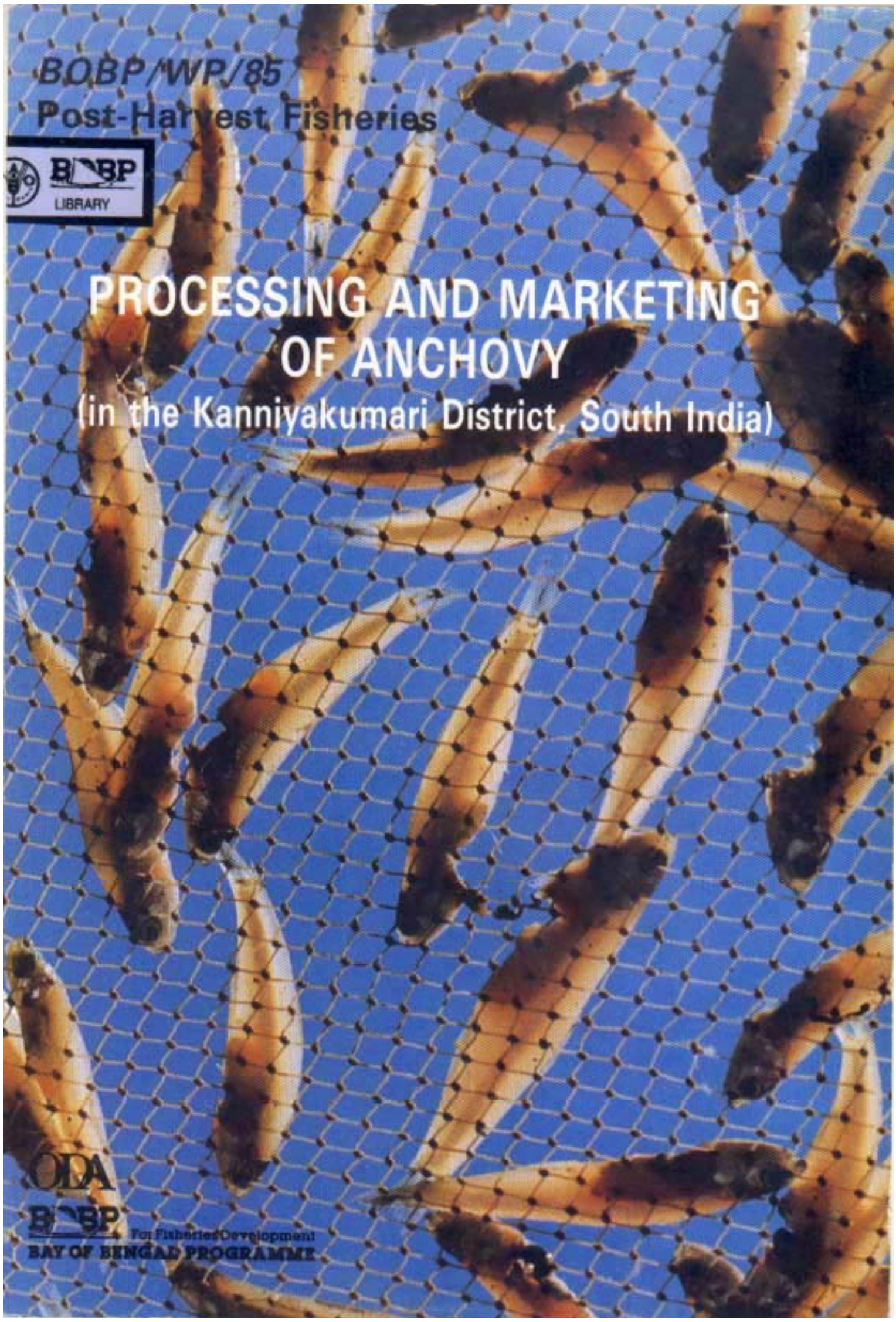

BOBP/WP/85
Post-Harvest Fisheries

PROCESSING AND MARKETING OF ANCHOVY

(in the Kanniyakumari District, South India)

ODA
BOBP
For Fisheries Development
BAY OF BENGAL PROGRAMME

BAY OF BENGAL PROGRAMME BOBP/WP/85
Post-Harvest Fisheries Overseas Development Administration

The processing and marketing of Anchovy in the Kanniyakumari District of South India Scope for development

by

T W Bostock
Post-Harvest Adviser, BOBP/ODA, Madras

M H Kalavathy
Consultant Sociologist, BOBP/ODA, Madras

R Vijaynidhi
Consultant Marketing Adviser, KDFSF, Nagercoil

The Bay of Bengal Programme's
Post-Harvest Fisheries Project
in collaboration with Kanyakumari District
Fishermen's Sangams Federation (KDFSF) and the
Central Institute of Fishing Technology (CIFT),
Kochi.

BAY OF BENGAL PROGRAMME
Madras, India
1992

From 1989 to 1992, the Bay of Bengal Programme's (BOBP) Post-Harvest Fisheries Project, funded by the Overseas Development Administration (ODA) of U.K., has been working together with the Kanniyakumari District Fishermen's Sangams Federation (KDFSF) based in Nagercoil, Tamil Nadu, India, to provide assistance in resolving several problems associated with the traditional practice of drying and marketing Anchovy. It was shown that losses in potential earnings as a result of poor fish landing, spoilage and low product quality were very significant. This was due primarily to the local practice of drying the fish directly on the beach sand.

An analysis of the market, both domestic and export, provided several important insights into the potential for developing value-added and higher quality products based on the existing, traditional *kattumaram* fishery. These have shown that dried Anchovy is a highly desirable product amongst a wide range of socio-economic groups in many countries, ranging from West Asia through South Asia to Southeast Asia. Given quality and presentational improvements, a quality premium is payable which can mean a fivefold increase in the product's wholesale price.

Simple and low-cost drying racks made from casuarina poles and second-hand netting were developed with the participation of artisanal fishermen from Kanniyakumari. These were demonstrated as being a technically and soclo-economically desirable means of achieving improvements in product quality and providing a simple method of enhancing producers' incomes.

This paper describes not only the development of the technical systems which have helped the KDFSF and fishermen achieve these results. but also discusses the methodologies and socio-economic considerations behind the project. Emphasis is placed on analysing potential impact on the target communities.

The authors would like to thank Mr Lucas (Coordinator, KDFSF): the staff of KDFSF: Dr Kandoran, Senior Scientist, Central Institute of Fisheries Technology (CIFT), Kochi; Dr Gopakumar, Director, CIFT'; Mr Vivekanandan, South Indian Federation of Fisheries Societies (SIFFS), Trivandrum; and the fishermen and fish traders from the Kanniyakumari District.

This paper is published by the ODA and the BOBP. The Bay of Bengal Programme is a multi-agency regional fisheries programme which covers seven countries around the Bay of Bengal — Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka. Thailand. The Programme plays a catalytic and consultative role: it develops, demonstrates and promotes new techniques, technologies or ideas to help improve the conditions of small-scale fisherfolk communities in member-countries. The BOBP is sponsored by the governments of Denmark, Sweden and the United Kingdom, by member-governments in the Bay of Bengal region, and also by AGFUND (Arab Gulf Fund for United Nations Development Organizations) and UNDP (United Nations Development Programme). The main executing agency is the FAO (Food and Agriculture Organization of the United Nations).

December 1992

Published by the Bay of Bengal Programme, 91 St. Mary's Road, Abhiramapuram, Madras 600 018 India, typeset and layout by Pace Systems, Madras 600 028 and printed for the BOBP by Balanoor Printers, Madras.

CONTENTS Page

Figures

Appendices

SUMMARY

This paper describes the artisanal *kattumaram* fishery of Kanniyakumari District in Tamil Nadu, South India, and focusses on some of the critical post-harvest problems and issues related to the traditional processing and marketing of Anchovy.

This district is very active in fisheries, producing some 15 per cent of the total catch of the State. Despite an increasing trend towards fresh marketing outside the district and, especially, towards lucrative exports of custaceans and cephalopods, local markets still represent around 90 per cent of the volume and about 60 per cent of total revenue.

Kanniyakumari boasts the highest landings of Anchovy *(Stolephorus* spp; *Nethili:* Tamil) in the state. Although data are scarce and generally unreliable, landings in the district probably vary from 5000-10,000 t/year representing some 60-70 per cent of the State's total.

As a backdrop to the description of activities carried out and further proposals made by the project, the paper provides a characterization of the existing fishery. The three principal target species of Anchovy are described, as are the locations, seasons and the gear used to catch them. The traditional markets and marketing thannels within India and to Sri Lanka are then examined and information on current price structures is presented.

There is much concern, backed up by several anecdotal reports, about heavy losses of Anchovy as a result of poor processing and restrictive marketing. The fishermen themselves were the first to point these problems out through their own representative body, the Kanyakumari District Fishermen's Sangams Federation (KDFSF), a non-governmental organization comprising active fishermen from several of the local communities. BOBP was approached by KDFSF in 1989 and asked to provide advice on what was clearly a major issue of considerable local concern.

The resulting studies of losses carried out directly by BOBP and, at the request of BOBP, by the Central Institute of Fisheries Technology (CIFT), Kochi, indicate that glut landings of these fish during certain periods of the year create a vast oversupply to local fresh fish markets. In order to avoid gross financial losses, the only realistic option open to the fishermen/processors is to dry the Anchovy on the sand. This is, at best, a hazardous operation, being carried out in direct contact with, more often than not, filthy beach sand which adheres to the product and often comprises 20 per cent of the final product weight. Other problems are caused by:

- Seasonal rainfall and the difficulties in drying when in close contact with humid sand;
- Excessive heat of the sand during sunny periods, when the product becomes cooked and very fragile; and
- Poor product storage and prevalence of insect infestation.

Ignorance of many of these factors by the fishermen is the rule rather than the exception. Few attempts have been made in the past to alleviate the situation.

The extremely poor quality product which results from this is downgraded to low vali:e, animal feeds. Losses are, therefore, characterized in terms of 'economic loss' *i.e* loss in potential revenue to the producer, and to actual physical loss, where the product is sometimes buried or used as fertilizer in local coconut gardens.

Realistic estimations of loss are extremely difficult to make, largely because it is unlikely that glut landings could ever be fully and adequately converted into value-added *(i.e.* improved quality) product and lost revenues thereby realized. After all, who is going to invest in machinery or infrastructure capable of handling the large volumes concerned and which may only be used for short periods during the year? For the sake of illustration, however, the data presented indicate a theoretical level of economic loss, calculated assuming that downgradation is eliminated and that

current market prices of the highest grade traditional product are achieved for the entire production. This indicates a level of loss in income of about 50 per cent.

The original studies of losses had suggested that the potential for tackling these problems through improving processing and marketing was good. In order to test how much impact could, in fact, be made on reducing losses, a series of practical trials were set up in coordination with the KDFSF.

As a first step, trials with low-cost and simple technology were carried out. Multi-layer drying racks were tested, and the trials demonstrated that technical problems of poor product quality could indeed be overcome in a cost effective way. Moreover, parallel studies of the market for Anchovy in India also showed potential for value-addition in that, although the price of traditional dried Anchovy was relatively inelastic, consumers were willing to pay a higher price for a better quality product.

Further market studies of dried Anchovy showed that several other options existed for marketing of a value-added product. Sri Lanka has traditionally imported large volumes of Anchovy from India. A dramatic decline in imports from India from 97 percent in 1985 to 11 per cent in 1988 combined with a huge increase in imports of high quality product from Thailand, underlined the demise of the Indian product. As less becomes used for export, the demand for raw material for low-grade animal feeds has become an easy option for the communities involved in this fishery. The potential for improved marketing and, especially for redeveloping the Sri Lanka export market, led to the subsequent project inputs.

The second step carried out during 1991 involved setting up, with KDFSF, a pilot processing centre in an Anchovy producing community. One tonne of high quality product was produced and utilized for test material. The main outcome of this was to confirm that, as long as quality can be kept high, higher prices and wider marketing potentials were appreciable for three processing options:

- The whole rack-dried product derived mainly from the seine net fishery (head-on);
- The rack dried, de-headed product from the gilinet fishery **(head-off), and**
- A dried fillet **(flake)** made from the rack-dried, head-off product.

Markets for these products were identified in Southeast Asia and West Asia where quality considerations are becoming of paramount importance. Moreover, it was also found that good potential exists within India, especially amongst the middle to upper income urban groups, who were prepared to pay for quality.

A conclusion from these initial trials was that the current level of economic loss can be partially resolved. This is achievable not through attempting to improve the quality of the **total** production, but through adding considerably to the value of a small proportion of the landings. Indeed, as the paper goes on to demonstrate, the enhanced quality *(i.e.* **value-added) products,** such as those produced by the project, have the clear potential to achieve market prices much higher than those currently obtainable for the highest grade traditional product. This is achieved through the application not only of simple technology, but also through several novel marketing strategies which are described.

Through the development of close working relationships with participating fishermen and Federation officials, this 'pilot' study also helped clarify that social feasibility of the project. A significant social benefit resulting from any development of this activity would include the employment generation potential for village women within the target areas. The manufacture of the flake product, for example, is extremely labour intensive, requiring one woman-day to produce one half kilogram of finished product. Product packing would also create employment.

A **third** step is now proposed. This involves the development of a commercial, community-level

project, coordinated and managed initially through the KDFSF members. This builds upon the experience already assimilated and continuing to rely heavily on complete participation of the target communities and community organizations at all levels. Costed proposals are presented and they demonstrate the economic and social feasibility of the options presented.

The commercial project involves the establishment of 120 drying rack units in two communities in Kanniyakumari District. These would be operated by fishermen family units selling the product to the project through the village *sangam* (fishermen's village level association linked to KDFSF). The project would be implemented through a simple organization operating, initially, under the direct control of KDFSF (with advice from BOBP) and, possibly, later becoming an independent company. This organization would be responsible for controlling quality, manufacturing flakes, organizing packing and marketing the product; it would be accountable to the Federation itself.

The level of production initially proposed for the project is 59,400 kg/year, comprising a mix of the three products described above. There will be upto 29 flake processing units, each employing five women, with an aggregate annual capacity of 12,090 kg of flakes. These units would manufacture flakes from dried, head-off Anchovy previously purchased from the fishermen. The total annual turnover is expected to be in the region of IRs. 2,632,000.*

The success of the project hinges on the assumption that the per kilogram revenue achieved by the new and better quality products is onsiderably higher than at present: whereas weighted average prices for sand-dried Anchovy bought from the target communities over the last two years indicate a sale price of only 7.40 IRs/kg, the project would purchase the rack-dried product from the fishermen at a minimum initial payment of 20 IRs/kg and sell at a minimum of 35 IRs/kg. The flake would sell at 130 IRs/kg.

The fishermen woulu also receive a bonus payment of 90 per cent of net profits on a shared, *rata* basis. Ten percent would be retained by the project/KDFSF for reinvestment purposes. These payments would be deferred for some time until annual profits have been calculated. At the rates indicated, however, the fishermen could expect to earn about three times the current rate per kilogram of dried Anchovy sold. Moreover important employment opportunities would be created for village women involved in the flake-making.

A calculated internal rate of rate of return of about 80 per cent for the project prior to financing is very acceptable. However, the means of financing is clearly an area which must be carefully assessed. Although the fixed capital outlay is small, working capital requirements are high due to the labour-intensive nature of the project and likely delays in payment for the finished product.

Apart from finance, the project appears to be sensitive to product price.

Flake production is the most preferable option, as this yields a higher return at the product price assumed. An increase in flake production would also have great social benefit in terms of increased employment. A problem, however, would be the increasing difficulty in controlling product quality. Doubling the production level of simply head-on or head-off product yields the same return as the standard model.

The commercial project is regarded as a preliminary stage to a much wider, district-wide or even regional activity. This, and the activities which led up to its implementation, could serve as a model for other communities with similar socio-economic structures which face similar fish processing and marketing problems.

* US $ 1 = IRs. 28/= appx.