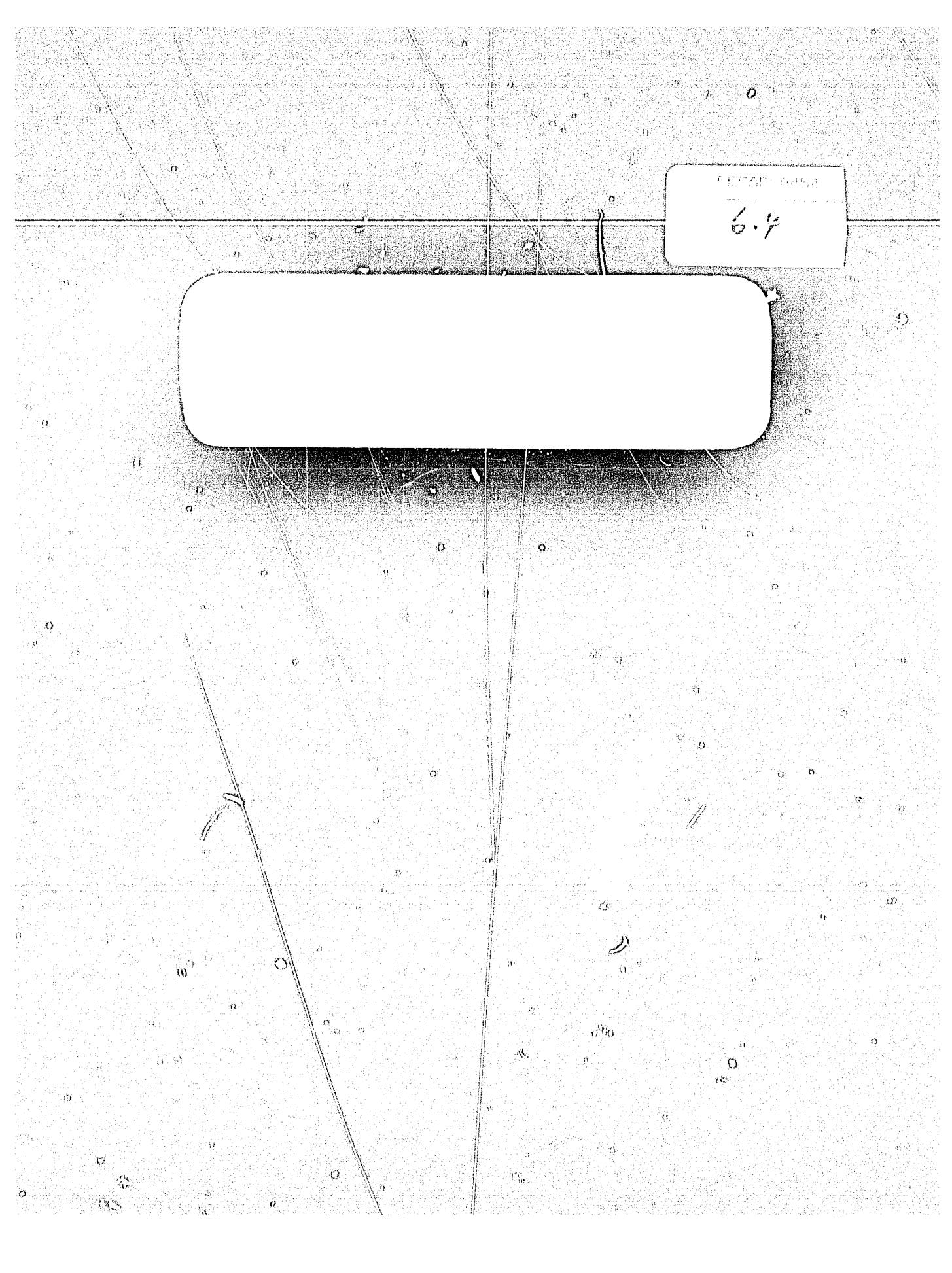
6.4

PROJECT FOR THE DEVELOPMENT OF FISHERIES
IN THE EASTERN CENTRAL ATLANTIC
INT/81/014

AN ACCOUNT OF FISHERY DEVELOPMENT PROJECTS IN THE CECAF REGION

T.R. Brainerd

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
UNITED NATIONS DEVELOPMENT PROGRAMME

Dakar, January 1984

The conclusions and recommendations of this and other reports of the CECAF Project are judged appropriate at the date of issue, but it is possible that they may be modified at a later date as our knowledge and analyses improve.

CECAF Project
56, Avenue Pompidou
Boite Postale 154
Dakar, Senegal

Telex : 676 UNDEVPR SG
Cables : UNDEVPRO DAKAR

Tel. 22.01.77
21.77.21

Mr. T.R. Brainerd is a Fisheries Officer of the Ministry of Natural Resources, Sierra Leone and is presently on study leave at the Department of Resource Economics, University of Rhode Island, U.S.A. This report was prepared whilst he was with the CECAF Project as a Professional Development Officer in July and August 1983.

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CURRENCY EQUIVALENT (October 1983)

SENEGAL	FCFA 403	US $ 1
THE GAMBIA	DALASI 2.6	US $ 1
GUINEA BISSAU	PESOS 4.17	US $ 1
SIERRA LEONE	LEONES 2.5	US $ 1

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1. INTRODUCTION

The Eastern Central Atlantic Region extends from the Gibraltar Straits to the Congo River (between 35°N and 6°N, approximately from Morocco to Zaire) with a coastline of nearly 10,000 kilometers. There are 20 independant developing coastal countries in the region. With the exception of Equatorial Guinea, the rest are members of CECAF. The countries vary considerably in size, population, and nature of their aquatic (mainly marine) resources. Zaire has the largest land area of 2.3 square kilometers. Apart from Mauritania, Nigeria, Cameroon and Morocco, the rest of the countries have land areas less than 300,000 square kilometers. Nigeria has the largest population nearing 84 million, and the rest have populations under 10 million with Zaire, Morocco, and Ghana being exceptions. The GNP per caput varies from $ 3,280 for Gabon, making Gabon the wealthiest country in the Region, and $ 170 for Guinea Bissau, making Guinea Bissau the poorest country in the region.

The continental shelf off West Africa is generally less than 20 to 30 nautical miles, except for areas between latitudes 24° to 20°N, and 15°N to 8°N, where the shelf is up to about 100 miles wide. The Region is characterised with two major currents, the Canary Current flowing southward down northwest Africa, and the Benguela current flowing northward up from southwest Africa. Between both currents

are the Equatorial countercurrent and its continuation, the Guinea current flowing eastwards into the Gulf of Guinea. Sub-tropical upwellings also occur in the North with cold, nutrient-rich waters, and tropical conditions in the South near the Equator. These factors make the waters of the northern sub-region much more productive than those of the southern sub-region. Various studies and respects have indicated the potential stock levels for most major commercial species by countries, and for the sub-regions.

Total fish production increased sharply in the early to mid 1970, and peaked at 3.8 million tons in 1977. This declined to 3.3 million tons in 1978, and to 2.8 million tons in 1979 (Everett et al., 1982). Because of increases in price, the value of the catch has remained fairly stable despite the decline in catch. This decline is attributed mainly to the reduced fishing effort of foreign fishing vessels due to the declaration of Exclusive Economic Zones (EEZs) by coastal countries. However, the total catch figure for 1980 (3.5 million tons) shows a reversal in the catch statistics. The Region remain a net exporter of fish (in weight and value) although some countries, notably in the southern sub-region import considerable quantities of fish to satisfy their domestic demands.

As the population in the Region continues to increase, and as other sources of animal protein become scarce and more expensive, increasing dependence is being put on the sea as a source of animal protein by coastal countries. Most countries have implemented, and are still implementing development projects aimed at increasing their domestic fish production to meet the nutritional demands of their populations.[1/] However, various factors are involved in achieving, and sustaining increased production. Among these are a knowledge of the resources, the provision of basic infrastructures, manpower needs, and the establishment of efficient management schemes. Fishery development projects in the Region have been designed to provide these inputs in order to achieve their goals. One noticeable factor is that most projects have depended on foreign assistance (aid) for their implementation, and the types of assistance foreign donors are willing to give have to some extent dictated the trends in fishery development projects in the Region.

The annual aid flows to fishery development projects in the Region is now estimated at over US $ 40 million (CECAF/FD/IV/81/Inf.4), and the major sources are through bilateral (government to government agreements), and through multilateral institutions such as UNDP,

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1/ Fishery development projects in the Region include a number of other objectives. These are discussed in section 2 of the report.

World Bank, etc. In addition, there are also aid flows through private commercial agreements. Such aid flows are directed mainly to the industrial fisheries in the Region Bilateral and multilateral funded fishery development projects could be classified into capital aid (75%) and technical assistance (25%) projects. Capital aid projects account for the largest share partly as a result of fishing agreements involving the granting of fishing rights to the donor countries by the coastal countries. Most of the capital aid projects involve the construction of infrastructures, administration and planning, and provision of facilities for the development of artisanal fisheries. Some countries, notably those with less potential for developing and expanding their marine resources have received substantial aid in aquaculture development projects.

Section 2 of this report describes the trends in fishery development projects in the CECAF Region by country, outlining the objectives of such projects as they relate to the needs of the countries. Section 3 presents an assessment of development priorities of the CECAF Project. (The CECAF Project was established under Article VI-2 of the constitution of FAO to assist developing countries in the Region to develop and manage their fish resources). An evaluation of fishery projects in the Region is presented in section 4. The next four sections present evaluations of artisanal fishery development projects in Senegal, The Gambia, Guinea Bissau, and Sierra Leone. The final section presents the conclusions and recommendations of the

consultant. Only three countries were visited by the consultant, however, all effort is made to verify the accuracy of the information obtained from various reports and other documents.

2. TRENDS IN FISHERY DEVELOPMENT PROJECTS

Because of the extreme variation in fishery devleopment projects in the Region, it is necessary to describe such projects by country. Also, the goals and objectives of National Development Plans of countries as they relate to fisheries vary considerably. This section describe fishery development starting with Morocco.

MOROCCO

The formulation and implementation of fishery development projects in Morocco is based on three basic guidelines :

a) the fishery sector must help find solutions to the nutritional problems of the people ;

b) the fishery sector must help to improve the balance of payments ;

c) the fishery sector must create jobs and promote the social status of the fishermen.

With these in view projects are already being implemented to provide infrastructure facilities and training to meet the manpower needs. Such projects include the construction of port facilities, large capacity refrigerated warehouses, freezing plants, ice-making plants, fish markets, etc. In addition, a training vessel was acquired recently through assistance from Japan. This vessel is attached to the Naval School, and will assist in training personnel to meet the demands of the fishing fleets. Assistance is also being provided in the field of training, research and stock assessment studies through FAO/UNDP funds. Spain is expected to provide assistance in the expansion of the fishing fleet through an agreement signed by the two governments.

In its Five-Year Development Plan (1981-85), the government has allocated US $ 120 million towards the construction of the facilities mentioned in the last paragraph. Substantial investments are being made by the private sector in the expansion of the fishing fleet and related areas. It is expected that such private investments will continue to increase with further stimulus from the government. Presently, the World Bank is assisting the government in the preparation of a comprehensive plan that will enable the formulation and implementation of fishery development projects to realize the governments objectives.

MAURITANIA

Both sectors (artisanal and industrial) in Mauritania are receiving active attention in fishery development projects. Such projects can be classified into :

a) the construction of infrastructure ;

b) the provision fo technical expertise ;

c) the provision of equipment for both sectors ;

d) the training of personnel to fulfill manpower needs in the fishing industry ;

e) research and stock assessment studies.

The governments Fourth Social and Economic Development Plan (1981-85) seeks to encourage increased production in the fishing industry, and improved balance of payment situation.

Infrastructure

A port construction project is underway in Nouakchott. When completed, it will provide facilities that will increase landings by fishing vessels. The Peoples Republic of China is providing aid for this project. Various projects involved with the construction of extensive processing facilities are the results of joint ventures agreements. Two fishery research units have been established in Nouadhibou. One by France and the other by the USSR , but both are based at the Research Center.

Training

Under a Technical Assistance Programme, Japan is supporting a training center for artisanal fishermen and has provided 4 technical experts based in Nouakchott and Nouadhibou. The fishery research units are also providing some training for the local staff, and training in the artisanal sector is being provided through FAO/UNDP Funds.

Equipment

Presently, there is a UNDP Project in artisanal fisheries development providing assistance to fishermen. There is also a boatbuilding component to this project. Another artisanal fishing industry project based in Nouadhibou is providing equipment to fishermen, and Japan is providing the equipment for this project. Equipment for the French research unit is being provided by France.

Technical experts

Under a fisheries development project, France is providing technical experts for stock assessment studies. The USSR also provides experts for stock evaluation.

CAPE VERDE

Fishery development projects in Cape Verde can be grouped into three major areas : provision of equipment, training and infrastructure. The General Directorate of Fisheries has concentrated mainly in providing assistance to the artisanal fishery. Various projects, funded by foreign donors are under implementation in the islands of San Antau, Sao Vicente, Brava,Fogo, and Maio. The Netherlands, France, Japan, Swiss and West German Governments are providing equipment to assist the development of the artisanal fisheries. Such equipment include outboard motors for motorization of canoes, fishing gear, spare parts, ice plants, and cold storage facilities. UNDP has also provided equipment in the past to improve processing, and distribution in the artisanal fisheries.

Three projects involved with the training of personnel are presently going on . Training projects are in the form of fellowship provided by Protugal, and Cuba, fishermen training on a fishing vessel supported by Iceland, and provision of experts for training personnel localiy by Japan.

A Fishing Boat Repair Yard Project is under construction. This will provide repair facilities to deep-sea fishing vessels. This project is jointly financed by EEC and BAD.

SENEGAL

The Sixth Development Plan of Senegal (1981/82-1984/85), has as its objective to increase the level of production through increase in the numbers of artisanal and industrial fleets and to increase export earning through increase in the level and value of fish exports. Thus, fishery development projects are geared towards fulfilling these broad objectives. About US$ [illegible] million is to be invested annually in industrial fishery development projects, and about US$ 31.6 million annually in artisanal fishery development projects. The estimated total public investment for the planned period is US$ [illegible] million (Everett et al, 1982).

Fishery development projects already implemented or under implementation in the industrial sector include the construction of a new fishing quay in the port of Dakar financed by the World Bank and Arab Funds, the purchase of handline vessels financed by France, the provision of fishing vessels by Spain through a fishing agreement, and the construction of a port at Saint Louis by Poland through another fishing agreement.

Artisanal fishery development projects include:

(a) Motorization of canoes, provision of spare parts, maintenance and repair facilities through Canadian Funds.

(b) Introduction and training of artisanal fishermen in the use of purse seine through FAO/UNDP Funds.

(c) Provision of vessels and outboard motors by Japan

(d) Provision of equipment for artisanal Fishermen's Cooperatives by the Catholic Relief Services, USA

(e) Provision of facilities to fishermen's Cooperatives for improved distribution and marketing of fresh fish through Canadian Funds.

The Oceanographic Research Center through different fisheries projects is receiving financial assistance from USA, Canada, and the Federal Republic of Germany. France is providing technical assistance to the center, and is to establish a shrimp culture Project in the Casamance Region.

Various local training programmes and overseas fellowships are being supported with funds from France, USA, Britain, USSR, and Canada. Some of these training programmes are part of other fishery development projects.

A monitoring, control, and surveillance (MCS) project is now being implemented through Canadian Funds. This project is being provided with infrastructure, hardware, and expertise for establishing an efficient MCS system to protect the resources inside the EEZ.

THE GAMBIA

Fishery development projects in the Gambia can be grouped into two main areas: artisanal fisheries development projects and a training project.

Two projects are presently being implemented in the artisanal sector. The EEC is financing a project which involves development and expansion of the artisanal sector through the introduction of improved fishing methods, training of fishermen in these methods, introduction of improved processing methods, provision of the plant, and facilities for improved distribution and marketing of fish, and improvement to feeder roads. The Japanese funded project involves the provision of equipment to artisanal fishermen.

Denmark has provided two fishing vessels for training purposes. Both vessels are expected to provide training to fishermen and other personnel to meet the needs of the fishing industry. An agreement to finance a project for the construction of a processing complex is expected to be signed shortly. This complex is to provide facilities for the industrial fisheries.

GUINEA BISSAU

Two artisanal fisheries development projects are currently being implemented in Guinea Bissau. Both involve the provision of fishing equipment, maintenance and repair facilities for outboard motors,

distribution and marketing facilities, and training. The first project is located in the island of Bubaque and is being supported with aid from Sweden. The first part of the second project located in Cacheu was funded through USAID Funds, and the EEC took over its funding in July 1982.

USAID has also provided technical assistance for the establishment of a management unit within the Fisheries Secretariat, and fellowships for the training of middle level technicians. Brazil is providing assistance in the training of personnel. Under the fishing agreement with EEC, scholarships will be provided for training Guineans in the scientific, technical and economic aspects of the fishing industry.

Joint venture agreements have been implemented with the USSR, Algeria and Cuba. These agreements involve the provision of industrial fishing vessels and infrastructure.

GUINEA

Fishery development projects in the Republic of Guinea are geared towards increasing production, providing storage and distribution facilites, and training. The motorization project for canoes was funded by Canada. FAO Investment Center has formulated a project for the establishment of Community Fishery Centers.

In the industrial sector, the USSR has fishing rights, and its vessels are landing part of their catch in Conakry. Norway has contructed

three vessels for operation by the Guinea State Enterprise - SOGUIPECHE, and Denmark has provided cold store and freezing facilities. There is a feasibility study for the construction of a fishing port in Conakry being carried out by the African Development Bank (ADB) with USAID Funds.

SIERRA LEONE

Four development projects are currently being implemented in artisanal and inland fisheries, and a fifth one should start soon. The Fisheries Pilot Project Tombo, is a project involving the establishment of a fishing community center, and the improvements to basic infrastructure in Tombo. The Federal Republic of Germany is providing funds for this project. Japan has provided fishing equipment under a small-scale fisheries development project. 130 fish ponds have been constructed through funds provided by USAID (Makali Project) and IFAD (Mapoasi Project). The small-scale Fishery Project which is a component of the North-West Intergrated Agricultural Development Project financed by the EEC should start soon.

The development projects undertaken in the industrial sector have been mainly through private financing. Landing facilities have been constructed for and industrial fishing company with a low interest loan from France. Fishing vessels have also been built for the company with loans provided from the same source. The USSR has a fishing agreement with the government involving the same company.

Various projects have provided technical assistance, training, and research facilities. FAO/UNDP, Britain, USA, Japan, Norway, Denmark, and USSR have all provided fellowships for training Sierra Leoneans in different areas of fisheries. Through USSR assistance, one industrial fishing company has established a fisheries school in Freetown for Training Sierra Leoneans in technical aspects. Under separate projects, Denmark and Japan have provided vessels for research and training purposes. UNDP and Germany have provided equipment and technical support to the oceanographic institute. The USSR provided a patrol vessel for MCS activities. An oyster culture project (2 phases completed) was funded by the International Development Research Center (IDRC) of Canada.

LIBERIA

The fishing industry in Liberia has seen much development in recent years. The only noticeable projects are stock assessment studies conducted by the USSR, and fish culture projects receiving technical assistance from US Peace Corps Volunteers.

IVORY COAST

The UNDP provided funds for a fishculture and inland fisheries development project. This project trained workers in fish culture in lakes, to develop fisheries in temporary lakes, to develop lagoon aquaculture, and to establish pilot fish farms. Four separate projects are currently being implemented, two involving inland fish culture, and two the development of lake and lagoon fisheries. All four projects

are financed by France. There is a marine artisanal fisheries project providing equipment to fishermen. This project is also supported by France.

The only recent project involving the industrial sector is the expansion of the tuna fleet of the state-owned company STPAR with a low interest loan from France. Oceanographic studies are currently being carried out by the Research Centre through technical assistance from France.

GHANA

The artisanal fishery has benefitted from credit schemes instituted by the government for the purchase of fishing equipment. The inshore and distant water fleets have also received assistance through bilateral and multilateral aid projects for their development and expansion. Presently, there is no active fishery development project going on.

TOGO

Three development projects have been undertaken in the fishing industry in Togo. A new fishing terminal has been constructed in Limé with funds provided by EEC. An aquaculture research project is presently in operation. This involves cage culture of Tilapia at the Research Center on Lake Togo. The IDRC is funding this project. A joint venture fishing company has been established with assistance from Libya.

BENIN

In artisanal fisheries, the following projects have been implemented:

Artisanal Fisheries Development: This project was implemented to improve the capacity and earnings of the lower income group of fishermen, to ensure efficient utilization of the marine resources, and to increase production of fish for domestic consumption. This project was funded by UNDP.

Artisanal Fisheries Development: This project provided canoes with outboard motors, spare parts, fishing gear, and a truck for the transportation of fish.

Fish Farming Project in Godmey: This project provided an aquaculture station with expatriate technical assistance, and was funded by the EEC.

Lagoon Fisheries: This project provided infrastructure facilities such as cold stores, maintenance and repair services, etc.. Funds were provided by the Federal Republic of Germany.

Women's Fish Processing Cooperative Project: Provided processing facilities, and trained women in new processing techniques.

Artisanal Fishermen's Cooperative Project: Assisted fishermen in establishing cooperatives, and provided fishing boats to fishermen.

A joint venture industrial fishing company has also been established with assistance from Libya.

NIGERIA

In artisanal fisheries, the government has embarked on a programme aimed at stabilizing the prices of fishing equipment to fishermen. A project for the establishing of a community fishing center is presently underway. It will also involve the formation of fishermen's cooperatives.

The government has also financed a project for the expansion of the trawl fleet. Forty-five small trawlers were purchased from Poland and are being sold to fishing cooperatives at 50 percent subsidy. Under an agreement with Mauritania, six fishing vessels of the Nigeria National Fishing Company are fishing in Mauritania waters. Three fishing ports are to be constructed under the 1981-85 Development Plan.

A federal Fishery School has been established to provide technical training to support the industrial fleets. The Regional Aquaculture Center is providing training in aquaculture to personnel from other countries in the region. The Oceanographic and Marine Research Institute is receiving assistance through various aid projects, and recently acquired a research vessel from Japan.

CAMEROON

The following fishery development projects are being implemented in Cameroon.

Small Farmer Fish Production: This project is to strengthen and expand existing infrastructure for fish culture and to extend fish culture technology to rural areas. The project is funded by USAID and US Peace Corps Volunteers are providing technical assistance.

Modernization of Artisanal Fisheries: This project aims at improving fishing methods, increasing the level of production, improving processing methods, and raising the standard of living of the fishermen. Canada is providing assistance to the project.

Integrated Rural Development (Inland Fisheries Component): This component aims at improving infrastructure for inland fisheries development.

Fish Port Construction: This project involves the construction of a new fishing harbour and access roads.

SAO TOME AND PRINCIPE

A technical assistance project funded by the EEC has conducted studies and prepared an analysis of the fishery sector. Stock assessment studies have also been conducted using acoustic survey methods. Cuba has provided some assistance in the training of personnel.

EQUATORIAL GUINEA

Artisanal fishery development projects have included the construction of canoes, and the provision of outboard motors and fishing gear by the EEC and France. Spain is currently undertaking research on the fisheries as part of a fishing agreement, and Spanish vessels are licensed to fish in Equatorial Guinea waters.

GABON

Only one fish culture project is currently operational in Gabon. This project involves the renovation of fish stations, and the provision of extension services to farmers with fish ponds in the villages by US Peace Corps Volunteers. Feasibility studies have been completed for four fisheries development projects that would involve:

(a) The establishment of a Fishery Community Centre

(b) Development of a Tuna fleet

(c) Development of a Handline fleet

(d) Development of fresh - and brackishwater aquaculture

CONGO

A Coastal Resources project is ongoing, and this project undetakes studies of the artisanal and industrial fisheries through technical assistance from France. An analysis of the fishery sector has been conducted with funds provided by the EEC.

ZAIRE

A project: "Assistance to the National Fisheries Office and Artisanal Fisheries Development" is being implemented. The project has acquired two Senegal canoes and one Japanese inboard diesel vessel for training artisanal fishermen. The project will also prepare a coordinated programme for fisheries development.

3. A SUMMARY OF CECAF PROJECT ACTIVITIES

The CECAF Project has given priorities to five main areas in providing assistance for the development of the fishery in the region. These areas are:

(a) The establishment and operation of Statistics Units by countries in the region

(b) The continuous assessment and evaluation of the resources in the region

(c) The provision of technical assistance to development planning and management programmes

(d) The development of artisanal and industrial fisheries

(e) The training of manpower at various levels.

This section assesses the role of the CECAF Project in each area.

3.1 Statistics

The project, aware of the importance of adequate and reliable data to the successful design and implementation of fishery development projects provided active support to governments for establishing improving, and operating statistics units within fisheries institutions. The project's statistician has worked with government officials concerned within fishery statistics to design and improve data collection systems, reporting methods, and analysis of data. Considerable emphasis has been given to statistical data collection systems for the artisanal fishery due to its nature, and the priority given to this fishery by most governments in their development plans.

The project has organized short training courses in fishery statistics which have provided instructions to participants in traditional statistical instructions to participants in traditional statistical methods, thus improving their knowledge in this area. Working Parties on Fisheries Statistics organized by the project have enabled participants from CECAF member countries to present their data for analysis, and joint discussion.

Because of the problem formally encountered with obtaining catch and fishing effort data from some international fleets fishing in the region, the project started a survey at Las Palmas of international fishing fleets operating in the region. The data obtained from this survey have assisted resource management studies. Five reports have been published since the start of this survey.

The project has also published three statistical bulletins for the whole region. These bulletins contain catch data by statistical division, by major species group, and by country.

3.2 Resource Evaluation

Various resource evaluation programmes have been implemented by the project to assist CECAF countries in the evaluation of their fishery resources. Some of these programmes include scientific meetings discussing specific fish resources in the region, training courses on resource evaluation which have provided scientists with opportunities to learn various methods and techniques used in resource evaluation work.

Cooperative acoustic and trawl surveys have been carried out by four research vessels in the region. The project has organized these surveys with assistance from some countries both in and outside the region. Scientists from CECAF countries participated in planning the surveys, took part in the surveys, and in the analysis of the data. These surveys have provided information on the state of the resources in the region, and have enabled scientists to acquire the experience needed to carry out similar surveys within the EEZs of their respective countries.

A catalogue of species indentification sheets for all CECAF countries has been published by the project. This catalogue is of significant value as a reference material. Presently, the project is preparing maps to illustrate the present distribution and migration of fish species in the region. Experiments on tagging possibilities have been conducted, and a

report for the northern sub-region has been published. This report will assist countries in resource evaluation activities, and in formulating management measures.

Work has been done on assessing the amount of fish discarded by trawlers to indicate to countries the significance of collecting this information, and its value in stock assessment work. The project has stressed the significance of the discards of shrimp vessels, particularly in obtaining information on the species composition and size.

Assistance has been given to countries in assessing their aquaculture potentials. The projects staff have supervised professional development trainees in resource evaluation work. Senior fishery officials have worked with CECAF Project staff in evaluating data on the fishery resources of the region. This has provided them with a regional perspective of the resources.

3.3 Development Planning and Management

The project has published various technical reports on development planning and management of the fishery resources in the region. These reports include analysis of trends and situations, identifying problems of management and development, and presenting models for fishery development planning in the region. The main objectives of these reports are to provide structured information on development trends, alternative strategies for developing and managing the fishery resources in the region, the benefits

that could be derived from implementing effective management measures, and observed problems of management and development. These reports are intended to aid CECAF member countries and donor agencies in designing development plans, and implementing management measures.

A Workshop on Fishery Development Planning and Management has been organized by the project. Four in-service trainees and two university students worked with the Planning Officer of the project for short periods to gain insight into planning activities.

A number of other activities have also been carried out to assist CECAF countries in their development and management efforts. These activities include:

(a) The assistance to some countries for improving the management of brackishwater fisheries.

(b) The provision of advice on fishing agreements, joint ventures, etc.

(c) The provision of an economist who undertook analysis of the potential economic rent to be extracted from certain fisheries, and the alternative strategies for their development.

(d) The promotion of the use of larger mesh sizes in trawl nets.

(e) The collection of data on trends in fishing costs and earnings, and the effect of these trends on the rate of return on investment.

(f) The promotion of MCS activities

(g) The promotion of the activites of the Sub-Regional Conference of Ministers responsible for fisheries in Mauritania, Senegal, The Gambia, Guinea Bissau and Cape Verde.

3.4 Artisanal and Industrial Fisheries Development

The project has organized meetings which discussed the general aspects of artisanal fisheries in the region various activities have been undertaken to aid countries in developing their artisanal fisheries, and the project has provided funds for artisanal fishermen from some countries to travel to other countries in the region to learn new techniques used by other artisanal fishermen. Other activities in this area include:

(a) The provision of assistance to consultants in identifying and formulating investment projects for both artisanal and industrial fisheries in the region.

(b) The project made specific missions to CECAF countries to discuss investment possibilities.

(c) The project prepared an inventory of fishing industry in the region containing data on fishing fleets, their characteristics, etc., and fish processing facilities.

(d) The project prepared documents for the Training Course on Fish Fish Inspection and Quality Control

3.5 Training

In-service training programmes have been organized by the project to enable fisheries officials for CECAF countries to work with CECAF Project staff, to work on research vessels, and fisheries research institutions in the region. A training course on training and acoustic surveys was organized in Casablanca, Morocco. Over 600 officials from government fisheries institutions have attended technical and training programmes organized by the project. These programmes have aided governments in providing the necessary training required for their officials to take more active role in development and management activities.

In addition, the project has provided advice to some CECAF countries on fishery legislation, and assisted in the formulation of new fishery legislations. The project's computer Programmer/ Analyst is currently preparing a system that will facilitate the processing of data for regional use. A report on the enforcement of fishery regulations in the region has been published.

The CECAF Project, in giving priorities to these areas has provided considerable support and assistance to overall fishery development in the region.

4. OUTLINE DESCRIPTION OF BILATERAL AND MULTILATERAL PROJECTS IN THE CECAF REGION

Bilateral and multilateral-funded fishery project in the CECAF Region can be grouped into the following categories:

(a) The construction of, and improvement to infrastructure.

(b) The establishment of research institutions, support and assistance to research and stock assessment work.

(c) The assistance to general fisheries development and management programmes.

(d) The assistance to the development and expansion of artisanal fisheries.

(e) The establishment of, and improvement to processing, distribution and marketing facilities.

(f) The provision of training facilities through followships, technical assistance, short courses, etc.

(g) The provision of administrative and technical advice.

(h) The assistance to the development of aquaculture and inland fisheries.

(i) The assistance to protection and enforcement of regulations within EEZs.

This section evaluates the overall success of these projects.

4.1 Infrastructure Development Projects

Most projects in this category involve the construction of fish harbours (ports) shore based facilities such as cold stores, shipyards, fish meal plants, and fishing vessels. These projects have aided development and expansion of industrial fisheries. The management of industrial fisheries in the region as a whole is fairly well organized, and the facilities provided have been utilized efficiently in most cases to increase production, thus increasing landings and transhipments, increasing domestic supply of fish, and increasing foreign exchange earnings.

4.2 Research and Stocks Assessment Projects

Projects in this area have assisted in the establishment of research institutions and centers, the provision of equipment for research activities, the provision and operation of research vessels, the provision of technical and scientific staff, and assistance in stock assessment studies. Some of the projects are on-going and are producing valuable results. Some projects were of specific durations and their results have been published. However, some of these projects collapsed at the end of the outside funding. It should be noted that some

countries in the region, particularly the smaller ones (in size and population) do not have the financial resources to undertake such projects themselves. Also, these countries do not give high priorities to such projects. A regional approach involving the establishment of regional research institutions could provide services to these countries. However, the logistics of their administration and management have to be carefully worked out. Though the idea sounds appealling, there are obstacles that should first be overcome. An alternative would be to encourage smaller countries to utilize the services of well established institutions in the region by contracting them for various projects.

4.3 General Fisheries Development and Management Projects

Projects in this category have involved the provision of technical expertise to assist governments in the formulation of development and management schemes, the provision of experts for feasibility studies, the analysis and evaluation of the fishery sectors in some countries, and the provision of information on management models, and alternative strategies for the development and management of certain fisheries.

Although most of the activities of these projects have produced useful information to CECAF countries, the extent to which this information has been used by countries is not known. It is apparent that some countries do not have the manpower and facilities to utilize this information. This is evident in the lack of follow-up which should take place with most of these reports. Some development and management schemes have also collapsed

because of the end of outside funding. Again, some countries do not have the financial resources to continue such projects. It should be noted that some countries, notably the advanced ones in the region have been able to sustain some of these projects with their own funds. However, it seems that development and management projects are likely to benefit most countries if they are planned on long-term basis.

4.4 Development and Expansion of Artisanal Fisheries Projects

Artisanal fisheries development projects have involved the introduction of new fishing gears to fishermen; the motorization of canoes, the training of fishermen in the use of new equipment, the provision of fishing equipment, maintenance and repair facilities, the improvement to processing, storage, distribution and marketing facilities, the improvement to feeder roads, and general assistance to rural development.

Motorization and introduction of new fishing gear aspects of these projects have been reasonably successful. However, these have often times resulted in increases in the levels of production which is one of the objectives of such projects, but consumers in some cases have not benefitted from such increases in the levels of production. This has been due to a number of reasons. Some of these projects simply did not include aspects of processing, distribution, and marketing, some failed to implement credit schemes that should have assisted fish processors and distributors in improving their facilities, some concentrated

on the distribution of fresh fish and the facilities provided could not handle the increased production, and most lacked knowledge of the distribution and marketing systems to effect any significant changes.

It is evident that given the fact that the stocks can sustain increased levels of exploitation, most projects have succeeded in increasing production, but have had setbacks or problems with effecting improvement in post-harvest activities. One possible reason is because most of the projects have concentrated on increasing the supply of fresh fish to rural consumers. Such measures have not been proven financial viable because of the low earnings of the rural population, and traditionally they have been used to eating mainly processed fish. While it is necessary to supply fresh fish to the rural population, more emphasis should be given in future projects to improving processing methods, and the distribution and marketing of processed fish.

One common feature of artisanal fisheries development projects is that most of them terminated with the end of outside financing. Such projects have not been successfully prepared for their long-run self-supporting operations. It is evident that such projects cannot be continuously subsidized, and the costs of equipment, services, etc. to fishermen have not reflected their full economic values. One way to avoid this problem is for public investments to be restricted to research and training aspects, and the commercial aspects left with private enterprises, such as cooperatives with some supervision.

Most artisanal fisheries development projects were also intended to increase the income of fishermen. Whilst it is true that this has resulted with few projects, with most projects this has not been the case. Two factors account for this. One is that distribution and marketing facilities have not been adequate to handle the increase, thus creating surplus production. This has often resulted in depression of ex-vessel prices, and spoilage particularly during the peak seasons. The other factor is that new technologies have increased capital and operating costs, and prices of the products have not increased correspondingly. Thus, the returns to fishermen have decreased in some cases.

4.5 Distribution and Marketing Projects

These projects are only related to industrial fisheries since these aspects of artisanal fisheries have been evaluated already. Most of these projects have provided ice-making plants, cold storage facilities, refrigerated and insulated trucks, and depots in inland areas. These projects have involved private investments, though some have been at less than commercial rates, and joint venture agreements. Again, the management of the industrial fisheries in the region is fairly well organized, and such facilities provided by these projects have been utilized efficiently.

4.6 Training Projects

Regional training programmes have been coordinated fairly well and have provided participants with the knowledge and skills to take active roles in the development of the fishery in the region. However, some of

the bilateral training programmes have resulted in duplication of efforts. This is particularly true when a number of donor countries or agencies offer the same type of fellowships to one country. Sometimes such training programmes have not resulted in the provision of expertise in the areas much needed, or the recipient countries do not have the facilities and financial resources to utilize the trained personnel fully. Training programmes will benefit CECAF countries if they are well coordinated, the manpower needs and priorities of the recipient countries are carefully assessed, and provision is made for the follow-up of the activities of the trained personnel.

4.7 Administrative and Technical Advice Projects

These projects have mainly involved the provision of consultants to governments to assist in the formulation and drafting of fishery legislations, in negotiating joint venture agreements, and providing information on strategies and alternatives for formulating policy decisions. Such projects have achieved their primary objectives, but the extent to which governments have implemented policy decisions varies according to political ideologies, facilities available to the governments, and the relative importance of the resources.

4.8 Aquaculture and Inland Fisheries Development Projects

Such projects have involved construction of fish farms, improvement to aquaculture facilities (hatcheries, equipment for research, etc.), development of brackishwater, river, and lake fisheries, and provision of

equipment to fishermen. In general, only few fish farm projects have achieved any measure of success. Most of them have not been cost effective, and cannot provide fish to rural consumers at low costs. Inland fisheries projects have met with varying degrees of success, but most have failed to achieve the planned levels of productivity.

4.9 EEZs Protection and Enforcement Projects

Most of these projects have provided hardware (e.g. aircrafts, surface vessels, communication systems, etc.), training, advice, and supervision. Because of the high capital and operating costs, most countries have had problems with maintaining their hardware particularly when outside assistance is terminated. There has also been technical problems in some cases due to lack of spare parts, repair facilities, and technicians for maintenance and repair to hardware. It is unlikely that countries in the region will be able to efficiently maintain elaborate MCS systems unless regional and sub-region systems are provided.

The next four sections evaluate artisanal fisheries development projects in Senegal, The Gambia, Guinea Bissau, and Sierra Leone.

5. SENEGAL - CAPAS PROJECT: DESCRIPTION AND EVALUATION

5.1 Introduction

The fishing industry in Senegal consists of the traditional artisanal sector (including river fishing) which is controlled by Senegalese, and the industrial sector of both local and foreign vessels.

The artisanal sector produced about 80 percent of the fish consumed locally, whilst production from the industrial sector is mainly exported canned or frozen. Because of the importance of the artisanal sector in providing cheap source of animal protein for the population in Senegal, and employement for the population in the coastal rural area, the Government of Senegal has provided, and is still providing assistance in the improvement and expansion of the artisanal sector.

The first assistance dates back to 1953 when the Direction de l'Océanographie et des Pêches Maritimes (DOPM) embarked on a programme of motorization of pirogues (canoes). From 1958 to 1961, 900 pirogues were equipped with outboard motors (engines). In 1973 a credit system was made available to artisanal fishermen through the National Development Bank in Senegal for the purchase of outboard engines. This system of credit was terminated in 1966 because of the low repayment rate. In 1966, the DOPM obtained outboard motors tax free for artisanal fishermen. This reduced the cost of the outboard motor to fishermen by 35 percent. Through financial assistance from Belgium, the motorization programme continued, and by 1971, 1,578 pirogues (49 percent) were fitted with outboard motors.

In 1972, the Governments of Senegal and Canada through the Canadian International Development Agency (CIDA) signed an agreement to aid the motorization programme. CIDA provided 6,300 outboard motors, spare parts, tools for repair and maintenance, and technical assistance

over a 5-year period (1972-78). The Government of Senegal provided land, buildings, administrative and technical personnel, and a para-statal body - "Centre d'Assistance à la Motorisation de la Pêche". for the operation of the motorization programme. About the same time (1972), experimental fishing with purse seine were conducted under a joint project by UNDP/FAO and the Government of Senegal. The trials were successful, and the adoption of the purse seine by artisanal fishermen has been increasing.

Both motorization and purse seine projects succeeded in increasing production, and expanding the artisanal sector. This led to surplus fish being produced, especially during the peak season causing a depression of prices. As a result, artisanal fishermen were not receiving the full economic benefits of their investments. To alleviate this problem, the government formulated another project in 1981 for the distribution and marketing of fish caught by the artisanal sector. This project called: "Centre d'Assistance à la Pêche Artisanale du Sénégal" (CAPAS) now embraces the motorization and purse seine projects. The proposed project components consist of an administrative and technical center, four regional centers in major fishing areas, and a possible four additional regional of the first four centers. The component dealing with the purchasing, storage and marketing of fresh fish is being financed by Canada through CIDA over a 5-year period. The other component for motorization and purse seine distribution, maintenance and repairs, is being financed jointly by the Governments of Senegal and Japan.

The present report evaluates the distribution and marketing of the fresh fish component of the CAPAS Project. A brief description of the objectives, inputs, and operations is presented followed by a financial analysis of the activities. A socio-economic evaluation of the objectives is presented with a discussion of the results of the evaluation.

5.2 Objectives

The objectives of the distribution and marketing component of the CAPAS Project are:

(a) The provision of facilities for handling, storage, and marketing of fresh fish, particularly during the peak season.

(b) The provision of an avenue for artisanal fishermen to dispose of their catch at stabilized prices, thus increasing their incomes.

(c) The regulation of market prices through the use of storage and distribution facilities.

(d) The increase of the supply of fresh fish from the artisanal sector to consumers, particularly in the rural areas, and the creation of an efficient marketing system.

(e) The training of members of cooperatives in the maintenance and operation of the facilities.

5.3 Inputs

The inputs of the distribution and marketing component of the CAPAS Project are:

(a) An administrative and technical centre at Thiaroye. Three distribution centers have been built at Kayar, Joal and Rufisque.

(b) Kayar and Joal Centers

(i) Three refrigerated (cold) rooms at each center with a capacity of 10 tons each.

(ii) Two ice plants at each center. The daily production at each centre is 20 tons.

(iii) Two refrigerated trucks at each center. Each truck has a total capacity of 7 tons (75 percent of this capacity if utilized for fresh fish and 25 percent for ice).

(c) Rufisque Center

(i) Two refrigerated (cold) rooms, each with a capacity of 10 tons.

(ii) One ice plant with a daily production of 10 tons.

(iii) Two refrigerated trucks, each with a capacity of 7 tons.

The center at Kayar was opened in October 1981, and during the 1982-83 accounting year an estimated 900 tons of fresh fish were handled at the center. The center at Joal was opened in May 1982, and during the 1982-83 accounting year an estimated 900 tons of fresh fish were handled at the center. The center at Rufisque was opened in April 1983, and up to July 1983 had handled 100 tons of fresh fish. Because of increase in costs, and other technical factors, the number of centers were reduced to three. It is expected that by 1985 the centers at Kayar and Joal will each be handling an estimated 2,500 tons of fresh fish, and the center at Rufisque will be handling 1,000 tons of fresh fish annually.

5.4 Operations

The three distribution centers are operated within a cooperative system. The centers are actually on loan to the cooperatives. The personnel employed at the centers are paid out of the earnings of the operations. Fish is bought at the landing sites close to the centers and taken to the centers, washed with running water, sorted (if necessary according to size), iced, and stored in the cold rooms. The refrigerated trucks are used to distribute the fresh fish according to demand. One refrigerated truck is available at CAPAS Headquarters in Thiaroye to assist any of the three centers if there is need. Radio communication link is kept between CAPAS

Headquarters, the three centers, and the trucks when they are out for directing them, and in cases of breakdowns. Presently, there are no established distribution points, and this affects the turnover time of the trucks considerably. Efforts are now being made to establish such points. The staff at CAPAS Headquarters only supervise the operations of the centers except for the maintenance and repairs to the equipment and vehicles. Local personnel are being trained to take over these activities when the contracts of the technical experts expire. The response by fishermen was very slow at the start of operations of the centres, but fishermen's participation is now increasing.

5.5 Financial Analysis

The financial analysis of the distribution and marketing component of the CAPAS Project consists of an evaluation of the financial activities for the three centers during the 1982-83 accounting year. Salaries of staff at CAPAS Headquarters, salaries of technical experts, and operating costs of the Headquarters are not included in the analysis.

Kayar Center

Table 1 gives the costs, sales, and earnings for the distribution center at Kayar. Net earnings were 10,000,000 F CFA for the period. This profit was distributed to the fishermen of the cooperative who sold fish to the center on a proportional basis depending on the quantity of fish fishermen sold to the center during the year. This was done to indicate to the fishermen that the cooperative is working in their interest, and it's activities are non-profit making. Data were not obtained for the various

cost factors, thus it is not possible to do any analysis to determine which factors account for the major share of the operating expenses. However, it can be seen from Table 1 that the purchase of fresh fish accounts for 64% of the total operating expenses.

Financial ratios

Two financial ratios are calculated to assess the efficiency and profitability of the operations. These are the operating ratios and the return on sales ratio. The operating ratio indicates the ability of the management to control the operating costs, including administrative expenses. As a rule of thumb (Gittinger, 1982) this value should be between 50% and 80%. Increasing operating ratio from period to period indicates that costs are increasing, or sales are declining, and that management has not trimmed down expenses to reflect the situation. If the ratio is close to 90%, the operations may have difficulty in making adequate returns. If it is below 50%, some costs have likely been omitted or underestimated. The value of 89% (Table 1) shows that the operations did not make adequate returns (given the level of investment) for that period.

The return on sales shows how large an operating margin the operations have on its sales. There is no rule of thumb for this ratio, but it can be compared with the ratios from similar activities. The value of 11%, through seemingly low might be adequate for the operations to be financially viable since fresh fish is fast moving, and there is no need to keep inventory for more than a few days.

Joal Center

Table 2 gives the costs, sales and earnings (loss) for the distribution center at Joal. The Center recorded a net loss of 6,400,000 CFA for the period. (It went bankrupt in January 1983 and CAPAS Headquarters had to take over its operations). Presently, CAPAS staff and the cooperative members are managing the operations. The center will be returned to the cooperative after the operations have shown profits and a manager has been trained.

Financial ratios

The two financial ratios (operating and return on sales) are negative. This is due to the net loss recorded for the period.

Rufisque Center

Table 3 gives the costs, sales and earnings for the distribution center at Rufisque. Net earnings of 351,000 FCFA were recorded for the 2-month period (May-June 1983). A breakdown of operating costs is given in Table 4. The salaries for 5 permanent staff, casual labour, and gasoline for the refrigerated trucks account for 86% of the operating costs.

Table 1 : Financial analysis of the operations of the Kayar Center for July 1982-June 1983 (FCFA)

Gross Earnings		
Sale of fresh fish	85,000,000	
Sale of ice	5,000,000	90,000,000
Less Expenses		
Purchase of fresh fish	51,000,000 (735 tons)	
Operating costs (salaries, fuel, maintenance and repairs, etc.)	29,000,000	80,000,000
Net earnings		10,000,000
Av. purchase price/ton of fresh fish	69,390	
Av. selling price/ton of fresh fish	115,650	
Gross profit margin/ton of fresh fish	46,260	
Operating ratio (%)		
Operating expenses / Gross earnings	89	
Return on sales (%)		
Gross earnings	11	

Table 2 : Financial analysis of the operations of the Joal Center for July 1982 - June 1983 (FCFA)

Gross earnings		
Sale of fresh fish	67,000,000	
Sale of ice	2,600,000	69,600,000
Less Expenses		
Purchase of fresh fish	47,000,000 (822 tons)	
Operating costs (salaries, fuel, maintenance and repairs, etc.)	29,000,000	76,000,000
Net earnings (loss)		(6,400,000)
Av. purchase price/ton of fresh fish	57,180	
Av. selling price/ton of fresh fish	81,510	
Gross profit margin/ton of fresh fish	24,330	

Operating ratio (%)

Operating expenses

Gross earnings (-)

Return on sales (%)

Net Income

Gross earnings (-)

Table 3 : Financial analysis of the operations of the Rufisque Center for May-June 1983 (FCFA)

Gross earnings		
Sale of fresh fish	7,000,000	
Sale of ice	51,000	7,051,000
Less Expenses		
Purchase of fresh fish	4,000,000 (47 tons)	
Operating costs (salaries, fuel, maintenance and repairs, etc.)	2,700,000	6,700,000
Net earnings		351,000
Av. purchase price/ton of fresh fish	85,106	
Av. selling price/ton of fresh fish	148,936	
Gross profit margin/ton of fresh fish	63,830	
Operating ratio (%)		
Operating expenses / Gross earnings	95	
Return on sales (%)		
Net income / Gross earnings	5	

Table 4 : Breakdown of operating costs of the Rufisque Center for May-June 1983 (FCFA)

		Av/month
Salaries (5)	193,000	293,000
Casual labour	372,000	158,000
Social security	45,000	19,000
Gasoline (Trucks)	621,000	263,000
Maintenance and repairs to trucks	26,700	11,300
Maintenance to equipment (cold rooms, ice plants,etc.)	9,000	3,800
Transparation	2,000	900
Hotels and restaurants for drivers and fish distributors	175,000	74,000
Miscellaneous	24,000	10,200
Total operating costs	1,967,700	

Financial ratios

The operating ratio for the center at Rufisque is 95%. This value is above the upper limit given by Gittinger, and it could be concluded that the operations are not making adequate returns. However, this value is for the first 2 months of operations, and it has been noted that at the start of operations of each center fishermen were very slow in responding. The return on sales (5%) is also low, but should increase with increase in fishermen's response.

In summary the financial analysis shows that the centers are not generating enough funds to be financially viable in the long-run. The operating expenses of the centers are relatively high compared to the gross earnings. It is projected that the center at Kayar will make net earnings of 13 million FCFA during the 1983-84 accounting year. 5 million CFA is to be shared amongst the fishermen of the cooperative, and 8 million FCFA will go towards amortization of equipment (excluding the building). Projection of net earnings for the Joal center during the 1983-84 accounting year is 1.5 million FCFA. The center at Rufisque is also expected to record net earnings during the same period. These projections are discussed further in the socio-economic evaluation.

5.6 Socio-economic evaluation

The socio-economic evaluation of the distribution and marketing component of the CAPAS Project consists of an evaluation of the objectives to determine whether they are being fulfilled, or if not to identify some of the constraints. The data obtained is for a one year period only. (In the case of the center at Rufisque, the data covers a 2-month period). Thus, it should be remembered that the Project is at the initial stage. However, all efforts are made to present realistic estimates in this evaluation pertaining to the long-run operations of the project.

The first objective concerns the provision of facilities for handling, storage, and marketing of fresh fish, particularly during the peak season. The three centers handled 1,900 tons of fresh fish during the 1982-83 period. (The Center at Rufisque operated for only 2 Months). Statistics published by the Fisheries Department for 1981 show that artisanal landings of fresh fish in the Thies Region was 80,934 tonnes. (Kayar and Joal are in this Region), and artisanal landings of fresh fish in the Cap-Vert Region was 19,654 tonnes for the same year. (Rufisque is in this Region). Assuming that production in both region remained relatively constant during 1982 and 1983, the quantity of fish handled by the centers was about 2% of what was actually landed.

By 1985, the centers at Kayar and Joal are each expected to be handling 2,500 tons of fresh fish annually. Given the capacities the cold rooms (30 tons) and the refrigerated trucks (14 tons) for each center, and the average turnover time of one truck (3 days) each center can handle 2,700 tons of fresh fish (excluding ice) annually operating at maximum capacity. This assumes that the center has to hold each maximum load (75% fresh fish and 25% ice) for an average of three days because of the turnover time of the trucks, and operating fully 30 days in the month throughout the year. However, each truck can transport 630 tons of fresh fish (excluding ice) annually. This means that only 1,260 tons of fresh fish can be distributed by the two trucks. In order to achieve the target of 2,500 tons for each center four trucks should be provided to each center.

The center at Rufisque is expected to handle 1,000 tons by 1985. Using the same assumptions above, it could handle a maximum of 1,800 tons of fresh fish (excluding ice) annually. The two trucks can distribute 1,260 tons of fresh fish. Thus, this level of distribution can be achieved by the center at Rufisque. The turnover time of the refrigerated trucks is very critical to the distribution of fresh fish. presently, a truck load of fresh fish from Kayar to Bakel (approximately 700 kilometers inland) has a turnover time of 7-10 days. In order to reduce this time considerably, distribution points must be established in various inland towns. However, given the capacities of the cold rooms and refrigerated trucks, the three centers can only handle 7,200 tons (7%) of the total landings, using the 1981 figures.

At present, there does not seem to be any regulated prices at the landing sites close to the centers. The traditional method of price fixing according to the level of production on a day to day basis by the middlemen/buyers/processors still prevails. However, fishermen have the option to sell to the centers which normally do not pay below the prices fixed by the traditional system. (In most cases the centers pay more than the fixed prices). Also, one center (Kayar) distributed its profits for 1982-83 (10 million FCFA to fishermen belonging to the cooperative, who sold fish to the center. The project plans to distribute a percentage of the profits made by the centers each year to the fishermen. It is likely that fishermen belonging to the cooperative can increase their incomes by selling their production to the centers, but it is unlikely that the centers can effect any long-term stability in prices given the small percentage of the total production they can handle.

Presently, there does not seem to be any competition between the centers and the middlemen/buyers/processors in the distribution and marketing of fish. The former distribute fresh fish only, whilst the latter distribute processed fish inland. Thus, they are operating in two distinct markets.The demand for fresh fish by consumers inland is likely to increase if the price differential between fresh fish distributed by the centers and processed fish is significant. This is supported by the fact that inland consumers can process the fresh fish themselves according to their preferences. Thus, price

regulation, unless it is realistic could lead to an increase in demand for fresh fish to the extent that the centers cannot technically meet such demand.

During the 1982-83 period, the center at Kayar distributed 76% of fresh fish handled to rural markets (inland areas),and 24% to urban markets. Joal center distributed 83% to rural markets and 17% to urban markets, and Rufisque Center distributed 72% to rural markets and 28% to urban markets. Despite the small quantity of fresh fish handled by the centers compared to the total production, the project has continued in increasing the supply of fresh fish to consumers inland. With distribution points set up, this supply of fresh fish inland could be better organized on a regular basis.

There is no evidence of any formal training programme for members of the cooperatives. However, they are having on-the-job training through active participation in maintenance and repairs to the facilities at the centers. CAPAS Headquarters, through supervision is also assisting cooperative members to develop management skills.

5.7 Conclusion

In summary, the centers could absorb some of the surplus production, especially during the peak season, but it is doubtful whether their operations will effect any sustained stability in prices. Care is also needed in fixing prices of fresh fish at various points inland to avoid establishing prices that are unrealistically low within the market system. If operated efficiently, the centers could ensure regular supplies of small quantities of fresh fish to consumers inland.

6. THE GAMBIA - EEC ARTISANAL FISHERIES DEVELOPMENT PROJECT

6.1 Introduction

The fishing industry of The Gambia consists of the artisanal and industrial sectors. The industrial sector consists of one major fishing company, Fish Marketing Corporation (FMC) which is a statutory body, and a number of smaller companies. The activities of these companies are geared mainly towards production for the export market. Some of their activities also involve the use of artisanal fishermen (lobster and shrimp fisheries) as primary producers (King, 1979). Latest statistics (Drammeh, 1981) estimate the total production of the industrial sector at 7,600 tons.

The artisanal sector consists of small-scale fishermen operating from open canoes along the marine coast, and the rivers. Various reports have given different estimates of the number of artisanal fishermen of up to 3,000. Drammeh (1981) estimates that there are 1,100 (full and part-time) fishermen operating along the marine coast and lower and upper rivers. The total production of the artisanal sector is estimated at 12,500 tons. This accounts for 62% of the total production from both sectors.

The government recognizing the potential of the fisheries resources for providing animal protein to the population and for export earnings, embarked on programmes to foster the development and expansion of the fishing industry. Considerable attention has been given to the development of the artisanal sector. In the early 1970's the government instituted credit facilities to enable artisanal fishermen to purchase fishing equipment and build smoking huts. A 4-year UNDP/FAO Project for the development of the inshore fishery was implemented from 1973-76. The project succeeded in introducing new fishing techniques and equipment, and establishing a data collection system with the training of government officials.

In its First Five Year Development Plan (1975-79), the government had as its objectives (fisheries) to achieve a 10% annual growth rate in production, the improvement of nutritional standards, the long-term rational utilization of coastal and inland fisheries resources, and increased employment and income for the rural population. Although most of these objectives were not met, total production increased by approximately 25% from 1975-78, then started to decline due to reduced fishing activities caused by rising costs. The Second Five Year Development Plan (1981-82-1985/86) which is basically similar to the First Plan, continues to give priority to the development of the fishing industry, and the government has embarked on an active programme of assistance to the artisanal sector. One

positive result is the Artisanal Fisheries Development Project funded jointly by the Gambia Government and the European Economic Community (EEC) through the European Development Fund (EDF).

This report describes the Artisanal Fisheries Development Project. A brief description of the objectives,inputs, and operations is presented followed by a financial analysis of some of its activities, and a socio-economic evaluation of its objectives.

6.2 Objectives

The objectives of the Artisanal Fisheries Development Project are :

(a) to increase the production and income of the artisanal fishermen ;

(b) to provide improved and efficient storage, distribution and marketing facilities ;

(c) to improve the nutritional standards of the population through the increased production of fish ;

(d) to create job opportunities for the rural population ;

(e) to assist in the diversification of the countings, economy through an expansion of the fisheries sector, and to promote export earnings from fishery products.

6.3 Inputs

The proposed inputs of the Artisanal Fisheries Development Project are :

(a) the establishment of a pilot project center in Gunjur for the provision of extension services and facilities such as outboard motor maintenance and repairs, simple Altona-type ovens, ice, cold storage and transportation facilities, introduction of improved fishing techniques, and training to fishermen ;

(b) the construction of an ice-making plant in Brikama to supply ice to nearby fishing villages ;

(c) the establishment of a credit scheme (revolving fund) to provide funds to fishermen for the purchase of fishing equipment,etc ;

(d) the improvement to the Tanji bridge and feeder roads linking fishing villages to main roads.

6.4 Operations

The Italian Agency, Coopconsult-Propesca is the executing agency for the EEC, and the Fisheries Department, Ministry of Water Resources in the executing agency for the Gambia Government. The project which is of 5-year duration, started in 1977 after long delays in the preparation of the design. The operations of the project can be divided into the following components : the Pilot center at Gunjur, the Ice-Making Plant at Brikama, the operation of the credit scheme, and the improvements to the Tanji bridge and feeder roads.

Pilot center at Gunjur

The project started the training of fishermen in the use of improved fishing techniques in 1979. An expatriate masterfisherman was recruited for this purpose. Trials were conducted with trammel nets, surface and bottom-set long lines, gill nets, and purse seine. Positive results were obtained with the long-lines, gill nets and purse seine. However, the purse seine operations were discontinued because the present distribution and marketing structure could not handle the increased catch. Details of the results of the trials are available in the Quarterly Progress Reports, the Advisory Mission Report and the Final Report of the first phase of the project.

The mechanical workshop provides maintenance and repair facilities to the fishermen for their outboard motors. There is a trained mechanic operating the workshop, but there is lack of management ability. No proper system of inventory control exists, and there is need to maintain proper records of job cards so that information could be provided for financial analysis of its operations.

The center has 52 sheds which are rented to fishermen at 10 dalasi per shed monthly for keeping their equipment. Twelve racks are available for dying "bonga". These are rented to fish processors at 5 dalasi per rack monthly. The fish is brined for 2 hours, then sun

dried for 2 days, and then smoked for flavouring. Each rack can hold approximately 100 kilograms of fresh fish. Two problems have been identified with this processing method. The drying time increases considerably during the rainy season causing spoilage, and there is insect infestation. Presently a Tropical Products Institute (TPI) Fish Processing Technologist is carrying out studies at the center to identify ways of solving these problems and to improve the quality of the products.

10 Altona-type ovens are being tested at the center. The results are expected to compare favourably with the traditional method of fish smoking. The capacity of one oven is only 150 kilograms of fresh fish. In addition, the center provides free running water to fishermen to wash the sand and slime off the fish, and storage space for processed aid fresh fish.

Ice-making plant at Brikama

The ice-making plant at Brikama has a daily capacity of 10 tons. 4 insulated trucks are expected to be provided from the projects funds for transporting ice to Gunjur and other fish landing sites. There is no evidence that the project management wants to be involved with its operation : the present intention is for its operation to be commercialized, and it is likely that it would be rented to one the

industrial fishing companies in Banjul or to a private firm. With this possibility being strongly favoured by the project management, it is doubtful whether the ice-plant would be used primarily for the operations of the project.

Operation of the credit scheme

The credit scheme or revolving fund became operative in October 1981. The Gambia Commercial and Development Bank is the administeing agency with the Fisheries Department as advisor on the technical merits of the applications. It should be noted that although the fund is to assist the project in fulfulling its objectives, the project manager has no involvement in its disbursement. The Final Report mentions that because of the failure of the Bank to release funds to fishermen when required the project had to curtail its activities or shift its focus on several occasions. One noticeable effect was the supervision of the purse seine operations because the credit line was not opened to fish processors to enable them to expand their facilities to cope with increased production. Only 40% of the amount available in the revolving fund has been utilized, and one report notes that some of those given credit facilities do not belong to the target group. The interest rate on the loans to fishermen is 6% annually. A 20% down payment is required and the repayment period is 3 years with 1-5 months grace period depending on the purpose of the loan.

Bridge and feeder roads improvement

The improvement to the Tanji bridge and six feeder roads has been completed. The work was sub-contracted to a private construction firm. The total amount for the work is 1,472,000 European currency units (1,437 Dalasi = 1 ECU).

6.5 Financial analysis

The financial analysis consists of an evaluation of two fishing operations (gill net, and purse seine) to determine their financial viability, and the expected returns on investment. No financial information was obtained for the other operations of the project, thus it is not possible to do any financial analysis of those activities.

Gill net operations

Trials originally started with the use of a 400 meters gill net. This was increased to 600 meters, and then to 800 meters at later stages. Five local fishermen were involved in the trials from February 1981 to January 1982. These fishermen received 40% of the gross earnings from the operations. Table 5 gives the financial return of two sizes (600 m. 900 M.) of gill nets for a 1-year period. For the 900 M. gill net, (only 800 M. were used at a time, 100 M. was kept on shore to replace sections of the net when necessary) the results

show that the 900 M. gill net operations yielded higher returns than the 600 M. gill net (36% higher gross earnings, 57% higher net earnings). The return on sales is 13% higher, and the 900 M. gill net can pay off its investment costs in one year.

Table 6 [1/] gives the annual production costs for the two sizes of gill nets. Again, the 900 M. gill net shows lower average production costs. However, the average price per kilogram at which the fish was sold was higher than the average total, and average variable costs for both sizes of gill net. Thus, the operations of both nets showed positive returns. The use of the 900 M. gill net by fishermen should be encouraged because of the higher returns relative to the investment cost.

1/ Cost of canoe 1,500 dalasi, 5 year economic life
Cost of ship engine 1,500 dalasi, 3 years economic life
Cost of 600 M. gill net 3,000 dalasi, 3 years economic life
Cost of 900 M. gill net 4,500 dalasi, 3 years economic life
Cost of accessories 150 dalasi, 1 year economic life

Purse seine operations

Trials were carried out at different times with the purse seine. The operations used two canoes (one as transport vessel). The total cost for both canoes is 15,000 dalasi, both are depreciated over 5 years. The outboard motors cost 3,600 dalasi with 2 years economic life, and the purse seine costs 15,000 dalasi with 5 years economic life. Because of the infrequent trials that were conducted, complete set of financial information is not available for the analysis. However, annual estimates of returns and production costs to the purse seine operations are presented based on the investment costs, the average landings, the operating costs, and the average ex-vessel prices from the trials.

Table 7 gives the gross and net earnings, and the returns on sales, and investment. Fuel cost is estimated at 50 dalasi per trip. The gross earnings is estimated at ½ of the catch sold to fish processors at 200 dalasi per ton, and ½ to the "banabanas" (fish distributors) at 500 dalasi per ton. Labor cost is estimated at 40% of the gross earnings. (This was the actual method of computing labor cost). The result show annual net earnings of 12,500 dalasi, return on sales of 20%, and return on investment of 37%.

Table 5 : Financial analysis of gill net operations (dalasi)

	SIZE OF GILLNET	
	600 M.	900 M.
Gross earnings	12,065	19,304
Less : Expenses		
Fuel	3,856	3,856
Labor	4,826	7,271
Maintenance and repairs	250	300
Net earnings	3,383	7,877
No. of days fished	279	279
Total catch (kg)	18,863	30,181
Av. catch/day fished (kg)	68	108
Av. price/kg	0.64	0.64
Return on sales (%)	28	41
Return on investment (%)	55	103

Table 6 : Annual production costs for gill net operations (dalasi)

	SIZE OF GILLNET	
	600 M.	900 M.
No. of trips	279	279
Av. catch/trip (kg)	68	108
Fixed costs	1,950	2,450
Boat	300	300
Gear	1,000	1,500
Engine	500	500
Accessories	150	150
Variable costs	8,932	11,427
Fuel	3,856	3,856
Labor	4,826	7,271
Maintenance and repairs	250	300
TOTAL COSTS	10,882	13,877
TOTAL CATCH (kg)	18,863	30,181
Av. TOTAL COST (DALASI/KG)	0.58	0.46
Av. VARIABLE COST (DALASI/KG)	0.47	0.38

Table 8 gives the estimated annual production costs of the purse seine operations. The average total and average variable costs are 340 dalasi and 310 dalasi respectively. Given the average catch per trip of 2 tons, and the average price per ton of 350 dalasi, the purse seine operations is financially and economically viable in the short-and-long-run. However, it should be noted that during the off season, the average catch per trip could fall below 2 tons, and that during the peak season the average price per ton could fall below 350 dalasi when there is surplus production.

6.6 Socio-economic evaluation

The socio-economic evaluation of the project consists of an evaluation of its activities to determine whether the project met its objectives, and if not, discuss some of the constraints.

The first objective concerns the increase in production and income of artisanal fishermen. There is no evidence from the project's activities to indicate that production increased. All the trials with different fishing gear were experimented. The delay in the disbursement of funds to fishermen prevented them from obtaining fishing equipment, thus commercialization of the fishing techniques was not achieved. The only evidence of increased income to fishermen concerns those that operated the canoes built by the project. However, the 40% of gross earnings paid to them as salaries by the project does not reflect their

Table 7 : Estimated annual returns to purse seine operations (dalasi)

Gross earnings		105,000
Less : Expenses		
Fuel	7,500	
Labor	84,000	
Maintenance and repairs	1,000	92,500
Net earnings		12,500

No. of days fished	150
Total catch (tons)	300
Av. catch/day fished (tons)	2
Av. price/ton	350
Return on sales (%)	20
Return on investment (%)	37

Table 8 : Estimated annual production costs for purse seine operations (Dalasi)

No. of trips (10 months season)	150
Av. catch/trip (tons)	2
Av. trips/months	15
Fixed costs	8,800
- boats	3,000
- gear	3,000
- engine	1,800
- accessories	1,000
Variable costs	92,500
- fuel	7,500
- labor	84,000
- maintenance and repairs	1,000
Total costs	101,300
Total catch (tons)	300
Av. total cost (dalasi/ton)	340
Av. variable cost (dalasi/ton)	310

opportunity cost of labor. It should also be noted that as increased investment is made on fishing equipment, more of the earnings would have to go towards amortization, and this system would have to be adjusted.

The fish drying racks and Altona-type ovens are also experimental. Again, the delays in the disbursement of funds have prevented their commercialization. One report puts the savings that could be made using the Attona-type oven at 14%. This estimate appears very modest compared to the results obtained with a similar oven by the Fisheries Pilot Project Tombo (evaluation presented in this report). However, the construction of these ovens is more elaborate than those constructed by the Tombo Project. This could create problems because of the high investment cost. There is need to design a simpler type using mainly local materials. The capacity should also be increased.

The ice plant built by the project is still inoperative. The present method of fish distribution by the "banabanas" does not lend itself to the use of ice. Fish is transported in baskets on bicycles, thus the ice would not keep for long considering the high ambient temperature and humidity. For the use of ice to the effective, insulated boxes should be introduced to them. However, the whole process will increase the price of fresh fish to consumers considerably. It is doubtful whether consumers in rural areas could affort the increase.

The improvements to the Tanji bridge and feeder roads have provided fish distributors with easy access to artisanal fish landing sites. With increase in production, it is likely that consumers will benefit from the availability of increased supply of fish. This will contribute to an improvement of nutritional standards, particularly in the rural areas. However, the distributors should be provided with adequate funds to enable them to purchase and distribute more fish efficiently.

At present, there is no evidence that the project has contributed to any significant increase in rural employment. With commercialization of its activities, this is likely to happen.

6.7 Conclusion

It is obvious that some positive results have been obtained and useful experiences gained from the activities of the project. The Quarterly Progress Reports, the Advisory Mission Report, and the Final Report for the first phase have all documented these activities. One major problem could be highlighted for the slow progress of the project. The Gambia Commercial and Development Bank has failed to disburse the funds expediently. There seems to be a lack of communication between the bank and the Fisheries Department. Despite the numerous mention of this problem in all the reports, there is no evidence that both institutions made any attempt to solve the problem jointly.

It is doubtful whether the ice-plant under the management of a private firm will serve the needs of the local fishermen. There is the possibility of a marketing company being formed and putting the "banabanas" out of employment. The project should have actively encouraged the formation of a fish marketing cooperative among the "banabanas" to establish and efficient distribution and marketing system. Such a cooperative could operate the ice-plant with supervision from the project management.

The two-tier price structure (ex-vessel prices) might create a disincentive to fishermen, and thus affect their capacity to increase production. Presently, the fish processors buy the larger proportion of the catch for processing, and it also seems as if they provide a more reliable avenue for the fishermen to dispose of their catch. The price they pay the fishermen is on average 60% less than what the "banabanas" who distribution fresh fish pay the fishermen. Since the bulk of the fresh fish is purchased by fish processors, any increase in production is likely to depress the price considerably depending on the financial and technical capabilities of the fish processors. Although no reliable date is available on the market prices of processed fish, it is likely that the 60% reduction in the ex-vessel prices is not reflected in the prices of the processed fish, thus the fish processors are likely to want to increase their income from an increase in production.

7. GUINEA BISSAU - BUBAQUE AND CACHEU ARTISANAL FISHERY DEVELOPMENT PROJECT : DESCRIPTION AND EVALUATION

7.1 Introduction

Because of its abundant fish resources, and the importance of fish as a source of protein for its population, and as a foreign exchange earner, the Government of Guinea Bissau (GOGB) has provided assistance in the development and expansion of its fishing industry through direct public involvement. The industrial sector now consists of three fishing companies through joint venture agreements between the GOGB and some foreign fishing nations. The artisanal sector consists of an estimated 3,000 fishermen utilizing dug-out and planted canoes (larger ones fitted with outboard motors), and different types of fishing gears. As a sign of the importance the Government attaches to its fisheries, a Secretariat of State for Fisheries was established in 1977. (Fisheries was under the responsibility of the Secretary of State for Transport).

Because of the acute shortage of fishing equipment (outboard motors, fishing gear, etc.) in Guinea Bissau, artisanal fishermen have not been able to carry out fishing operations regularly. Some reports indicate that these fishermen sometimes dispose of part of their catch in Senegal in order to purchase outboard motors, fishing gear and accessories and sometimes fuel. The GOGB in order to alleviate some of

these problems, requested foreign assistance to develop and expand the artisanal sector. As a result, two projects are now being implemented in Guinea Bissau aimed at providing assistance to the artisanal fishermen for developing and expanding this sector, and also for increasing the distribution of high quality fresh fish to consumers in Guinea Bissau.

The first project which is located in Bubaque is jointly financed by the GOGB and by Sweden through its agency for international development (SIDA). The second project is located in Cacheu, and is jointly financed by the GOGB and the United States Agency for International Development (USAID).[1/] This report presents a brief description of the objectives, inputs, and operations of both projects. A financial analysis of their operations is presented, followed by a socio-economic evaluation of the achievements of both projects to date.

1/ The European Economic Community (EEC) took over the operations of the Cacheu Project in July 1982 at the end of USAID funding.

7.2 Bubaque project

The Bubaque Project located in the island of Bubaque in the Bissagos archipelagos started operations in 1979 through financial and technical assistance provided by SIDA.

7.2.1 Objectives

The original objectives of the project were :

(a) to increase the incomes of the artisanal fishermen in the island through increased production by the provision of fishing equipment and an avenue for marketing their catch ;

(b) to increase the consumption of high quality fresh fish in Bissau and nearby areas through the establishment of an efficient distribution and marketing system.

7.2.2 Inputs

The inputs of the Bubaque Project are :

(a) an administrative and technical center at Bubaque ;

(b) materials for constructing 3-men and 8-men type canoes ;

(c) outboard motors of 6, 8, and 25 horse powers ;

(d) spare parts for outboard motors ;

(e) fishing nets (gill nets, seines, etc.) and accessories ;

(f) two 5 ton ice plants at Bubaque and Bissau ;

(g) cold rooms and refrigerated trucks ;

(h) technical experts.

7.2.3 Operations

The Bubaque Project is operated by the technical experts provid through SIDA and officials of the GOGB. A credit scheme is in operation for the provision of fishing equipment to the artisanal fishermen. Fuel is also provided to the fishermen by the project. The project buys fresh fish from the fishermen on landing. There government regulated prices for the different commercial classes of fish (see table 9). The fish are sorted, iced, and stored in cold rooms before transported in refrigerated trucls to Bissau according to the demand. There is cold storage facility also in Bis The project assists the Fisheries Secretariat in its efforts to col statistics on catch and fishing effort by recording purchases by spec

weight, type of canoe and fish gear, days fished, etc., on a daily basis. Copies of these recordings are sent to the Secretariat monthly.

7.2.4 Financial analysis

The financial analysis consists of a determination of the level of purchase and sales necessary for the distribution and marketing aspect of the project to be financially viable. There is no data available on the supply of fishing equipment and the credit scheme for fishermen, thus it is not possible to analyse the financial performance of this aspect of the project.

The data obtained for this analysis was collected over a 14-month period. (A breakdown of the various cost factors is not available). The average monthly cost over the 14-month period for the distribution and marketing aspect is 466,650 pesos. This cost does not include salaries of technical aspects and amortization of equipment (ice plants, cold rooms, etc.). The total amount paid by the project to fishermen for fish landed was observed to vary monthly according to the volume and commercial class composition. Also, the cost of diesel fuel varied monthly according to the number of trips the trucks made to Bissau. The other major cost factor, labor, was constant throughout this period because the project kept a permanent staff irrespective of the low level of operations during the off-season.

Table 9 : Government regulated prices for the four commercial classes of fish (pesos) 1/

COMMERCIAL CLASS	LANDING PRICE/KG (PRICE RECEIVED BY FISHERMEN)	RETAIL PRICE/KG IN BISSAU
FIRST	30.00	50.00
SECOND	25.00	40.00
THIRD	15.00	30.00
FOURTH	13.00	22.50

1/ This price structure was established by the GOGB in November 1

The total weight of fish landed in 1981 is 6,478 kilograms. This gives a monthly average of 540 kilograms. According to Epler (1983), the landings of Bubaque fishermen consist on average, of 38% first class, 18% second class, 11% third class and 33% fourth class fish. Thus, the average monthly gross earnings from the sale of fresh fish by the project is 19,935 pesos in 1981. This shows an average monthly loss of 466,715 pesos. Given the present cost structure, and the catch composition, the project should market 12,640 kilograms of fresh fish monthly to breakeven. This is approximately 24 times the average monthly quantity marketed in 1981. Thus, the financial analysis shows that the distribution and marketing aspect of the project is not financially viable under the present conditions.

7.2.5 Socio-economic evaluation

The socio-economic evaluation consists of an evaluation of the objectives of the project to assess its impact on the target groups, and to provide information for designing and implementing similar projects in other fishing settlements in Guinea Bissau.

Since no information is available on the operational costs of the artisanal fishermen in Bubaque, it is not possible to determine whether their incomes have increased. Although no data is available on the landings of artisanal fishermen before the start of the project, it is likely that their landings have increased due to the provision of fishing equipment and fuel for outboard motors by the project. Also,

the project has adequate facilities to handle all the fish landed by the fishermen, thus providing an avenue for them to dispose of their catch.

The distribution and marketing of fresh fish by the project has also increased fish consumption in Bissau and nearby areas. Again, it is not possible to determine the increase in per capita consumption of fish resulting from the operations of the project due to lack of data.

7.3 Cacheu projects

The Cacheu Project is located in the town of Cacheu along the Cacheu River. The planned operation of the project by USAID was 30 months, but the actual implementation was from June 1981 to July 1982. In July 1982 EEC took over the operations of the project.

7.3.1 Objectives

The objectives of the Cacheu Project are :

(a) to improve the nutritional standards in Guinea Bissau through the provision of increased high quality fresh fish. This is to be achieved by the establishment of an artisanal fisheries pilot project in Cacheu;

(b) to increase the level of production and incomes of artisanal fishermen in Cacheu through the provision of fishing equipment and fuel by the pilot project to ensure their efficient operation ;

(c) to assist the GOGB develop a Fisheries Management Unit within the Fisheries Secretariat. The present report discusses objectives (a) and (b).

7.3.2 Inputs

The planned inputs of the Cacheu Project are :

(a) a retail store in Cacheu for selling fishing equipment and fuel to fishermen ;

(b) a credit system to enable fishermen to purchase fishing equipment ;

(c) a workshop for maintenance and repairs to outboard motors ;

(d) a cold room and insulated truck for the distribution of fresh fish ;

(e) training facilities for the local project personnel.

(At the end of USAID funding, inputs (c) and (d) were not operational).

7.3.3 Operations

A Fisheries Field Advisor (FFA) was provided by USAID. The F . acted as administrative and technical manager for the Pilot Project, . was assisted by the local staff provided by the GOGB. Only two aspect of the Pilot Project was operational. These are the retail store and credit scheme for fishermen. (Although local staff members benefited from on-the-job supervision, there was no formal training programme for them).

Fishing gears were sold at 25% above the purchase prices, and outboard motors, spare parts, fuel and lubricants were sold at 10% above the purchase prices to the fishermen. This was done to build up a working capital for the retail store. The credit scheme was operated with a 1% interest on the monthly balance.

7.3.4 Financial analysis

The financial analysis deals with the operations of the retail store from June 1981 to March 1982, and a summary of the net returns on investment for the three boattypes.

Retail store

The data obtained for the operations of the retail store from June 1981 to March 1982 show a gross earnings of 555,972 pesos. (10,082 pesos was earned as interest on loans to fishermen). The total operating expenses for the same period was 303,932 pesos. (This figure does not include salary of FFA and rent for the building). Thus the net earnings from its operations was 252,040 pesos.

The inventory turnover ratios show that there was high demand for all the goods sold by the retail store, and that the store was unable to meet the demands after the first six months of operations. The operating ratio for the period (55%) indicates the omission of some costs, and does not truly represent the operating expenses since some cost factors (rent for building, FFA salary) were not included. Since return on sales ratio (45%) seems to be a wide enough margin for the store to be financially viable if the demand for the goods continue to be high. The return on assets ratio (9%) is likely below the commercial bank lending rate in Guinea Bissau. Thus, the ratio is below the opportunity cost of the store's capital.

The financial analysis shows that there was high demand for the goods, but that inventory was not replaced fast enough to meet the demand. Also, the stores earning power was low compared to its invested capital.

Fishing operations

The data used for this analysis is obtained from the sale of fresh fish at the Cacheu market from January to December 1982, and the retail prices of equipment and fuel sold by the store. A raising factor was used to estimate the landed weight and hence value of fish, since approximately only a third of the fish landed is sold at the Cacheu market.

Table 10 gives the net returns on investment for the three boattypes in 1981. The Niominka boat is the largest and is usually operated with a 25 h.p. outboard motor. The net returns is calculated based on an average of 15 trips per month during the dry season (8 months), and 10 trips per month during the wet season. The average catch per trip is estimated at 200 kilograms.

The Felupe boat is the second largest and is usually operated with an 8 h.p. outboard motor. The net return is based on the same average number of trips as for the Niominka boat, and an average of 150 kilograms per trip. The non-motorized canoe is the smallest boattype and is propelled using paddles. The net return is computed

Table 10 : Net returns to fishing equipment (engine, fishing gear and canoe for three boattypes (pesos)

BOATTYPE	AV. NET RETURNS
NIOMINKA	27,680
FELUPE	43,360
NON-MOTORIZED	38,580

based on 15 trips per month during the dry season, 8 trips per month during the wet season, and on average of 50 kilograms per trip. The figures show positive net returns on the investment of the three boattypes.

7.3.5 Socio-economic evaluation

The socio-economic evaluation of the Cacheu Project consists of an evaluation of its objectives to determine the overall performance of the project.

The project failed to assist in the distribution of fresh fish because of the lack of the provision of building space by the GOGB for installing the cold room. However, the provision of fishing equipment enabled fishermen to operate on a regular basis. This increased their level of production over the period, thus increasing the amount of fish available to consumers in Cacheu and nearby areas. Also, the need to dispose of part of their catch in Senegal was estimated by the availability of fishing equipment, spare parts, and fuel in Cacheu.

The average net returns on investment figures show that only fishermen operating the Felupe canoe increased their net returns, using the net returns on the non-motorized canoe as a base. The Niominka canoe, although earning positive returns has an average net return on investment less than that of the non-motorized canoe. This is a reflection of the

extra-investment on the outboard motor, the extra fuel needed for the higher horsepower, and the relatively high maintenance and repair costs of the 25 h.p. compared to the 8 h.p. outboard motor. The analysis indicates that the operations of the Niominka canoe could have been more profitable using an 8 h.p. outboard motor.

7.4 Conclusion

Both projects succeeded in increasing the levels of production of the fishermen in Bubaque and Cacheu. However, it is not evident that this generated increased income to all the fishermen. Both projects seemed to have suffered considerable delays because of the lack of provision of buildings to house some of the facilities. This is very evident in the Cacheu Project. At the end of USAID funding the Workshop and distribution aspects were never operational.

The regulated price system presents a serious problem to the financial viability of the distribution and marketing of fresh fish in Guinea Bissau. The regulated prices are artificially low, and do not reflect the handling, storage and distribution costs. If the Governments objective is to provide fish to the population at low costs, then upgrading the traditional processing methods to improve on quality and to reduce spoilage could fulfil this objective. Also, regulated prices encourage fishermen to dispose of their catch outside the market system to obtain higher returns. This is evident in the fact that only a third of the fish landed by fishermen in Cacheu is sold at the Cacheu market.

Credit facilities are vital to the development of the artisanal fishery in Guinea Bissau since most fishermen do not have the financial means to invest on fishing equipment. However, the credit scheme operated by the Cacheu Project did not reflect the cost of lending money by charging 1% interest on the monthly balance. Such a low interest rate cannot generate enough funds for the credit scheme to become self-sustaining in the long-run.

Finally, both projects cannot become self-supporting if no external source of funding is available.

8. SIERRA LEONE - TOMBO ARTISANAL FISHERY DEVELOPMENT PROJECT : DESCRIPTION AND EVALUATION

8.1 Introduction

The fisheries resources of Sierra Leone offer considerable potential, particularly as a source of animal protein for improving the nutritional standards of the population. The fishing industry consists of the industrial sector which is mainly operated through private investments and joint venture agreements with foreign fishing nations and foreign fishing vessel owners, and the artisanal (small-scale) sector consisting of an estimated 20,000 full-time fishermen dispersed

along the entire length of the coastline, and along lagoons and rivers, inland. Part of the industrial production is landed for local consumption, whilst the high value fish products are exported. The total production of the artisanal sector is consumed locally, and this accounts for approximately 75% of the local fish consumption.

Because of the importance of the artisanal sector in supplying cheap source of animal protein to the population, and providing employment for the rural coastal population, the government has encouraged the development and expansion of this sector through subsidies, loan schemes, provision of technical facilities, etc. Various new types of fishing gear have also be introduced in an effort to increase the efficiency of fishing operations. However, most of these activities met with little or no success. Some, indeed met with outright rejection by the artisanal fishermen.

Under the bilateral technical assistance agreement between the Government of Sierra Leone and the Federal Republic of Germany, a small-scale fishery project was started in 1980. This project which has adopted a :"Community Fishery Centre Approach" seeks to identify the barriers that have prevented the successful implementation of previous small-scale fishery projects, and to directly involve not just fishermen, but the rural population dependent on artisanal fishing operations through systematic socio-economic studies, introduction of appropriate technologies and scientific research.

The project, called "Fisheries Pilot Project Tombo", is located at Tombo Village approximately 40 kilometers South-East of Freetown, the capital city. This report describes the project activities, and evaluates the achievements of the first phase (3-year) of the project.

8.2 Objectives

The objectives of the Fisheries Pilot Project, Tombo is to support the self-help potential of the fishermen and the rural community to satisfy their basic needs through :

(a) the improvement to basic infrastructure. For example, the provision of adequate supply of running water, the generation of energy from water, wind, biogas and the sun ;

(b) the introduction of low-energy fishing equipment such as sails, and diesel inboard engines ;

(c) the improvement to traditional boatbuilding techniques through the introduction of seasoned timber, simple tools for shaping keels, fumes, etc. ;

(d) the improvement to traditional landing, processing and marketing methods in order to reduce spoilage, to produce better quality products, and to establish an efficient marketing system ;

(e) the introduction of appropriate fishing techniques for harvesting high quality fish products that could increase the earnings of the fishermen, and also generate foreign exchange ;

(f) the improvement to the access road from Tombo to the first major distribution point, a distance of approximately 12 kilometers.

In addition, the project in cooperation with other agencies plans to assist in providing health facilities in Tombo, through the construction of a health centre, the improvement to sanitation through the construction of latrines, the improvement to primary education and to the general living conditions in Tombo. These are to be achieved through the formation of self-help groups by the Tombo community.

8.3 Inputs

The project is open-ended thus some of the inputs are determined according to the identified needs of the Tombo community. The following inputs are already in use :

(a) an office/store space, a guesthouse, workers quarters, netloft and a boatshed ;

(b) two traditional-type canoes with improved construction, one to be fitted with an 8 h.p. inboard engine ;

(c) an 11 meter "V" bottom boat fitted with a 33 h.p. diesel inboard engine to be used for purse seining ;

(d) construction of sails which are now on experimental trials by the local fishermen ;

(e) different types of passive gears (set-nets, long-line, etc.) which have been tried to determine their efficiency and suitability ;

(f) a Workshop for maintenance and repairs to fishermen's engines ;

(g) an experimental Altona -type oven (ten Altona -type ovens have been built for fish processors in Tombo with loans provided through the project ;

(h) an experimental solar drier ;

(i) small dam and pipes for improvement to pipe-borne water supply ;

(j) administrative and technical staff, and vehicles.

8.4 Operations

The German Agency for Technical Cooperation (GTZ) is the executing agency for the Federal republic of Germany, and the Fisheries Division, Ministry of Natural Resources is the executing agency for the Sierra Leone Government. The operations of the project are divided into various sections.

At the top is the administrative and supervisory staff consisting of a German Project Manager, a Sierra Leone Co-Project Manager, and other supporting staff. Their duties include overall supervision of the projects activities, control and disbursement of the project's funds, procurement, and coordination between both governments.

The boatyard section, consists of a German Master Boatbuilder, a Sierra Leone Counterpart, and supporting staff. Their duties include the introduction of simple and more efficient construction methods of improved boattypes, construction and testing of new designs to determine their suitability.

The marine section consists of a German marine engineer, a Sierra Leone marine mechanic, and supporting staff. They are responsible for the installation of engines on the project's boat, the operation of the marine workshop, and for working with the local outboard motor mechanics to help them develop their technical and managerial skills.

The fishing section consists of a German Masterfisherman, a Sierra Leone counterpart, and supporting staff. They are involved with the testing of different types of fish gear to determine their efficiency and suitability and instructing the local fishermen on improved and efficient fishing methods. There is a fishery biology component consisting of two biologists linked to this section. They are involved with biological sampling, statistical data collection, species identification, and other fishery biology related activities.

The socio-economic section consists of a German sociologist and Sierra Leone field workers. Their duties include demographic and infrastructural profile studies, studies on the womens role in Tombo, working with fish processors to develop improved processing techniques, and to establish an efficient marketing network.

The Project also assists in community development programmes in Tombo through contributions and coordination with other agencies, both national and international.

8.5 Socio-economic evaluation

Most of the activities of the project during the first phase (1980-83) have involved experimental trials, research, and community development. No attempt is made to do any financial analysis of those activities. However, an evaluation of the progress and impacts of the activities on the target group is presented. The processing section has produced some commercial results on fish smoking (Kotnik, 1982). These results are evaluated to determine the financial and economic benefits of the improved technique, on the distributional effects of such benefits.

Boatyard section

The local boatbuilders were employed in the construction of the first two canoes built by the project. The aim was to demonstrate improved construction methods to them, and the use of more durable materials to extend the economic life of the canoes. So far the local boatbuilders have not adopted the acquired techniques in building canoes for the local fishermen. Through personal discussion with them, they maintained that the techniques were useful, but that the time required for the construction of a canoe using those techniques is too long. Also, the local fishermen are not prepared to pay the extra cost involved with using better quality materials for constructing the canoes. This according to the local boatbuilders would make the cost of constructing one canoe approximately twice what it used to be. To ensure the adoption of such improved methods, the project will have to prove to the local fishermen the durability and long-term financial aims from using the canoes by allowing them to fish with them over a period of time. There might also be a need to create a credit scheme to make funds available to them.

The other aspect of the boatyard section involves redesigning the canoes for installing inboard diesel engines. It is expected that 60% savings could be made on fuel, and a substantial reduction in maintenance and repair costs. The present design of the "bonga" canoes with a false transom could be fitted with an inboard diesel engine with little alterations, but the "herring" canoe with a double bow would need

considerable alterations. The 11 meters FAO designed, "V" bottom boat for purse seining seems to be a very big step from the herring canoe. Apart from the high capital investment involved for the local fishermen, it takes approximately four months to construct. It is likely that only fishing units consisting of a few boatowners/fishermen can invest in this type of boat. Landing facilities will have to be provided for canoes with inboard engines since the present system of beaching canoes would be unsuitable.

The sail activity is still in an experimental stage. However, because of the increasing cost of fuel (Le. 6.00 a gallon in Tombo), fishermen are eager to give it a try. Already, 8 local fishermen have their canoes equipped with sails. (The sail activity started with the visit of a CECAF Project consultant, and is now being continued by an expatriate employed locally by the project). The sail design is of approximately 31 square meters standing lug rig quadrilateral in size. The present problem is the use of only a steering oar instead of a rudder because of the present design of the "herring" canoe. The materials for fixing the sail are obtained locally, and the approximate cost of one sail is Le.310.00. The project also intends to rig the 11 meter boat with a sail. It is likely that the fishermen will adopt the use of sail as a fuel-saving measure whenever the wind permits.

Fishing section

Two prominent fishermen in Tombo were sponsored by the project to observe seining operations by the local fishermen in Senegal. (The CECAF Project provided financial and logistic support). On their return, one of the fishermen was eager to embark on purse seine operations. The project provided a purse seine that was rigged by fishermen in the Fisheries Division for this fisherman for trials but the trials were not successful because the purse seine was much bigger than the size required for their operations, and also proved awkward to handle. The project intends to carry out further trials with purse seine with the "V" bottom boat.

One possible setback to the adoption of the purse seine by the local fishermen is the high investment required. Also, some fishermen believe that the purse seine will destroy all the juveniles, thus removing their source of livelihood. (A previous attempt by the Fisheries Division to introduce it in another artisanal fishing village met with hostile reception). Also, there is not enough biological data to indicate that the fishing grounds that the local fishermen operate on have dense concentrations of pelagic species to justify the investment. Some studies are needed to verify this. The project has recruited an ex-CECAF Project consultant with considerable experience in purse seine operations among Ghanaian fishermen to introduce the purse seine to the local fishermen.

Experimental trials have been conducted with different types of passive fishing gears. Most of the trials involved the use of different hanging ratios with set nets, the use of different nets according to seasons, and the use of certain gears for catching high valued species for the export market, e.g. lobsters, shrimps, and crabs. Some successes have been achieved from these trials (although no published report is available), but the experiences gained are yet to be used commercially by the local fishermen.

Marine section

The marine section provides maintenance and repairs facilities to the local outboard motor mechanics. The mechanics were allowed to use the project facilities at a nominal fee depending on the type of work done. The project's staff also provided supervision to the local mechanics and instructed them on efficient maintenance and repair procedures, management of workshop facilities (including procurement of spare parts), and accounting procedures. These mechanics have now established their private workshops in Tombo providing services to the fishermen.

The project now has a well equipped marine workshop housed in its building complex. This workshop is expected to play an active role in the installation of inboard diesel engines, their maintenance and repairs. More local mechanics are expected to be assisted in establishing their private workshops.

Community development programmes

One of the most noticeable and welcomed activity of the project is the provision of pipe-borne water supply. Before the start of the project, the village (Tombo) was only getting running water for a few hours on alternate days, particularly during the dry season. Villagers had to travel considerable distances to obtain water at times. The project constructed a small dam about 7 kilometers from the village and linked it with the existing water supply system. Now Tombo and other nearby villages up to 8 kilometers distant have running water throughout the year. Standpipes have also been erected at various points in Tombo for public use.

The project is actively involved in a sanitation programme with the Ministry of Health (MOH) to improve sanitation in the village. Most of the houses do not have sanitation facilities and there is no refuse disposal system in the village. Through organized self-help groups, a number of latrines are now being constructed. Refuse dumps are to be constructed at various points in the village. The MOH provides technical supervision, whilst the project provides building materials, and the village provides space and free labor. Such facilities will improve sanitation in the village, thus improving health standards.

Plans are at their final stages for the construction of a health center in the village. This center will be provided with a midwife and a pharmacist by the MOH. There is also a proposal to expand the primary school building, and to provide equipment to aid in teaching instructions. The access road from Tombo to Waterloo (about 12 kilometers) which is the first major distribution center for smoked fish is to be upgraded during the second phase of the project which starts in September, 1983. The improvement to, and creation of facilities will not only benefit fishermen and the Tombo community, but also a cross-section of the population in the long-run.

Socio-economic section

Two reports have been published on the activities of the projects sociologist. The first one (Kotnik, 1981) presents the results and analysis of a demographic and infrastructural profile survey conducted in Tombo from December 1980-March 1981, the peak season for fishing activities, and July/August 1981, the off fishing season. This report contains valuable information on the overall structure of the Tombo community which are much needed for the formulation of development projects.

The second report (Kotnik, 1982) examines the role of the women in Tombo in small-scale fisheries, their roles in the homes and the community and presents case studies of 5 women in Tombo. This report is the result of a survey conducted through intensive interviews of 52 women in Tombo during January 1981.

It reveals the important socio-economic role of the women, particularly in fish processing and marketing, education of the children, family planning, investment decisions, and distributional issues.

The sociologist has also introduced a simple Altona-type oven to the women fish processors. Already, 10 simple Altona-type ovens are in commercial use in Tombo. Studies conducted by Walter-Dehnert (1981), and Kotnik (1982) show that the traditional smoking platform (banda) used by the women has the following disadvantages. For smoking 600 dozen herring (about 400 kilograms) :

(a) 12 hours of continuous labor is required from the time the fish is landed until the finished product. This involves about a total of 9 people working at different stages (a total of 18 man-hours) ;

(b) post-harvest losses vary from 10%-40% due to spoilage because of the time factor ;

(c) an estimated 15% of the fish is burned because of exposure to direct fire ;

(d) only about 75% of the total fish smoked is of good quality ;

(e) processing cost amounts to about 15%-75% of the cost of the fresh fish depending on the extent of smoking ;

(f) fuel cost (firewood) is high because most of the heat is lost to the atmosphere ;

(g) direct contact with the heat and smoke create health problems for the women.

Results obtained during experimental trials with the Altona-type oven indicate 50% reduction in smoking time, 60% savings on fuel, 60%-70% savings on maintenance and repair costs, and over 50% improvement in the quality of the final products. The implications of these results are many. In the short-term, fish processors will increase their net earnings, work under better health conditions, and use less labor. Consumers will benefit from improved quality products, increased supply of smoked fish due to reduced losses, and it is possible that some of the savings might be passed on to consumers in the form of lower prices. One of the long-term benefit concerns the environment. Presently, there is potential damage to the economical environment due to the indiscriminate felling of forest trees to be used as fuel. (This problem has not been given much consideration). With 60% reduction in the amount of firewood required, the demand for firewood will be considerably reduced thus easing the indiscriminate deforestation practice. The increased earnings to the women would also likely be reflected in increased investment in the education of their children, improved standard of living, and increased investment in fishing and other business activities.

The sociologist is presently working with the women on other methods of fish processing, storage, and marketing. A solar drier is being tested for drying small quantities of certain species of fish. Preliminary results being encouraging (according to the field workers), and if found suitable, the women will be encouraged to use it for small quantities of fish. A bee-hive in clinp work of mud/clay mixture with thatched roof has been constructed and will be used for storage of

smoked fish. It is expected that the interior would be much cooler than the outside temperature, thus extending the shelf-life of the products. A truck would be provided to the women through the projects funds for the distribution of smoked fish to the inland areas of the country. This should help relieve the total dependence on the present inadequate public transportation system. The women are expected to operate the truck on a cooperative basis with initial supervision from the project, and to repay the loan from their earnings.

Two United States Peace Corps Volunteers (PCVs) are working with the project in helping the fishermen and the fish processors to form organized groups. The idea is to encourage cooperative efforts within these groups which would help to enhance the project's activities. The project has experienced both problems working with small groups, like trying to organize individuals, and there are also advantages in investment possibilities. The project plans to establish a retail store in Tema that will supply fishing equipment and other related goods. This store is expected to be operated by one of the groups.

8.6 Conclusion

Within the first 3 years of its implementation the Fisheries Pilot Project Tombo has covered a lot of areas according to its objectives. Most of the technical aspects of its operations have involved experimental trials which have produced some encouraging results. The community development aspects have undertaken activities that similar projects have not engaged in, but that are very critical to the success of such projects. These activities have increased the awareness of the needs of the target population, and have created an atmosphere of trust amongst this population for the project's intentions. The importance of this trust cannot be overemphasized. Without it, intentions can be misconstrued, and this could lead to lack of cooperation, and even rejection in some cases.

The demographic and infrastructural profile, and socio-economic studies have not only provided information for the project's use, but have also created an awareness of other public sectors to the needs of these people. For example, the coordination between the project and the MOH in improving sanitation and health facilities in Tombo was the result of the information produced by these studies. It is obvious that such improvements will help to enhance the development of the fishing sector on which the Tombo community depend for their livelihood. One point worth noting is that only these two reports have

been officially published, although the project is involved in a lot of other activities. There is need to stress the importance of officially publishing the achievements and shortcomings of projects activities so that the experiences could be shared by others. Progress reports published at regular intervals, containing technical information could be very valuable in this respect.

As the project enters the second phase of its implementation, it is faced with the task of commercializing the technical aspects of its operations. This has always been the failures of most projects of this nature. This task is by no means a simple or an easy one. It is no secret that most projects of this nature in which governments are involved have never been financially self-supporting, and the Fisheries Pilot Project Tombo cannot be considered an exception. However, the idea of establishing cooperative groups is a step in the right direction towards commercialization. The project should provide the necessary support for these groups to become established, and then play a supervisory role. This approach might break the usual scenario which seem to prevail in other similar projects when the foreign assistance ends.

9. CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations are presented in six broad areas. These areas are : Artisanal and Industrial Fisheries, Aquaculture and Inland Fisheries, Training, Research and State Assessment, Development and Management, and Enforcement of EEZs.

Artisanal and Industrial Fisheries

A number of artisanal fisheries development projects have been implemented, and are still being implemented due to the interests of most governments in developing this sector. Considering the broad range of objectives of these projects, only a few have been achieved, and in some cases (e.g. sensitivity to increased production), unpleasant situations arose. Some of the problems encountered have been due to lack of data (biology and socio-economic) in designing these projects unrealistic projections, delays in construction work and procurement, lack of institutional support, and lack of communication.

When data is not available, it is important to build in flexibility into the project design and to provide for the collection and utilization of data particularly during the early stages of the project so that changes could be made if necessary. Given the nature of the artisanal fisheries in the region (seasonal in most countries) projections should be made over the short-run, unless adequate historical data are available to support long-run projections. There have always been delays in construction and procurement with most

artisanal fisheries projects. Such delays are sometimes due to rigid administrative procedures which cannot be surpassed easily. It is thus necessary to make contingency plans to accomodate such delays to a reasonable extent. In some countries a number of institutions are involved with similar activities, but at the same time do not coordinate these activities. It is important that efficient institutional structures should be in place to design and implement projects successfully. Also, there is lack of communication of project's results for others to share the experiences and to avoid the same mistakes. Periodic publication and distribution of results should be encouraged.

Most of the public investment projects in the industrial fisheries have been directed towards infrastructure and in some cases hardware. Recently, joint venture agreements have helped to facilitate such projects. Problems have however evolved in some cases due to overinvestment, particularly in vessels. Some countries developed their industrial fleets rapidly without developing the support facilities for them. Also, the extension of EEZs saw a lot of fishing vessels lying idle because of loss of fishing grounds.

The importance of providing adequate support facilities for the fisheries sector cannot be overemphasized. Although the world economic situation has contributed to creating some of these problems, such problems could be minimized if care is taken to ensure that adequate information is available on the potential of the stocks, and support facilities are adequately provided to meet the demands of the projects.

Aquaculture and inland fisheries

Noticeably, almost all countries in the region have interests in aquaculture and inland fisheries. Even those that have marine resources with high potential that are yet to be utilized have implemented projects in aquaculture. However, because of the general objective of some aquaculture projects which is to provide cheap source of protein for the inland rural populations, such projects are ill-advised. Most of the fish farms that have been constructed had low productivity and high construction and operating costs. Also, other problems have emerged in the wake of some of these projects.

While not suggesting that countries should not be encouraged to develop aquaculture and inland fisheries, it is important that careful studies should be undertaken to assess their potentials. Where it is discovered that it is more cost effective to develop and improve distribution and marketing systems to allow fish to get to inland consumers from coastal areas, countries should be encouraged to do so. This way, scarce resources will be more efficiently utilized.

Training

Training programmes have been ongoing on bilateral, multilateral, regional and national levels. Even within a country different institutions offer the same types of training. This means duplication of efforts given the limited financial resources available in these countries. At the national and regional levies, there is a need to take a complete inventory of trained personnel and their placements, institutions and the types of training they offer with the facilities available for the training, and the manpower needs of countries according to their development priorities. With this information, training programmes can be organized so that resources are utilized efficiently, and that such programmes cater for the needs of these countries.

At the bilateral and multilateral levels, donor governments or institutions should review their present systems of providing training programmes to CECAF countries so that such programmes could be better coordinated and utilized.

Research and stock assessment

Research projects have tended to provide support for the activities of research institutions and stock assessment studies. Some countries have benefitted considerably and now have jointly well established and organized research institutions. Others have not been able to derive much benefit from such projects. Regional and sub-regional stock assessment projects generally have been better organized and have produced some good

results. While it is essential that those countries with the capabilities should continue to develop their research institutions and activities, it is also important to encourage regional and sub-regional activities in this area so that they could facilitate the exchange of personnel and information.

Development and management

Most projects in this area are directed towards institution building, providing management models, and information and advice on policy issues. Primarily, they have served useful purposes, but most of the countries have not utilized such projects effectively. One reason for the lack of utilization is the lack of institutional structures. This problem has already been stressed. In some countries there is lack of personnel preventing the formation of the appropriate institutions to undertake development and management activities, in others, there is adequate personnel but lack of organization. The present forms of institutions should be reviewed in order to create institutional structures that would be effective and efficient. Again, the formulation of development programmes and management models, schemes, etc., can only be utilized or implemented successfully if there are effective institutional structures.

Enforcement of EEZs

The extension of EEZs by CECAF countries have left them with the responsibility to enforce regulations to protect their EEZs. However, it is obvious that these countries by themselves cannot effectively protect their EEZs. Projects in this area have provided assistance in the form of infrastructure, hardware, technical expertise and training. Also, one project is trying to encourage countries to adopt a sub-regional approach on sub-groups, particularly for countries sharing the same stocks. The latter approach, apart from being cost-effective, would assist smaller countries that cannot develop and maintain such systems by themselves. However, there are problems to be overcome with this approach. For example, this activity does not involve fisheries only, some intelligence information is also collected, and such information can usually be a closely guarded secret.

However, whatever approach countries in the region decide on, the nature of their resources, their financial capabilities, and their technical and support services should be carefully assessed to ensure that they can effectively utilize such systems. Funding agencies should also consider these factors in making such systems available to CECAF countries.

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