, stationary, printing,etc)	18 000
60.00	Computers (Pentium desktop, upgrades, a printer) and software <sup>7</sup>	12 000
80.00	Workshop	5 000
Total		196 000

<sup>1</sup> The estimates are tentative and only inputs for the purpose of the socio-economic component are considered; other activities or project running costs have not been taken into consideration.

<sup>2</sup> The studies may incorporate the assistance of national graduate trainees or Associate Professional Officers (APOs) in their implementation. Under the overall supervision of the CTA, they may also assist in processing and analysing the information. These services should be at no costs to the project, and the implementation of the programme may not be dependent on their availability.

<sup>3</sup> At the time of preparation of this report, a preferred profile of the CTA was in preparation by LBDA. In view of the heavy socio-economic component during the last phase of the project, it is considered that it may be preferable to have a CTA socio-economist with experience in aquaculture. If this is the case, an international consultant in socio-economics may not be required. Incorporation of socio-economic information and strategies in the project document for the consolidation phase will be part of the CTA's coordinating responsibilities. It should be stressed that the CTA whether socio-economist or aquaculturist has the end responsibility for the implementation of the study programme.

<sup>4</sup> i.e. demographer/nutritionist to assist in analysing baseline data; computer programmer for a tailor made data processing programme; economist for pricing of alternative uses of resources, etc.

<sup>5</sup> Per diems are estimated on the basis of 60 days field work per team and, on average, 5 team members, at the current rates for national experts.

<sup>6</sup> Cost of sub-contracts (all inclusive) for participation of NGOs, particularly in the PRA exercise, and for training of LBDA staff in PRA techniques.

<sup>7</sup> In order to efficiently process and analyze data, as well as for proper reporting, the computer facilities of the project need to be upgraded. It is recommended that one of the three available computers be replaced by a machine with Pentium processor and minimum 8 MbRAM. The replaced machine should stay within the project for word processing purposes. The two others (486) can be upgraded with additional 4 MbRAM each and extended hard disks. Printing facilities in the project are in a deplorable state; it is recommended that a laser printer be purchased, together with an interface to link up three PCs. Proper software would comprise Microsoft Office packages.

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- Evaluation, formulation, progress and terminal reports

Attachment I

**Key-persons met:**

<b>Rome</b>	
Mr R. Seneviratne	Project Operations Officer, TC04
Mr M. Mann	Senior Project Operations Officer, TCO4
Mr G. Everett	Senior Fishery Planning Officer, FIPP
Dr A. Tacon	Fishery Resources Officer, FIRI
<b>Kenya</b>	
Mr H. Norton	FAO Representative, Nairobi
Mr V. Valeri	FAO programme officer
Mr G. Aertssen	Head Agricultural Sector/BSF Co-ordinator, Embassy of Belgium
Mr I. Lethbridge	Director, Fisheries International Development Organization
Mr S.M. Machooka	Managing Director, LBDA
Mr S. Obuya	National Project Co-ordinator a.i., TCP/KEN/4551
Mr P. Gikonyo	Assistant Director, Fisheries Department
Mr T. Dola	Senior Aquaculture Officer, LBDA
Ms C. A. Ongadi	Technical Officer/Western Zone, LBDA
Mr D. A. Onyango	Technical Officer/Northern Zone, LBDA
Mr Z. O. Wilson	Technical Officer/Southern Zone, LBDA
Mr O. Aggrey	District Fishery Officer/Bungoma, Fisheries Department
Mr K.E.O. Werimo	Centre Director, KMFRI
Mr R.O. Abila	Agricultural Economist, KMFRI
Mr E. Yongo	Socio-economist, KMFRI
Mr D. Ogwai	Fisheries Officer, Fisheries Department
Mr O. Ong'ang'a	Executive Director, OSIENALA
Mr A.O. Omolo	Project Manager, CARE Kenya
Mr A.O. Ogwande	Consultant Socio-economist
District Extensionists	
Fish Farmers	

Attachment II

Terms of reference  
Consultant Socio-economist  
TCP/KEN/4551

Under the overall supervision of the Chief, Fisheries Operations Service (TCO4), and in direct collaboration with the FAO Representative in Kenya as well as the Aquaculturist/Team leader and the relevant national officers concerned, the consultant will be expected to:

- Review the draft project document G24359 (GCP/KEN/060/BEL) with particular attention to the likely socio-economic impacts on the ultimate beneficiaries - the grass root small scale fish farmers;
- Discuss with the Scientific Advisor of the Belgian Embassy in Nairobi, the overall principles of the Belgian Survival Fund assistance in the target area of Western Kenya, and specifically the existing and expected additional socio-economic benefits concerning the ultimate beneficiaries;
- Draw up a programme for the immediate assembly by national experts of existing baseline socio-economic data, within two months, as well as the routine monitoring of the main parameters over the next three years;
- After discussions with the Aquaculturist/Team leader and the FAO Representative, submit to the Chief, TCO4 a draft mission report summarizing his observations, conclusions and recommendations.

Duty station: Kisumu, Kenya

Languages: English (Swahili and other local languages desirable but not essential)

Duration: 1 month (February/March 1996)