

PREPARATION OF FISHERY INVESTMENT PROJECTS

by

Jan E. Engström
Fishery Industries Division
Department of Fisheries, F.A.O., Rome

Summary

It has been increasingly recognized that one of the major difficulties encountered in implementation of development programmes in developing countries is project preparation. Inadequate and poor preparation of investment projects has often been responsible for slow growth and a waste of scarce capital resources. While project analysis is not the only aspect of fishery development planning, careful project preparation has proved to be one of the essential means of ensuring efficiency in the implementation of plans. The paper outlines the various stages of project preparation, presents the characteristics of fishery projects and shows how project preparation is linked to country development plans and programmes. After listing various sources for identification of fishery projects, the need for and the scope of project pre-feasibility studies is explained. The paper presents the various aspects of project formulation, emphasizing the need for a systematic analysis of the technical, financial and economic feasibility of projects. Techniques that can be applied to test the fulfilment of various commercial and national investment objectives are outlined. A review is made of different problems that need to be investigated further in the appraisal stage before the final decision to invest in a project.

1. INTRODUCTION

1.1 Purpose of Paper

It has been increasingly recognized that one of the major difficulties encountered in the implementation of development programmes in developing countries is project preparation. Inadequate and poor preparation of investment projects has often been responsible for slow growth and a waste of scarce capital resources. While project preparation must not be equated with fishery development planning (formulation of development objectives, selection of priority areas, framing of policies, mobilization of resources, etc.), careful project preparation has proved to be one of the best means of ensuring proper implementation of plans.

By tradition fishery administrations in most developing countries are weak and have had great difficulties in convincing central planning authorities of the need for investments in fisheries. A number of potentially good fishery investments have been turned down because of poor presentation of expected economic and financial results.

The need for better knowledge of project preparation is greater also because international development banks and bilateral aid organisations increasingly insist on certain minimum standards in the preparation of loan and aid applications.

The purpose of this paper is to present in a simple form the various steps required in project preparation and to describe some of the techniques that are used in this process to test the feasibility of different projects. Although references will be made to various fishery problems throughout the paper, the purpose is not to present a model that is applicable to all types of investments in fisheries. The report is primarily addressed to government officials in central planning bodies, fishery administrators responsible for fishery investment planning, staff of national development banks and staff of international development organizations working in fisheries projects of a research and pre-investment character.

1.2 Stages of Project Preparation

Project preparation is usually considered to include all those activities which preclude a final decision to invest. In this process one may distinguish between the following stages: (1) identification and pre-feasibility, (2) formulation and (3) appraisal. During each phase a number of activities and analyses are conducted at various degrees of depth and precision, deeper and more precise as you go, and the findings are used to meet the requirements of the subsequent phase until the project is finally evolved.

The method of preparation and relative importance of each stage is often a function of the respective roles played in this process by various agencies, such as:

- the promoter
- the investor
- the financier
- the consultant.

Broadly speaking, we may say that while the promoter is mainly concerned with the identification and pre-selection phase, the investor and the financier place relatively more importance on the formulation and the appraisal phase. A consultant is often employed for the technical studies in the formulation of the project. When the investor and the financier are identical bodies, the formulation phase is sometimes ignored so that implementation (invitation for tenders, contracting, construction, etc.) may be started immediately after the identification phase.

1.3 Characteristics of Fishery Products

An investment in a fishery project may include the following: (1) vessels, (2) fishing gear, (3) fishery harbour and/or landing facilities, (4) ice plant, (5) cold store, (6) processing plant, (7) inland transportation facilities and (8) wholesale and retail markets, etc. A project may be anything from a single unit (a vessel, plant, etc.) to a whole integrated chain including all the objects of investments mentioned. While the criteria related to the planning of projects in general can be used to meet the requirements of most other projects in the economy, each sector has its own special features for which the general criteria may not prove adequate. These features are particularly evident in the fisheries sector.

Fish production is subject to higher risk and uncertainty than most other industries. Due to biological and environmental factors, the volume of output for a particular fishery may vary considerably from year to year and from season to season. For the individual operator, these variances are further aggravated by the common property nature of the resource (with the exception of fish farming), and the resultant competition among several fishing units for the same stock. In a situation where the total yield from a certain resource is close to its biological maximum, an increase in competition generally results in a lower catch for each unit and a reduction in total yield - in extreme cases such an increase in fishing effort may jeopardise renewal of the stock.

Fishing is also characterised by its division into two distinct sectors: one traditional and one modern sector. The former includes the inshore fishery which in most cases is in the hands of a larger number of small independent producers, which makes it difficult to impose control on fishing effort, introduce changes in fishing methods and fish handling, etc. The latter includes the inshore fishery which occupies fewer units and which is generally capital intensive (demanding heavy investments in harbours, vessels and gear). The perishable nature of the product - which in the absence of investments in fairly sophisticated preservation and transportation facilities results in high losses in product value - is another characteristic that tends to make fishery investments complex and subject to economic uncertainty.

1.4 Development Plans, Programmes and Projects

In order that a specific investment project can make a real contribution to economic and social development, it is of vital importance that the project be linked to the development of other projects in the same sector - or of associated projects in other sectors. The general limitation of scarce resources, such as capital and skilled labour, encourages a degree of coordination in the preparation of projects, programmes and overall development plans. Overall planning and project preparation are inter-dependent, and both are essential for achieving a high and balanced economic growth. Many projects may be derived from already established programmes or plans which indicate priority areas for investment, provide basic information on development strategy, broad allocation of investment funds, supply/demand projections, etc. The economic evaluation of individual projects is dependent upon "national parameters" reflecting the national goals and objectives as expressed in these plans. Overall planning, therefore, exerts a considerable influence on project planning. On the other hand, project preparation in its critical review of established policies and priorities could also influence the planning.

2. IDENTIFICATION AND PRE-FEASIBILITY STUDY

If one excludes those rare cases where individual projects are identified and partly formulated in development plans, the process of identification often begins with the search for an idea with a development potential and ends with a specific project. This process of gradual build-up of a project can be quite strenuous and time-consuming. The project planners may have to make a number of successive approximations and analysis before the most promising project alternative has been selected.

2.1 Analysis of the General Economic Situation and Constraints and Priority Areas in Fisheries

One basic approach to identifying suitable investments in fisheries is to make a brief diagnosis of a country's economic situation in general and a more detailed study of the fisheries sector. The first study will usually include statistics on population, gross national product, savings, investments, foreign trade, food consumption, etc. The second study will include production figures (by regions, type of fishing, vessel, landing port, species, etc.), number of fishermen, number of fishing craft, fish utilisation (percentage of catch that is canned fresh, processed for human food, for fish meal, etc.), fish trade (foreign and domestic) and consumption pattern. If possible the figures mentioned should be given for a certain period of time so that development trends may be discerned. In order to get an idea of the potential expansion possibilities of fisheries, it is of great value to obtain indications of the trends in the yield of a resource (total catch and catch per unit of effort).

The analysis of the general economy and the fisheries sector, together with an analysis of existing development plans and supply/demand projections form a basis for identification of various constraints which, in turn, are of great importance for the selection of priority areas and identification of specific projects. Apart from the limitation of fish resources the areas of constraints are often encountered in infrastructure (fishery harbours, storage and transport facilities, water and electric power), institutions (general fisheries administration, fisheries resource management, training, credit, fishermen's organizations) and technology (fishing techniques, fish handling, processing, business management and ability).

2.2 Other Sources for Identification of Projects

Historically many fishery projects have been identified from an analysis of the world market for fishery products. The existence of ready markets combined with the expectation of a strong future demand have been the essential features leading to investments in, for example, the shrimp, tuna and fish meal fisheries.

Ideas for investments often emerge from the fishing sector itself. Investment promotion agencies, project identification teams, etc. should therefore carefully sound the views of the fishermen, of the fishery industrialists and of the fishery administrators before making detailed preparations for projects. Sectoral studies, reports by economic review missions, pre-investment surveys organized by the UN, IBERD, FAO, regional banks and other international organizations may also serve as sources for ideas for specific investments in fisheries.

2.3 Pre-feasibility Study

The purpose of the pre-feasibility study is to determine:

- whether the objectives of the project conform with overall government development policies;
- how the proposed outline of the project compared with other alternatives available;
- whether the project is sufficiently promising from the financial and economic points of view to deserve further consideration;
- which aspects of the project appear particularly uncertain and would seem to merit further special attention.

An investment proposal is unlikely to be conceived in only one form. Following the identification of a potential fishery development project in general terms, it is important that the planning team make a preliminary review of the major alternatives that a project may take. It is essential that such a study be made in an unbiased fashion - if not, there is always a danger of some highly beneficial alternatives being overlooked. In lucky

circumstances such oversights are pointed out and corrected in the later stages of project preparation - but considerable financial and technical resources may have been wasted in the process. In other circumstances, the mistake is discovered very late or not discovered at all - with the result of even greater losses.

As an example of poor pre-feasibility analysis, one may mention a proposal to produce and market dried fish when a somewhat more careful analysis would show that marketing of the same fish in fresh or frozen form would yield higher benefits both to the investors and to the country. Another example is a proposal to establish a new and costly harbour located at A overlooking the fact that an expansion of existing facilities at B would yield the same benefits at much lower total costs.

The pre-feasibility study will usually include provisional estimates of:^{1/}

- resource availability
- market outlets and sales prices
- fishing methods
- processing techniques
- location of facilities
- project organization, availability of labour and management
- total investment cost
- financial and economic profitability.

3. PROJECT FORMULATION

Once the main alternatives for an investment proposal have been analysed and a choice made of the most promising alternative, the next major task is to formulate the selected proposal and to examine systematically and in greater depth its essential features. Apart from a description of the project and analysis of its major elements, the formulation will usually include a detailed evaluation of both the financial and economic returns. The purpose of the formulation is to cover those aspects which are necessary for a financier to reach a decision on providing funds for the project.

3.1 Description of Project and Project Area

The description of the project should preferably start by listing the main national objectives (to increase food supplies, improve incomes of fishermen, earn foreign exchange, etc.) which it aims to fulfil. This should be followed by a presentation of project components: processing methods, marketing arrangements, location of plants, phasing of constructions, investment cost, organization and management.

In the project area section there should be a description of those characteristics (supply of labour, power, water, communications, repair facilities, etc.) which will have a direct bearing on the project operations. This section should also include a brief analysis of the functions and effectiveness of existing government and private institution services which are likely to concern the project.

3.2 Analysis of Fishery Resources and Catch Projections

For reasons mentioned in the Introduction, the raw material supply side of any fishery project proposal will warrant particularly detailed investigation. Subject to the availability of basic data the analysis should include the following:

- (i) description of the fishing grounds (area, depth, distance to ports, etc.);

^{1/} FAO Agricultural Planning Studies (14), 1971

- (ii) estimate of maximum sustainable yield of major species on these grounds (reference should be made to source of these estimates);
- (iii) total catches by major species for the last five to ten years (and approximate number and size of vessels that were employed each year);
- (iv) projected catches by project vessels during each year of the project (the projections will be a function of number of vessels, size of vessels, number of operating days/trips per year and average catch per day/trip);
- (v) commercial characteristics of the fish (species, size composition, quality, seasonal differences, etc.).

The information under (ii) and (iii) is essential for forming an opinion on the state of the existing fishery before the start of the new project. Such an opinion will in turn influence the figure for average catch to be used in the projections under (iv). In a fishery which is already much developed an increase in the number of vessels may result in only a modest increase (or a decrease) in total yield. To use the average catch for existing vessels as the catch rate for new vessels in such a fishery may in such circumstances give an overly optimistic picture of the performance of the proposed project. In order to determine the optimum size of the fishing fleet, of the harbour and the processing plants, it is important to have information on both the seasonal and the spatial distribution of the fish - such information is particularly important for the exploitation of shoaling species such as sardine, anchovy and tuna.

3.3 Analysis of Demand and Sales Price

A careful analysis of the effective demand for the final products is just as essential as a study of the resource availability before committing capital and manpower to any project. If the intention of the project is to market different products (fresh fish, frozen fish, fish meal, etc.) to different markets (international, domestic wholesale, domestic retail, etc.) the analysis should preferably be made separately for each product and each market. If there are wide discrepancies in consumer preferences and prices for different species, it may even be necessary to make further breakdowns - demand for prime grade fish, second grade, etc. The forecasts should be made on a year-by-year basis and be supported by information regarding:

- past and present product demand (trend in product sales, prices, major customers, etc.);
- studies of future demand and prices (for internationally traded products reference could be made to world supply/demand forecasts made by international bodies, producers' associations and national public research organizations; for domestic products, reference could be made to local studies, taking into consideration such factors as population growth, income growth and income elasticities);
- the advantages and disadvantages in comparison with major competing countries or enterprises (differences in transportation costs, in tariffs, trade agreements, Government subsidies and differences in product quality and marketing efficiency);
- planned project marketing policy (e.g. whether the project intends to substitute current imports of fishery products, whether it intends to get a major share of the domestic market at the expense of other local producers, whether it intends to make major sales promotion efforts or improve distribution systems with the aim of reaching new customers, etc.)

3.4 Technical Feasibility

(i) General

The purpose of the technical evaluation is to investigate whether the elements of a proposed project are internally consistent and whether the project is workable under realistic assumptions regarding resource availability, supply of manpower and operating materials, supporting facilities, markets, etc. The comprehensiveness of the technical study will in general depend on the magnitude of operations and on the complexity of the techniques involved. A vertically integrated fishing/processing project involving new methods will demand more analysis than, for example, a simple fishing project based on traditional methods.

As a general rule when proposing the location of facilities and types and sizes of vessels, gear, etc., a justification should be given for the selections made. This is particularly important when new or fairly untried equipment is proposed. While a part of the selection process has been covered in the pre-feasibility analysis, the purpose of the complete technical evaluation is to give further assurances that the proposed project is based on the most suitable and economic production alternatives. A careful evaluation, with ample justifications, will facilitate the appraisal of the project and reduce the need for complementary studies.

(ii) Fishing operations

The study will normally contain a description and an evaluation of:

- environmental conditions (depth of water, weather, tide, sea bottom, etc.);
- fishing vessels (source of supply, type, overall size, fish-hold capacity, crew accommodation, maximum trip endurance, operational experience of similar vessels, availability and quality of vessel service facilities, ownership, management, etc.);
- operational pattern (number of trips, length of trips, turn-around time, etc.);
- fishing gear (type, size, variation according to season, operational experience, etc.);
- fishing crews (number, function, skills, experience, need for training, etc.);
- input of operating materials (sources and reliability of supplies of fuel, water, bait, ice, spare parts, nets, etc.).

(iii) Landing facilities

Under this heading would be a description of:

- functions, capacity, organization, efficiency, etc.

(iv) Processing and storage

This item should give details of:

- ice plants;
- methods, capacity, organization, previous experience, need for technical assistance, etc.

(v) Marketing and distribution

For marketing and distribution there should be a description of:

- transportation facilities, wholesale and retail outlets (capacity, ownership, management, delivery schedules, etc.);
- packaging;
- advertising and sales promotion.

3.5 Financial Feasibility

(i) Investment costs, operating costs and cash flow

Traditionally, costs for project preparation purposes are divided into (a) investment costs and (b) operating costs. While the former constitute all expenditures on assets, services incurred in the pre-construction phase, the latter costs constitute expenditures on goods and services needed for the operation and maintenance of the project. The initial working capital, i.e. the estimated capital required by the project to cover operating expenses before cash receipts are obtained for products which have been sold, is generally also considered a part of investment capital.

Expenditures on harbour work and other supporting facilities should be considered project investment costs only to the extent that they are incurred by the project (which would be the case if, for example, the project were the sole user of the harbour and no public financing were provided for the harbour). In the project formulation stage estimates for the major cost elements should be based on price quotations from construction companies and equipment suppliers. In periods of significant inflation it is desirable for the impact of expected price increases to be shown explicitly in the cost calculations. In order to allow for uncertainties and unexpected events (e.g. a change in exchange rates which affects the costs of imported materials), a contingency item is usually also included in overall investment costs.

Operating costs, which include recurrent cash outlays for wages, materials, insurance administration, taxes, etc., are usually calculated on a yearly basis.

On the basis of the estimates of operating revenues (which in turn are based on the sales projections as shown in (c) - Analysis of Demand and Sales Prices) and the operating costs, annual cash flow statements for each year of the project are estimated. On preparing the statement only those items that constitute actual cash receipts or cash outlays are taken into consideration (depreciation and interest on equity capital are therefore excluded).

The annual operation cash flows will indicate the annual debt repayment capacity of the project, which in turn will indicate how the short, medium and long-term financing may be arranged to cover investment costs.

(ii) Financing of the project

The details on project financing contained in the formulation phase may vary greatly depending on type and size of project, on type of entity managing the project, on degree of commitments made by some external suppliers of capital, etc. Proposals for new projects formulated by an investment promotion agency without previous identification of an investor or financier, cannot give the same comprehensive picture of the financial structure, terms for credits, etc. as a proposal for the expansion of an existing project where the formulation is done by the investor himself and where some sources of capital have already been identified. Whatever the situation with regard to knowledge of the investor and potential financiers, a financial plan should be prepared showing what will be the capital requirements in the construction phase and in the initial operational phase, and what are likely to be the main internal and external sources (a hypothetical example of such a plan is shown in Appendix I).

(iii) Financial profitability - internal financial return

The cash flow estimates, apart from expressing the financial liquidity of the project form the basis for the calculation of the financial profitability which, in turn, is used to measure the absolute (whether to reject or accept a project), as well as the relative (whether Project A is better than Project B, etc.) profitability of a project. The most commonly used indicator of financial profitability used by international development banks is Internal Financial Return (IFR). As illustrated in Appendix II, this is the rate at which the present value (the calculation if IFR implies use of a discounting technique which takes into account that a unit of money earned in the future is worth less than a unit of money earned today) of future operational cash surpluses equals the cost of the investment. When a project is said to have an IFR of, for example, 20 per cent, it usually means that the average earning power of the money used over the project's life period is 20 per cent. ^{1/} This is the same as saying that the project could afford to pay up to 20 per cent interest on capital (if all capital required were borrowed) and still break even. Internal Financial Return is often also calculated to show the return on own invested capital (equity). In these cases payments for debt servicing - amortization and interest - of borrowed capital are treated as cash outlays, just like wages, materials, etc., in the cash flow analysis. On the other hand, the lifted loans are shown as cash receipts in the cash flow. Therefore when reporting the IFR it is important to specify from what point of view the calculation was made. The project above, yielding an IFR of 20 percent as a return to all capital invested may show an IFR of perhaps 30 per cent, taking into consideration that a substantial part of the capital required is borrowed at a favourable, say 10 percent, rate of interest. ^{2/}

Apart from IFR, the following indicators are used, often as complimentary tools, to measure financial profitability in project formulation: (1) Accounting Rate of Return (annual operating profit less depreciation as a percentage of investment cost), (2) Payback Period (number of years needed to accumulate financial surpluses to cover investment cost) and (3) Benefit-Cost Ratio (average annual operating profit in relation to average annual capital costs, i.e. depreciation and interest on investments).

3.6 Impact on National Economy

(i) Economic profitability

The same discounting cash flow technique that is used to measure financial profitability from the investor's point of view may be used to measure the Internal Economic Return (IER) or the return to the national economy of a project. While the financial calculations are based on prices of goods and services on the open market, economic calculations are (at least in principle) based on social opportunity costs (or the value to the economy of employing a unit of a certain resource in the best alternative usage). In developed and diversified economies with almost perfect competition, market prices usually do not differ much from the social opportunity costs. In developing economies, however, "imperfections" in the market (price controls, monopoly elements, import restrictions, minimum wage laws, subsidies in credit systems, etc.) tend to make market prices less suitable as guides for resource allocation. This tendency is also aggravated by the custom of levying taxes on certain goods. These taxes are measures used by the governments to transfer resources from one sector of the economy to another. To overcome the deficiencies of market prices in relation to allocation of capital resources for development purposes, some central planning agencies and development banks have introduced the concept of "shadow prices" ^{3/} in project evaluation.

^{1/} This rate is sometimes called "intrinsic financial return".

^{2/} This ability of an individual investor to change his own Internal Financial Return through the use of borrowed capital is termed "leverage".

^{3/} "Shadow price" may be defined as that price which would prevail in the economy if it were in perfect equilibrium under conditions of perfect competition.

The calculation of shadow prices is a cumbersome and costly undertaking. Therefore, for typical fisheries projects it is hardly worthwhile going into the process of producing shadow prices of most of the goods and services employed. For the calculation of IER it is usually sufficient to use market prices and make the following adjustments:

- deduct government taxes and duties included in market prices for major cost items (vessels, gear, plant machinery, fuel, electricity, etc.);
- add subsidies paid by the government to promote fish consumption (consumer price subsidies, subsidies for ice production, subsidies for inland transportation, etc.);
- recalculate the cost of imported goods and revenues of exported goods (apply the shadow rate of foreign exchange recommended by the Central Planning Bureau);
- recalculate the cost of capital (for the calculation of the benefit/cost ratio it is necessary to apply a fixed rate of interest - it is recommended that the shadow price of capital used by the Central Planning Bureau should be applied).

While it is often maintained that shadow prices should be employed for labour used in fishery projects, there seem to be widely differing opinions on how to construct these prices. The argument that the labour costs should be zero, which implies that the value of the alternative production is nil, does not seem to coincide well with the conditions of such projects, which are dependent upon the availability of trained personnel (drivers, engine service staff, accountants, etc.). It appears that from the comparatively few cases where shadow prices for labour have been employed in fisheries projects, those shadow prices have been applied only for the unskilled personnel and at rates somewhat lower than the going wage rate.

Due to the problems mainly related to the identification, valuation and quantification of cost and benefits which are not incurred directly in the project, there are also varying opinions of how to include "secondary" and "tertiary" effects in the calculations of the Internal Economic Return. While the leading development banks through the 1960's were generally contrary to the inclusion of these effects, it seems as though the attitude has changed in recent years. This change in attitude seems to have grown out of the realization that many investment projects, while being quite viable from the financial point of view, have contributed very little towards overall development of the country. In view of the substantial potential "linkages", both backwards and forwards, often encountered in fisheries this increased importance of economic and social effects in comparison with financial effects (Finance and Development 1974) may prove to be quite beneficial for fisheries development in general.

The question of "primary" and "secondary" effects in project evaluation is related to the type of project concerned. For a vertically integrated fishery development project - where most of the linkage effects tend to be incorporated in the financial analysis - there is a less obvious need for a separate calculation of linkages than would be the case for "horizontal" project involving only, for example, the fishing activity.

As a complementary measure to Internal Economic Return, "value added" is particularly useful for comparing the impact on the national economy of alternative projects. For each enterprise value added is defined as the sales value of its produced goods and services minus the cost of material and services purchased from outside domestic or foreign sources. Value added may also be defined as what is left over in the production process for the payment of taxes, wages, salaries, interest and dividends. When the value added calculations are extended to include value added created in enterprises other than the enterprise or project under study, it will embrace the secondary and tertiary effects mentioned above. A fish canning project which has considerable backward linkages (e.g. local construction of fish vessels and gear) and forward linkages (e.g. distributing and marketing of canned fish) thus have a large value added component in comparison with an alternative project (e.g.

fish meal industry) which relies heavily on imported equipment and which offers few opportunities for employment of labour in marketing (UNIDO 1974, where these aspects have been illustrated in a fisheries case study).

For calculation of the national value added of a project (and this principle also applies to the costs and benefits included in the calculation of Internal Economic Return) care should be taken to include only those net incremental values that are created. Thus, for example, if the effects of a new fishery harbour project at A are evaluated, care should be taken not to attribute to this project the value added that is being created already in another project at B (assuming that project A aims at attracting some of the catches that landed at B). As another example, when considering the expansion of fishing effort in a fishery which is close to being fully exploited biologically (the introduction of new vessels is thus likely to reduce average catches of existing vessels), care should be taken to deduct the loss in value added incurred by the existing fishery from the value added created by the new project.

(ii) Supply of food for domestic consumption

To provide food for domestic needs seems to be the most frequent national objective of fishery development and is the one usually given first priority (Lawson 1974). An increasing number of countries have recognized the importance of fish as a factor to improve the nutritional standards of its population. Since fish is rich in protein and in certain important vitamins and minerals, it is often selected as a priority item in national food development plans. In many countries, e.g. in the Far East, fish supplies contribute between 10 to 20 percent of total protein and over half of the total animal protein supplies. In some countries, e.g. India, low average per caput consumption figures tend to conceal the fact that fish is a major source of protein for large populations living in coastal areas.

While fish has a great role to play as a supplier of food, rational economic planning will have to recognize that there are alternative ways of supplying protein, minerals, etc. and that the objective of developing fisheries to increase domestic food supplies may conflict with other important objectives.

One possible conflict for fishery development may be the need to put scarce capital resources to the most profitable use. If the poultry or beef sectors can produce animal protein at a much lower cost than fisheries, it would make little sense to give large subsidies, provide costly infrastructures, etc., to the fisheries sector. Another conflict may arise from the need to increase foreign exchange earnings. If the locally produced fish (e.g. shrimp and tuna) can be sold at considerably higher prices abroad than local consumers are willing to pay, a policy to limit the sales of fish to the domestic market will imply that the country foregoes the earning of foreign exchange. Such earnings could, in turn, be employed to import essential food which can be produced cheaper abroad, or to develop other sectors which are of high national importance. As Lawson points out a government intending to promote fish as a means of improving dietary standards must consider the real costs of this policy.

(iii) Employment creation

Of the various possible national development objectives, it appears that the employment creation objective has assumed increasing importance in recent times. The rapid increases in population coupled with the drift of people to urban centres and the overall disappointing experience from providing employment through the industrialization process, has led many developing countries to take a new look at creating job opportunities in the traditional agriculture and fisheries sectors. Another factor is the growing recognition that large capital intensive projects in general have been unduly favoured in many countries (through artificially cheap credits, cheap imports and measures preventing competition) in relation to small labour intensive projects. The search for rural projects requiring a large amount of labour employing simple and intermediary techniques, has therefore become a major activity of national development agencies.

While it is true that the small-scale fisheries sector in general has been neglected and that there is scope for considerable employment creation in fisheries, it should be remembered that certain types of fishing do not lend themselves to many alternatives as scale of operation and degree of mechanization. The choice, particularly in the case of fishing in deep offshore waters, may be to use a certain capital intensive, modern approach or not fish at all. This situation reflects the extremes of a conflict between economic efficiency and employment creation. In fisheries it is therefore necessary to approach the problem of efficiency versus employment on a selective basis, which reflects differences in the availability of the fishery resources.

As regards the comparison of the employment impact of alternative projects, there are various methods available. Indirect technique is to use shadow pricing for labour and capital. Projects employing a large number of unskilled, previously unemployed labour workers in this way show a higher Internal Economic Return (provided that efficiency differences are not too great) than an alternative project employing much capital and little labour. Another more direct method is to relate the number of job opportunities created to the investment cost of the project (the inverse method would be to calculate the investment needed to create an average job opportunity).

(iv) Income redistribution

An increasing number of countries has come to look upon income redistribution as an important national objective and has realized that choice of public investment projects is one important tool for bringing about a desired change in the distribution of incomes. In regard to the fisheries sector, one might well imagine that a government would be more willing to support a scheme which will raise incomes of a large number of fishermen or retailers than an alternative scheme mainly producing additional benefits for a group of middlemen even though the latter scheme seemed to promise in total a higher economic return to society. Because of its increased importance, it has been proposed that the income distribution objective be explicitly incorporated in the calculation of Internal Economic Return. It has been suggested that a system of weight indices be used, whereby incomes to poor groups receive a higher value than incomes to rich people (e.g. UNIDO 1974).

(v) Foreign exchange

A country where foreign exchange is considered to be a major constraint to development in a certain direction may want to make great sacrifices in overall project profitability in order to obtain foreign currency. Through the use of shadow rates of foreign exchange, the fulfillment of the foreign exchange objective may be measured in another way. Another way is to calculate how much it will cost in domestic currency to generate a unit of foreign exchange in the project, i.e. to find the Internal Foreign Exchange Rate (Gittinger 1972). This rate, compared with the shadow rate of exchange, will indicate whether it will be "cheaper" for the country to import fishery products from abroad than have the project produce the fish. Finally, it may be of value to make a separate comparative analysis (using the official rates of exchange) of the effects - perhaps in the short and long terms - on the balance of payments. For such an analysis some of the following elements, positive (+) and negative (-), may appear:

- + revenues from export of fishery products;
- + reduced payments for imported fish products;
- + revenues from servicing foreign vessels;
- + foreign loans (or equity capital contribution by foreign joint venture partners) received;
- initial payments to foreign companies for delivery of vessels, port equipment, etc.;
- recurrent payments for spare parts, operating materials and foreign technical assistance;
- amortization and interest on foreign loans, expatriation

(vi) Regional development

The growing interest in regional development and regional planning in many countries may be related to some of the following factors:

- growing disparities in standard of living between regions;
- increased regional political awareness and claims for a more equitable distribution of national financial resources;
- growing interest in rural development in general, in turn related to the recognition of the symbiotic relationship between rural and urban areas and to the need to increase food production.

The satisfaction of regional development aspirations may conflict considerably with other national goals like achievement of a certain economic growth, savings of foreign exchange, etc. Due to these conflicts and the difficulties in establishing clear-cut rules as to what extent sacrifices should be made in satisfying the regional development objectives, regional development effects in project formulation are often evaluated only in broad terms. In the case of public investments, where there are competing project proposals, it is often left to the Central Planning Commission to indicate a preference between the alternatives. To facilitate this selection, the policy makers may give instructions that benefits or value added should carry a higher weight when accrued in region A than in region B, etc.

(vii) Public finance

Given the need for stable economic development (e.g. with regard to prices) and recurrent public commitments (defence, health, public administration, etc.), most governments have an excess of potential development projects in relation to public financial resources available. In view of this constraint, the impact of the project on the government's finances may become a decisive factor in the selection of type and size of projects. While it is generally true that projects showing a high financial or economic return yield higher government revenues than projects showing low returns, the opposite may also be the case. Because of the magnitude of taxes, duties, tariffs, fees at different levels of society and because of the difficulties in identifying and evaluating the secondary effects, a detailed assessment of the impact on government revenues of a project is a difficult task, which may be justifiable only for investments in processing plants or fish harbours. For most fishery projects it will be sufficient to indicate in broad terms what the expected impact will be.

(viii) Other objectives

Sometimes particular attributes of investment projects are singled out as a subject for special attention on the grounds that their national importance is greater than what consumers think it is. Such objectives may be called "merit wants" (OECD, 1971). Education, defence and self-reliance are often considered as such wants.

4. APPRAISAL

The last step in the project preparation process that precedes the final decision to implement the project is the appraisal. Generally this step is undertaken by a team of experts attached to the national agency or to the financing agency which is considering the granting of a loan to the project. The purpose of the appraisal work is to make a critical assessment of the various elements of the project, to check whether the elements form a workable project and finally to ascertain that the project can be justified both financially and economically. The magnitude of work undertaken by the appraisal team is directly related to the previous formulation of the project. If the project has been well formulated, the

appraisal will mainly consist in checking the basic data and assumptions used in the pre stage. If, on the other hand, the project is loosely defined and has important gaps in presentation, the appraisal will be extended to include basic data collection and project elaboration. The team may also recommend that some critical elements are investigated further by outside expertise before final approval of the project. The aspects to be considered in the appraisal can be grouped in the following categories: (1) technical, (2) commercial, (3) organizational, (4) financial and (5) economic. The questions listed below may be considered as a check list for the appraisal of fishery projects.

4.1 Technical Review

(i) Fishery resources

1. How have the figures for maximum sustainable yield been arrived at ?
2. Is it likely that further exploratory surveys will discover new resources in the area ?
3. How large are total catches likely to be in the project area in the near future ?
4. How will the seasonal and cyclical variations in overall catches and in catch composition affect the project ?
5. How will possible changes in fisheries resource management affect the project ?

(ii) Fishing operations

1. Is the proposed number of vessels adequate to reach total catch targets ?
2. Are proposed characteristics of vessels adequate for the proposed fishing pattern ?
3. Is the proposed size of vessel an economical size - if not on what grounds has selection been made ?
4. Is the proposed fishing gear the most suitable gear for the vessels selected ?
5. What has been the experience of similar vessels and similar fishing methods in the area ?
6. Are the projected catch rates realistic ?
7. Are the landing facilities adequate for the operations ?
8. What are the possible causes for delays in unloading of fish ?
9. What are the bottlenecks in the fish landing operations and what will be the costs/benefits of removing these obstacles ?
10. Will the proposed methods for preservation of fish satisfy quality requirements ?
11. What are the costs/benefits of improved fish preservation ?

(iii) Fish processing and storing

1. How efficient are the proposed methods for bringing the fish into the plant ?
2. Is the proposed location, size and design of plant technically and economically feasible ? What are the main alternatives ?

3. Is the proposed timing for construction and phasing of plants realistic ?
4. What will be the production yield ?
5. Have adequate margins been made for waste in raw material and in finished products ?
6. Will the quality of the products meet market requirements ?
7. Is the capacity of the raw material storage adequate for efficient operation ?
8. Is it technically feasible to produce with more labour intensive techniques and in that case what would be the impact on employment and profitability ?
9. What are likely to be the main causes of interruption in the operation ?
10. How can plant be utilized (e.g. processing of meat and vegetables) in periods of low fish catches ?

4.2 Commercial Review

1. Are the proposed procedures to acquire the vessels to construct the plants, etc. adequate to ensure start of operations according to plan ?
2. What measures are planned to ensure timely deliveries of electric power, water, fuel, ice, spare parts, packaging material, etc. ?
3. What is the quality of, and how reliable are, the services for repair of vessels, gear and plant ?
4. Are the project cost figures for all the goods and services realistic ?
5. If the project is dependent upon deliveries of fish from independent vessel owners and fishermen, what arrangements are proposed to ensure steady supplies ?
6. How realistic are the demand projections and the sales prices ?
7. Will the project obtain any special privileges, protective measures, etc., from the government regarding supplies of project inputs or sale of project outputs ?
8. What are the alternative ultimate consumers of the products ?
9. If the project, for sale of its products, is dependent on middlemen, sales agents, e how efficient and reliable will their collaboration be ?
10. What are the alternative ways for marketing the fish products ?

4.3 Organization and Management Review

1. What is the legal status of the project ?
2. Has a project organization plan and job description for the key staff been prepared ?
3. Have the operation objectives been defined ?
4. What are the functions of the various units and how is it ensured that they will work towards the achievement of the overall objectives ?
5. Are the monetary and other incentives for the project staff adequate ?

6. Are the responsibilities given to key personnel matched by delegation of authority ?
7. Are the experience and the capability of the staff (managers, supervisor, master-fishermen, vessel engineers, refrigeration technicians, fishing crews, etc.) adequate to reach the project targets ?
8. If foreign technical assistance or training programmes are needed, how will they be provided ?
9. How efficient are the administrative routines (purchasing, invoicing, cost accounting, budgeting, internal audit, recruitment of staff, etc.) ?
10. How will the progress of operations be measured and controlled ?
11. What are the most important bodies or enterprises with which the project will have relationships and how may the effectiveness of these bodies influence the project ?

4.4 Financial Review

1. Are the revenues and costs used in the cash flow estimates of the project authority realistic ?
2. Are the estimated figures for foreign currency requirements, contingencies and working capital adequate ?
3. How sensitive is the Internal Financial Return to, for example:
 - an increase in investment and/or operating costs of 10 percent ?
 - a delay in finalization of project vessels and processing plant of one year ?
 - a reduction of projected yearly catches per vessel of 10 percent ?
 - a reduction in sales prices of 10 percent ?
 - a reduction in project life of one year ?
 - a combination of two or more of the above adverse events ?
4. What is the break-even production volume ?
5. Are the proposed financing plan and related terms of credits realistic ?
6. Will the project generate sufficient annual cash surpluses to service its debts ?
7. What would be the likely source of finance if the project needed additional working capital during its operations ?
8. Is the project dependent upon annual cash subsidies from the government ?
9. Is the projected financial return for independent fishing companies, processing plants or other enterprises related to the project activities attractive enough to ensure continuous collaboration during operations ?
10. If the project is to be undertaken by an existing organization, what are the financial records of the project authority.

4.5 Economic Review

1. Given the overall development objectives of the country, what is the relative priority of the project ?
 2. What is the economic efficiency of the project ?
 - are the assumptions made for the calculation of Economic Rate of Return Valid ?
 - how does the Rate of Return compare with the return of other rural development projects ?
 3. Who will be the main beneficiaries of the project and how will their incomes be affected ?
 4. How realistic is the calculated project impact on:
 - earnings of foreign exchange ?
 - employment ?
 - redistribution of incomes ?
 - regional development ?
 - food production ?
 5. What are likely to be the forward and backward linkage effects of the project ?
 6. What will be the impact on government revenues ?
 - what will be the additional public expenditure for infra-structures, supporting services and other elements which are required for efficient project operations, but which are not included among project funds ?
 - what will be the additional tax incomes ?
 - will any existing revenues be foregone as a result of the project ?
5. CONCLUSION

While modern project preparation methods have an important role to play to attract resources to fisheries and to contribute to more efficient use of resources allocated, it must be recognized that fisheries in most developing countries are faced with constraints which tend to prevent these countries from drawing maximum benefits from these methods. The main constraints appear to be the following:

- lack of a sound information base
- lack of clearly formulated development objectives
- lack of proper planning and coordinating machinery
- lack of economic research and technical studies of fishery projects
- lack of staff with proper training and experience of project preparation.

Most countries in the IPFC area have shown that they are well aware of the need for building up a base of statistical information. Regarding the importance of creating a fisheries resource management system and the kind of data that should be assembled for such a system, reference is made to papers presented at previous IPFC meetings. For project preparation purposes, it will also be necessary to collect information on trade and price of fish, fish utilization, employment, number and capacity of fishing craft, processing plants, cold stores, ice plants, etc., and on cost and earnings from the various sub-sect in fisheries.

As pointed out by Lawson, many of the objectives for fishery development listed by the IPFC countries are conflicting. Increased economic efficiency may conflict with increased employment; increased foreign exchange earnings may conflict with increased supplies of food for domestic consumption, etc. While it is true that the existence of broad and inconsistent objectives is not a specific fisheries problem, it appears that fisheries is one of the most underdeveloped sectors in this respect. This can perhaps in turn be related to the often inadequate planning machinery in fisheries. As indicated in the report, one of the most important functions of project preparation is to provide a tool for evaluating different projects in an unbiased and explicit manner. When the given objectives of development are very unclear and conflicting, it will be difficult for the evaluator to carry out a meaningful evaluation and to show the absolute or the relative merits of particular projects. The guidance that the project evaluation can offer under similar circumstances to the policy and decision makers will therefore often be of limited value.

To facilitate the preparation of fishery projects - whether for implementation by Government bodies or by private enterprises - it is suggested that the fishery planners open a dialogue with the central planning bureaus and that these are requested to give guidelines on shadow prices of foreign exchange, social cost of capital and minimum economic returns of public projects and other matters which express the requirements of central government. The fishery planners should furthermore try to get a clearer indication of the relative importance of various development objectives, both from the central and the regional decision makers. It is also suggested that the fishery administrators promote economic research and empirical studies of fishery projects and inform central planning bureaus and the policy makers of the implication of previous decisions, so that mistakes in old projects can be avoided in the future. The countries within the IPFC region could benefit considerably from an exchange of experience from investments in fisheries.

Regarding the last constraint - lack of trained staff - one possible solution would be for IPFC to arrange within its region, training courses on preparation of fisheries projects. It is proposed that in the first phase these courses be directed to staff who already have a good knowledge of fisheries and who hold important posts in fisheries planning or in public fisheries corporations. In the further phases, staff from development banks, private major fisheries enterprises, young fishery economists, etc., could be invited to participate. The length of these courses could be 2-4 weeks and the outline of the courses could be as follows:

- Introduction (about 1/3 of total time)

- (i) Relationship between project planning and national planning
- (ii) Essential components of fishery project preparation work
- (iii) Discussion and demonstration of techniques for evaluation of projects
- (iv) Sources of finance and procedures adopted by different banking institutions for project preparation

- Practical training - based on case study material (about 2/3 of total time)

- (i) Preparation of commercial fishery projects (vessels, processing plants, ice plants, etc.)
- (ii) Preparation of public fishery projects (fishery harbours, integrated industrial fishery schemes, artisanal fisheries programmes, etc.)

The Symposium may wish to comment on this proposal.

Sources and Uses of Project Funds

	Construction		Operation	
	local currency	foreign currency	local currency	foreign currency
<u>Sources of funds</u>				
1. Equity capital	x	-	x	-
2. Government budget	x	x	-	-
3. Medium and long-term loans	x	x	-	-
4. Short-term loans	-	-	x	x
5. Sales of produce	-	-	x	x
6. Total resources	x	x	x	x
<u>Uses of funds</u>				
1. Capital investment	x	x	-	-
2. Current assets	-	-	x	x
3. Production cost excluding depreciation	-	-	x	x
4. Interests on short-term loans	-	-	x	x
5. Payment of short-term loans	-	-	x	x
6. Interest on medium and long-term loans	-	-	x	x
7. Payment of medium and short-term loans	-	-	x	x
8. Taxes	-	-	x	-
9. Dividends	-	-	x	-
10. Reserves	-	-	x	x
11. Total uses	x	x	x	x

Note: (x) indicates likely entry to be made

Calculation of Internal Financial Return

Year	Investment Cost	Sales Revenues	Operating Costs	Cash Flow	Discount Factor at 18%	Discount Factor at 19%	Present Value at 18%	Present Value at 19%
0	-10,000			-10,000	1.00	1.00	-10,000	-10,000
1		8,000	6,000	+ 2,000	0.85	0.84	+ 1,700	+ 1,680
2		9,000	6,000	+ 3,000	0.72	0.71	+ 2,160	+ 2,130
3		11,000	7,000	+ 4,000	0.61	0.59	+ 2,440	+ 2,360
4		11,000	7,000	+ 4,000	0.52	0.50	+ 2,080	+ 2,000
5		11,000	7,000	+ 4,000	0.44	0.42	+ 1,760	+ 1,680
Total Net Present Value							+ 140	- 150

Internal Financial Return = 18.5%

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