

 Open access • Journal Article • DOI:10.2307/221067

Fishing for development : small-scale fisheries in Africa — [Source link](#)

Inge Tvedten, Bjørn Hersoug

Published on: 01 Jan 1994 - International Journal of African Historical Studies (Nordiska Afrikainstitutet)

Topics: Fisheries management, Fisheries science and Fishing

Related papers:

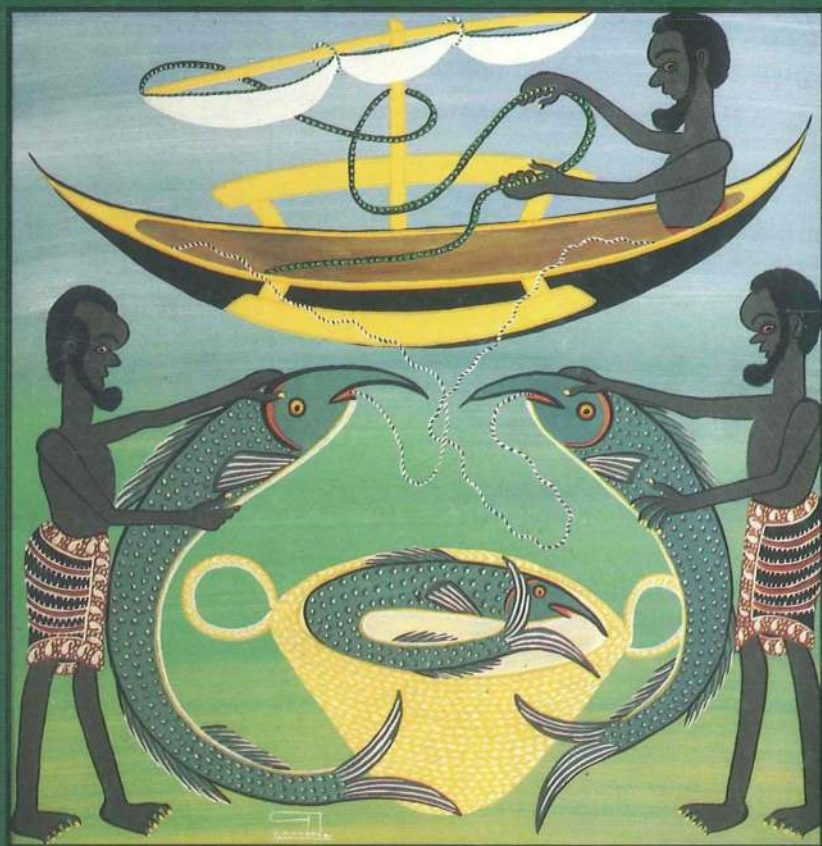
- [The Economic Theory of a Common-Property Resource: The Fishery](#)
- [Management Concepts for Small-Scale Fisheries: Economic and Social Aspects](#)
- [Managing artisanal/small-scale fisheries in developing countries: the need for a complementary approach.](#)
- [Developing New Fisheries in Western Australia.](#)
- [Managing Redundancy in Overexploited Fisheries](#)

Share this paper:    

View more about this paper here: <https://typeset.io/papers/fishing-for-development-small-scale-fisheries-in-africa-shkikIngpd>

FISHING FOR DEVELOPMENT

Small-Scale Fisheries in Africa



Edited by
Inge Tvedten and Bjørn Hersoug



Nordiska Afrikainstitutet
(The Scandinavian Institute of African Studies)

FISHING FOR DEVELOPMENT

Small-Scale Fisheries in Africa

Edited by
Inge Tvedten and Bjørn Hersoug

Nordiska Afrikainstitutet, Uppsala 1992
(The Scandinavian Institute of African Studies)

Indexing terms:

Small-scale fishery

Fishermen

Fishery development

Africa

Cover picture: O. Amonde, Tanzania

Typesetting: Inger Nygaard and Marianne Serck-Hanssen

Copyediting: Sonja Johansson

© Nordiska Afrikainstitutet, 1992

Printed in Sweden by

Motala Grafiska AB, Motala 1992

ISBN 91-7106-327-7

Contents

Introduction	7
<i>Inge Tvedten and Bjørn Hersoug</i>	
PART I THE ARTISANAL FISHERY SECTOR	
Industrial vs. Artisanal Fisheries in West Africa: The Lessons to be Learnt	33
<i>Jan M. Haakonsen</i>	
Ethnogenesis, Mobility and Politics in the History of West African Canoe Fishermen	54
<i>Mariteuw Chimère Diaw</i>	
Attitudes towards Modernization in African Small-Scale Fisheries	70
<i>Eyolf Jul-Larsen</i>	
Small-Scale Fisheries and the Evolutionist Theory of Institutional Development	91
<i>Jean-Philippe Platteau</i>	
Artisanal Fishermen and Intermediaries in Mozambique	115
<i>Vibe Johnsen</i>	
PART II ARTISANAL FISHERY DEVELOPMENT	
Limits to Aid: Some Considerations on Fisheries Development Aid Projects	135
<i>Bjørn Hersoug</i>	
Men, Money and Fisheries Planning: The Case of the Northern Province of Zambia	155
<i>Else Skjønberg</i>	
When is a Fishing Man a Fisherman?	173
Artisanal Fishery Development in Guinea-Bissau	
<i>Mette Bækgaard and Henrik Overballe</i>	
Management of Small-Scale Fisheries in Africa. Is it Possible?	191
<i>Ossi Lindqvist and Hannu Mölsä</i>	
Resource Management and Artisanal Fisheries: Relevance and Conditions	208
<i>Poul Degnbol</i>	

List of Participants	225
Notes on Contributors	226

List of Tables

Development aid to the fishery sector according to type of donor	21
Development aid to the fishery sector according to project/programme	22
Development aid to the fishery sector according to region	23
Artisanal fisheries share of total potential catches	37
Artisanal fishermen's contribution to domestic supply of fish by country	38
Canoes, motorization and number of fishermen in West African marine fisheries	41
Estimated number of artisanal fishermen, catch value and average annual earnings from the Zambian waters of Lake Tanganyika	162
Estimated number of artisanal fishermen, catch, catch value and average earnings on Lake Mweru Wa Ntipa	163

List of Maps and Figures

Global production of fish 1950–1988	20
The connection between catching operations, production and markets in the fishing sector in developing countries	25
Sofala province—Beira area. Fishing societies and centres of marketing and extension services for artisanal fishermen	118
A bio-economic model for fisheries management	137
The project cycle	146
Participation in the MFDC-project (Tanzania) 1987/88	149

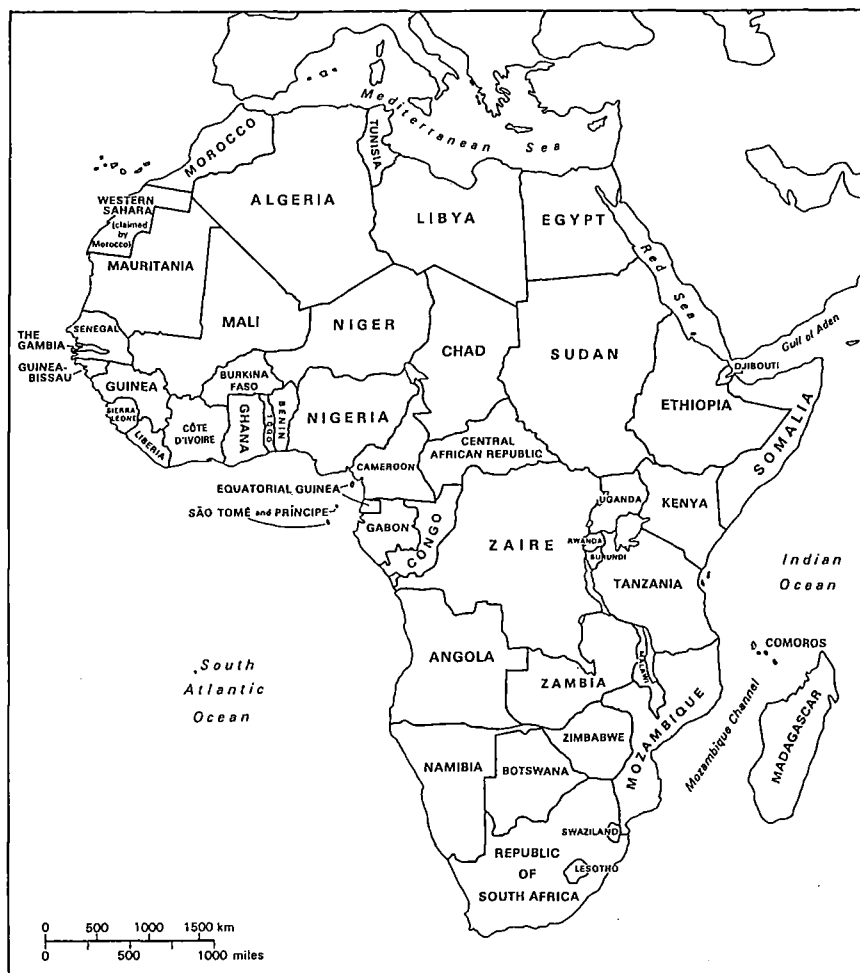


Figure 1: Political Map of Contemporary Africa
 Source: *Africa South of the Sahara*, 1992



Introduction

Inge Tvedten and Bjørn Hersoug

The artisanal fishery in Africa seems to have been a neglected sector among Nordic social scientists, compared with other systems of primary production. At the same time, the importance of artisanal fisheries as a source of animal protein and income is increasingly realized by national governments, and the artisanal fishery sector has for a long time had an important position in Nordic development aid.

The seminar "Socio-economic Conditions for Development of Artisanal Fisheries in Africa", arranged by the Scandinavian Institute of African Studies in collaboration with the Norwegian College of Fishery Science, was organized with the aim of assembling social scientists working with artisanal fisheries, to apprehend the "state of the art" and to identify research priorities for the future. Most of the invited participants were Nordic researchers, but social scientists from mainland Europe and Africa, as well as fishery scientists with a particular interest in socio-economic conditions, were also invited as resource persons (see List of Participants).

This book is a collection of the principal part of the papers presented at the seminar. They are of two main categories: One presents socio-economic aspects of the sector *per se*, while the other is concerned with artisanal fishery development efforts.

As the artisanal fishery sector seems to be fairly unknown to many social scientists and others interested in African affairs, we have chosen to include a more general outline of the sector in this Introduction. After a short presentation of fisheries in Africa in general and the artisanal fishery in particular, we briefly discuss types of external assistance to the sector, particularly development aid. Most of the issues raised will be treated in detail in the following papers. We have also included a brief note on research priorities.

FISHERIES IN AFRICA

Fish is an important source of subsistence and income for a large number of people in Africa. It is also an important source of revenue for several national governments. The continent accounts for 7.4 million metric tons or approximately 8 per cent of the world's total annual production, of around 92 million mt. Of the world's total production, developing countries account for about half, with Asia being the continent with the highest production (33 million mt) and with Latin America in second place with a total production of around 13 million mt. Africa's production has not increased significantly in real terms, but the continent contains some of the world's larger remaining underutilized resources even though there are also cases of severe over-exploitation.¹

As regards fish resources, the potential in Africa is estimated to be 10 million mt (6.8 million for marine and 3.2 million for inland fisheries). Actual total production is, as noted, 7.4 million mt for domestic and foreign fleets combined. The domestic marine production is 2.8 mt, of which the artisanal fisheries account for 42 per cent. Of the inland production of 1.6 million mt, practically all are domestic and artisanal catches. On a world basis artisanal catches account for 25 per cent of total production, and 40 per cent of the fish used for direct consumption.

As concerns trade, Africa has been a constant net importer of fish products since 1976. Over the period from 1970 to 1986, foreign trade with fish products has been characterized by a huge (400 per cent) increase in the quantities imported and only a moderate (20 per cent) increase in exports. Countries in West Africa (the CECAF zone) accounted for 60 per cent of the total import quantity. Principal exporters are currently Morocco, Senegal and Mauretania. The pattern as regards value of the trade is, however, different. Since 1984, earnings from exports exceed expenditure

1. The preceding data on global catch figures are taken from FAO, 1991. *FAO Yearbook. Fishery Statistics. Catches and Landings*, 1989. FAO Fisheries Series, 36 and FAO Statistics Series, 68. Rome: FAO. For the sake of comparison, 1986 data have been used. If not otherwise stated all subsequent data are taken from Bonzon, Alain and Benoît Horemans, 1988. *Socio-economic Data Base on African Fisheries*. FAO Fisheries Circular No. 810. Rome: FAO. All these data are from 1986. An updated version of the socio-economic data-base with 1989 figures will be published in the first half of 1992.

for imports with a net gain of USD 442 million registered in 1986. This partly reflects the importance of high value export of crustaceans, clupeoids and scianenids from Africa. Foreign fleets dominate especially in the fisheries for tuna, hake and horse-mackerel. The data does not take into consideration trade among African nations, which is significant, particularly in the artisanal sector in West Africa.

The per capita fish supply in Africa (including imports) is estimated to be 9 kgs a year. The equivalent supply in developed countries is 25 kgs. In Africa per capita supply has decreased overall in the 1970–1986 period from 11.5 kgs, meaning that total supply has not kept pace with the population growth (estimated at around 3 per cent per annum). Of the total supply of animal protein, fish is estimated to account for 35 per cent. As fish is a relatively cheap source of food in most of the countries concerned, the importance of fish among the poorest sections of the population is considerable.

The total number of full-time, part-time and seasonal fishermen on the continent is around 1.9 million, of whom 98 per cent operate in the artisanal sector. Employment in the secondary sector (processing, transport, distribution) is thought to increase the number of people involved in artisanal fisheries to nearly 10 million, or about 9 per cent of the total labour force in agriculture.

For future developments, it is especially noteworthy that as much as half of the marine production (and 38 per cent of total catches in African waters) is caught by foreign fleets. It is true that the foreign fleet has implications for Africa in the form of landings in host countries, licence fees, fishery development projects etc., but returns both in the form of fish for the population and revenue for national states could be improved significantly.

Regional variations

The aggregated data presented conceal considerable variations both as regards domestic production and consumption and the overall economic value of national fisheries.

Five countries (South Africa, Namibia, Angola, Mauretania and Morocco) account for 57 per cent of the marine potential. The zones of West Africa and Southern Africa (the so-called CECAF

and ICSEAF zones) together yield 88 per cent of marine production. Four countries (Nigeria, Egypt, Tanzania and Ghana) account for 47 per cent of the employment in the sector. The SADCC-region (principally Zambia, Tanzania, Zimbabwe and Malawi) accounts for 60 per cent of total inland catches in Africa. Regarding consumption, fish supplies per capita vary from close to 50 kgs per year (Seychelles, Congo) to less than 3 kgs per year (Ethiopia, Mozambique and most of the landlocked countries).

In a broad perspective, fisheries is most important in the western and southern part of the continent, and least important in the east and north. This has partly to do with the resource situation, but also with national fishery policies and tradition. The discrepancy between resources and catches is particularly high off the Horn of Africa and in the Red Sea. However, whereas the trend on the western coast of the continent is characterized by stability of catches since 1973, catches have dropped from 1973 to 1986 for the main producers in Southern Africa. The Mediterranean/Red Sea area and the countries bordering the South West Indian Ocean (the SWIO zone) show a sustained pattern of growth at an average rate of 3 per cent and 2.6 per cent per year respectively since 1970.

Opportunities do exist for accelerating development in the marine and inland catch sectors, as well as in aquaculture. But there are obviously numerous constraints to be overcome. Lack of equipment, technology and expertise are common problems which particularly affect development in the domestic industrial fisheries. Shortcomings with marketing and distribution channels, with pricing and credit arrangements, and with storage and processing systems are also widespread. At the level of regional economic groupings, mandates to organize joint approaches to the fishery sector are difficult to carry out in practice. And resources are unevenly distributed and exploited, which complicates the identification of priority areas for coordinated policies also regarding possible over-exploitation of fish resources.

Why artisanal fisheries?

When interest in the development of small-scale fisheries has increased among governments and international aid organizations,

this is related to five principle factors. First, the option of controlling fish resources increased with the establishment of 200 mile economic zones (EEZs) during the 1970s. Even though the practical implications of the right for domestic production of fish have varied greatly and in many instances been negligible, developing countries do have a tool for controlling their own fish resources. Secondly, the tendency during the 1950s and 1960's, both by governments and aid organizations, to copy large-scale western industrial fisheries have yielded a sufficient number of failures to initiate change of strategies. Thirdly, the production costs within artisanal fisheries are low and the employment effects considerable. Fourthly, a number of cases (like Mozambique and Senegal) have shown that artisanal fisheries may become economically viable also from a national point of view. And finally the production potentials within fresh-water fisheries in general and to some extent also aquaculture have been increasingly realized.

THE ARTISANAL FISHERY SECTOR

Traditional definitions of what constitute the artisanal fishery sector have emphasized characteristics like simple technologies, low level of productivity and socially and geographically constrained systems of distribution. Others have argued against formal definitions on the ground that they preclude the many points of articulation between industrial and artisanal fisheries, subsistence and commercial fisheries, etc., ending up with characterizations emphasizing the small-scale of artisanal adaptations and their inherent constraints for development. A classical definition (Smith 1979:3) states that:

Artisanal fisheries are normally carried out by small-scale fishing units, often consisting of kin groups using small, occasionally powered boats or none at all. The fishing activity is often part-time, and household income may be supplemented by other non-fishing activities. Payment to fishermen is often on a share basis and vessels and gear are usually owner operated. Gear is normally operator assembled and requires minimal or no machine assistance to operate. Investment levels are relatively low, with capital often borrowed from those who market the catch. Catch most often does not enter larger markets, but is sold at dispersed points of landing. And part or all of the catch is operator or family consumed.

Whereas the delimitation given no doubt still hold true for most artisanal fishery adaptations, recent studies have increasingly emphasized cases of highly productive and commercially oriented adaptations and the economic potential inherent in the artisanal fishery sector. Most commonly these cases are taken from West Africa and socio-linguistic groups like the Fante, the Nyominka, the Ewe and the Wolof, but there are also cases of highly productive and commercially oriented production groups in contexts normally associated with more subsistence oriented adaptations.

In line with this, artisanal fisheries in Africa contain adaptations ranging from the highly specialized fisheries of the Fante, with motorized canoes up to 15 meters in length, crews of 15–20 full time fishermen, highly sophisticated gear including purse-seines and trawls, seasonal or semi-permanent migration to main fishing sites and markets, and intense and extensive involvement in capital markets of exchange; to adaptations in inland floodplains and rivers like that of the Bayei of the Okavango where simple traditional gear like fish-fences and tubular traps are used, the fishing is carried out by individual fishermen (who most often are women), fishing is one of several economic activities pursued by the fishermen and catches are solely used for consumption.

Despite the apparent gulf between different fishery adaptations, however, there is a set of common denominators related to the sector which, in one way or another, is important for explaining the characteristics found.

The external dependency of the sector

One such characteristic is the external dependency of the sector, meaning that fishermen and others involved in production and distribution are influenced by external processes to which they largely have to adapt.

Most artisanal fishermen will rely on productive means that are produced outside their local context. Only in rare cases, such as in certain floodplain and river fisheries, will all means of production be produced locally. Otherwise both fishing-gear (nets, hooks, lines, etc.) and boats, sails, outboard motors, ice, salt and sometimes even bait often have to be acquired through external channels. For motorized production groups, moreover, access to motor

oil and gasoline will also have a determining influence on productive capacity. In line with this, outboard engines from the United States and Japan, nets and lines from China and Korea and hooks from Norway are found in the remotest fishing villages.

Furthermore, most fishermen producing beyond mere subsistence will rely on some type of external market of exchange for the sale of their fish, either directly or through intermediators. The prices will, in normal cases, fluctuate due to processes beyond control of the individual fisherman such as national supply and demand, government decisions, changes in consumer preferences, etc.

Finally, the industrial fleet influences all maritime artisanal fisheries and also some of the larger inland artisanal fisheries (like in the Kariba, Malawi, Tanganyika and Victoria lakes). The influence is both indirect through the industrial vessels' impact on the resource situation and price levels on fish, and direct through their physical presence in waters used by the artisanal fleet. Trawlers too close to the shore (i.e. inside the 3 mile limit normally being defined) may ravage catch, destroy gear and even jeopardize the lives of artisanal fishermen.

The external dependency is currently clearly demonstrated through the impact of the structural adjustment programs now being implemented in most countries in Africa. Common austerity measures such as import restrictions (on outboard engines, gear, gasoline, etc.), export incentives (often on exportables such as shrimp) as well as liberalization of prices and the creation of a generally more commercial economic environment, are now profoundly changing artisanal fishery adaptations throughout the continent.

The variability and insecurity of catches and income

A second general characteristic of the artisanal fishery sector is related to the variability and insecurity of catches and income. The risk-aspect is partly the outcome of characteristics of the fish resource itself, with migrations, fluctuating accessibility and susceptibility to environmental degradation and overfishing. The vulnerability of fish resources is exacerbated by the open-access to fish in most settings. The individual fishermen often have no

choice but to continue fishing even when biological and economic overfishing is apparent. Fishermen will as a response try to increase their own production in relation to that of others through enhancement of fishing effort, development of particular skills, adoption of innovations and technical change or an effective management of information and capital. The alternative response, which is to indulge in types of cooperation or conflict-solving devices, like regulation of access to fishing-grounds or use of gear, is more difficult to establish (cf. "the tragedy of the commons").

Other more immediate reasons for the insecurity of catches and income are the necessity of staying ashore due to weather conditions, destruction or loss of essential equipment such as gear, inadequate supportive infrastructure (which is particularly important in fishing due to the need to process or distribute rapidly as the fish easily spoils) and illnesses and injuries due to the hardships involved in the occupation.

Fish and fish products also tend to give fluctuating and often low prices. In the fishing communities themselves many people will have direct access to fish which lowers demand, and in larger markets of exchange the bargaining position of fishermen is often weak due to the mentioned need to distribute the fish rapidly and, as we shall see, dependency relations with people outside the production process.

The insecurity of access to fish for consumption and income has a number of implications for the nature of artisanal fishery adaptations. One such implication concerns the internal organization of production units. The economic insecurity is commonly thought to imply some form of sharing system where the fishermen receive portions of the catch rather than fixed wages or payment in kind. Shares are normally allocated to both labour and capital. Allocation to different crew-members may vary with factors like skill and experience, relationship to owner of boat and gear and general status in the local community. It has been noted that relations tend to be relatively egalitarian in relation to those found in other systems of primary production. One reason, it is argued, is the central importance of each worker both for productivity and avoidance of disaster. There are, however, also numerous examples of considerable differences in income between owners and crew, particularly in settings with more capital intensive fisheries.

The insecurity of the profession also has implications for recruitment to the fishery sector. There seems to be an emphasis on skills and personal qualifications at the expense of kinship and friendship relations, although this pattern is far from universal and depends on the type of fishing in question. A non-qualified person will not only produce little for himself, but also have negative effects on the productivity of the production groups as a whole. In addition, employing non-relatives seems to be a way to avoid redistributing surpluses, particularly among more commercially oriented production units.

A final implication of the insecurity of fishing to be mentioned regards the prevalence of ritual and magic. Several studies have found a clear correlation between the degree of economic and physical risk and the number and importance of ritual observances. Magic and ritual influence fishermen's behaviour and strategies both in their work situation and in their relation to non-fishermen. Examples of the former are when specific fishing-grounds are to be avoided, particular rituals are to be observed when going to and coming from the sea, when specific types of fish are to be avoided and when amulets or other objects are to be attached to boats in order to improve catches and avoid disasters. Observances towards non-fishermen involve conversion barriers related to the exchange of fish, when people from specific social groups are to be banned from the occupation and avoidance rules in relation to women. Rituals and magic will in most cases be considered an integral part of fishing technologies rather than "additions", and should be treated as such by external institutions.

The interdependence between the processes of production and distribution

The important role of middlemen and middlewomen as links between production and distribution is yet another basic characteristic influencing most artisanal fishery adaptations. Besides the need to acquire capital and credit from non-formal credit institutions, the importance of intermediaries is the outcome of the need to distribute the fish rapidly for processing or consumption. The fishermen themselves are normally not in a position to do this, as distribution is immediately preceded by long and hard hours at

sea and the exchange process requires special skills and continuous involvement. Furthermore, middlemen and middlewomen will often represent a security for the fishermen as the former will be interested in maintaining production also in times of difficulties resulting from low production, loss of gear, etc. And artisanal fishermen, often living in marginal coastal areas with few if any alternative income earning possibilities, are increasingly dependent on money and markets of exchange for their general survival and well-being.

In economic terms the relation between fishermen and intermediaries is generally considered to be of an asymmetrical and exploitative nature. Through their organizational advantages in relation to individual production groups, and the dependency implied by their money-lending and purchase of fish, the intermediators are in a position to define repayment conditions, acquire a hold over the supply of fish and in some cases also directly influence the organization of production. Extraction of surplus value may be considerable and the interests on loans high. Also for the relations of a smaller scale, as between fishermen and their wives, the economic relation may turn significantly in favor of the intermedator.

From an economic point of view, such relations may have negative implications for producers both as regards options for capital accumulation, investments of time and labour and hence productive capacity and performance. At the same time, however, studies related to economic relations in artisanal fisheries show that the nature and implications of the type of relations in question are the outcome of a broader set of socio-economic and cultural conditions than strictly economic ones. The social relations between producers and intermediators also involve factors such as access to economic resources beyond those involved in the exchange relation *per se*, they may represent vital socio-economic security for the fisherman and his family and they may influence the socio-cultural status of both the fisherman and the intermedator. Furthermore, the nature and outcome of the relations are influenced by the fact that fishermen/intermediators often will be involved in a complex network of interlocking social ties as relatives, friends, neighbours, political and religious affiliates, etc.

The separation of women from the production process

Implicit in the discussion so far has been a fourth basic characteristic of artisanal fisheries, namely the separation of women from the production process. Given the fact that women account for the bulk of the work-load in other systems of primary production, and have the principle responsibility for the well-being of children and other non-producers in most rural societies, this is a characteristic with significant implications.

Theories of male stamina and strength have been forwarded as main explanatory factors, but knowing the work load of women in other systems of production (as in arable agriculture with tasks like clearing and destumping, hoeing, weeding and harvesting) and on the domestic scene (fetching water and firewood, rearing children, cooking, house-construction and repairs, etc.), this is at best a partial explanation. More plausible reasons seem to be the physical separation of fishing from local and family life, the traditional role of men as producers and managers of surplus income and the tendency in many societies of allocating activities of socio-cultural importance to men (cf. hunting). The last point is substantiated by the characteristics of most fishing communities where women do have a role in production. It is most common in inland fisheries, where fishing normally is less important and carried out on an individual basis.

The fact that women do not normally take active part in fish production does not, however, mean that their role is irrelevant. First, we have already shown that they have important roles in the distribution of fish, which ultimately determines the economic returns for the fishermen and their families. Secondly, women are often providers of input factors like bait, ice, salt and provisions. Thirdly, they may mend equipment like nets, traps and hooks. And fourthly, women are often central in the processing of fish (salting, drying, smoking, etc.).

The combination of fishery with other sources of subsistence and income

The final characteristic of the artisanal fishery sector to be treated here follows from the ones treated above, and this is the dominant

tendency to combine artisanal fisheries with other sources of subsistence and income.

Both the low income earning capacity of most small-scale producers, the variability and insecurity of catches and income, the investment requirements for improving productive capacity and the separation of women from the production process imply that fishermen and their households must be involved in other income earning activities. Arable agriculture is the most relevant alternative system of production, and access to land will in most cases be perceived as economically more secure and socially more important than artisanal fisheries. Other typical alternatives are petty trade, extraction and sale of local products like firewood and palm tree extracts, and production of artifacts. Some active fishermen will also be involved in fishery-related activities like production or mending of gear, boat building and acquisition of bait and salt. Women involved in fisheries will, in most settings, have time consuming and heavy responsibilities on the domestic scene. An otherwise important sector like pastoral production is less relevant in most coastal settings. And active fishing is difficult to combine with formal employment due to the irregular hours, even though involvement through ownership is possible and also takes place.

The possibility of combining small-scale fishery with other systems of production and income will depend both on the composition of the family, and the household resource situation. Poor households will be most dependent on alternative sources as a risk reduction strategy, but will also be in the least favourable position to do so. Richer households have a wider range of alternatives, and will also have the option of concentrating their labour, time and resources in one or a few sectors should this be optimal from an economic point of view.

From the point of view of the fisherman, the combination of activities may be totally rational. If the fishing fails, both food and income must be obtainable from other sources. Also for households with means to invest in fisheries, other sectors may present themselves as better from an investment point of view. From the point of view of fishery development, however, involvement in other sectors will easily present itself as counterproductive. A number of fishery development projects have failed for the appa-

rently "irrational" behaviour of fishermen involved, and the importance of seeing fishermen and fisheries in its larger socio-economic context is evident.

THE ARTISANAL FISHERY SECTOR AND EXTERNAL ASSISTANCE

In most developed and developing nations, the state plays a crucial role in the administration and development of larger-scale fisheries. Also historically the state has supported industrialized fishing, either organized as state owned companies (parastatals) like in Ghana or Tanzania, or in concert with private interests, like in Senegal or Morocco. When the state has played a supporting role the response from fishermen, producers and exporters have usually been up to the challenge. State intervention has been based on the idea that development can best be initiated from above and that "modernization" is the best strategy. "Modernization" usually means industry-based fishing vessels, where the existing fishing fleet and methods are considered obsolete, "backward", etc. As Platteau (1989:590) remarks:

Given this policy orientation it is puzzling to note that artisanal fishing and related activities have not receded into the background, but have actually made an important contribution to the growth of fish production and fish exports—not to speak of their contribution to employment—in many developing countries, especially in Africa and Asia.

This is to say that when artisanal fishing has survived and developed, it has more often been *in spite of* government efforts than because of their involvement.

In many African countries, the large number of small-scale fishermen are not linked directly up with the government apparatus. They sell their products through local middlemen and receive their inputs from them as well. They do not depend on formal credit arrangements and very often their actual fishing goes on independently of any state regulations or surveillance. In such instances the state has only a limited possibility of influencing the direction of development, or more often: the state supports or runs the (limited) modern, industrialized sector, while the artisanal sector is left to fend for itself.

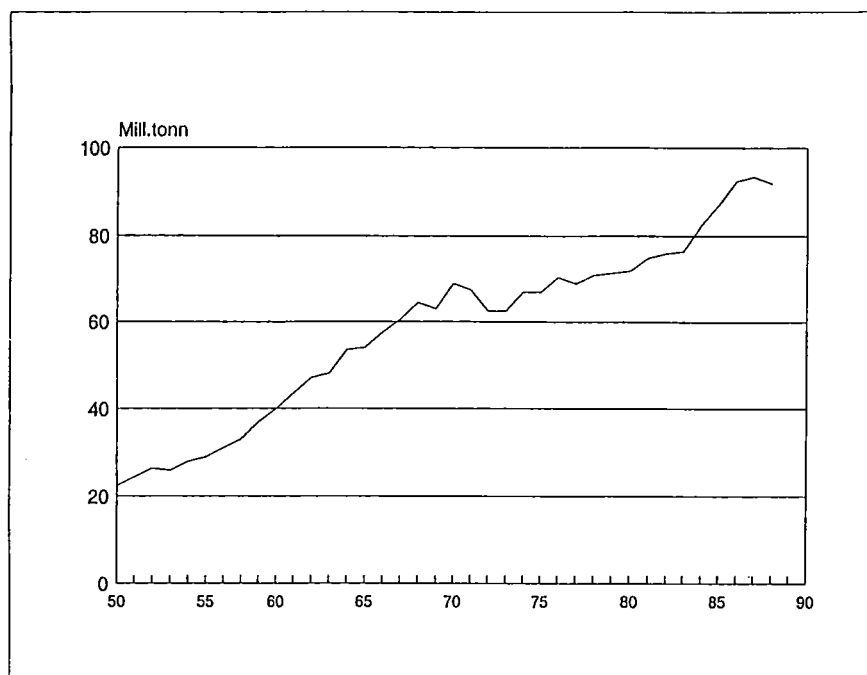


Figure 1. *Global production of fish 1950–1988*

Aid and trade

From Figure 1 it is fairly easy to understand why the developing countries would like to copy the fishing strategy of the industrial nations: in the 1950s and 1960s the annual growth in catches was approximately 6–8 per cent. However, the frontrunners experienced severe problems, both in terms of maintenance, lack of industrial infrastructure and in entering controlled markets. Without development aid the industrial fishing strategy would probably never have materialized in the African context. In this period we find a coincidence of a “modernization” strategy both in the developing countries and among the main donors (aid organizations, national as well as multi-national). By copying the fishing development of industrial countries themselves, developing nations were thought to be in a position to leap-frog forward. Some countries succeeded, at least for a period. Mauritania, Ghana and

Table 1. *Development aid to the fishery sector according to type of donor (USD'000)*

	1975	1977	1979	1981	1983	1985
Multilateral	64.2	72.8	108.4	176.5	221.2	222.3
EEC	1.0	1.4	3.1	11.7	19.9	30.3
OPEC	15.3	7.1	12.7	21.2	20.0	27.3
Bilateral	56.1	82.1	171.6	191.8	238.4	137.5
Total	136.6	163.4	295.8	400.9	499.5	417.4

Source: Josupeit, 1984.

Nigeria built up large, well-functioning industrial fleets. Other countries, like Ivory Coast, experienced economic catastrophies.

By the beginning of the 1970s the industrial paradigm experienced a crisis. First, resources were no longer abundant. FAO experts (Gulland, 1971) warned about the "resource ceiling", and the growth rate stagnated. Secondly, the prices of industrial inputs increased dramatically with the oil crisis (1973). Thirdly, in 1972 the first Law of the Sea (LOS) conference opened in Caracas, indicating the closing of the era of open access. It was evident that the industrial strategy had to be changed or at least revised. But reactions were at best slow.

Development aid in the fishery sector actually started with the Kerala project (later the Indo Norwegian Project, INP), initiated by Norway in 1952. But generally the international engagement was very limited in the 1950s. A strong push forward took place in the mid 1960s, with the establishment of European Development Fund (EDF) and the engagement of the World Bank from 1964 and the establishment of UNDP in 1966. At the same time the bilateral aid to fishery projects increased. Still, by 1984 the fishing sector occupied only 3 per cent of the total development assistance, amounting to 3.3 billion NOK, or 550 mill. USD. The very same year the total value of fish-trade between nations amounted to 16.5 billion NOK, or 2.75 billion USD. The table above (Table 1) can give some impression of who are the most important donors in the fishing sector.

Table 2. *Development aid to the fishery sector according to project/program (USD '000 and per cent)*

	1978	%	1981	%	1984	%
Research	21.3	10.4	36.6	9.1	37.5	7.6
Small-scale fisheries	34.6	16.9	73.7	18.4	84.1	17.0
Industrial fisheries	40.4	19.9	49.4	12.3	86.8	17.6
Vessels and infrastructure	65.3	31.9	131.4	32.9	120.4	24.5
Processing and marketing	7.0	3.4	14.1	3.5	35.9	7.3
Aquaculture	18.9	9.2	61.0	15.2	82.0	16.7
Economics/planning	10.7	5.2	16.9	4.2	17.0	3.5
Training	6.3	3.1	17.7	4.4	28.7	5.8
Total	204.5	100.0	400.9	100.0	492.4	100.0

Source: Josupeit, 1984.

As can be seen from Table 2, small-scale projects did not constitute more than 17–18 per cent of the total amount of development aid to the fishery sector between 1978 and 1989, being relatively stable the whole period. The industrial projects experienced a downward trend in 1978, but are back with 18 per cent in 1984. If we calculate that a considerable part of vessels and infrastructure also refer to the industrial sector, nearly 50 per cent of the total aid is used for industrial-based development projects. Unfortunately we do not have any calculations for the latter half of the 1980s for all donors. For the EC we have a calculation showing that artisanal projects received 25 per cent of the EC funds in the period 1985–89.

Even if these calculations are very crude, they indicate that there is a long way from the small-scale rhetoric to a situation where small-scale, artisanal projects receive their fair share. One reason why small-scale projects do not receive more aid is probably that they fit badly into the profile of the development aid organizations, requiring relatively small sums of money but large quantities of administrative work.

If we take a look at the receiving side (see Table 3 below), there is a pattern of relative stability. Asia receives 40 per cent, Africa 30 per cent and Latin America 20 per cent. But calculated on the basis of inhabitants or the number of fishermen, there are great differences. African countries receive twice as much as Asian countries,

Table 3. *Development aid to the fishery sector according to region (Per cent. USD per 1,000 inh. and per fisherman)*

	1978-85 %	USD per 1,000 inh.	USD per fisherman
Asia	40	124	129
Africa	28	243	62
Latin America	20	175	91
Near East	9	113	143
Oceania	2	1,842	105
Caribbean	1	178	75

Source: Josupeit, 1984 and North Sea Centre Group, 1988.

both in terms of inhabitants and per fisherman. This pattern makes sense, considering that Africa contains 24 of the 36 least developed countries in the world (the LDCs).

Talking specifically about the Nordic countries, all of them have been (and still are) involved in fishery projects in Africa. However, the types of projects, their orientation and extent differ. Finland (FINNIDA) has mainly been occupied with fresh water fisheries, and especially resource assessments. Sweden (SIDA) is engaged in all the former Portuguese colonies with fishing projects (Angola, Moçambique and Guinea Bissau), ranging from educational institutions to direct inputs in production. Denmark (DANIDA) has concentrated much of their efforts on the delivery of freezing and cooling equipment to a number of African countries. Iceland (ICEIDA) has worked both with artisanal projects (Cape Verde) and industrial fisheries (Namibia). While Norway (NORAD) is involved in a number of projects in East Africa and the SADCC countries, ranging from institutional support in Moçambique and Namibia, to an educational institution in Tanzania, aquaculture developments in Zambia and resource assessment in Zimbabwe and Zambia. In addition NORAD is, in cooperation with FAO, running a research vessel (Dr. Fr. Nansen) assessing the fishery resources on the African coast as well as the coasts of other Third World countries.

In terms of the importance of fishery aid in relation to total bilateral assistance, practically all the (albeit still limited) aid from Ice-

land goes to fishery projects. For Denmark and Norway the fishery aid represents a little over and a little under 3 per cent respectively (1990), whereas the fishery aid from Sweden and Finland is more limited.

CONCLUSIONS

The fishing sector in Africa is not homogeneous. It varies both in terms of species, catching devices, fleet composition, production methods, markets and institutional arrangements. Hence it is difficult to produce sweeping generalizations valid for all or a great number of countries. On the other hand, we know that the artisanal sector generally is well established and has been able to expand its activities. During the last ten years more resources, both locally and in terms of foreign aid, have been directed towards artisanal fishing. Still there is a conflict in most developing countries between artisanal fishing and industrial fishing. This conflict applies to fish resources as well as credit, institutional support and market arrangements. With the establishment of EEZs, the developing nations suddenly had some options as to how to develop the (marine) fishing fleet. The option of using foreign fleets in order to obtain monetary compensation have proved attractive to a number of countries. For the developed countries, with a large overcapacity within their own domestic fleets, this has been primarily a commercial transaction. When coupled with aid, some of the agreements have proved more beneficial for the developing countries. Still, there is widespread discontent with the behaviour of the distant water fleets, especially since their catching operations have been so difficult to control.

In the end, the different developing nations have to decide for themselves what is the most appropriate strategy and the ultimate goals for their own fishing industry. As researchers, the best thing we can do is to investigate the experiences of others and try to uncover what is really happening when a country is embarking upon a certain strategy. It is easy to put up the two poles; either industrialized fishing or artisanal fishing. But the most interesting theme is: what is happening in between the two ideal types, what is the development direction, how do the different types of fishing

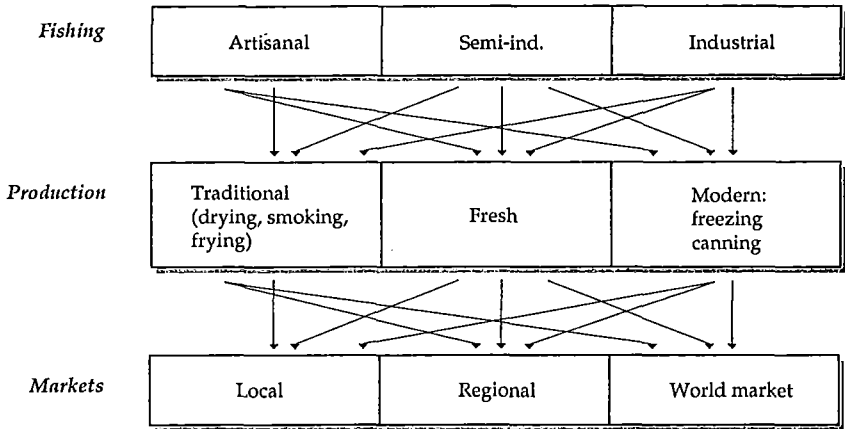


Figure 2. *The connection between catching operations, production and markets in the fishing sector in developing countries*

interlock with each other, etc. As can be seen from Figure 2, we find 25 other combinations of fishing, production and markets in addition to the two "ideal types" of industrialized and artisanal fisheries.

The challenge is to develop the best "mix", taking into consideration traditions, resources and development goals. Naturally, this mix of different fishing strategies will vary over time. In India, they say that "Daughters and fish are no lasting commodities". The same can be said about fishing development strategies.

Research priorities

From the previous brief presentation of artisanal fisheries and fisheries aid in Africa, it follows that the range of possible social science research is enormous. Even if we combine European research with local African research carried out, we have just started to understand part of the dynamics involved in artisanal fisheries in Africa. Actually, we still know more about the different species of fish in African waters than we know about African artisanal fishermen, both in terms of quantity, migrations and internal dynamics.

We have no intention of setting up a research agenda; research-

ers are connected with different institutions, in different countries, with different qualifications, doing their research under very different conditions. No wonder they have different fields of interests and different priorities, which is evident from the following ten articles. On the other hand, these articles also give an impression of "the state of the art" and hence, where we find the most challenging questions for further research.

First and foremost, the Nordic researchers have to make up their minds as to what kind of priorities they should make; development research or development aid research? Even if the answer hardly is either or, the choice has some very important implications. When the Nordic countries have decided to concentrate their development efforts in the SADCC region, this means that a number of the most interesting countries from a fisheries point of view, located in Western Africa, fall outside the scope of their research. For very natural reasons, researchers have tended to follow the path made by the development aid organizations, which means that Nordic researchers have done most of their work in East Africa, in the SADCC region and in some selected countries in West Africa, like Guinea Bissau.

As shown in this volume, among others by Jul-Larsen, Diaw and Haakonsen, three of the most interesting countries from a fisheries point of view are situated in West Africa (Ghana, Senegal and Nigeria). Furthermore, Mauretania and Morocco have for a long time been established as important fishing nations, while other countries have the potential of becoming important. Therefore, there are good reasons for *not* following the 'aid track'. Or formulated more positively: in order to understand the dynamics involved in artisanal fishing in Africa, Nordic research should be given the opportunity to follow the development also outside the countries selected for development aid.

Following the very simple division of this proceedings between socio-economic conditions of the artisanal fishery sector *per se* and artisanal fishery development, some research priorities should, finally, be mentioned more specifically:

1. Following the line of argument both in Jul-Larsen's and Haakonsen's contribution, a central and puzzling question is why some ethnic groups have adapted so successfully to fish-

ing while others, who may have considerable maritime experience, never get beyond the very simple operations, despite heavy government involvement and external assistance. If it is correct that most African economies can adequately be described as 'economies of affection', how come that these particular ethnic groups have succeeded in circumventing or escaping the pressure from the larger family and local community, thus accumulating and setting up larger fisheries enterprises? On the other hand, Jul-Larsen is claiming that these enterprises are not capitalistic. But what are they then, what are their special characteristics and where do they differ compared to more standard Western capitalist enterprises?

2. As shown in this introductory article, as well as in other contributions, artisanal fisheries have some very special characteristics. Artisanal fishermen normally combine fishery with other occupations, they relate to intermediaries both for capital and inputs in production and the distribution and processing of fish, and, directly or indirectly, they relate to the state either through the regulation of inputs or through the regulation of markets. In order to understand the dynamics of artisanal fishing, these relations have to be researched more thoroughly.

As regards intermediaries in particular, the debate about their role has been going on for more than ten years, especially concentrating on the Asian context. But the debate is equally interesting for Africa. As shown by the contributions of both Johnsen and Platteau, the answer is not as simple as often suggested; that fishermen are exploited or suppressed by middlemen. Actually middlemen (who, as noted, often are women) perform a number of functions, and their relations to the fishermen are complicated, depending on competition, markets, lending opportunities, etc. A more accurate description of the relation between fishermen and middlemen is certainly required also in order to understand the role and functioning of development aid and the state.

3. A capitalist style of development, including the industrialization of fisheries, has in the past been considered the only viable way for most African fishing nations. However, as shown by Haakonsen as well as Platteau, the capitalist style has not been a success in Africa, at least not with the state in charge. Still, the

relation between the modern and the traditional is much more complicated. A great number of the most 'advanced' artisanal fishermen have acquired their ideas and technical improvements from their experience with industrial fisheries proper. Furthermore, we find in a number of countries a fleet which could be labelled 'semi-industrial', i.e. taking some important features from industrial fishing, while others are closely connected with traditional fisheries.

Hence, a more detailed picture of the 'modern' fishery compared to the 'traditional' one is required. We also know that the relation is marked by conflict; industrial vessels use the same resources, supply the same markets and utilize the same subsidies as the more traditional fishermen. But the story is more complex; fishermen are moving back and forth between adaptations, technologies are adapted, markets discovered, etc.

4. Turning to the development aid research, it is evident from the contributions of Skjønberg, Hersoug and Bækgaard and Overballe that also the Nordic countries have their fair share of project failures. As Skjønberg indicates, a more comprehensive knowledge of the socio-economic situation for the artisanal fishing communities could have improved the quality of planning and implementation—a point which is clearly demonstrated by Bækgaard's and Overballe's story from Guinea Bissau: a fishing man is not necessarily a fisherman!

But as shown in Hersoug's contribution; it is not only a question of more information (or rather other information), it is also a question of more adequate project organization. And a central question remains unsolved: is it possible to implement an open ended fishing project based on popular participation?

5. In a period where the Nordic countries are turning away from the traditional production oriented projects, orienting development aid more towards education and institution building, it is worthwhile to raise the fundamental question posed in the article of Lindqvist and Mölsä: management of small-scale fisheries in Africa, is it possible? And if it is possible, in which way and for what purpose? The doubt concerning traditional western style models of resource management is further elaborated in Degnbol's contribution, where the message is that sometimes the imported 'resource management' by out-

siders can do more harm than good. The slogan 'adaptive management' was presented more than ten years ago, but what it means in different African contexts has yet to be elaborated.

6. Finally, it is worth noting that both African countries and their development partners are increasingly turning to joint ventures as a 'new' solution for utilizing the local fishery resources. Basically these joint ventures are considered as commercial activities, but most often they are combined with different types of development aid. The extent, the actual performance as well as the results of these companies, are to a large degree still unknown. What do the developing nations get back in return; in terms of fish, licence fees, education and technical support and what do they have to 'pay' in terms of overfishing, lack of control, dependency and blocking of national development possibilities?

Both for the artisanal fishery sector in general and fishery development aid in particular there are a number of important questions for research. A more comprehensive understanding could help us to escape some of the most traditional pitfalls in artisanal fishery development. Maybe the most important contribution of this volume is to underline the opinion that artisanal fisheries are not remnants, doomed to extinction as the 'modern fisheries' are expanding. On the contrary; more than 90 per cent of the fishermen and approximately 65 per cent of the domestic catch belongs to the artisanal sector. The further development of this sector also has to include the nearly 8 million people involved who are not fishermen. But the key problem is, as Haakonsen formulates it: How to communicate the experiences. This volume is a modest contribution.

REFERENCES

- Bonzon, Alain and B. Horemans, 1988. *Socio-economic Data Base on African Fisheries*. FAO Fisheries Circular, 810. Rome: FAO.
- FAO, 1991. *FAO Yearbook. Fishery Statistics. Catches and Landings*, 1989. FAO Fisheries Series, 36 and FAO Statistics Series, 68. Rome: FAO
- Gulland, J.A. (ed.), 1971. *The Fish Resources of the Ocean*. West Byfleet, Surrey: Fishing Books Ltd.

- Josupeit, Helga, 1984. *A Survey of External Assistance to the Fisheries Sector in Developing Countries 1978–1984*. FAO Fisheries Circular, 755. Rome: FAO.
- North Sea Centre Group, 1988. *Evaluation of the EEC's Fisheries Development Project and Policy. Synthesis Report*. Hirtshals, Denmark: The North Sea Centre
- Platteau, J.-Ph., 1989, "Penetration of Capitalism and Persistence of Small-Scale Organizational Forms in Third World Fisheries", *Development and Change*, 20,4.
- Smith, I.R., 1979, "A Research Framework for Traditional Fisheries", in *ICLARM Studies and Reviews*, 2. Manilla: International Centre for Living Aquatic Resources Management.

PART I

The Artisanal Fishery Sector

Industrial vs. Artisanal Fisheries in West Africa: The Lessons to be Learnt

Jan M. Haakonsen

Ever since the Industrial Revolution in Europe, the very word industrialization has almost invariably been associated with progress, economic growth and prosperity, at least up to the comparatively recent concerns with the potential damaging effects of industry on the environment. If there has been one area where "capitalists" and "marxists" have been on common ground, the belief in the necessity of industrial development to achieve economic growth must be the one.

The fisheries sector has been no exception. Its industrialization in Europe and North America can be said to have started in the second half of the 19th century with the introduction of steam engines on fishing vessels which in turn allowed for the installation of winches, refrigeration systems, etc., culminating in some of today's giant factory ships with all the latest navigation, fish detection, processing and preservation technologies.

It is not surprising then that the industrialization equals progress belief was readily accepted as a guide for developing the often marginally exploited fisheries sector in the new emerging nations in Africa in the 1950s and 1960s. Whatever fisheries existed they were, in their very basic artisanal form, seen as backward and inefficient and bound to disappear over time once the industrial part of the sector "took off", to use a prevailing development terminology from the 1960s.

A third of a century later, we can see that these expectations were ill-founded. In West Africa, only in a couple of countries did industrial fisheries "take off", and then only to a moderate extent and with a limited degree of success. The "backward" artisanal fisheries, on the other hand, has prevailed, expanded and even prospered by comparison, adopting simple, but efficient technological innovations on its way.

This paper seeks to review this unexpected development. It is perhaps written from a somewhat subjective point of view, but arguably based on realities, both well documented facts and not-so-well researched impressions. The purpose is to identify some of the lessons that can be learned from experiences in the region. On the one hand, we have very interesting historical lessons, starting with the truly indigenous, precolonial fisheries, their developments over centuries, and the key technological innovations which have brought the artisanal fisheries to their present stage. On the other hand, we have several distinct national fisheries developments with two West African countries standing out as more "advanced" than the others.

Ten years ago, Rowena Lawson advised that it would seem "useful that lessons learnt in the more advanced countries, or those having more experience of fisheries growth and change, should be studied and recorded so that other countries may benefit" (1980:10). Simple and logical as this advice may be, it has been followed to a surprisingly limited extent. National fisheries authorities and international development agencies have tended to do things their own way, alas frequently with depressing results, while a closer look to the fisheries experiences in countries like Senegal and Ghana could probably have prevented them falling into many a pitfall.

WEST AFRICAN ARTISANAL FISHERIES

Artisanal fisheries can easily be an ambiguous term or, perhaps more correctly, a relative term. An "artisanal fisherman" in the North Sea, who may use sophisticated electronic fish detection devices in addition to advanced navigation systems in his daily activity, is obviously quite different from somebody making his living by using an unmotorized dug-out canoe on the East-Central Atlantic coast. Using the term "small-scale" fisheries which many prefer, does not solve the problem, as the term remains relative to the situation it describes.

Platteau (1989) regrets this lack of a clear definition and outlines two different ways of determining small-scale or artisanal fisheries, one restricting the term to beachlanding fishing units,

another on the active participation/management of the fishing operations. There are problems with both definitions, and it is probably impossible to arrive at a commonly agreed upon terminology, at least on a world-scale.

In West Africa, the situation is perhaps somewhat simpler as artisanal fisheries are usually taken to be the equivalent of canoe or pirogue fisheries, including planked versions such as the "Ghana-boat" in Sierra Leone and, to a very minor extent, fibre-glass duplicates of traditional vessels such as the Nigerian "banana-boat". Some would argue that small decked trawlers/purse-seiners and lineboats such as Ghana's "inshore vessels" or the "sardinières" and "cordières" of Senegal should be included in the artisanal fisheries category. They are usually not, however, perhaps chiefly because they are essentially restricted to the two countries mentioned where they are generally placed in the "semi-industrial" category.

Potentially more problematic is the question of distinguishing professional from part-time fishermen. A large number of the around half a million canoe fishermen in West Africa are in fact fishing very occasionally, either on a subsistence level or to supplement income which is mainly derived from another economic activity, usually agriculture. Most of these part-timers are characterized by the utilization of low-cost craft, usually one-three-man canoes, and the employment of gear requiring relatively moderate capital investments.

Yet, looking at vessels and fishing technology alone can be deceiving as many Kru-fishermen of Liberia, Vili of Congo or Sherbro of Sierra Leone rely on fishing as their only economic activity. On the other hand, many Serer and Nyominka of Senegal, using quite large motorized canoes which take them across several borders where they employ nets representing substantial investment, spend much of the year growing rice in their home villages in Sine-Saloum.

Perhaps the distinction "professional" vs. "non-professional" (usually part-time fishermen) can best be done on a socio-economic basis.

Firstly, we have to look at how much fishing is contributing to a fisherman's and his household's income; secondly, how much time and effort he puts into fishing; and thirdly, how he himself

and others perceive him or, in other words, whether his status in the community is that of a fisherman regardless of whether this may be "high" or "low" in his particular society. Of course, all this can be difficult to determine statistically, but in general the various elements are normally easily observed.

Thus, a professional artisanal fisherman in West Africa is a canoe fisherman deriving most of his income from and spending most of his working time in fishing activities. Any attempt to make a more precise definition is probably both futile and unnecessary.

WEST AFRICAN ARTISANAL FISHERIES FROM A MACRO-PERSPECTIVE

Over the years quite a few general overviews of West African artisanal fisheries have appeared and more will no doubt continue to appear (for example, Gerlotto & Stequert, 1978; Diaw, 1983; Pollnac, 1985; Everett, 1988 & 1989; etc). There is therefore no need to restate what is already better documented elsewhere. However, certain points can usefully be recalled and emphasized.

The first is that artisanal fisheries in West Africa plays a dominant role. 70 per cent of the fish landed from Cap Blanc to the Zaïre river are caught by artisanal fishermen from the sub-region, and in all countries, with the exception of Mauretania and possibly Ivory Coast, the portion caught by artisanal fishermen exceeds that landed by industrial vessels. It has not always been so, but the trend over the last twenty years has been the increasing share of fish supply provided by artisanal fishermen. Table 1 gives an impression of the strength of artisanal fisheries, though the data must be considered as primarily indicative as fisheries statistics in West Africa are often notoriously unreliable, particularly those pertaining to inland fisheries. When reading the table, it should also be remembered that a large proportion of the "total marine potential" consists of fish resources beyond the reach of artisanal fishermen, such as large pelagic species, meso-pelagic species and most resources living deeper than 50–60 m. For resources potentially catchable with small-scale fisheries methods in countries like Senegal and Ghana, local canoe fishermen are probably ap-

Table 1. *Artisanal fisheries' share of total potential catches (in tons)*

Country	Artisanal catches Marine	Inland *	Industrial catches	Total marine potential	% art. catches of mar. pot.	Total potential (mar. + inl.)	% art. catches of total pot.
Benin	8,300	31,500	825	12,000	69 %	42,000	94 %
Cameroon	30,000	20,000	23,136	62,000	48 %	118,000	42 %
Cape Verde	7,500	0	2,184	25,000	30 %	25,000	30 %
Congo	8,086	12,000	17,513	32,000	25 %	207,000	10 %
Ivory Coast	7,500	33,400	48,796	40,000	19 %	79,000	52 %
Equat. Guinea	1,254	450	0	19,000	7 %	19,400	52 %
Gabon	15,000	1,800	8,022	130,000	12 %	157,000	11 %
Gambia	18,131	2,700	2,218	75,000	24 %	86,000	21 %
Ghana	218,429	53,000	112,524	300,000	63 %	356,000	53 %
Guinea	30,000	2,000	3,080	270,000	11 %	280,500	11 %
Guinea-Bissau	2,000	100	1,701	250,000	11 %	250,800	1 %
Liberia	9,000	4,000	2,652	40,000	23 %	65,000	20 %
Mauritania	15,000	6,000	80,238	550,000	3 %	577,000	4 %
Nigeria	127,496	106,000	23,321	170,000	75 %	384,000	61 %
Sao Tomé and Prin.	3,500	0	1,500	17,000	21 %	17,000	21 %
Senegal	131,878	15,000	119,280	310,000	43 %	330,000	45 %
Sierra Leone	30,000	16,000	11,840	130,000	23 %	148,000	31 %
Togo	10,055	714	145	15,000	67 %	17,000	63 %
Zaire	1,000	100,000	2,548	6,000	17 %	330,000	31 %
TOTAL	674,129	404,664	461,463	2,503,000	27 %	3,318,000	33 %

* Includes brackish water lagoon fisheries, particularly important in the cases of Benin and Ivory Coast.

Sources: Mostly elaborated from Bonzon & Horemans 1988 except for 1st column which is mostly from Everett 1988, with some readjustment for more recently available data.

Table 2. *Artisanal fishermen's contribution to domestic supply of fish by country (in tons)*

Country	Total Domestic* Production	Imports	Exports	Net** Supply	% art. catches of net supply
Benin	40,625	7,481	145	47,961	83 %
Cameroon	73,136	340	6,731	150,745	33 %
Cape Verde	9,684	15	2,054	7,645	98 %
Congo	37,599	33,147	1,000	69,746	29 %
Ivory Coast	89,636	148,490	33,856	204,270	20 %
Equat. Guinea	1,704	2,366	149	4,070	42 %
Gabon	24,822	8,425	5,440	27,807	60 %
Gambia	23,049	8,500	5,672	25,877	81 %
Ghana	383,953	18,000	24,134	377,819	72 %
Guinea	35,080	3,051	0	38,131	84 %
Guinea-Bissau	3,801	230	1,260	2,771	76 %
Liberia	18,423	13,891	1,050	31,232	42 %
Mauritania	132,470	100	127,042	5,428	387 %
Nigeria	256,817	190,024	700	446,141	52 %
Sao Tomé and Prin.	5,000	n.a.	n.a.	5,000	70 %
Senegal	266,158	24,637	93,975	196,820	75 %
Sierra Leone	57,840	7,900	1,347	64,393	71 %
Togo	10,914	8,084	405	18,593	58 %
Zaïre	103,548	58,724	n.a.	162,272	62 %

* Total domestic production = Total artisanal catches (marine & inland) + Total industrial catches.

** Net supply = (Total domestic production + imports) - exports.

Note: The percentages in the last column do not necessarily mean that all the artisanal catches are consumed locally, indeed some are also exported. It merely indicates the artisanal fisheries capacity to satisfy local supply in percentage terms

Sources: Same as for Table 1.

proaching the 100 per cent mark. In other countries such as for instance Guinea and Guinea-Bissau there is great potential for expansion of the artisanal fisheries, as is also the case for inland fisheries in "wet" countries like Gabon and Liberia.

Table 2 gives an indication of artisanal fishermen's contribution to the total fish supply in the various countries. One must here remember that, with the exception of South East Asia, no other sub-

region in the world is as dependent on fish for its protein supply, particularly animal protein. In more than half of the countries listed in the table, fish accounts for one-third or more of the animal protein available. Thus the artisanal fishermen, who represent perhaps two or three per thousand of the total population in the region, make a disproportionately elevated contribution to the nutrition in the various countries. It should also be pointed out that, as a result of the economic crisis in the last two, three years, imports of fish are declining in countries like Congo, Ivory Coast and Nigeria, making local fishermen's catches even more important than indicated in the table which is mainly based on 1986 figures.

Not all artisanal fishermen, however, are equally productive. Another significant characteristic of West African fisheries is the dominance of fishermen belonging to a handful of ethnic groups. A rough overview of the 70 or so ethnic groups engaged in marine or brackish water fisheries on the West African mainland, shows that fishermen from less than ten of them account for some three-quarters of the total catch. The principal ones include the Wolof, Lebou, Nyominka, Fante, Ga/Adan, Ewe, Ijaw and the Ilaje (branch of the Yoruba) who basically come from three countries: Senegal, Ghana and Nigeria (Haakonsen, 1990).

As a consequence, a large proportion of the artisanal catches, the marine ones in particular, in the remaining countries are provided by fishermen from these three countries, another characteristic feature of the sub-region's fisheries. This has more than once caused certain friction between the fishermen and some host-country governments who complain that foreigners come and take away the country's national fish resources. Such governments tend to overlook certain basic facts, however. First of all, it is unlikely that the countries' own fishermen would take over the very productive role of the foreign fishermen, the Temne of Sierra Leone and the Plah and Pedah of Benin being just about the only groups having successfully adopted the techniques of immigrants, in both cases Ghanaian fishermen.

Secondly, all catches made by migrant fishermen, with a few minor exceptions in border regions, are landed in the country where the migrant fishermen operate at any one time, thus contributing to local fish supply (the alternative would usually be for

the host country to increase imports). Thirdly, although some of the earnings are repatriated and invested at home (though frequently in canoes and fishing gear unavailable in the host country), a large percentage of the fishermen's income is used locally for official and non-official fishing "permits", for fuel, rent, food, clothing, etc. And fourthly, this income from a primary sector, together with the product itself, generates secondary (processing, marketing) and tertiary (trade of general goods, food preparation, new outlets for local agricultural products, services) employment for the local population which would probably never have been created otherwise.

The dominance of a few ethnic groups in West African fisheries is of course linked to these groups' ability to adapt certain key technological innovations and to organize their fishing units and capital requirements around these technologies which gradually have led to increased specialization. Originally, many of these "typical" fishing tribes were no more born fishermen than, say, the part-time Baga of today's Guinea or the moderately productive Dwala of Cameroon. In fact, when the first Europeans anchored off the West African coast, the Wolof, Temne and Fante, today among the most productive and skillful fishermen in Africa, were still largely inland tribes.

The question of why some ethnic groups have adapted so successfully to fishing while others, who may even have considerable maritime experience, never get beyond simple hand-lining from a one-man canoe despite government incentives and abundant technical assistance, extension, availability of credit, etc., is one of the great sociological/anthropological questions in West African fisheries that has still not yet been properly answered. Further investigation into this puzzle is a requirement not only in order to satisfy academic curiosity, but indeed to understand where future government policies and development projects within the sector should be oriented.

Finally, the importance of the employment generated by artisanal fisheries in West Africa must be noted. Table 3 below gives a certain idea, again based on sometimes less than reliable statistics. Basically only full-time fishermen are considered here, though definitions vary from country to country. For instance, the large difference between the number of fishermen in Ghana and

Table 3. *Canoes, degree of motorization and number of fishermen in West African marine fisheries*

Country	Year	Canoes	% Motor-ization	Fisher-men
Benin	1988	654	35 %	3,200
Cameroon	1984	6,000	33 %	18,600
Cape Verde	1984	1,170	34 %	3,300
Congo	1985	410	48 %	1,800
Ivory Coast	1986	800	55 %	5,500
Equatorial Guinea	1985	1,130	3 %	2,600
Gabon	1983	1,800	52 %	5,000
Gambia	1984	870	48 %	2,300
Ghana	1986	8,214	52 %	104,000
Guinea	1985	1,950	38 %	5,600
Guinea-Bissau	1987	600	35 %	2,500
Liberia	1986	900	30 %	4,000
Mauritania	1987	740	90 %	3,700
Nigeria *	1986	50,000	40 %	200,000
Sao Tomé and Prin.	1979	1,500	20 %	1,500
Senegal	1986	8,300	64 %	40,000
Sierra Leone	1981	7,000	10 %	18,000
Togo	1987	256	56 %	2,400
Zaire	1979	316	11 %	500
Total		92,610	40 %	424,500

* Estimates on Nigeria continue to be based on very dubious data. Actual figures may differ considerably from the ones reported here.

Source: Haakonsen 1988 a: 40

Senegal, despite equivalence in the number of canoes and a similar size in distribution, is attributable to different criterias of what constitutes a full-time fisherman in the two countries.

Excluded from the table, of course, is all the landbased employment directly linked to fishing, such as processing and marketing. Here too, activities are very labour intensive and it is generally estimated that for each artisanal fisherman, there is a land-based fish worker, usually a woman. Note otherwise the high percentage of motorized canoes and that the table includes only marine fisheries (including brackish water).

THE INTERNAL DYNAMICS OF ARTISANAL FISHERIES IN WEST AFRICA

This again is a subject which has been taken up in several studies, both general and specific, particularly in countries like Senegal (for example, Chauveau, 1985 & 1988; Chauveau & Samba, 1989; Weber, 1989) or Ghana (Lawson & Kwei, 1974; Vercrujisse, 1974; Haakonsen, 1988), but some key works have also been produced in less evident fishing nations such as Sierra Leone (Linsenmeyer, 1976) or Benin (Pliya, 1980). Other writers have concentrated more on a specific ethnic group or village, but it is beyond the scope of this paper to mention them here. It is nevertheless worth while reminding of the pioneering research among Fante and Anlo Ewe fishermen as well as lagoon fishermen of Ivory Coast by Albert de Surgy (1966 & 1969). Again only certain main points will be underlined here.

In order to do so, it may be worth while to start with de Surgy as his analysis, later followed up by scores of others, took issue in the fishing unit and how it was organized. Indeed, with the exception of the rather insignificant fisheries from one-man canoes, the cornerstone of artisanal fisheries in West Africa is the fishing unit, not the individual fisherman.

There are many ways a fishing unit may be organized, partly depending on the general social organization of the unit's group, partly on the principal type of fishing gear used. Often the two are closely interlinked, sometimes to such an extent that one can with a high degree of accuracy determine the ethnic group of a fishing unit from the type of fishing they do. For instance in Ghana and much of the rest of the Gulf of Guinea countries, beach seining is the exclusive domain of Anlo Ewe fishermen, collective handlining a typical Ga'/Adan activity, while shark fishermen are almost exclusively Fanti, as are also most of the purse-seiners.

Linked to the different types of fishing units are the various share systems. For instance, in the Fanti "company" system of a purse-seine unit it is common for the canoe to get three shares (of the catch value after running expenses have been deducted), the purse-seine and engine also three shares each, the captain two shares, the motorman and *bosun* (mate) 1.5 shares each, and each crew-member (minus apprentices) one share. Thus, if one man

owns both canoe, seine and engine, he gets nine shares of the catch value or alternatively of the catch itself. Should he also be the captain, which seems increasingly rare as such a wealthy man would tend to retire from active fishing, he would get eleven shares out of a total of perhaps 20 or 24.

In another share system which seems to become increasingly common among Temne fishermen, particularly in Goderich where wealthy Freetown traders external to the fishing sector invest in a fully equipped planked canoe and hire a fishing unit, all income from fishing goes to the owner except once a week when the fishing crew takes all. In addition, the owner keeps the crew supplied with cigarette money.

Other fishing units throughout the region may be based more on family units or a combination of a kinship share system and a "company" contract. There are several variations, but what is common for the more advanced artisanal fishermen is that they are well organized into fishing units with clearly defined share systems.

Associated with this are defined systems for the distribution and sale of fish for processing and further commercialization, often through the fishermen's own wives. Linked to this is the financing of both equipment and day-to-day operations, which again is linked to traditional credit systems.

The intricacies and complexities of the relationship between fishermen and market women or "fish-mamies", who may or may not be of the same kin, is another extremely important characteristic of West African fisheries. Cost and income studies of fishing operations *per se* frequently seem to make artisanal fishing look unprofitable (see, for example, van Hoof, 1987 for Sierra Leone; Afful and Osafo-Gyimah, 1979 and Odoi-Akersie, 1986 for Ghana), at least when conventional and fixed economic criteria are used. However, as particularly Vercuijsse (1984) has pointed out, the profit or non-profit of a fishing operation is only part of a greater socio-economic system within a kinship network.

Even outside the kinship system, the role of the fish traders as sources of credit is more than a strict commercial one. Their relationship with the fishermen is more a patron-client association which includes obligations by the "patron", i.e. the fish-mamy, towards the general well-being of the "client", i.e. the fisherman,

when it comes to the latter's health, family commitments, etc., as described by for instance Weigel (1987 & n.d.). What happens when the fishtraders are removed from their traditional role in West African fisheries, is perhaps best illustrated by the rather disastrous results of the CIDA financed CAPAS project in Senegal designed to "eliminate the exploitation of fishermen by traditional fishtraders" (see, for example, Chaboud, 1983 & 1985).

Perhaps it is precisely these complexities in the traditional social and economic organization of West African fishing societies which have allowed artisanal fisheries not only to survive, but also to thrive in spite of the challenge posed by industrial fisheries.

ARTISANAL VS. INDUSTRIAL FISHERIES IN WEST AFRICA

It is disconcerting at times to see how little heed policy makers and development planners pay to history, even recent history. The history of industrial fisheries in West Africa can teach many lessons both for the particular fisheries in question and for countries which still appear to be convinced that massive investments in "modern" vessels is just about the only way to develop a national fishery.

There is hardly a harbour in West Africa where one cannot observe the rusty mast-tops of a sunken fishing vessel sticking above the shallow water, or see the relics of past trawlers washed ashore on nearby beaches. The history of industrial fishing in the region as a whole is not much of a success story, to a large extent attributable to an unquestioned faith in modernization through up-to-date technology around the time of independence in Africa's emerging nations, an ideology largely supported by the retreating colonial powers, "developers" and the increasing number of not always impartial donors. Only in two countries did a national industrial fishing fleet really "take-off", to go back once again to the prevailing terminology of that time, though in forms quite distinct from each other.

The case of Senegal is well documented and analysed historically, thanks largely to the works of Chauveau (1985, 1989 and together with Samba, 1989). Here we see how the French at an

early stage tried to establish a European industrial fleet in the country without any great successes, except perhaps during World War II when great shortages of fish in Europe caused a temporary boom, though interestingly, these European fisheries depended very much on artisanal landings, too. An attempt to establish a Senegalese tuna fleet in 1955 did not succeed, and the next major industrialization effort came when the newly independent state decided to establish the Société Sénégalaise d'Armement à la Pêche (SOSAP), a decision it would later regret: after 14 years the company formally folded leaving a disastrous financial legacy.

In Ghana, the emergence of an industrial fishery followed a somewhat different path as eloquently described by Lawson & Kwei (1974). Contrary to pre-independence Senegal, efforts by the Ghanaian Fisheries Department were not so much directed towards a European-style "modern" fishery, but to provide a beach-landing alternative to the dug-out canoe. Small, 27–31 foot, trawlers were introduced, but they soon became too small for some of the first owner-skipppers, including such remarkable entrepreneurs as R. Ocran and E.N. Soli who in the space of a few years built up solid fishing companies, Mankoadze and Soli Fisheries, comprising fleets of larger fishing vessels. These were the first truly African industrial fishing companies.

Mankoadze in particular became a real success story, despite having to face policies introduced by Nkrumah which were anything but designed to encourage private enterprise. Emphasis then were on public enterprises such as the State Fishing Corporation (SCF) which soon proved to be almost a bottom-less pit as far as public funds were concerned. When Ghana's Government decided to "disinvest" itself with many of its public enterprises two years ago, SCF was put on top of the sale's list, but to no avail: at the moment of writing it is still not sold, and it appears it now may be broken up into smaller components in the hope of getting rid of at least part of the "assets".

Private fishing companies, and Mankoadze in particular, fared much better during the 1960s and 1970s, but the catastrophic economic decline of the country in the late 1970s and early 1980s also reached these dynamic enterprises. Today many of them are bankrupt, including Mankoadze, though in this particular case

part of the reason may be due to losses following Ocran's unsuccessful attempts to diversify into sectors outside fisheries.

The small trawlers and later also purse-seiners which were supposed to take over the role of the "backward" canoes also proved quite viable for a time, having undergone several design changes in the 1950s and 1960s. Today, however, most of the 450 "inshore vessels", as they are referred to in Ghana, lie idle most of the time despite a major programme to refit and rehabilitate their inboard engines by an EEC funded project launched in 1985.

Interestingly, Senegal also tried to develop a similar alternative to the canoe through the introduction of small trawlers, purse-seiners ("sardinières") and hand-liners ("cordières") though in more modest numbers than in Ghana (see Kebe 1982 and Deme 1988 for details). However, like their semi-industrial Ghanaian equivalents, their usage has declined drastically. The reason, Chauveau & Samba (1989:611) suggest, may simply be their inability to compete "with the highly efficient technique of canoe fishing".

THE VIABILITY OF A MODERN CANOE FISHERY

The statement above is indeed significant, because this is probably the key to the success of artisanal fisheries in West Africa. Throughout the world, advocates of artisanal fishing often bring out a number of political, social, socio-economic and ecological arguments in favour of artisanal contra industrial fisheries. They include:

- artisanal fisheries are labour intensive and create more employment;
- they require less investment and thus less capital which industrial fisheries often have to seek abroad;
- artisanal fishermen are less dependent on harbours, thus stimulating the economy of rural areas and working against urban migration and centralization trends;
- the technologies used are simpler, avoiding a dependency on high-tech skills and spare parts from abroad;
- they are more selective than industrial fishing technologies

- and, in any case, practically all artisanally caught fish is utilized, mostly for human consumption;
- artisanal fisheries produce mainly for local markets and thus increase local nutritional levels;
 - artisanal fishing methods are less destructive for the marine habitat and fauna;
 - artisanal fisheries pollute less and consume less energy

Although perhaps not always universally applicable, arguments such as the ones above easily win appeal, not least among "developers" based in the industrial world who are equally attracted by arguments in favour of improving, say the position of women in the Third World and saving the African elephant. However, they often encounter tremendous obstacles in implementing their noble goals, often due to close-mindedness based on deep traditions, hard economic realities and simply self interest among certain groups of powerful people.

This is perhaps why the artisanal fishermen of West Africa, at least those belonging to the more dynamic groups outlined earlier, have proven themselves to be so extraordinary. After all, they have developed their fisheries into a highly competitive activity in strictly economic terms, against most expectations and against financial policies encouraging industrial fisheries. It is significant that in the two main fishing nations of West Africa, the artisanal fishery sector has grown in periods of general economic decline. For Senegal, it has been stated that "the condition of maritime fisheries... contrasts strongly with a general state of economic recession in the country" (Chauveau & Samba, 1989:599). In the case of Ghana, I have myself pointed out earlier that while the Ghanaian economy was declining at a rate of 4.5 per cent yearly from 1973 to 1983, the artisanal fisheries grew considerably both in terms of employment and production (Haakonsen, 1988:51).

It should be emphasized here that the reason for the progress of much of the artisanal fisheries in countries like Senegal and Ghana has been the fishermen's adaptability and readiness to incorporate new technologies, thus proving themselves quite different from the image of the backward, narrow-minded and ultra-traditional "peasant-type". First and foremost has been the rapid acceptance of the outboard engine on traditional canoes, which

took place in the late 1950's in both countries (see Chauveau, 1988 for Senegal; and Kwei, 1961 for Ghana).

Other key technological innovations in the canoe fisheries have occurred in both fishing and preservation technology, for example, the introduction of canoe operated purse-seines, ice-boxes for line-fishermen specializing in the capture of high value species; etc. Once a new technology has been recognized as viable by the fishermen, it has been spreading surprisingly quickly. The big question remaining is: why only among a handful of ethnic groups?

ARTISANAL VS. INDUSTRIAL FISHING: COMPETITION OR COMPATIBILITY

Although this paper has so far put artisanal fisheries in a very favourable light, it should not be forgotten that industrial fisheries has played and will hopefully continue to play an important role in West Africa, so that a rapidly growing population can make maximum use of its local food resources and local economies can be helped with the export of high-value species. The latter can also make nutritional sense, as the export of for instance one kilo of shrimp can be "exchanged" for up to 10 kilos of imported horse mackerel.

Artisanal and industrial fisheries in West Africa do not necessarily have to be in competition with each other, though admittedly conflicts abound as a large number of studies reveal (see, for example, Platteau, 1988; Luginbuhl, 1984; Kebe, 1985). However, many of the conflicts could and should be resolved with adequate legislation and proper law enforcement.

As suggested in an earlier section, there are areas which are beyond the reach of artisanal fishermen and, if the resources are to be exploited, industrial vessels will have to be used. This applies especially to the countries with a very large continental shelf, from Mauritania to Sierra Leone. On the other hand, it would appear to make questionable economic, ecologic and social sense to use industrial vessels to exploit depths of five meters close to the coast as a fleet of small Brazilian-built trawlers may soon be starting to do in Guinea.

In some cases, industrial and artisanal fisheries can be very compatible with each other. There are for instance several examples from both Senegal and Nigeria of industrial vessels selling their by-catch at a cheap price to canoe fishermen, who then bring it to shore for traditional processing. On other occasions, it may be the illegal undersize portion of a trawler catch which is disposed of this way, but the point is that it would otherwise have been thrown overboard anyway. Thus the transaction is of economic value to both parties and more acceptable from an ecological point of view.

Industrial type fishing installations on shore can also be of use for artisanal fishermen, for instance in order to sell high value species destined for export as in Senegal and Mauritania. Examples from Ghana also show that freezing plants built for the industrial sectors often save bumper catches of sardinella rotting on the beach, though this is essentially limited to the Tema harbour. The short, intensive sardinella season would not alone justify the setting up of such plants.

It is also possible that industrial vessels inspire artisanal fishermen to innovate and understand new techniques. For instance, the introduction of canoe purse-seines in Ghana and Senegal was probably facilitated by the fishermen's acquaintance with purse-seines operated from inshore vessels and sardinières, respectively. Similarly, the importance of ice-boxes to preserve the quality of high-value fish may have been readily understood in part due to the example of the industrial vessel.

CONCLUSION

There are signs that artisanal fisheries are becoming more recognized by many governments in West Africa, though public funds allotted to this sector continue to be generally less than those going to industrial fisheries. Yet, some governments have learnt their lessons as have some of the aid agencies who, it must be said, played strong roles in encouraging governments to go for "modern" industrial fisheries two to three decades ago.

Many governments are still paying the price, literally, for over-ambitious industrial fisheries projects now transformed in huge

foreign debt bills. These include "advanced" fishing countries like Senegal and Ghana which, for obvious reasons, have been referred to most in this paper. Artisanal fisheries in these countries are probably more recognized for their actual worth than ever before, though there will always be certain officials who will feel dismayed at having primitive canoes spearheading one of their nation's most important economic sectors.

More disconcerting is the fact that other countries, particularly those where fish resources are exploited only to a minor degree locally, appear to be about to commit the same mistakes in fisheries development as the pioneer countries 30 to 40 years ago. Lip service may be paid to artisanal fisheries, possibly because many donors insist on it, but public investments tend to be geared mostly towards a "modern industrial fishery" unlikely ever to become economically or technically viable. And one day, the investment loans will have to be paid back.

It is perhaps here that researchers, aid workers and others with an intimate knowledge and experience of fisheries development in the region have a role to play by making sure past lessons can be learned also by countries which have not undergone the experiences of the "advanced" fishing nations themselves. The experiences are there for everybody to assess.

The key problem is how to communicate these experiences. Articles in scientific journals are unlikely to reach or be read by relevant fisheries officials or ruling politicians, thick technical reports will likewise be put unopened aside if by chance reaching the desks of the "decision-makers". One will have to find alternative ways to present the main lessons in a concise, understandable manner which catches the attention of the relevant officials.

This will require a closer collaboration between researchers, administrators and developers than the case is today. Although researchers are occasionally consulted by the other parties and even hired to do specific investigations, this is often very much on an *ad hoc* basis. The relationship between researchers and local fisheries departments is, moreover, often characterized by mutual mistrust.

International development agencies should have as one of their tasks to bring these two parties closer together, for instance by helping put into place long-term investigation and monitoring

programmes which will enable researchers and fisheries officials to keep better track of what is really happening in their sector. It is no secret that our knowledge of African fisheries suffers from a lack of reliable facts, from simple catch statistics to socio-economic information, but this is often due to financial reasons. Both research institutions and fisheries departments tend to be severely short of funds for necessary field investigations, and sometimes just the means to buy petrol and pay *per diem* for their staff would be sufficient to drastically improve the data base.

Unfortunately, funds made available by donors and technical agencies are usually linked to specific projects and by definition short-term. African governments are normally in no position to continue the financial support of project-introduced data-collection and interpretation once the project is finished. The introduction of long-term programmes designed to ensure continued information gathering and the dissemination and exchange of results could be one way to help "educate" governments about the important role played by artisanal fishermen in the West African sub-region.

REFERENCES

- Afful, K., and K. Osafo-Gyamah, 1979. *Economic Organisation of the Rural Fishing Industry*, CDS Research Report, No. 19. Cape Coast: Centre for Development Studies, Cape Coast University.
- Bonzon, A., and B. Horemans, 1988. *Socio-Economic Data Base on African Fisheries*, FAO Fisheries Circular No. 810. Rome: Food and Agriculture Organization of the United Nations.
- Chaboud, C., 1983. *Le Mareyage au Sénégal*. CRODT-Documents Scientifiques No. 087. Dakar: Centre de Recherches OCE monographiques de Dakar-Thiaroye.
- 1985. "La Commercialisation des débarquements de la pêche artisanale. Commerce traditionnel et projets de développement: l'exemple sénégalais". Contribution à l'Atelier Régional FAO/COPACE/DIPA sur le Développement et l'Aménagement des Pêches Artisanales, Lomé, 20-29 Novembre 1985.
- Chauveau, J-P., 1985. "Histoire de la pêche maritime et politiques de développement de la pêche au Sénégal", *Anthropologie Maritime*, cahier No. 2.
- 1988. "Note sur l'histoire de la motorisation dans la pêche artisanale maritime sénégalaise". Contribution au CIRAD/MESRU—Economie de la Mécanisation en Région Chaude, Montpellier, Sept. 1988.

- 1989. "Histoire de la pêche industrielle au Sénégal et politiques d'industrialisation" (3 parties), *Cahiers de Sciences Humaines*, 25 (1–2).
- Chauveau, J.-P., and A. Samba. "Market Development, Government Interventions and the Dynamics of the Small-scale Fishing Sector: An Historical Perspective of the Senegalese case", *Development and Change*, 20, 4.
- Deme, M. 1988. "Etude économique et financière de la pêche sardinière sénégalaise". Document Scientifique, No. 107. Dakar: CRODT.
- Diaw, M.C., 1983. *Social and Production Relationships in the Artisanal Maritime Fisheries in West Africa*. Michigan State University. (Master of Arts thesis.)
- Everett, G.V., 1988. *West African Marine Artisanal Fisheries*. Cotonou: IDAF/WP/22.
- 1989. *Small-Scale Fisheries Development Issues in West Africa*. Cotonou: IDAF/WP/26.
- Gerloto, F., et B. Stequert, 1978. "La pêche maritime en Afrique de l'Ouest", *La Pêche Maritime*, 57 (1202).
- Haakonsen, J.M., 1988a. "Estimating the Number of Canoes and Canoe Fishermen Engaged in Marine Fisheries in West Africa", in Everett, 1988, *West African Marine Artisanal Fisheries*. Cotonou: IDAF/WP/22.
- 1988b. "Socio-Economic Aspects of Ghana's Canoe Fisheries", in Haakonsen, J.M. (ed.), *Recent Developments of the Artisanal Fisheries of Ghana*. Cotonou: IDAF/WP/21.
- 1990. "The Role of Migrating Fishermen in West Africa: What We Know and What We Still Need to Learn", in *Compte Rendu du Symposium "La recherche en Face à la Pêche Artisanale"*. Montpellier: ORSTOM/IFREMER.
- Kébé, M., 1982. "La pêche cordière au Sénégal". Document Scientifique, No. 081. Dakar: CRODT.
- 1984. "Conflits entre pêche artisanale et pêche industrielle au Sénégal". FAO Rapport de consultation: Rome: Food and Agriculture Organization of the United Nations.
- Kwei, E., 1961. "Recent Developments in the Canoe Fisheries of Ghana", *Ghana Journal of Science*, 1 (1–2).
- Lawson, R.M., and E. A. Kwei, 1974. *African Entrepreneurship and Economic Growth*. Accra: Ghana Universities Press.
- Lawson, R.M., and M.A. Robinson, 1983. "Artisanal Fisheries in West Africa", *Marine Policy*, Oct. 1983.
- Linsenmeyer, D.A., 1976. *Economic Analysis of Alternative Strategies of Sierra Leone Marine Fisheries*. Michigan State University. (Ph.D. thesis.)
- Luginbuhl, N., 1984. "Rapport sur les conflits entre pêche artisanale et pêche industrielle en Côte d'Ivoire". FAO, Rapport de Consultation. Rome: Food and Agriculture Organization of the United Nations.
- Odoi-Akersie, W., 1986. "Cost and Earning Studies of Small-Scale Marine Fisheries of Ghana". FAO, Consultancy Report. Rome: Food and Agriculture Organization of the United Nations.
- Platteau, J.-Ph., 1988. *Les problèmes de la pêche artisanale en Afrique vus par les acteurs eux-mêmes*. Namur: Cahiers de la Faculté des Sciences Economiques et Sociales No. 23.

- 1989. "The Dynamics of Fisheries Development in Developing Countries: An Overview", *Development and Change*, 20, 4.
- Pliya, J., 1980. *La pêche dans le Sud-Ouest du Bénin*. Paris: Agence de Coopération Culturelle et Technique.
- Pollnac, R.B., 1985. *Socio-Cultural Issues in West African Fisheries Development*. Kingston: ICMRD/WP/45.
- Surgy, A.N. de, 1965. *Les pêcheurs en Côte d'Ivoire* (3 fasc.). Abidjan: Centre National de Documentation de Côte d'Ivoire.
- 1966. *La pêche traditionnelle sur le littoral evhé et mina*. Paris: Groupe des Chercheurs Africanistes.
- Vercrujssse, E.V.W., 1984. *The Penetration of Capitalism: A West African Case Study*. London: Zed Press.
- Van Hoof, L., 1986. *Small Scale Fish Production in Shenge*. Cotonou: IDAF/WP/12.
- Weber, J. 1983. "Socio-économie de la pêche artisanale en mer au Sénégal: hypothèses et voies de recherche". *Document Scientifique*, No. 84. Dakar: CRDOT.
- Weigel, J-Y, 1987. "Nana et pêcheurs du port de Lomé: une exploitation de l'homme par la femme?", *Politique Africaine*, No. 27.
- n.d. "Les systèmes de financement non-institutionnel de la pêche artisanale ouest-africaine sub-saharienne: caractéristiques, propositions et difficultés méthodologiques". Manuscript.

Ethnogenesis, Mobility and Politics in the History of West African Canoe Fishermen

Mariteuw Chimère Diaw

One fundamental element in West Africa's demographic history is the complex process of ethnic fusion and fission through which individuals, groups and communities became both assimilated and differentiated along ever-changing new identities. This process of ethnogenesis, nurtured by the considerable displacement of people through vast expanses of African territory, has been a fundamental element in the emergence of the State and in its ability to function efficiently during the Middle Ages. Fisherfolks have been an integral part of this process despite their exclusion from most historical accounts of that period. From the privileged viewpoint of history, it can even be asserted that this dual process of migration and ethnogenesis is still going on today and must be included into any comprehensive attempt to interpret contemporary migration phenomena in fishing and to deal properly with the issues related to migrant fishermen.

MIGRATIONS OF PEOPLES AND ETHNOGENESIS (400 A.D.–1800 A.D.)

To understand the situation of West African fisheries, it is necessary to keep in mind their distribution along the three major life zones of West Africa and their subsequent position in the dense and intricate political and economic developments of the precolonial era.

The Sudanic Savanna Grasslands

States in West Africa emerged first inland, in the Western Sudan where the Senegal and Niger river complexes provided the axis

around which empire building was made possible.¹ Fishing folks, such as the Bozo, Somono, Sorko and Sorkawa, who dominate the history of inland fishing in the region, played a crucial role in this process.

The Bozo are believed to be the most ancient inhabitants of the interior delta on the western side of the Niger bend. Archeological evidence found in Jenne-Jeno show that its first occupants (250 B.C.–A.D. 50) made use of iron, cultivated rice and were "heavily reliant on aquatic resources including fish, tortoise, crocodile and waterfowl" (McIntosh & McIntosh, 1981:15). Whether these people were Bozo, born out of the holes of the Delta, as suggested by certain oral traditions, is not clear (Fay, 1989). Between 400 and 900 however, the central Delta underwent intense immigration flows, and the beginning of this "second phase" of occupation should be considered as the latest possible date of Bozo "arrival" in the area.

By the 5th century A.D., the middle Niger was functioning as an important north-south axis of riverine transport, which in fact is congruent with seasonal migrations of Bozo fishermen, from the Jenne region to areas beyond lake Debo, in pursuit of the oil-rich Nile perch (Sundström, 1972). Original masters of all water bodies, the Bozo (Sorogo, Tié and Kelinga) had an early interaction with Nono autochthonous rice producers and exchanged excess production with later (Bamana, Soninke, Rimabe, Pël) immigrants as well (Cissokho, 1966; Tymowski, 1970; Verdeaux & Fay, 1987).

At about the same time, between the 5th and 11th centuries, the Sorko, a skilled group of nomadic fishermen, were then following a long north-west migration route along the eastern side of the Niger bend. According to Boubou Hama², the Sorko were coming

1. "It was the Niger which enabled remote provinces to be brought under control and administered, which gave access to markets and whose banks provided sites for the main towns (...). 'C'est au fleuve que ces territoires doivent leur cohésion politique et économique' writes Tymowski" (Smith 1970). This statement, which refers to Mali (12th–15th A.D.), Songhai (15th–16th A.D.) and the Bamana States of the Middle Niger Valley (17th–19th A.D.), is also true of Tekrur and Ghana which had emerged around the Senegal river by 500 A.D. Contemporary of Mali and Songhai, or emerging from their respective breakdown, a host of smaller states (Kaabunke, Nyominka, Wolof, Mossi, Haussa...) were also created in the area.
2. From personal notes; reference not available.

from the vicinity of Niamey while the Sorkawa moved later from Yawiri, another Sorko point of origin in Nigeria.

Benefiting from their large number and their great mobility, the Sorko founded several colonies such as Gao and Kukya, which were to become capitals in the Songhai empire, and went as far as lake Debo where they were stopped by the Bozo. They established their rule over the Do (the first fishermen in the area,³ and the Koromba, Gurmanche and Gabibi agriculturalists, whom they partly assimilated until the emergence of a new entity, the Songhai people, of which they were the nucleus and the dynamic element (Cissokho, 1966, 1975; Stride & Ifeka, 1971; Tymowski, 1970).

The genesis of the Somono—the boat people—is a peculiarity in West Africa as its emergence was directly promoted by the State of Mali, in the context of a growing demand for fish related to population increase (Tymowski, 1970) and of the State's need to organize its political control over the river. The Somono were initially a multi-ethnic grouping (of Bamana, Bobo, Soninke, Dogon) based upon a Bozo nucleus and on servile manpower provided by the State (Diaw, 1983; Fay & Verdeaux, 1987). Later, in the 18th century Bamana State of Segou, they metamorphosed into a closed ethnized caste of fishermen and developed one of the most sophisticated fishermen-State relations in the history of the region (Roberts, 1981; Diaw, 1983).

Fishermen in the Western Sudan had a strategic importance that was reflected by their full participation in the reproduction of the State. Integrated in the tributary economy, they paid taxes, dues and customs in the form of cowries, dried fish, grass for horses, help in the repair of building of State fortifications, as well as canoes, crews and ferry services for the movement of information, material and troops (Tymowski, 1970; Roberts, 1981; Diaw, 1983).

Fishermen were also deeply involved in the trans-Saharan trade. By the 12th century, fish was dried, salted and smoked while Bozo and Sorko fishermen supplied the whole Niger up to the

3. Reflecting the actual sequence of arrival of the major fishing groups in the Niger bend, the system of fishing rights gives Do fishermen the "spiritual authority" over the very "essence" of the aquatic environment, while Sorko fishermen retain property rights on its "content" (particularly over large animals) and Sorkawa, only a usufruct right over the resource (Boubou Hama, from personal notes; reference not available).

Saharan oasis and down to the forest region (Mauny, 1961; Cissokho, 1975). Boats constructed for that purpose had amazing sizes and fabulous load capacities and river ferrying, more attractive than other means of transportation⁴, was a major tool in the trade of salt, cereals, fish, kola nuts, honey, cattle and war slaves.

In return for all their services, fishermen were fostered "through special recruitment and privilege" (Roberts, 1981). They had the exclusive right to navigate and fish the river, were (particularly the Somono) regularly supplied with slaves, benefited from the special protection of the king and were heavily represented in the State administrative and military apparatus. In Songhai, the State had organized an extensive network of ports which were headed by fishermen such as the Goima-Koi in Gao or the Kabara-Farma in Kabara. They were to collect entrance and exit fees, to record the loads and number of boats and to keep track of the State's fleet. The overall system was headed by the Hi-Koi, supreme military commander, and the Hari-Farma, supreme chief of the water (Tymowski, 1967).

Thus, the State sponsored the expansion of a group of fishermen who, in turn, provided goods and services crucial to its continued ability to make war.... The State inserted itself in the Somono mode of production (...) through renewal of the social relations of production and through the extraction of a portion of the social product (Roberts, 1981).

The Senegambia and the Upper Guinea Coast

The peopling of the West Atlantic littoral, which in the Middle Age developed as a dependency of the savanna States, was mainly the result of a continuous dislocation over the centuries, of populations from the interior to the coast.⁵ By the 11th century, this general pattern of migration was well established, as people moved from north and east to west and south, each migration wave coming to superimpose itself over already existing human aggre-

4. The Songhai "kanta" could carry up to 30 tons of goods, i.e. the load capacity of 1,000 men, 200 camels, 300 cattle or a flotilla of 20 regular canoes (Mauny, 1961). Some of these boats had an even greater load capacity of 50 to 80 tons (Tymowski, 1967).

5. According to Rodney (1970), this process might have started as early as the third century A.D.

gates.⁶ The Banun, who probably are the most ancient ethnic formation in the region and who occupied a vast territory stretching from the Cacheu to the Salum rivers, were followed in the area by a host of other groupings (Beafada, Bram, Bijago, Manjak, Mankan, Joola, Balant, Mandinka). By the 19th century, the three latter groups (and 15th century Tukulor immigrants as well) had taken over all Banun territory and had assimilated them in such a way that the group was considered almost extinct⁷ (Diaw, 1985).

North and south of the Casamance/Guinea-Bissau area, similar phenomena were taking place. The Sereer, moving from the Senegal river valley, had reached the Petite Cote and had even pushed further into the Gandun island where they merged with the local population (probably Banun as well as Mande) to form the Nyominka entity. By the 12th century, the Sherbro were present in Sierra Leone as well as the Bullom, who were the single dominant group of that area (Rodney, 1970; Stride & Ifeka, 1971). The Baga, displaced from the Futa Jalon mountains, had reached their present habitat in Guinea.

The end of the 8th–13th centuries' wet periods (Brooks, 1981), and various economic and political developments of the Western Sudan at that time (Diaw, 1983), accelerated migrations toward the coast, through the Futa Jalon mountains. This was the case for the Susu⁸, who moved into the Futa Jalon after their defeat at the hand of the Mandinka. They later left for the coast, under the pressure of Fulani pastoralists. It is also during this period that the nature of Mandinka traders' and settlers' infiltrations in the area is transformed by Tirimagan Traore's conquest and by the subsequent foundation of the Kaabu and Nyomi dependencies of Mali. Other

-
6. Sereer myths and archeological evidence show that the whole coastal area from the "Petite Cote" south of Cape Verde to the rivers of Casamance and Guinea Bissau was the site of a common civilisation, "the civilisation of the shell hills" (Gravand 1983).
 7. The history of the Beafada, who in the past occupied about three-fourths of the Guinea Bissau area and who are now reduced to hardly 12,000 people concentrated south of the Geba and Corubal rivers, is comparable to that of the Banun. Both show a typical characteristic of ethnic relations on the Atlantic coast, as migrations favoured intense processes of ethnic assimilation, through war, competition as well as long Pacific interactions.
 8. Among which were iron smiths looking for suitable species of hardwoods necessary for the iron-making process (Brooks, 1981).

Mande groups such as the Vai and the Kono settled further south in Sierra Leone and Liberia.

The Atlantic was only minimally exploited and navigated until the arrival of the Europeans at the 15th century. Consequently, the social and economic history of the coast is marked by its links with the hinterland and its integration into the trans-Saharan trade network. According to Rodney (1970), salt collected from mangrove leaves, extracted from the soil by percolation or produced by direct evaporation of seawater, was "the most important item fostering contacts between the littoral and the hinterland" and had "the ability to attract people through amazing distances". Dried fish and molluscs were part of the riverine and coastwise trade of kola nuts, malagueta pepper and other forest products along the Petite Cote, the Salum and Gambia rivers and the upper Guinea coast. According to Brooks (1981), even gold, iron and cotton production could have exerted a powerful stimulus for commerce with riverine and coastal societies of the Guinea-Bissau region linked by relay trade to the peoples of the forest.

By the mid-fifteenth century, Beafada mariners had developed a seaborne commerce for kola, pepper and indigo which took them as far as the river Nunez and even further south (Brooks, 1981). As early perhaps as 700 A.D., Nyominka mariners of the Salum islands were trading with Banun of the Gambia and Casamance (Linares De Sapir, 1971). Banun also traded with Sereer and Wolof traders up to Cape Verde "which marked the northernmost point of coastwise navigation whence caravan routes extended northwards through Wolof territory to the Senegal river, to link with trans-Saharan routes" (Brooks, 1981).

Besides navigation, fishing was also a regular activity of coastal populations before the 15th century. It was practised up to 2-3 leagues from the coast while gear and boats were sufficiently diversified to suggest some significant exploitation of fish resources. It is probable, however, that most of the fishing activities were done inland in the fishing-grounds of protected estuaries, lagoons and coastal lakes (Diaw, 1983; 1985). During that period, only the Cape Verde and the Petite Cote on the Senegambian littoral seemed to have offered secure conditions sufficiently stimulating for the development of a more intense exploitation of marine resources. For a significant sea-fishing activity to develop,

it is necessary to wait for changes that take place later, from the 17th century on, and which affect the entire coast down to the Gulf of Guinea.

The Gulf of Guinea

The origin of fishing on the coasts of present Ghana has been subject to some confusion as Fante maritime fishermen were being credited by well-known authors for introducing the craft of fishing in the area.⁹ Such a belief is not well founded, since it ignores both the role of pre-Akan people on the "Gold" and "Ivory" coasts and the place of continental fishing which, as elsewhere in the continent, served as the laboratory where fishing technology and knowledge were first tested and elaborated.

Long before the migratory waves of Fante, Ashante and other Akan groups reached the area in the 17th century, fishing was already largely practised by indigenous peoples.¹⁰ Archeological evidence shows that in the lagoon swamps of the Ivory Coast, fishing was practised by people living in tiny hamlets bordering the lagoons "since at least the iron age and, probably, since the stone age" (Stride & Ifeka, 1971). These people developed later an original civilisation based on the complementarity of fishing, agriculture and iron-working (Verdeaux, 1981). By 1400, salt, fish and cloth from the coastal region, and kola nuts, gold dust and slaves from the forest area, were integrated in the trans-Saharan trade network. At that time, three branches of this network's two most important routes connected the great markets of Hausaland and Mali to the coastal termini of Elmina, Cape coast and Accra (Adu Boahen, 1965; Stride & Ifeka, 1971).

Coming from the North, the Twi-speaking Akan were still on the northern side (Bono, Banda) of the forest border at the 11th-12th century (Ki-Zerbo, 1978). While the Ashante remained inland, the Fante and some other Akan groups followed the Black Volta opening through the forest and the Akwapim hills and

9. Such as Lawson or Brown (see Diaw, 1983:61).

10. In fact Akan peoples were looking for fish and salt when they first established contacts with Guan and Ga-Adangme peoples (Fyfe, 1965). This gives a further confirmation of the anteriority of fishing not only among iron-age lagoon folks but among pre-Akan immigrants as well.

pushed their migration southward until they reached the coast. There, they met with people such as the Ga who had left Nigeria and were following a westward route along the coast which took them to the Accra plains. Following the same path, several Akan groups went as far as the Ivory Coast. Among them were the Eotile, who settled on the lagoon Aby where they came under the control of later Agni migrants (Perrot, 1989) and the Alladian. Others, such as the Ebrié and Attié might have taken another route through the forest (Ki-Zerbo, 1978). Dan people, such as the Kru, Géré, Bété and the Bakwe, came from the West, probably under Mande pressure and formed between the 14th and the 19th centuries the present Neyo-Kru entity after having assimilated the original occupants of the mouth of the Sassandra, the Gnagbia. It is probably under their pressure that the Ajukru were pushed further East (Swartz, 1974).

In congruence with the pattern found in the Western Sudan and on the West Atlantic coast, a complex process of ethnic aggregation and disaggregation, conflict and cultural assimilation of the lagoon peoples was triggered by the arrival of these successive waves of immigrants. Still not achieved today, this process was far from unilateral. In the Ivory Coast, migrant groups have not only taken up fishing under the influence of indigenous communities, they also adopted some of their distinctive socio-cultural features, such as the Afzi system of age classes found neither among Akan nor Kru societies (Verdeaux, 1981). In the Gold Coast, the Ga-Adangme even incorporated the fishing gods of the Guan into their own religion (Stride & Ifeka, 1971).

In the lagoons of ancient Dahomey, fishing history is dominated by two Adja groups: the Xweda (Pedha) and the Xwla (Plah) but counts other Adja fishing people such as the Gun, "people of the water" (Bourgoignie, 1972), the Aizo and even some Fon. The Xweda are generally considered as the first settlers of the country. They were, however, preceded by groups of hunter-fishermen, the Aghe, who are still today the real "owners of the land" (Pliya, 1981).

Further east, in the 28,000 km² of mangrove swamps, creeks and waterways of the Niger Delta, peoples such as the Itsikeri and the Sobo (western delta), the Ibo (central delta), the Ijaw and the Efik (a branch of the Ibibio which moved from the forest to the creeks

around the Calabar river in the eastern delta) also found indigenous inhabitants of the area—"Umuale"—whom they had either chased or absorbed by the 15th century (Stride & Ifeka, 1971).

Fishing people have been affected in at least three different ways by the coincidence between the late advent of centralised states¹¹ in the Gulf of Guinea and the opening of the Atlantic trade, which was responsible for chronic inter-state rivalries and the expansion of the slave trade in the 17th and 18th centuries.

While Fante fishermen and Kru mariners seem to have generally benefited from their position within the emerging Atlantic system, fishing folks of ancient Dahomey's lagoons were most negatively affected by these occurrences. In 1727, the Xweda capital, Sahe, was burned to the ground by a conquering Abomey army and its main coastal outlet, Whydah, was captured. This was to provoke a major exodus of Xweda people toward lake Aheme¹² and proved to be the beginning of a long period of persecution accentuated by Abomey's direct contact with the slave trade. Continuously hunted down, raided and dislocated, Xweda were forced¹³ to move always further into the swamp zones where they met other refugees such as the Xwla and even some Fon. In these refuge zones, the populations specialised in fishing and salt production and were unable to form any structured political entity (Pliya, 1981).

Peoples of the delta city-states lay at another extreme of the spectrum. Probably in response to environment conditions, they did not develop centralised states but, instead, a myriad of settlements and villages built around the "house system", i.e. their socio-political division into households and wards. The city-state was a confederation of "houses" controlling a trading region in

11. Benin and Oyo in the 14th century; Abomey, Asante and other Akan states such as Fante and Akwaifu in the 15th–17th centuries. In 1629, there were 34 small states clustered in Southern Ghana, among which 28 were Akan states (Adu Boahen, 1965; Stride & Ifeka, 1971).

12. Where they might have met Aizo hunter–agriculturalists coming to establish fishing and agriculture settlements on the banks of lake Aheme (Pliya, 1981).

13. In spite of their resistance through ambush, blockades and other forms of naval warfare used at different moments (1726–1727; 1753) in this conflict (see Smith, 1970).

the interior forest belt. It had two main activities, fishing and trading, and was part of the long-distance trade network.

With the development of the slave trade, the content of these trading activities is profoundly modified as delta people become major slave dealers, well organized within the "canoe-house", a fishing, trading and fighting corporation of kinsmen, strangers and slaves. The canoe-house was essential to keep open the strategic waterways linking the coast to the hinterland and became the real foundation of wealth and state power in the delta in that period.

THE DEVELOPMENT OF MARITIME FISHING AND MODERN FISHING MIGRATIONS

The development of maritime fishing in West Africa was not the work of early coastal dwellers, who relied primarily on the system of inland waterways, but of new migrant populations which did not reach the coast before the full growth of the Atlantic trade at the 17th century.

The Wolof-speaking Lebu's first contact with the sea took place only at that time, after they were chased from Cayor and reached the Cape Verde and Petite Cote areas in Senegal. In St. Louis, Get-Ndar, as a fishing settlement, was created even later, in the 18th century, by Subalbe and Wolof fishermen from the Senegal river valley. Freetown as a Kru settlement was also founded only in 1790, which is the period when the fame of the Nana-Kru as mariners starts to be recognized on the coast. Until the middle of the 17th century, the Fante Union was still an inland state controlling no more than three coastal outlets. Only thereafter does it become a coastal society through the progressive occupation of pre-existing villages.¹⁴ In the same vein, Anlo-Ewe were supposedly not familiar with the use of boats when they came to settle on the coast, east and west of the Volta river. As regards the Lewu, their first stable boat was introduced in Anlo country in 1702 only, by Amega Le and a group of migrants coming from Adangme and Ga

14. This is the case of Cape Coast, an Efutu settlement, and of Anomabu created by the Guan, where Fante came to settle around 1662 and 1690, respectively.

towns (Diaw, 1985b; Green, 1988; Chauveau, 1982; Lewis 1977; Boahen, 1965).

With the creation of new coastal towns and increasing exchange flows related to the littoral economy, the role of coastal communities as intermediaries between European traders and the hinterland becomes central; fishing and navigation technics (bar-passing, rigs and sail) also go through tremendous improvements.¹⁵ The development of the slave trade and increased inter-states rivalry have various impacts on different points of the coast. While fishing and navigation improvements are still developing in the colonial outpost of St. Louis (Get-Ndar) and the Fante coast for instance, a regression of maritime activities is noticed in several parts of the Senegambian (Chauveau, 1982) and Guinea coasts. In Anlo country, the full use of new boat technologies is impeded until at least 1769 by the Ako wars and later conflicts as well (Greene, 1988).

Until the 19th century, continental fishing remains probably the main source of fish production. Fuelled by the colonial drive, the establishment of a capitalist exchange economy, growing urbanisation on the coasts and an increased mobility of peasants towards the new poles of dependent economic growth, dramatic changes start taking place in the maritime fishing industry at the end of the century.

In Benin, the construction of the wharf of Cotonou in 1891 triggers Xwla and Kru migrations (Pliya, 1981). This is also the time when Lebu and Get-Ndar fishermen start coming into the estuary of the Casamance where they introduce new gear such as cast-nets and gill-nets (Diaw, 1985a). During World War II, Get-Ndar fishermen are reported as the main suppliers of the market of Conakry which they leave shortly before the end of the war. In the early 50s, their presence is first attested in Ivory Coast¹⁶ where they find Fante, Ewe and Nzima settlements going back to the 30s (Berron, 1975) and maybe to the beginning of the century (Delaunay, 1987). In the 20s, Anlo-Ewe migrants are also present in Benin (De Surgy,

15. See Chauveau 1982 for the Senegambia; Diaw, 1985b; Christensen, 1977; Smith, 1970 for the Gulf of Guinea.

16. Diaw, forthcoming. To be noted is also the later migration of Lebu fishermen (1960), now established at San Pedro.

1969) where they are followed by Ada and Fante fishermen (Pliya, 1981).

Today, Fante and Ewe fishermen cover the whole area from Sierra Leone to Cameroun. Under their influence, former lagoon fishermen such as the Xwla and Xweda are now going as far as Cameroun, Gabon and Congo (Haakonsen, 1989). The ethnic map of the fisheries is getting increasingly heterogeneous as more people enter the fisheries and as internal and international migrations are developing.¹⁷

River fishermen are also part of this process. Since the beginning of the century, Bozo fishermen have been moving toward the coastal regions of Ivory Coast where their presence is related to major crises of the lagoon fisheries, while Somono were going as far north as St. Louis (Gruvel, 1907). Somono are also present in southern Senegal (Casamance) where they have permanently settled among Balante and Mandinka peasants after introducing the drift féfé-félé net in the 30s (Diaw, 1985). They were followed in the area by Subalbe (Tukulër) fishermen, who introduced their own version of the féfé-félé and played a prominent role in the development of the shrimp-fishery (Diaw, 1985; De Jonge, 1980; Van Chi, 1970). As a clear indication of their reconversion capacity, Subalbe were found until recently in the expanding marine lobster fisheries of La Guerra in Mauritania (Chaboud & Kebe, 1989) while in Casamance, non-Subalbe Tukulër were overcoming caste barriers to enter the fisheries (Diaw, 1985).

CONCLUSION

The widespread distribution and the high mobility of West Africans throughout the coastal and riverine areas of the region is dependent upon a heterogeneous complex of variables, conjunctural and structural, biological, economic or demographic.¹⁸ As such,

17. For a good summary of today's spread of maritime fishermen in West Africa, see Haakonsen (1989).

18. These include fishing strategies and ecological conditions, regional economic disparities (differences in production costs, market size and prices, infrastructure, monetary exchange rates) as well as micro social and demographic strategies (savings, inheritance, marriage, etc.).

these migrations are related to two essential forms of movement in fisheries: "regulated fishing migrations" and "labour migrations" (Diaw, 1983). History shows, however, that in the long run, these movements could but be transitional forms of peoples' migrations, a concept which refers to the historical and global mobility of groups, nations or communities across the continent.

This point could prove essential to management polities, as expulsions of fishermen, caught in the midst of inter-state contradictions or as scapegoats in limited electoral calculus, are still taking place in many African countries. Such measures often result in economic recession and perturbations of the fisheries and local economies.¹⁹ They also fail to address a more fundamental issue: the possibility of generating an endogenous and long-lasting development in Africa without establishing integrated policies transgressing the limited boundaries of national jurisdictions. The expression "integrated policies" is both an evocation of the concept of African integration (which has almost acquired a mythical resonance after two generations of intellectual debates) and a "*clin d'œil*" to people concerned with strategic issues related to Africa's development. Two interrelated components are implied by our use of the concept: regional integration and integration of the "informal" economy.

The success of canoe fishing in West Africa (which forecasted extinction and served as the basis of French colonial policies in particular, between the 1850s and 1945), and the vigor of the transnational aspects of its dynamics, cannot be viewed just as some kind of incidental peculiarity. Rather, they could be better understood as an expression of the potential and the relevance of the so-called informal economy (which I prefer to refer to as "the African sector of the African economy"), and as a partial explanation for the failure of three decades of narrow micro-nationalist policies based on an inadequate understanding of important historical experience.

A fetishist perception of the state has traditionally tended to view a whole range of local as well as "trans-border" initiatives and structural relationships (which logics often predate both its

19. Though neglecting the fisheries, Zachariah & Condé's (1981) study of West African migrations in the 60s and the 70s shows that large-scale immigration has tended to accelerate growth in receiving countries, while expulsions of workers have contributed to economic recession.

birth and the Berlin Congress) as a threat to its territorial and ideological legitimacy. To call for an integration of policies is thus to call for a progressive—but not necessarily “non-traumatic”—remodeling of economic, administrative and cultural policies along the dynamic lines of concrete social experiences at the local and regional levels.

In operational terms, and with regard to fishing, the concept has thus little to do with issues such as “quotas” or “transnational tenurial rights”, born out of the cultural context of capitalist rationality in European and North American fisheries. In our understanding of the West African situation, an integrated policy would necessarily have a regional dimension and integration global issues related to monetary disparities, customs and immigration laws as well as other regional aspects of national policies. Its most fundamental trait, however, should be the incorporation of phenomena such as the “tontines”, the share system, “informal” lending arrangements, local tenurial rights, communal organizations (such as those so efficiently run by Fante, Ewe and “Popoh” international migrants), international movements of fishermen, women fish traders and processors, ethnic solidarities, etc., into a strategic frame for the development of the fishery sector.

By shedding some light on the tight interplay between ethnogenesis and mobility within regional politics, history might be of some help in the definition of such a strategy for West African fisheries.

REFERENCES

- Berron, Henry, 1977. “Ghanaian fishermen in Ivory Coast. Their implantation in Abidjan”, *Maritime Pol. Management*, 4.
- Boahen, Adu A., 1965. “Ashante and Fante, A.D. 1000–1800”, in Ade Ajayi & Ian Espie, *A thousand years of African history*. Ibadan: University Press.
- Bourgoignie, Geroges, 1972. *Les hommes de l'eau: ethno-hychtiologie du Dahomey lacustre*. Paris: Editions Université.
- Brooks, George E., 1981. “Mankinka commercial and political links with the Guinea-Bissau region to the nineteenth century”. Paper presented at the African Studies Association meeting, October 1981, Bloomington.
- Chaboud, Christian, and Moustapha Kébé, 1987. “Rapport de la mission

- effectuée en Mauritanie du 30 Juin au 16 Juillet 1987". Document de travail, Enquête-cadre sur le littoral Mauritanien. Dakar: CRODT/ISRA.
- Christensen, James B., 1977. "Motor power and women power: technological and economic change among the Fante fishermen of Ghana", in Estellie Smith (ed.), *Those who live from the sea: a study in maritime anthropology*. New York: West Publishing Co.
- Chauveau, Jean P., 1982. "La navigation et la pêche maritime dans l'histoire économique du littoral Sénégalais". Association des Historiens Africains: Conférence sur Bilan et Perspectives de Recherches. May 1982. Dakar.
- Cissokho, Sekene M., 1966. *Histoire de l'Afrique occidentale: Moyen âge et temps modernes*. Paris: Présence Africaine.
- 1975. Tombouctou et l'empire Songhai: épanouissement du Soudan Nigérien au XVème et XVIème siècles. Abidjan: NEA.
- De Jonge, Klaas, 1980. "Peasant fishermen and capitalists: Development in Senegal", *Review of African Political Economy*, 15–16.
- De Sapir, Olga L., 1971. "Shell middens of the lower Casamance and diola protohistory", *West African Journal of Archeology*, 1.
- Delaunay, Karine, 1987. "L'expansion des pêcheurs ghanais sur les côtes ouest africaines: une approche historique (Cas de la Côte d'Ivoire)". Communication au Séminaire de Tabou, May 1988.
- Diaw, M. Chimère, 1983. *Social and production relationships in the artisanal maritime fisheries of West Africa. A comparative analysis*. Michigan State University (M.A. thesis, sociology).
- 1985a. *Formes d'exploitation du milieu, communautés humaines et rapport de production. Première approche dans l'étude des systèmes de production et de distribution dans le secteur de la pêche en Casamance*. Dakar: CRODT. Document Scientifique 104.
- 1985b. "La pêche piroguière dans l'économie politique de l'Afrique de l'Ouest: les formations sociales et les systèmes de production dans l'histoire". Paper presented at the 45th Congress of the Americanists, July, 1985. Bogotá.
- Fay, Claude, 1989. "Sacrifices, prix du sang, eaux du maître: fondation des territoires de pêche dans le delta central du Niger (Mali)", *Cahiers Sciences Humaines*.
- Fyfe, Christopher, 1965. "Peoples of the Windward Coast: A.D. 1000–1800", in Ade Ajayi & Ian Espie, *A thousand years of West African history*. Ibadan: University Press.
- Gravand, Henry, 1983. *Cosaan: les origines. La civilisation sereer*. Dakar: NEA.
- Greene, Sandra E., 1988. "Social change in eighteenth-century Anlo: the role of technology, market and military conflict", *Africa*, 58, 1.
- Gruvel, Abel, 1907. *Les pêcheries des côtes du Sénégal et des Rivières du Sud*. Paris: Challanel.
- Haakonsen, Jan M., 1989. "The role of migrating fishermen in West Africa: what we know, what we still need to learn", in *La Recherche face à la pêche artisanale. Contributions provisoires*. Livre 2. Montpellier: ORSTOM/IFREMER.

- Ki-Zerbo, Joseph, 1978. *Histoire de l'Afrique Noire d'Hier à Demain*. Paris: Hatier.
- Lewis, Mari A., 1977. "Female entrepreneurial style: an examination of coastal Fante businesswomen". University of Washington (Ph.D. dissertation).
- McIntosh, R.J. and S.K. McIntosh, 1981. "The inland Niger Delta before the empire of Mali: Evidence from Jenne-Jeno", *Journal of African History*, 22, 1.
- Mauny, Raymond, 1961. "Tableau géographique de l'Ouest Africain au Moyen Age d'après les traditions orales, les tradition écrites et l'archéologie", *Bul. IFAN*, 40, B(1).
- Perrot, C.H., 1989. "Le système de gestion de la pêche en lagune Aby au XIXème siècle", *Cah. sci. hum.* 25, 1-2.
- Pliya, Jean, 1981. *La pêche dans le Sud-Ouest du Bénin*. Cotonou: Enda.
- Roberts, Richard, 1981. "Fishing for the State: the political economy of the middle Niger Valley", in Crummey & Steward, *Series on African Modernization and Development*, Vol. 5. Beverly Hills: Sage.
- Rodney, Walter, 1970. *A history of the Upper Guinea Coast: 1545-1800*. New York: Monthly Review Press.
- Swartz, André, 1974. "Nous connaître pour nous unir: les krou de Côte d'Ivoire", in *Arts, Lettres & Spectacles*, Fraternité Matin, no. 2955 du 17 Septembre 1974.
- Smith, Robert, 1970. "The canoe in West African history", *Journal of African History*, 11, 4.
- Stride G.J., and Carolyn Ifeka, 1971. *Peoples and empires of West Africa. West African in History: 1000-1800*. London.
- Sundström, L., 1972. "Ecology and Symbiosis: Niger waterfolk". *Studia Ethnographica Uppsaliensia*, 35.
- Tymowski, Michael, 1967. "Le Niger, voie de communication des grands Etats du Soudan occidental jusqu'à la fin du 16ème siècle". *Africana Bul.*, 6.
- 1971. "La pêche à l'époque du Moyen âge dans la boucle du Niger", *Africana Bul.*, 122.
- Van Chi Bonnardel, N. Régine, 1970. "Aspects récents de l'économie de la pêche en Basse Casamance (Sénégal): la crevette de Ziguinchor", *Bul. IFAN*, 32, 3, série B.
- Verdeaux, François, 1981. *L'Afzi pluriel: chronique d'une ethnie lagunaire de Côte d'Ivoire*. Abidjan: ORSTOM.
- and Claude Fay, 1987. *Projet de recherche pluridisciplinaire: Pêche dans le delta central du Niger (Mali)*. Document de travail. Paris: ORSTOM.
- Zachariah, K.C., and J. Condé, 1981. *Migration in West Africa. Demographic aspects*. A joint World Bank-OECD study. New York, Toronto, Delhi: Oxford University Press.

Attitudes Towards Modernization in African Small-Scale Fisheries

Eyolf Jul-Larsen

Fisheries development, defined as increased productivity and market integration, is by many considered to be particularly problematic compared to development in other economic sectors. The present paper will partly provide substance to those who support such views. However, it will simultaneously lead the attention to perhaps one of the most dramatic and extensive processes of economic growth which has taken place in Africa during this century, observable within the same fisheries sector. In fact, it is strange that so little attention has been attributed to these changes in the general literature on economic development in Africa.

For almost two decades the "theoretical aristocracy" of economic development research gave little or no attention in their works to the endogenous conditions within existing African production systems. With the emergence of the dependency theory and later the basic need theory, and with the sharp increase in neo-classical economic aid literature, the debates on economic change and development to a large degree concentrated on external factors.

Fortunately, the question of the internal conditions for development was brought back on the agenda in the beginning of the 1980s. One important contributor to this was Goran Hyden. This paper is almost exclusively concerned with the endogenous factors influencing economic development in African small-scale fisheries. Its objective is, through a discussion of the underlying economic assumptions of Hyden's primarily political theory, to investigate to what extent empirical cases from African artisanal fisheries support the validity of his assumptions and, more importantly, to illustrate how studies of development in African fisheries reveal their major weaknesses. The works consulted are his *No Shortcuts to Progress. African Development Management in*

Perspective (Berkeley and Los Angeles: University of California Press, 1983) and "The Anomaly of the African Peasantry" (*Development and Change*, 17, 4, 1986).

THE ECONOMY OF AFFECTION AND ITS RELATION TO MARKETS AND STATES

Hyden's theory is based on the assumption of the prevalence and dominance of an economic system in rural (and to a large extent also urban) Africa, which is qualitatively different from a modern market economy. Based on his own research mainly in Tanzania, combined with substantial amounts of economic and anthropological research material, he defines the character of this economy which he calls the "economy of affection". His assumption is hardly a new one. The same was the basis for the substantivist economic school in social anthropology, and since then it has been the concern of a range of researchers in different disciplines. While returning to the approaches of yesterday, however, Hyden represents something refreshingly new. Let us therefore quickly resume the main characteristics of the economy of affection.

First of all, there is the well-known argument that economic structures cannot be separated from other spheres of social life

... the economy of affection argument implies that economic decisions are embedded in social and other non-economic conditions, along the lines originally suggested by Polanyi.... (Hyden, 1983:9)

More descriptively Hyden states:

It must be said from the outset that the economy of affection has nothing to do with fond emotions *per se*. Rather, it denotes a network of support, communications and interaction among structurally defined groups connected by blood, kin, community or other affinities, for example, religion. It links together in a systematic fashion a variety of discrete economic and social units which in other regards may be autonomous. (Hyden, 1983:8)

From the point of view of individual decision-making, Hyden stresses that

... decisions made within the confines of affection criteria are totally rational, although it may be a form of rationality different from the western concept of "economic man". (Hyden 1983:11)

In a society dominated by the economy of affection, the rationality is, according to Hyden, not primarily the realization of surplus and its reinvestment into new productive activities as in a modern capitalistic economy. On the contrary, production is defined by and in relation to social structures outside the sphere of surplus production. The consequence will often be that accumulation of surplus and reinvestment are prevented or at least impeded.

Although the economy of affection is qualitatively different from a modern market economy, this does not imply that individuals belonging to communities dominated by the former cannot act within the institutions of the latter:

In this situation, it seems perfectly possible and logical for the peasant to use his rational response to market incentives in order to enhance his role in the economy of affection. This compatibility is likely to persist as long as the process of proletarianizing the peasantry is far from being at an advanced stage and therefore leaves the rural producers with economic options outside the scope of the macro-economic system. Here it is important to accept that this ability of the African peasant to stand with one foot in the economy of affection and the other in the wider national economy leads him to make decisions that sometimes are supportive of, at other times contrary to, macro-economic and national objectives. Whatever the implications of his decision, however, it takes place with some consideration of the principles of the economy of affection. To that extent the "moral economy" seems to prevail over the "rational peasant". (Hyden, 1983:10)

This point leads Hyden to one of his most important assumptions concerning the rural producers. Since most of them today act within and relate to a modern macro-economic system, what distinguishes African peasants from peasants elsewhere is their independence from the macro-economic institutions. The prevalence of classless societies structurally dislinked from modern institutions like markets and states, leaves the peasants uncaptured by the modern economy.

As the productive and reproductive needs of the peasants can be met without the support of other social classes, relations between those who rule and those who till the land are not firmly rooted in the production system as such. Instead, appropriations by those in control of the state are made

in the form of taxation and as such they are simple deductions from an already produced stock of values. These are tributary rather than productive relations and they do imply a much more limited degree of social control. In this respect, African countries are societies without a state. (Hyden, 1983:7-8)

About the peasants' relation to the market he says:

The majority of the peasant producers in Africa fall into the category of those who merely press their noses against the shop-window of the market-place. They are not in there hustling and are more concerned with protecting the relative order and stability outside it. ... To be sure, they accept that they have to pay a price for both window-shopping and the occasional venture into the market-place, but neither these actions nor the payment of tax to the government forces them to give up their relative autonomy. (Hyden, 1983:691)¹

Based on this assumption, Hyden concludes that external initiatives aiming at promoting increased productivity and market integration in these economies have a tendency to fail. As peasants are uncaptured, and economic growth requires accumulation as well as reinvestment of surplus, conflicts arise between the expectations of the existing society and the requirements of the new one. In such situations the peasants tend to remain in their traditional adaptation, particularly since the intensity and the drudgery of labour tend to increase with the increase in productivity.

Although Hyden never mentions fisheries or fishermen explicitly, but concentrates on agricultural producers, there are few reasons why his assumptions should not include also them. On the contrary:

- a) It is questionable to treat African fishermen or ethnic groups involved in fishing as fishermen or fishing communities *per se*. They are generally part-time fishermen, spending much of their time in other forms of production. For inland and lagoon fisheries, in which the majority of African fishermen are involved, very few exceptions exist. In marine fisheries specialized groups do exist, mainly within populations living on

1. For a more specific analysis of factors likely to determine the ability of peasant households to react to the laws of the market, see pp. 692-3.

small islands where agriculture is difficult, but even here one will find strong links (through other members of the household or close kin) to agricultural activities on the mainland in many households.

- b) Catching fish is a natural adaptation, where access to the resource—although often socially restricted—is not more limited than in agriculture. In line with Hyden's arguments in relation to pastoralism (Hyden, 1988:9), fishermen may in many cases be even more autonomous of the macro-economic system than farmers.

According to Hyden's assumption of an economy of affection, African fishermen's attitudes towards modernization must hence be expected to be relatively cool, and external intervention aiming to raise productivity must be expected to have little impact.

ATTITUDES TOWARDS MODERNIZATION AND EXPERIENCE FROM EXTERNAL INTERVENTION

The considerable amount of existing literature concerned with social organization of small-scale fishing communities all describe the organization of production and distribution in these communities as heavily embedded in other spheres of social life. Strong non-economic mechanisms may regulate peoples' access to crucial resources like fishing grounds, material for the production of gear, and labour. The distribution and flow of different products is often regulated according to principles which complicate or prevent any accumulation of wealth. We have (in a different context) found it legitimate to question whether it is correct to assume that the producer has exclusive rights to his own product (Wijkström and Jul-Larsen, 1984). My own observations underline the same assumption.² Sometimes it is impossible to define where the economy ends and where politics and religion start.

2. I have worked longer periods in Mali (Central delta), Kenya (Turkana) and Northern Angola, both as a researcher and as an aid worker related to fisheries. In addition I have visited Benin, Congo, Ivory Coast, Gabon, Malawi, Mauritania, Mozambique and Sierra Leone as a consultant to governments or aid agencies related to fisheries development.

The fact that African small-scale fishing economies empirically show the same organisational features as those Hyden attach to the economy of affection, is of course no proof of the validity or the usefulness of the concept related to modernization processes. In fact, a large part of the literature tends to interpret the economy and its rationality in a very different way. The validity of Hyden's assumptions can only be demonstrated through the examination of interventions which have not succeeded, or through empirical studies of processes of change.

Initiatives of modernizing African small-scale fisheries have a relatively long history. Mainly in marine, but also in many inland fisheries, attempts to increase productivity and integrate production in the market can be traced back to the early part of this century. After political independence, the initiatives have increased in number as well as intensity. Some have succeeded—at least partially—but many have failed. In the following, I will examine some cases taken from my own experience with the small-scale fishery sector.

Generally speaking, most small-scale fishermen seem ready to accept changes in their production. Whether it implies new capture technologies, or other alterations of existing adaptations, their attitudes to such changes are positive as long as they are convinced that the changes will have positive effects either for their income or in the form of a decrease in the drudgery of labour. I have, in fact, never experienced that fishermen refuse technological innovations as such. On the contrary, they always stress their need for new and better equipment.

In this respect we may say that the fishermen's attitudes towards modernization seem extremely favourable. The problems arise when it comes to accepting the social and economic consequences embedded in the technological innovations. A change, for example, towards the use of more and more differentiated nets, introduction of boat engines, new vessels or more effective processing facilities, is not only a question of technically managing the equipment. As already indicated, it also implies changes in the management of funds in terms of saving for future reinvestments and alterations in the labour patterns in order to optimize the use of the equipment. It may also imply needs to produce more and sell a larger part of the catch. When these "hidden" characteristics be-

come apparent, it often leads to modifications in the attitude towards technological innovations.

Among the local Imraguen fishermen in Mauritania, the government has run support programmes to introduce modern technology (gear, vessels, processing facilities, etc.) for many years, but there are very few (if any) signs of really increased market integration among this group of fishermen. For political reasons the government continues to subsidize their "modern" adaptation and as long as it does, the fishermen continue to use the modern technology without this entering into conflict with their traditional obligations. Productivity remains low and if one compares the Imraguen fishermen with foreign Wolof fishermen operating in the same waters, the difference in productivity and market integration becomes striking. Although no statistics exist comparing the two groups, there is no doubt that one Wolof canoe, which to a large extent uses the same type of equipment and exploits the same resources, is catching much more than an Imraguen one. The Imraguen seem to remain within the context and rationale of their traditional society, but heavy subsidies make it possible for them also to participate in the market economy in which the Wolof operate.

In Turkana in northern Kenya, the government has for many years supported the fishery on the lake through introduction of modern gear, new vessels and marketing facilities. The original idea was to create alternative economic opportunities for the pastoralist population, in order to diminish the pressure on the scarce pasture resources. Results from a fieldwork undertaken in the area (Jul-Larsen, 1981) indicate that to the extent that surplus is generated by the fishermen (largely as a result of government subsidies), this surplus is not reinvested into fisheries but into the traditional pastoral sector enabling some of the fishermen to return to what for them appears as the only meaningful way of life.

Instead of listing more cases illustrating my points, I will dwell on two concepts which often are emphasized as important mediators of modernization, namely those of "entrepreneurs" and "diffusion". Our experience is that although these concepts may be of importance in some cases, they often turn out to have rather limited significance.

When trying to introduce a new fishing vessel (28 feet with in-

board engine) on the coast of Northern Angola, skippers/boat owners who to some extent were marginal in relation to the fishing community were deliberately chosen. They were school teachers, carpenters, mechanics and others, and they had all shown clear interests in investing in fisheries. The boat owners selected their own crews of 4 or 5 men. The strategy was to a large extent based on the assumption that as entrepreneurs they would more easily act economically and in line with the requirements of the new technology. Out of the multitude of problems which arose, one is of particular interest here. Although the intentions and the abilities of the boat owners may have been the best, they were still dependent on crew-members with their feet firmly based in the traditional community of fishermen. The latter seemed to define their labour input as they pleased, and the result was that the boats often were lying idle due to lack of personnel. The only possible sanction the skipper had, was to replace crew members with someone else. On some of the boats the mobility of crew became considerable, whereas on others the crew remained more stable. However, all of them were far from a performance which would legitimize the investments made.

As for diffusion, the picture of the West African coast is interesting. In Pointe Noire in Congo one may observe the Popo (a group of fishermen mainly from Benin) and the indigenous Vili fishermen side by side within an area of 20–30 km of coast-line.³ The Popo utilize the impressive Ghanaian canoes which may be as large as 18 meters long, with outboard engines and huge drift nets, and two villages on the beach function as virtual fish factories, where tons of fish are smoked or dried every week. The Vili, on the other hand, are mainly part-time fishermen practising a simple gill-net and hand line fishery from their small dugouts mostly navigated by oars. Economically, the worlds of the Popo and the Vili are far apart. The former are fully integrated and heavily dependent on markets and other dynamic institutions in the region. Many young Vili have learned fishing by taking employment with the Popo and permanent relations of intermarriage exist between the two groups (Jorion, 1989). Nevertheless, the Vili remain in their traditional adaptation showing few signs of copy-

3. For a more detailed description of the Popo, see Nguinguiri, 1991.

ing the fishery of the Popo after about 40 years of coexistence. Similar situations of groups coexisting are found along the entire West African coast (Ndowe vs. Yoruba in Equatorial Guinea; Fon vs. Pla and Ewe in Benin; Bijago vs. Niominka in Guinea Bissau; and Imraguen vs. Wolof in Mauritania).

I do not claim that diffusion of new technologies leading to increased market integration does not take place. Closer studies along selected areas of the coast would probably reveal examples where it does. Neither do I claim that economic entrepreneurs are of no interest when we study modernization processes. The point is merely to illustrate the remarkable strength which traditional social structures seem to play in limiting the role of these factors in promoting modernization within fisheries.

Although perfectly aware that the brief cases presented may be interpreted differently, they do indicate that productivity and market integration in many African small-scale fishing communities remain weak and that important reasons for this are endogenous factors related to the traditional organization of these communities. Generally speaking, we think this picture is representative for large parts of African small-scale fisheries today. From this point of view, Hyden's assumption of an economy of affection may be said to represent an interesting analytical framework for explaining why processes of modernization often do not succeed in spite of heavy external support. Hyden talks about a peasantry uncaptured by the market economy. It may seem that in some cases "a peasantry captured by the economy of affection" is an even more accurate way to describe the situation.

Although the presentation so far has given a rather static picture of African small-scale fisheries, it is important to keep in mind that the focus of this discussion is on processes of increased productivity. Changes in the economic adaptations of these societies take place all the time, but substantial changes towards a higher degree of market integration and economic growth seem to be fairly limited. However, some changes seem to have become fairly widespread and should be noticed. The use of nylon nets now appears to be widespread. These nets can only be bought for cash. As a result of this, and to some extent also as a result of changes in consumption preferences, it is therefore probably correct to claim that small-scale fishermen are making more use of the market to-

day than they did 20 or 30 years ago. But as has been discussed earlier, using the market is not synonymous with being dependent on or captured by it, as long as it does not come into conflict with the traditional social systems of these people. In the case of the fishermen, they may still regulate their use of the market by buying more or fewer nets (most do still know how to produce some gear locally), or more or fewer consumption commodities, in accordance with what the rules and regulations of their own society "permit" them to. They are still to a very large extent independent actors on the market-scene.

MAJOR CHANGE PROCESSES—THE CASE OF THE WEST AFRICAN COASTAL FISHERIES

The use of Hyden's work as a point of reference in the first part of this paper, has forced us into a discussion of what factors impede modernization processes. In this last session, we will put the question upside down by asking the equally important question of what are the preconditions for the success of such processes.

When discussing the economy of affection, Hyden gives this system an internal development potential when he says

...but the latter [the informal sector] may capture at least parts of the developmental activities that are fostered by the economy of affection. These include farm purchase and farm development, promotion of small-scale business, house construction, support of education, facilitation of migration and community development. (Hyden, 1983:13-14)

He then goes on to describe the characteristics of the informal sector in terms of "social networks" and "informal loan arrangements", where the purpose of savings is to cover a lot of "non-economic" expenditures. His conclusion maintains:

While the latter [the economy of affection] serves many useful purposes in society, some of which are generally underestimated by analysts and policy-makers, it also tends to impose limitations on the capacity of African countries to develop as nation-states and macro-economic entities by diverting resources from public institutions and delaying the development of a public morality that sustains effective state power and keeps the state machinery functioning. (Hyden, 1983:28-29)

Although Hyden continuously refers to specific growth processes (particularly in Kenya), it is surprising that he never analyzes them in any detail in terms of investigating their potential. Instead, he quickly classifies what he calls the informal sector as just another variation of the same economy of affection.

We will argue that Hyden's work, although sometimes useful for explaining the limited effects of modernization efforts, is unable to come to grips with the potential forces in African rural societies related to processes of economic growth. This will be illustrated by a modification of the picture of small-scale fisheries presented in the first section.

The most obvious exception is the dramatic change having taken place in the West African coastal fisheries. With roots in Senegal, Ghana (later including Togo and Benin) and Nigeria, some of the perhaps most remarkable contemporary processes of economic change on the African continent south of Sahara have taken place within fisheries. These processes are characterized by extraordinary technological innovations, new and extended migration patterns, substantial changes in the organization and relations of production and considerable increase of productivity and catches. Contrary to what has been claimed to be the situation for other fishermen, this type of small-scale fishery practised by fishermen belonging to the Wolof, Lebu, Niominka, Fante, Ga, Ewe, Pla, Pedah and Yoruba tribes, from Nouadibou in Mauritania in the north to Pointe Noire in Congo in the south, is intimately related to and dependent on extended and complicated market structures.

Technologically the changes have been remarkable with motorization, larger vessels⁴ and expansion in the volume and variation of fishing gear. Many fishermen are now utilizing a variety of different fishing technologies, whereas they previously used a more limited number of capture methods.⁵ Many now depend on cooling facilities (ice and cool stores, etc.) and some have even started

4. Motorization is today almost 100 per cent. The average size of the Ghanaian canoes has increased from 6–8 metres in the late 1950s to 15–18 metres at present.

5. Nukunya estimates the basic investment cost for an Ewe canoe going to Freetown or Congo at present to be more than USD 15,000 (1989:160). Out-board engines are not included in this figure.

using additional modern support equipment like, for example, echo-sounders.

The migration patterns⁶ of the mentioned groups have undergone dramatic changes both in terms of increased distances, numbers involved and the duration of the migration periods. The migration is also characterized by the emergence of long-term settlements around a number of urban centres where foreign fishermen have established easily definable and more or less permanent "villages" or "ghettos" where they reside. The transportation to the more distant epicentres is done by shipping the canoes on modern ships, with the crews following either by road or by air.

The organization of production has changed accordingly, with larger crews, hiring of "foreigners" on the vessels, and new and varying types of "contracts" between boat owners, gear owners and "labourers". While fishing part-time, family based recruitment to the boats and immediate sharing of the catch after landing were the common forms of organization. Now almost all are full-time fishermen, and it is the "company"⁷ which today dominates as recruitment principle on the canoes. Companies show great variation as to how they are organized. However, the common characteristics are the following: kinship is no longer the dominant principle for the recruitment of crews, the internal economic transactions to some extent take the form of a modern enterprise and the sharing of the outcome is postponed sometimes until the company is dissolved at the end of a fishing campaign which may last as long as two years or more.

The technological changes have also led to the emergence of new forms of credit, saving and economic security arrangements for the fishermen. The whole catch is now commercialized and the alterations of the relations of production have led to new dependency links where the market is essential. The consequence of the extended migration patterns has been that the fishermen, more than being dependent on one market, now depend on an extended regional market-network. Company-members may for example be dependent on a boat- and gear-owner, who himself

6. For a description of the historical development of the migration patterns, see Chauveau, 1991.

7. Descriptions of the company system are given in, for example, Jorion, 1985; Nukunya, 1989 and 1991; and Nguinguiri, 1991.

depends on a fish-mamie in Lomé for credits and economic security arrangements related to vessel and engines; the gear may be received on credit through a fishmonger in Libreville; and the company may rely on the internal fish-market in Cameroon for the prices of their catch.⁸

In terms of productivity, catches have increased dramatically. In Ghana the canoe landings are reported to have increased from 27,500 tons in 1961 to 262,400 tons in 1987.⁹ Estimates indicate that the groups of fishermen who are part of the changes described constitute about 10 per cent of all coastal fishermen in the region, and that they land about 80 per cent of the total catches deriving from the canoe fisheries (Haakonsen, 1988). In another paper in this volume, J.M. Haakonsen states that in spite of the general economic recession in Ghana and Senegal, the coastal fisheries in the two countries have grown considerably both in terms of employment and production. In Senegal, 46 per cent of the volume of exported fish originated from the canoe fisheries in 1981 (Dème, 1983. Quoted from Chauveau and Samba, 1989:618).

This picture given of the dramatic changes in West African coastal fisheries does not imply that all the referred groups of fishermen have participated in all the changes. It is, therefore, important not to make sweeping generalizations about the developments. In addition, we are not only discussing one, but at least three empirically distinct processes. No data we have consulted indicate any direct link between what has happened in Senegal, in Ghana and in Nigeria. Nevertheless, since the processes coincide in time, and also to a large extent in space, the changes have led to a situation where the West African coastal fisheries emerge as a highly efficient and productive economic system which may be looked upon as regional and where processes originating in different countries combine into a very complex regional system.

To sum up, the case of the West African coastal fisheries demonstrate the emergence of a highly efficient macro-economic system perhaps involving as many as a million people or more.

8. Although this is a constructed case, some studies demonstrate clearly the complex set of dependencies existing. See, for example, Atti-Mama, 1991.

9. Hernæs, 1991:159–60. Although there are uncertainties related to the figures and they do not take account for the increase of the fleet, they can serve as an illustration of the increased productivity.

The actors (fishermen as well as others) in this system not only depend upon one market, but rather a regional market-network covering several countries where everyone has to adhere to the general rules of the market in order to survive. Moreover, the surplus generated is also to a large extent reinvested in the sector, instead of being saved or immediately redistributed. In our opinion it becomes meaningless to classify this kind of economic system as a variation of the economy of affection, as Hyden seems to do. Its rationale is simply too different. Concerning the development in Senegal, J-P. Chauveau and A. Samba conclude:

There is nothing less informal or less traditional than the process that has given the canoe fisheries of Senegal their present shape. (Chauveau and Samba, 1989:617)

As will be illustrated in the next section, however, West African fisheries should neither be considered as anything like a modern capitalistic system.

PRECONDITIONS FOR THE CHANGES IN WEST AFRICAN CANOE FISHERIES

The immediate question arising is, of course, how the changes in West African fisheries started in the first place. If the fishermen only were part-timers and strongly dependent upon the social structures in their traditional societies some generations ago, how was this dependency broken?¹⁰

One of the few instances where Hyden addresses the preconditions for economic growth is when he says:

The rapidity with which modernization of peasant agriculture has taken place in some parts of Africa is impressive but it is important to acknowledge that where this change has taken place it has normally been associated with specific circumstances supporting such a change, for example, land scarcity forcing producers to intensify methods of cultivation, availability of good soils and accessibility to reliable market outlets.

10. The dramatic changes became really visible in the 1950s or 60s. However, as most of the literature shows, some of the preconditions on which we concentrate must be sought in processes which started at the end of the last or in the beginning of this century.

Where one or more of these conditions are absent, evidence of change in agricultural techniques and practices has been much more limited. (Hyden, 1983:5)

As Hyden never makes it his task to study ongoing processes of change, his reasons for selecting the three factors of land scarcity, good soils and reliable market outlets remain obscure. Only the first factor is related to the endogenous conditions in the societies in question. The two others are factors external to the traditional societies, and therefore not of the kind Hyden perpetually claims to be of major importance, viz. the factors created by changes in the material conditions of Africa's own history.

By referring to some recent studies of change processes in West African fisheries, we shall address the question of preconditions. Particular attention will be given to the question of land scarcity, since it is the only endogenous factor mentioned by Hyden, and since it is an important element in the theories of researchers like E. Boserup, J. Dupâquier and R. Wilkinson (Boserup, 1965; Dupâquier, 1972; Wilkinson, 1973).

One study dealing specifically with this issue is presented by P. Jorion and relates to the Anlo-Ewe of Ghana and the Xwala of Benin. Although he puts the question in a slightly different way (How have Anlo-Ewe and Xwala become fulltime maritime fishermen?), his overall argument, phrased as a universal law, is the following: "No one ever becomes a full-time maritime fisherman other than under duress" (Jorion, 1988:152). For the two ethnic groups in question he concludes:

I have been dealing here with two ethnic groups, the Xwala and Anlo-Ewe, who have turned to full-time maritime fishing for similar reasons: scarcity of land. Once access to land has been severed, diversification of occupations becomes impossible and risk-minimization strategies need to take an altogether different direction: mobility in following the fish wherever they go. There are two distinct qualitative ways of doing this. Follow the fish over a stretch of coast centred on one's beach settlement, an outpost of the ancestral village, which I have called *seasonal moves*, or, via what I have called *migration*, turning to the more drastic solution of exiling oneself for a time under more favourable skies, where fish are plenty and buyers rich. (Jorion, 1988:152)

Although seen from a slightly different perspective, it must be legitimate to rephrase this conclusion and say that, according to

Jorion, the major cause behind the change in economic systems and the disruption of the economy of affection among certain groups of the Anlo-Ewe and the Xwala, is population pressure and scarcity of land in their original home areas.

In a discussion with Jorion, C.K. Nukunya gives further substance to the important role of marginalization in the case of the Anlo-Ewe:

The need to migrate was no doubt caused by population pressure, which was so grave that all available land "including cemeteries [was] put under cultivation" (Benneh, 1971:74). The intensification of cultivation in the shallot industry was only a partial solution; nor was the poultry for which the area has been traditionally noted (Winnett 1850), of much help. (Nukunya, 1989:157)

In an article about the development of Senegalese fisheries and its causes, J.P. Chauveau and A. Samba state:

The regional differentiation of the Senegalese coastline was reinforced: Saint-Louis, whose hinterland soil had lost its fertility, gave up groundnut cultivation and asserted itself as a centre of maritime fishery and inland navigation. This region constituted a reservoir of migrant Guet-ndar and Walo-walo fishermen. (Chauveau and Samba, 1989:604)

Chauveau and Samba thus indicate that land erosion may have played a role in this process.

There is hence support in historical data for relating the economic changes we are discussing, to land scarcity and marginalization. But unlike Jorion, the authors of the two latter works quoted only seem to consider this element as one (and not even a very important one) among many others. Nukunya, who actually criticizes Jorion, tends to emphasize external factors like the availability of rich fishing waters, increased security through political change and increased monetarization (Nukunya, 1989:157). Although these factors clearly are important elements for the understanding of the changes, there are also problems attached to them. They are, as we see it, incapable of explaining why the changes have occurred only among certain groups and not among others.

Chauveau and Samba, in their historical analysis of the Senegalese small-scale fisheries and the role of state intervention, also underline the important role of external factors like increased demand and market opportunities and the introduction of new

technologies—particularly motorization—in the development of these fisheries. But the authors exceed this level of explanation by showing that the actual realization of the development potential of these factors only can be understood if one looks at how changes in the endogenous conditions favour the utilization of the external opportunities:

The artisanal sector has gradually built itself, autonomously, first by benefiting from the enormous inland market, later by elaborating its own strategies vis-à-vis external initiatives and interventions. (Chauveau and Samba, 1989:617–18)

Except for the question of land-scarcity already quoted, Chauveau and Samba emphasize two other internal factors of considerable importance. First, the changes in and extension of *migration*. These changes were favoured partly by land scarcity and partly by new environments, but also by the fact that the traditional adaptations to a large extent were based on needs for seasonal moves. The new and extended migration patterns were hence established as a result of new technologies, the increase in the external demand for fish as well as of better marketing opportunities. These changes in turn had important consequences for the economy. Extended migration led to decreased social control by the traditional structures of the society, which again facilitated the accumulation of a surplus. Indirectly this happened, for example, through the emergence of new forms of recruitment of crew members (i.e. the companies). New technologies and changes in production made accumulation necessary, and changes in migration patterns are a key element for understanding how this became possible.

Another important element in facilitating accumulation is found in the traditional *tontine* system described, among others, by Jorion and Atti-Mama (Jorion, 1985:35–37; Atti-Mama, 1990). Atti-Mama's description shows how this informal saving system, which originally met the social security needs of community members (guaranteeing support for unexpected ritual expenses), has been reshaped to serve needs for investments. While Jorion says it is "...designed to protect financial savings from potential pressure of kin and clients", Atti-Mama argues that it has been re-designed and extended to include this function. Atti-Mama also shows how far this has come today, in that some fish-mamies in

Cotonou now use the *tontine* system both to be able to provide the large credits, and as an economic security system in cases where credits are not refunded (Atti-Mama, 1990:13).

The second endogenous factor underlined by Chauveau and Samba is the emergence and the functioning of a decentralized and flexible network of buyers and sellers. It is important to keep in mind that specialization and the extended migration in fisheries were paralleled by specialization in other sectors. While some chose fisheries, others chose the market. Decentralization and flexibility is certainly important enough, as has been underlined in a series of studies and policy-papers. Equally important is, in our opinion, the multitude of social rules in addition to the general market laws which regulate a market. Studies of the big West African fish-markets reveal that their functioning relies on much more than buying cheap and selling expensive. The principles underlying, for example, the big fish mamies' provision of credits, are in themselves so complicated that, to our knowledge, no-one has been able to describe their full scope. But one thing remains certain: Their resemblance to modern banking is virtually non-existent. For the fishermen, however, the rules and regulations of the informal credit system are familiar and help them retain the necessary understanding and confidence. In this way, we may say that the success of the market integration to a large extent has been caused by the capacity of the market to adapt and utilize the rules and values of the traditional societies.

This short discussion on the causes behind the dramatic changes in West African fisheries shows three things:

- a) It is a specific combination of external and internal factors, emerging within a particular period of time, which explains the system of West African fisheries as it appears today.
- b) The economic growth in these fisheries has been made possible due to, and not in spite of, institutions and social regulations of the traditional societies. It is through peoples' extension and redefinition of traditional institutions, combined with physical pressure against the traditional adaptations, that a new and economically much more productive system has developed.

- c) Substantial economic growth does not necessarily require modernization, defined as capitalistic relations of production. One should therefore avoid using the two concepts synonymously, as Hyden tends to do.

There are reasons to conclude that socially endogenous factors of African small-scale societies constitute a kind of Janus face in relation to economic growth. On the one hand, these factors may represent serious constraints on growth processes, and on the other they may constitute important accelerating forces which probably have led to a faster and more extensive growth than what the introduction of any modern market system could have done.

To what extent the new economic system will continue to grow is, as pointed out by Chauveau and Samba, impossible to say much about at the present stage. We do not even know to what extent its reproduction relies on fisheries as such or whether the system can switch into other forms of production. Only more in-depth knowledge may enable us to confront these questions.

FINAL COMMENT

Hyden's theory is primarily a political one, concerned with the role of the nation state in economic development. This has not been the issue of this paper. What has been the issue is the underlying economic assumptions of his theory. We have demonstrated that these assumptions have strong weaknesses. Although in many cases they do seem useful for explaining why economic growth is impeded or does not appear, they are incapable of grasping the character and the potential of important change processes.

Hyden seems to fall into the same trap as he legitimately accuses many development researchers of falling into. Instead of analyzing the role of the endogenous factors in processes where economic growth is generated, he chooses to define every emerging economic system in Africa as only one more variation of the traditional African economy of affection on the basis of a classical and oversimplified model of historical materialism. The model becomes a static one and it is, therefore, not capable of revealing the underlying dynamics in economic change. Conclusions such as:

"... capitalism is likely to be the most effective force to break the hold that the economy of affection still has over Africa" (Hyden, 1983:25), become as epistemologically biased as the conclusions of those he criticizes.

REFERENCES

- Atti-Mama, C., 1990. Systèmes traditionnels et modernes d'épargne et de crédit en milieu pêcheur au Bénin. PMB/WP/12. Cotonou: FAO.
- 1991. "Fishermen's Migrations in Togo and Benin", in Haakonsen, J.M. and M.C. Diaw, (eds.) *Fishermen's Migrations in West Africa*. Cotonou: IDAF/WP/36.
- Boserup, E., 1965. *The Conditions of Agricultural Growth*. London: Allen & Unwin.
- Chauveau, J-P., 1991. "The Historical Geography of Fisheries Migrations in the CEECA Region (end XIX century to 1980s)", in Haakonsen, J.M. and M.C. Diaw, (eds.) *Fishermen's Migrations in West Africa*. Cotonou: IDAF/WP/36.
- Chauveau, J-P. and A. Samba, 1989. "Market Development, Government Intervention and the Dynamics of the Small-Scale Fishing Sector: An Historical Perspective of the Senegalese Case", in *Development and Change*, 20 (4).
- Dème, M., 1983. "Les exportations de poissons de la pêche artisanale sénégalaise." In *Document scientifique* No. 85, pp. 1–27. Dakar: CRODT.
- Danida, 1989. Maritimen, Kølehuskæde, Midtvejs review mission. Copenhagen.
- Dupâquier, J., 1972. "De l'animale à l'homme—le mécanisme autorégulateur des populations traditionnelles", *Revue de l'institut de Sociologie* No. 2. Université libre de Bruxelles.
- Hernæs, P.O., 1991. *Modernizing Ghanaian Fisheries. The Need for "Social Carriers" of Technology*. Oslo: Ad Notam.
- Hyden, G., 1983. *No Shortcuts to Progress. African Development Management in Perspective*. Berkley and Los Angeles: University of California Press.
- 1986. "The Anomaly of the African Peasantry", in *Development and Change*, 17 (4).
- Haakonsen, J.M., 1988. "Background to West African Fisheries", in *Report of the Mission to Formulate the 2nd phase of the IDAF Programme*. Rome: FAO.
- Jorion, P.J.M., 1985. *The Influence of Socio Economic and Cultural Structures on Coastal Fisheries Development in Benin*. Cotonou: IDAF/WP/4.
- 1988. "Going Out or Staying Home. Seasonal Movements and Migration Strategies among Xwala and Anlo-Ewe fishermen", in *MAST*, 1 (2).
- Jul-Larsen, E., 1981. *The Lake is our Shamba*. DERAP WP/A-244. Bergen: Chr. Michelsen Institute.
- Nguinguiri, J.C., 1991. "Fishermen Migrations in Congo. The So-called 'Popo' Fishermen", in Haakonsen J.M. and M.C. Diaw, (eds.) *Fishermen's Migrations in West Africa*. Cotonou: IDAF/WP/36.

- Nukunya, G.K., 1989. "The Anlo-Ewe and Full-time Maritime Fishing: Another View", in *MAST*, 2 (2).
- 1991. "The Anlo-Ewe Fishermen's Migrations", in Haakonsen, J.M. and M.C. Diaw, (eds.) *Fishermen's Migrations in West Africa*. Cotonou: IDAF/WP/36.
- Wijkström, U. and E. Jul-Larsen, 1986. "Tackling the Major Constraints", in *CERES*, 19 (4). Rome: FAO.
- Wilkinson, R.G., 1973. *Poverty and Progress*. London: Methuen.

Small-Scale Fisheries and the Evolutionist Theory of Institutional Development

Jean-Philippe Platteau

The evolutionist thesis applied to human institutions states in a nutshell that institutions are not "designed mechanisms" but rather unintended regularities of social behaviour that tend to emerge "organically". In this approach, institutions are thus seen as evolving unconsciously and gradually from the pursuit of individual interests as agents repeatedly face the same types of social problems or situations. Institutional adjustments therefore take place spontaneously under the impulse and action of rational self-interested individuals so as to enable them to adapt optimally to—or to continue to draw maximum benefits from—changing circumstances.

The evolutionist theory of land rights provides us with a concrete illustration of the evolutionist approach as applied to the agricultural sector. Although admittedly subject to enormous regional variations, the evolution of land rights is said to follow a common tendency. With increasing population density, specific land rights develop and gradually replace general land rights. The cultivator can begin to assert certain rights over plots, beginning with the right to resume cultivation of the specific plots after a period of fallow. At a later stage he asserts—and receives—the right to assign the plot to an heir or to a tenant and, as population pressure continues to rise, the use right to the plot becomes still more individualized. More precisely, the lineage ceases to exercise control over the land and eventually the rights assignable by the individual cultivator include the right to refuse stubble grazing and, most important, become completely alienable. Indeed, with decreasing land-labour ratios, land acquires a sales value, and a market for land sales develops. A cultivator can then lease and sell plots to individuals from outside the lineage. This transition to secure specific land rights provides incentives for invest-

ing in specific plots, which is quite appropriate since such investments are precisely required for the intensification of production and preservation of fertility (Binswanger and McIntire, 1987:87; Pingali and Binswanger, 1986:26; Popkin, 1988:270).

Land disputes provide the mediating mechanism through which demand for institutional change in land rights is articulated. Thus, in Asia, for example, a rise in real land prices was associated with an increase in the demand for more precise and secure property rights. This demand was actually articulated through land disputes since the rising value of land "led to disputes over ownership that often exposed weaknesses in the prevailing system of identifying and administering land rights". With the appreciation of land prices, indeed, the expected gain from obtaining ownership rose and justified the transaction cost of dispute. And the government responded to such disputes by developing more elaborate systems of land rights and, often finally, by undertaking a full cadastral survey (Feeny, 1988:283-95).

Now, as land becomes a privately appropriable commodity which appreciates under the joint impact of population growth, market penetration, and technological change, it comes to acquire collateral value and the availability of such a major collateral asset sharply increases the supply of credit (with the result that the sales value of land now includes a collateral premium). The emergence of a class of (professional or non professional) moneylenders and the concomitant rise of a class of landless people are the natural consequences of the reduction in the lender's risk due to increased collateral options on the one hand and the possibility of acquiring land pledged as collateral whenever the borrower defaults on his loan on the other. If we except gifts (including inheritance), land may thus change hands in two main ways: through foreclosure or through voluntary market transactions.

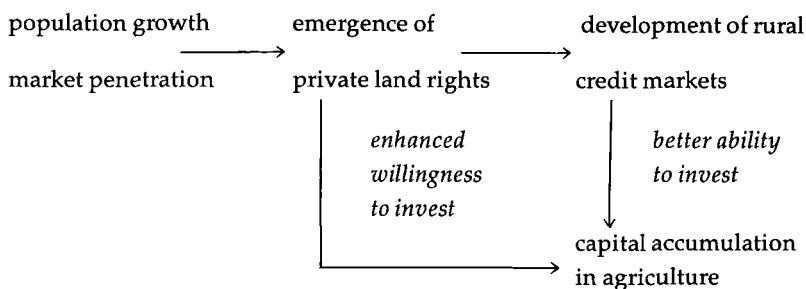
In the above analytical perspective, changes in relative factor scarcities or prices clearly play a major role in inducing institutional change. The rising price of land thus causes a shift from communal to individual tenure, or from general to specific land rights. In addition, it is noteworthy that institutional adjustments or innovations are supposed to always provide an appropriate response to new cost-and-benefit configurations (Alchian and Demsetz, 1973).

Consider the case of agricultural intensification. As land becomes increasingly scarce, there is a need to shift from extensive to more intensive forms of land exploitation. Such a shift will not occur unless the required long-term investments—particularly in the form of land improvements—are undertaken, which in turn presupposes that the two following conditions can be met: (1) the landowner obtains good guarantees that the benefits of his investment efforts will accrue to him, and (2) he can have access to the credit required to purchase the modern inputs used in land-augmenting agricultural practices. As explained above, both conditions are in fact fulfilled through the establishment of private property rights that are freely transferable. To the extent that such rights tend to emerge more or less spontaneously as a response to increasing land scarcity, induced institutional change can be said to be functional to society's needs.

In fact, the above-described evolutionist approach is nothing else than an extension of neoclassical economic analysis to the study of institutions. No wonder then that it exhibits the same kind of harmonious vision as can be found in standard neoclassical theorizing. In particular, even though it potentially allows for a (minor) role to be played by the state as soon as the supply side of institutional change is considered, it suffers from both a mechanistic and a technocratic bias. The former bias results from the complete neglect of class conflicts and power relations which arise from the heterogeneous nature of all real societies. As for the latter bias, it must be ascribed to an unrealistic conception of the state: this agency is indeed viewed as a neutral super actor which responds rather passively to the demands for institutional change articulated by abstract rational (self-interested) individuals. Therefore, it does not follow any objective of its own and is entirely geared towards meeting the requirements of economic efficiency within the assumedly optimal framework of decentralized economic initiatives and actions. In the particular case examined above, a direct consequence of the mechanistic and the technocratic biases built in the evolutionist explanation of the development of private land rights is that it often ignores all the costs which this development has implied in terms of equity, social cohesion, and political stability.

For the purpose of the following discussion, there is one impor-

tant point that needs to be borne in mind: the scheme of interpretation proposed by this approach, albeit largely incomplete and biased, provides us with a good account of the sequence of events that has actually occurred and still occurs in most human societies of the modern world, that is the sequence:



What shall be contended in the next section is that the evolutionist approach to institutions is much less powerful when applied to the situation obtaining in the fisheries, particularly in those of the Third World where artisanal units continue to play an important role. This is due to the fact that the first link in the above chain of events is missing with the result that all subsequent outcomes cannot be automatically induced by the parallel processes of rural population growth and increased commercialization of primary sector activities.

THE IMPACT OF HIGH TRANSACTION COSTS AND STRONG MARKET IMPERFECTIONS IN SMALL-SCALE FISHERIES

During the last decades, the fishing sector of most developing countries with a good potential has undergone major transformations under the joint impact of rapid population growth and increased market penetration. As a result, many actors have entered the sector as workers, investors, or both. Thus substantial additions to the fishing workforce have come from natural increase in the fishing communities themselves or from other overpopulated sectors. This is particularly evident in countries where pressure on land and repeated natural disasters (like the prolonged drought

which hit the Sahelian countries during the seventies) have pushed many rural dwellers to leave agriculture and join a more promising sector. Fisheries can actually be a host sector for such people whenever entry is easy because of low initial skill requirements. In fact, there is often some room for absorbing rather unskilled outsiders either to work as helpers on the beach (to drag the boats ashore, to transport the fish, etc.), or even to join fishing crews and handle nets under the direction of a core of specialized fishermen. A good illustration of the latter possibility is provided by artisanal purse-seiners in Senegal (that is sets of two "nyominka" pirogues equipped with a purse-seine net) whose number has increased dramatically during the last two decades and which can accommodate large numbers of unskilled operators tightly supervised by a group of experienced fishermen. On the other hand, to the extent that (artisanal) fishing equipment is not too costly, entry into the fisheries is also easy for investors willing to seize the new profit opportunities born out of the increased market integration of fishing communities (thanks to the rapid development of linkages—both infrastructural and commercial—with both urban sources of demand and world markets). However, for reasons that will be explained later, outside investors usually prefer to involve themselves in the fish trade business rather than in production (harvesting) operations in the artisanal sector (investment in industrial vessels is a field largely occupied by big companies, often of foreign or multinational origin).

As a consequence of the above trends, growing pressure has been exercised on fish resources and the regime of open access has frequently caused situations of economic or even biological overfishing to arise. The disastrous effects of these situations, particularly from the viewpoint of traditional fishing communities, are too well-known to be recalled here. What deserves to be noted, nevertheless, is that access to the sea and its fish resources has become so problematical, especially for small-scale operators using artisanal harvesting techniques, that serious conflicts between various categories of claimants (between modern and artisanal operators, between mechanized and non-mechanized fishing units, or between users of different fishing techniques within the artisanal sector itself) have become a common occurrence in many developing countries (Kurien, 1978; Moorsom, 1984; Meynen,

1989; Verdeaux, 1989; Mathew, 1990; Platteau, 1990b). Moreover, such conflicts have often been exacerbated by state policies aimed at actively promoting industrial fishing (through various kinds of assistance and subsidies) in order to exploit as quickly as possible the new export opportunities in luxury fish and thereby earn badly needed foreign exchange (Platteau, 1989a).

THE MISSING LINK IN THE EVOLUTIONIST CAUSAL SEQUENCE

A striking feature of fisheries development is that, contrary to the evolution observed in agriculture, growing conflicts over the access to fish resources have not resulted in the emergence of private property rights, except in some exceptional circumstances. One powerful reason accounting for the absence of private access rights in fisheries lies in the (prohibitively) high transaction costs of establishing such rights. In theory, as is well-known, there are two main ways of conceiving the privatization of rights of access to the fish resources. The first method consists of subdividing the water space into compartments and apportioning them to different individualized rightholders according to some allocation rule (ranging from any kind of administrative selection procedure to public auctioning). With the second method, by contrast, the natural base (water) remains undivided but the production means or capital goods required to harvest the resource it contains are subject to strict regulations aimed at controlling the fishing effort. The allocation of fishing licences and quotas represents the most widely used means of achieving this aim.

Now, there are serious problems with both methods. Thus, in the case of vast open sea spaces, the first method involves tremendously high transaction costs for the demarcation of fishing zones, and for the surveillance and protection measures necessary to enforce the corresponding rights. Moreover, when the fish species available are highly mobile, the delineation and apportionment of fixed water areas cannot allocate fish resources in a satisfactory way; nor can it prevent continuous demarcation disputes from arising in connection with the chasing of the fish.

As for the second method, it has been largely resorted to in the

coastal waters of industrialized countries where the fisheries are exploited by a manageable number of industrial (or semi-industrial) fishing units. In most developing countries, however, this method is hardly applicable because fish resources are being harvested not only by industrial (or semi-industrial) vessels, but also by numerous artisanal (small-scale) units. Indeed, since their livelihood depends on guaranteed access to the sea, no government can allow itself to openly exclude traditional fishermen from participating in the fishing effort by granting fishing licences and/or quotas to a restricted number of industrial vessels only. On the other hand, the solution consisting of allocating such licences and/or quotas to traditional operators is not feasible either, as these operators are very difficult to count, record, and monitor due not only to their sheer numbers but also to their high degree of intersectoral and/or geographical mobility, at least in many countries (such as those of West Africa). The difficulties are compounded by the fact that artisanal boats are scattered, a direct result of the decentralized pattern of small-scale fishing activities. This is in obvious contrast with the situation obtaining in the industrial fishing sector, where the operating units are always attached to a well-identified harbour and therefore easy to register and follow up. The problems confronting the second method of issuing private rights of access to the water can therefore be summarized as follows: the procedure which is acceptable on equity grounds entails prohibitively high administrative costs and is not manageable or, conversely, the procedure which can be cost-effective even after allowing for transaction costs is so inequitable that it is not politically feasible.

For the reasons highlighted above, private use or ownership rights have not developed in Third World fisheries despite the increasing scarcity of fish resources (relative to demand), and the growing incidence of damaging conflicts over access to the water. Since traditional systems of community management, wherever they existed, have largely disappeared under the combined influence of population growth, market integration, state intervention, and erosion of traditional values and authority structures, these fisheries have generally become the object of unregulated entry and fierce struggle among various claimants.

ABSENT AND IMPERFECT MARKETS

It is evident that, when private tradable rights in fish resources do not exist—whether in the form of ownership or use rights over a given water space, or in the form of fishing licences and quotas—they cannot serve as collateral like secure (duly registered) titles in land do in the agricultural sector. The problem thus created is all the more serious as the capital goods used by the fishermen to catch the fish are not considered as an acceptable security by most lenders, especially those operating in the formal (organized) credit sector. This is so because fishing-equipment is not a safe value-storing asset: as a matter of fact, it may quickly deteriorate and lose much of its initial value if it is damaged or even sunk in the sea. Since they are thus unable to reduce or avoid the risk of default on the part of the debtors (debtors may not be capable or willing to repay the loans taken), institutional lenders prefer to ration credit by refusing to give loans to those who have no acceptable collateral to provide them with. Economic theory has actually offered a strong rationale for this widespread banking practice (Catt, 1965:359–60; Jaffe and Russell, 1976; Raj, 1979:113; Stiglitz and Weiss, 1981; Sen, 1981; Binswanger and Sillers, 1983; Diaz-Alejandro, 1985; Carter, 1988; Yotopoulos and Floro, 1989; Eswaran and Kotwal, 1990): if the interest rate were raised so as to include the premium required to adequately cover the lender's risk (in the absence of collateral), it would probably exceed the level at which the expected rate of return to the lender per unit of money lent reaches a maximum. As a result, the interest rate will be set at a level smaller than the market-clearing rate and not all the agents willing to borrow at the ruling interest rate will have their demand satisfied: the worse risks will be evinced from the credit market.

It must now be reckoned that the above problem could be solved if only there would be insurers ready to cover fishing-boats and gear against major risks (sea accidents and thefts): adequately insured, these assets would indeed become acceptable collaterals for credit-givers and a serious market imperfection would thus be removed. Yet such possibility does not exist for artisanal fishing units because no profitable insurance market can emerge in an environment fraught with so many hazards and so important infor-

mational asymmetries as the fishing sector. This point requires some explanation and further reference to economic theory.

Any insurer is confronted with two kinds of problems whenever information is costly and asymmetrically distributed, that is whenever the information available to one party of the contract is not the same as that available to the other party: the problems of "adverse selection" and those of "moral hazard". By adverse selection a situation is meant in which only people with high risks are attracted by an insurance policy given that insurance companies must offer everyone the same policy. In effect, the problem lies in the impossibility of distinguishing good from bad risks. It can therefore be expected that the insurance will attract only bad risks, since good risks will not subscribe to a policy whose terms are calculated on the basis of an overall average risk. There is moral hazard when people, once insured, tend to be less concerned with avoiding the contingencies for which they are insured, than if they were to bear the costs involved (Newbery and Stiglitz, 1981:165-6; Binswanger and Rosenzweig, 1986:507, 514-5; Newbery, 1989:278-9).

Now, a central feature of small-scale fishing, particularly evident in the case of marine fisheries, lies in the highly decentralized pattern of its operations as a result of which the participants in the sector can easily conceal strategic information from the scrutiny of any outside agency. This is all the more so as fishing in the small-scale sector traditionally involves membership in a social group, a community or a village in which strong ties of solidarity exist vis-à-vis the external world. Consequently, an outsider has little recourse for improving its information base. In this sector, therefore, informational asymmetries are considerable and the two afore-mentioned incentive problems are bound to be quite important.

Given the above conditions, an insurer will make a profitable business only if he incurs high transaction costs for the screening of applicants and the collection of relevant information pertaining to the contingencies which give rise to claims, or alternately, if he introduces coinsurance clauses in the contract to reduce the incentive problems. In both cases, however, we end up in a deadlock. If the insurer follows the first path—incurring high transaction costs in order to reduce incentive problems of the adverse selection and moral hazard kinds—the insurance premiums charged

by him will be so high that no owner of fishing assets will be ready to pay them to get insured. And if he chooses the second route instead, the insurance will have such a low potential utility to these asset owners that it will cease to attract them even though its price may be moderate. In either eventuality, the demand side of the insurance market vanishes and the market forces turn out to be unable to reduce risks in a decentralized manner (Rothschild and Stiglitz, 1976; Rasmusen, 1989:189–93; Newbery, 1989). State-subsidized insurance schemes can of course be envisaged to overcome this market deficiency. Nonetheless, for the afore-explained reasons, their cost to the national budget should not be underestimated.

In the industrial fishing sector, by contrast, an insurer can generally assess the value of boats and gear, estimate the extent of reported damage, and assign responsibilities at much lower costs than in the artisanal sector. Important reasons for this are the facts that industrial vessels are easily identifiable (they are immatriculated and have a national flag) and localizable (they are attached to a determinate port of origin) while their owners are often corporate entities with a legal status. Now, since administrative costs per unit of money insured can be kept within tolerable limits, the insurer may charge moderate premiums and at the same time avoid recourse to exclusionary clauses. As a result, attractive insurance policies can be offered to boat owners and a market may actually emerge.

INFORMAL CONTRACTUAL ARRANGEMENTS AND INTERLINKED DEALS AS WAYS OF OVERCOMING INCENTIVE PROBLEMS

From the above analysis, it is therefore evident that the imperfection of the insurance market has the effect of transferring incentive problems (moral hazard and adverse selection) to the credit market. Since loans cannot be guaranteed by acceptable collaterals, the lenders have to take these problems into account while making their decisions about whether to give a credit and, if the answer is positive, what interest rate ought to be charged on it. As a matter of fact, borrowers who are willing to pay the highest in-

terests are likely to represent bad risks either because they are dishonest (in the sense that, from the very beginning, they do not intend to return the loan); or because they are unconscious of the financial discipline required from a borrower and careless about the use of the loaned money. As has been pointed out earlier, the presence of such risks tends to prompt the lenders to ration credit and to avoid granting loans at high interest rates, even though a class of borrowers would be willing to pay them.

If it is true that credit market imperfections are likely to act as a constraint on the adoption of new harvesting technologies, it would be incorrect to conclude that they have the effect of depriving small-scale fishermen of any access to investment finance. What needs to be emphasized is that the main impact of these imperfections is rather to shape the modes of access to capital resources in a particular way. To understand this point, it is important to bear in mind that the lender's risk may possibly be reduced if collateral substitutes acceptable to the lender are provided by the borrower. Two such substitutes appear to play an important role in fishing communities and thus deserve to be discussed here: personal trust and market interlinking.

EXTENDED FAMILY NETWORKS

Trust is commonly based on a personalistic relationship and it explains why many fishermen actually borrow from friends and relatives, often but not always at zero or comparatively low interest rates. In Asia, however, limited evidence tends to indicate that loans obtained from friends and relatives are generally of a lower amount than those obtained from other sources of credit. Related to this feature is the fact that loans based on personal trust are granted for consumption rather than for production purposes (see, for example Platteau, Murickan, and Delbar, 1985:295-317). As has been argued elsewhere, these characteristics of personal loans follow from the fact that they are often used to stabilize incomes intertemporally in a context of high day-to-day fluctuations of fishing catch values and it is possible to equalize current incomes on given days because their covariance is remarkably low in artisanal fishing (Platteau and Abraham, 1987:466-71; Platteau,

1990c:149–54). In the artisanal fisheries of sub-Saharan Africa, by contrast, it seems that such loans play a more important role than in Asian (and Latin American) fisheries, especially because they tend to be of a larger amount and are more frequently intended for investment financing. This noticeable difference between Africa and Asia (or Latin America) arises to a large extent from the widespread existence and pervasive influence of extended family networks throughout sub-Saharan African societies in general. Within the vertically integrated structure of these networks, the elders have usually accumulated enough assets to make loans to the younger members without running too high a risk of destroying the family property. This being said, it is a customary practice in many African fishing societies (like in agricultural ones) that fishermen gain access to capital goods (boat and nets) through inheritance from a deceased or retired family head. Such is typically the case in countries like Senegal and Ghana, which have among the largest small-scale fishing sectors in the whole African continent.

The extended family system has undeniable advantages. Besides providing loans (or gifts) to its members, it acts as a powerful risk-pooling arrangement insofar as it owns several fishing units: indeed, all these units will not sink together or return empty to the shore on a given day. Yet the system is not without its shortcomings and, in particular, it may well have the effect of slowing down the pace of innovation and adoption. This disadvantage actually occurs when young or middle-aged fishermen have to refrain from adopting capital-embodied innovations due to the conservative spirit of the eldest member in whom the property of the family fishing assets is vested.

CREDIT-CUM-MARKETING RELATIONSHIPS

The second collateral substitute, which may allow the lender's risk to be reduced so as to make possible credit transactions that would not take place otherwise, is the borrower's commitment to sell his catches through his credit-giver. In other words, by linking up credit with marketing relations, the latter may offer loans to owners of fishing units on the security of future catches: to the extent that he can easily enforce the repayment of the loan (and the

payment of the interest) at the time of the landings, the inter-linked contract serves the same function as a collateral. This way of overcoming credit-related incentive problems is actually resorted to on a large-scale throughout most artisanal fisheries of the Third World. This is particularly so in regions or countries where (1) there is a stiff competition for access to the fish catches, and (2) there is no alternative source of investment credit to which fishermen willing to acquire fishing assets can turn (for more details, see Platteau, 1984, 1989b). The second condition helps a good deal to explain why interlinkages of credit and marketing relations are apparently more prevalent in Asia and Latin America than in Africa where, as we have seen, the extended family system still assumes special importance. As for the first condition, it has to be understood thus: when there is stiff competition for access to the fish catches, middlemen and merchants are keen to secure themselves against the risk of poor trade transactions and, as a result, they usually try to buy their supplies of fish in advance. In the absence of organized forward markets for fish, one obvious way of achieving this is to offer (willing) owners of fishing units inter-linked contracts in which their access to credit is preconditioned upon the establishment of contractual or customer market relationships for the sale of their fish takings.¹ Revealingly, when they are satisfied with the performance of their owner-debtors and the duration of the contract is indefinite (the contract is not automatically terminated at the end of the fishing season), merchant-creditors do not show any eagerness to have their loans wholly repaid; on the contrary, they try their best to prevent the fishermen from clearing their debts. (Platteau and Abraham, 1987:481; Platteau, 1989b:635; Merlijn, 1989:691).²

1. Empirical evidence testifying to the existence of sale insurance arrangements in small-scale fishing communities is actually plentiful. The reader will find a list of references in Platteau, 1989b:635.
2. Referring to the case of Sarawak (Malaysia) Merlijn noted that:
... the dealers were often similarly vague concerning the exact amount owed them. This 'vagueness' about outstanding debts reflects the basic stake at the root of the debt relationship. The middlemen are basically interested in the persistence of this relationship, and use the loans in order to maintain access to the fishermen's catches. To the extent that they are satisfied with their fishermen, they are eager to prevent them from repaying their loans. The fact that neither party appears to wish to settle these running debts should be seen in this light (1989:691).

To sum up, sales-tying loans extended by fish intermediaries to boat owners achieve a double objective. For one thing, they help to cement the commercial relationship and to enhance its continuity while enabling the fishermen to acquire the right kind of fishing-gear and to increase the output of the fish-species in keen demand. And on the other hand, they considerably reduce the risk of default for the credit-giver since, by taking a loan from him, a boat owner surrenders his right to sell fish in the open market and thereby to freely dispose of the sale proceeds.

This last point, however, is not fully convincing for a reason which I have explained elsewhere (Platteau, 1989b:636–37). Indeed, because they are normally from backgrounds not associated with fishing, large-scale fishdealers and agents of large business ventures are particularly exposed to risks of the moral hazard type. With no intimate knowledge of, and only loose connections with, the fishing communities, they are not in a good position to assess the trustworthiness of the fishermen, to establish social bonds with them, or to bring effective pressure on them with a view to controlling opportunistic behaviour. In other words, owing to important informational asymmetries, business transactions are very risky and costly for these merchants. In particular, fishermen or boat owners may be incited to embezzle fishing-gear obtained on credit, or to sell part of their catches in underhand dealings to other buyers (because of the better prices received, family ties, or any other reason).

To solve these problems of moral hazard, fishdealers or agents have usually adopted either of the two following strategies. First, they can employ local intermediaries or sub-agents who come from fishing stocks and belong to the fishermen's own castes or communities. On the beach, fishermen-dealer relationships are often actually founded on "ties of caste, residence, kinship, and custom" and, as a result, they tend to be rather symbiotic, which does not mean, of course, that they are entirely devoid of any power element (Ottirrat, 1974:197–8; Klausen, 1964; Platteau et al., 1981). Mechanisms of social control, then, ensure that free-riding will not take place or, at least, will be minimized. When this is not possible—for example, because large-scale or external dealers have no reliable connections with local intermediaries (moral hazard problems may also arise between the former and the lat-

ter), there remains the possibility of appointing agents to supervise operations on the landing sites so as to make interlinked contracts with fishermen more effective. If, however, the transaction costs thus involved turn out to be too high, vertical integration may be eventually preferred to customer market relationships or loan-secured sale arrangements. This would most probably happen, for example, if fishermen have a high degree of mobility and possibilities of free-riding are consequently numerous and difficult to control.

A major shortcoming that is generally ascribed to credit-cum-marketing arrangements, especially in the socio-anthropological literature of Marxian inspiration dealing with artisanal fishermen communities, is the exploitative power which they are deemed to confer on the merchant-creditor. According to this dominant view, owners involved in loan-secured sale arrangements are considered as false owners divested of any genuine ownership right over their fishing assets and as bonded labourers completely surrendered to the will-power of the merchant-creditor. This is clearly a simplistic view which can be criticized on theoretical as well as empirical grounds. On the theoretical level, what needs to be stressed is the following: as long as there exists a strong competition among fish buyers for gaining access to the fishermen's catches, boat owners will never be at the complete mercy of their merchant-creditors and the asymmetry in the relations between them will normally remain within tolerable limits (Platteau and Abraham, 1987:482). Under these circumstances, indeed, a mechanism of shifting debts actually ensures that owners willing to free themselves from debt vis-à-vis particular fishmerchants will always be able to do so, at least if their fishing units are performing reasonably well. As a matter of fact, an owner (1) dissatisfied with his relation to a merchant-creditor to whom all his future catches have been pledged and (2) unable to redeem his outstanding debt towards him may entertain the hope of being rescued by another fishmerchant eager to secure access to his catches and ready to take over all his past sales-tying debts. As a result, situations of permanent attachment do not exist (see, for example, Platteau, Murickan, and Delbar, 1985:158–63; Merlijn, 1989:693).

In this context the case of Senegal is especially interesting because fishbuyers are strongly competing with one another, par-

ticularly since the fish business trade has been literally invaded by agriculturists who left the countryside following a series of catastrophic droughts during the seventies. Evidence of strong competition among Senegalese fish middlemen has been acutely provided by Chaboud (1983:31–42) who showed that their profit margins are often quite low, above all among small- or medium-scale operators. More precisely, there are a number of indications that owners of artisanal fishing units are far from being powerless in their dealings with the merchant-creditors. There is one particular aspect of these dealings which deserves to be mentioned here. Loans are given by the fishbuyers—for investment and current production purposes—only on the promise of delivery of future catches. In actual practice, however, the fish-landings are not automatically disposed of through the creditor. Instead of being predetermined, the price is actively discussed and haggled over between the boat owner or captain (or a specialized agent entrusted with the responsibility of the sale of the catches) on the one hand, and the credit-giver acting as a fishbuyer on the other hand. Moreover, if the ultimate price offered by the latter is not considered satisfactory by the former, the two parties may agree to stop the negotiating process in which case the indebted fishermen recover their freedom, for that particular day, to sell their fish to whichever merchant offers them the best price.

To put it in another way, owners tied through credit to a given merchant have only a commitment to treat their creditor as a preferred buyer to whom they will always propose their catches as a matter of priority. Yet such a commitment does not typically imply the duty to actually sell their catch to him if a strong disagreement exists about the sale price. Indebted owners therefore wield significant bargaining power and it would be absurd to view them as being “bonded” to merchants in any sense of the term. This is all the more so as merchant-creditors suffer a real loss whenever a deal cannot be struck with the owners indebted to them. True, a strong point can be made that, when preferred fishbuyers give up a transaction with fishing units “attached” to them on a particular day, it is probably because, on that day, they can make a better bargain with other units. Nonetheless, the fact still remains that this better bargain must be measured up against the alternative deal achievable with the owners of “their” units given that they fail to

impose comparatively low purchase prices on them. In other words, if the bargaining strength of these owners was not as great as it is, there would not be any better bargain to be made with other, non-attached owners. Now, there is another cost which merchant-creditors have to bear whenever they choose (or are obliged) to withdraw from a negotiation with indebted owners. This cost arises from the slowing down of the process of loan repayment insofar as debts are usually returned in a gradual fashion by way of an automatic deduction from the current sale proceeds (at least when these proceeds are not too low).

This being said, it must be admitted that the fishermen's bargaining power is greater when they have taken loans from middlemen only to finance circulating capital expenditures. In effect, when they have incurred debts to purchase investment goods, their position may be more delicate inasmuch as their merchant-creditor, in case disagreement arises, may threaten them with taking back all the fishing-gear which he has financed. Even if there are other middlemen interested in occupying the seat left vacant, frictional unemployment may result from the change-over implied.

Also, before concluding that merchant-creditors exploit the fishermen, the totality of their relationships must be considered. In particular, due account must be taken of the fact that the former offer a different product than that offered by more formal lending agencies. Thus, when it exists, interest is typically stipulated as a given percentage of the gross catch value, and not of the amount of the loan principal. That is to say, interest payment conditions incorporate a risk-sharing device to which fishermen are always very sensitive given the context of high day-to-day income fluctuations in which they typically operate. The same risk-sharing device is often involved in the procedure adopted for the repayment of the loan principal and, not infrequently, additional insurance mechanisms are at work.

On the other hand, it is worth bearing in mind that middlemen often provide their client owners with a variety of auxiliary services for which local markets are either absent or imperfect: short-term loans given at short notice for consumption or gear repair purposes, ice supply, various kinds of logistical support, etc. (see, for example Amarasinghe, 1989; Merlijn, 1989). The provision of

insurance and other services by the fishmerchants actually explains why the relationships between them and the fishermen are often highly personalized and stable as long as both parties are satisfied with each other.

THE PROBLEM OF EXTERNAL INVESTORS

So far, it has been assumed that fishermen are completely specialized. Yet this is far from being universally true and there are numerous regions, particularly in sub-Saharan Africa, where fishermen are also agriculturists who go out fishing only during the lean agricultural season. To the extent that these seasonal fishermen own some land, they are of course in a position to get access to credit agencies in the formal or organized market. Also, it is not rare to see African agriculturists invest their own agricultural savings in fishing assets with a view to provide themselves and their family with part-time (seasonal) employment, to diversify their income sources, or to seize upon the new profit opportunities arising in the export fishing sector (like cocoa planters have done in Ghana during the last decades).

On the other hand, one is apparently justified to entertain the fear that urban owner-investors—industrialists, civil servants, members of the army, etc.—will gradually displace small-scale fishermen from ownership of fishing assets. First, they have assets such as immovable property, stable public employment, or good political connections which they can use to get access to finance in the organized credit market. Second, there are a number of factors which are likely to prompt people with investible funds (whether these funds come from their own savings or credit finance) to acquire assets in the small-scale fishing sector. (1) As the price of these assets is relatively low (compared, for example, with the purchase price of an industrial vessel, an ice-making factory, or other industrial equipment), the investment required is of a moderate amount. (2) Small-scale fishing is part of the informal sector and, as such, it is not subject to the labour laws in force in the so-called modern sector of the economy. And (3) the incomes from artisanal fishing are tax-exempt. The latter feature is a result of the prohibitively high administrative costs which tax assessment and

collection would entail in the small-scale fisheries. Indeed, the highly scattered pattern of artisanal fishing activities makes any registering and follow-up of fishing units an almost impossible task to accomplish. To some extent, the same fact accounts for the impossibility of enforcing labour laws.

This being said, the risk of artisanal fishermen being gradually dispossessed of productive assets is probably much lower than the above considerations tend to suggest.³ This is again due to serious incentive problems since, given the characteristics of small-scale fishing—a sector comprised of mobile units which can easily escape the control of outside non-fishing owners—external investment in this sector is a venture that is in fact highly risky and very costly once transaction costs are taken into account. Thus, when it comes to selecting a captain, an outsider who does not belong to the fishing milieu finds it very difficult to know the exact quality of the candidates; he can therefore easily end up with a team of mediocre fishermen (bear in mind that crew members are usually chosen by the captain). Now, even with a highly competent crew, an outside owner runs the risk of being confronted with moral hazard problems such as output under-reporting, input over-reporting, labour-shirking, and asset mismanagement (for more details, see Platteau and Nugent, 1989; Azabou, Bouzaiana, and Nugent, 1990). Note that most of these problems persist even when the owner supervises fishing operations from the shore. This explains why, unless they have close ties (relatives or friends) inside the fishermen communities themselves, these external investors normally prefer to limit their financial commitment to the trading, transporting, and processing of fish instead of getting directly involved in the harvesting operations as such.

3. Dispossession of traditional fishermen may occur either because the new fishing technologies are acquired by outside owners while these fishermen are not able to adopt them owing to capital constraints; or because investment by outside owners gives rise to economic and, perhaps, biological overfishing with the result that fishermen with a low asset base are forced to sell their fishing gear due to a continuous decline of their fishing incomes.

CONCLUSION

The evolution of institutions and the unfolding of economic progress in the agricultural sector is certainly not as smooth and harmonious as the evolutionist theory of institutional development tends to indicate. What the present paper purported to show, however, was that much greater problems arise when this theory is applied to the fishing sector and, in particular, to small-scale or artisanal marine fisheries. The fact of the matter is that there is an important missing link in the causal sequence postulated by the evolutionist approach to institutions: secure and marketable property rights in water spaces (especially in the open sea) have not developed like they have typically done in agriculture with respect to land. Since, moreover, fishing assets do not have the required properties for being accepted as collateral by credit-givers, at least as far as they are not insurable at reasonable cost, an organized credit market cannot normally develop to meet the financial needs of the fishing sector and thereby ensure its expansion.

If the government does not subsidize credit or insurance schemes especially meant to overcome the above market deficiencies, it may apparently be feared that fisheries development will be held back by severe capital constraints. Fortunately, however, original institutional arrangements exist or have emerged within the artisanal fishing sector to release these constraints. Family networks and interlocked contracts in the form of credit-cum-marketing relationships have thus come to play an important role by enabling fishermen to shift to new harvesting technologies either to catch species of fish that have acquired a high marketable value and were not caught before, or to increase the productivity of fishing efforts. A common characteristic of these institutions is that they involve a large amount of trust with trust being based on a personalistic relationship.

What the present study therefore confirms is the remarkable ability of the informal sector to evolve alternative modes of behaviour in response to market imperfections, a feature which is being increasingly acknowledged among development economists (see, for example, Hayami and Kikuchi, 1981; Wade, 1988; Stiglitz, 1988, 1989; Bardhan, 1989; Yotopoulos and Floro, 1989; Platteau, 1990c). Moreover, it has been contended that some criti-

cisms often levelled at these informal arrangements—particularly the exploitative nature of the relationships involved—are misled or at least grossly exaggerated. Rigorous analysis and systematic marshalling of empirical evidence on the basis of precise concepts and carefully delineated hypotheses are badly needed in matters such as have been examined in this paper. It is just to be hoped that studies meeting these criteria will multiply in the near future and that more collaboration between economists and anthropologists will take place with a view to highlighting the economic and, possibly, non-economic rationale of informal sector and non-market institutions.

REFERENCES

- Alchian, A., and H. Demsetz, 1973. "The Property Right Paradigm", *The Journal of Economic History*, 33, 1.
- Amarasinghe, O., 1989. "Technical Change, Transformation of Risks and Patronage Relations in a Fishing Community of South Sri Lanka", *Development and Change*, 20, 4.
- Azabou, M., L. Bouzaiane and J.B. Nugent, 1990. "Contractual Choice in Tunisian Fishing", in M.K. Nabli and J.B. Nugent, (eds.), *The New Institutional Economics and Development: Theory and Applications to Tunisia*, Amsterdam: North-Holland.
- Bardhan, P., 1989. "Alternative Approaches to the Theory of Institutions in Economic Development", in P. Bardhan, (ed.), *The Economic Theory of Agrarian Institutions*, Oxford: Clarendon Press.
- Binswanger, H.P., and D. Sillers, 1983. "Risk Aversion and Credit Constraints in Farmers' Decision-Making: A Reinterpretation", *Journal of Development Studies*, 20, 1.
- Binswanger, H.P., and M.R. Rosenzweig, 1986. "Behavioural and Material Determinants of Production Relations in Agriculture", *Journal of Development Studies*, 22, 3.
- Binswanger, H.P., and J. McIntire, 1987. "Behavioural and Material Determinants of Production Relations in Land-abundant Tropical Agriculture", *Economic Development and Cultural Change*, 36, 1.
- Carter, M.R., 1988. "Equilibrium Credit Rationing of Small Farm Agriculture", *Journal of Development Economics*, 28, 1.
- Catt, J.L., 1965. "Credit Rationing and the Keynesian Model", *Economic Journal*, 75, 298.
- Chaboud, C., 1983. *Le Mareyage au Sénégal*, Dakar: CRODT (Centre de Recherche Océanographique de Dakar-Thiaroye), Scientific document No. 87.

- Diaz-Alejandro, C., 1985. "Goodbye Financial Repression, Hello Financial Crash", *Journal of Development Economics*, 19, 1.
- Eswaran, M. and A. Kotwal, 1990. "Implications of Credit Constraints for Risk Behaviour in Less Developed Economies", *Oxford Economic Papers*, 42, 2.
- Feeny, D., 1988. "The Development of Property Rights in Land: A Comparative Study", in R. Bates, (ed.) *Toward a Political Economy of Development*, Berkeley, Los Angeles & London: University of California Press.
- Grabowski, R., 1988. "The Theory of Induced Institutional Innovation: A Critique", *World Development*, 16, 3.
- Hayami, Y., and M. Kikuchi, 1981. *Asian Village Economy at the Crossroads—An Economic Approach to Institutional Change*, Tokyo: University of Tokyo Press.
- Jaffe, D., and T. Russell, 1976. "Imperfect Information, Uncertainty, and Credit Rationing", *Quarterly Journal of Economics*, 90, 4.
- Klausen, A.M., 1964. "Technical Assistance and Social Conflict. A Case Study from the Indo-Norwegian Fishing Project in Kerala, South India", *Journal of Peace Research*, 1.
- Kurien, J., 1978. "Entry of Big Business into Fishing. Its Impact on Fish Economy", *Economic and Political Weekly*, 13, 36.
- Mathew, S., 1990. "Fishing Legislation and Gear Conflicts in Asian Countries", Samudra, Monograph Series, 1.
- Merlijn, A.G., 1989. "The Role of Middlemen in Small-scale Fisheries: A Case Study of Sarawak, Malaysia", *Development and Change*, 20, 4.
- Meynen, W., 1989. "Fisheries Development, Resources Depletion and Political Mobilization in Kerala: the Problem of Alternatives", *Development and Change*, 20, 4.
- Moorsom, R., 1984. *Exploiting the Sea*, London: Catholic Institute for International Relations.
- Newbery, D., 1989. "Agricultural Institutions for Insurance and Stabilization", in P. Bardhan, (ed.), *The Economic Theory of Agrarian Institutions*, Oxford: Clarendon Press.
- Newbery, D., and J. Stiglitz, 1981. *The Theory of Commodity Price Stabilization: A Study in the Economics of Risk*, Oxford: Oxford University Press.
- Pingali, P.L., and H.P. Binswanger, 1986. *Population Density, Market Access and Farmer-Generated Technical Change in sub-Saharan Africa*, Agriculture and Rural Development Department, World Bank, Report No. ARU 58.
- Platteau, J.-Ph., 1984. "The Drive Towards Mechanization of Small-scale Fisheries in Kerala: A Study of the Transformation Process of Traditional Village Societies", *Development and Change*, 15, 1.
- Platteau, J.-Ph., 1989a. "The Dynamics of Fisheries Development in Developing Countries: A General Overview", *Development and Change*, 20, 4.
- Platteau, J.-Ph., 1989b. "Penetration of Capitalism and Persistence of Small-scale Organizational Forms in Third World Fisheries", *Development and Change*, 20, 4.
- Platteau, J.-Ph., 1990a. *Land Reform and Structural Adjustment in sub-Saharan Africa: Controversies and Guidelines*, Rome: FAO.

- Platteau, J.-Ph., 1990b. "Etat, marché et pêcheurs marins artisanaux en Afrique francophone et lusophone", *Afrique Contemporaine*, 29, 154.
- Platteau, J.-Ph., 1990c. "Traditional Systems of Social Security and Hunger Insurance: Past Achievements and Modern Challenges", in E. Ahmad, J. Drèze, J.P. Hills, and A.K. Sen, (eds.), *Social Security in Developing Countries*, Oxford: Oxford University Press.
- Platteau, J.-Ph., J. Murickan, and E. Delbar, 1981. "Interlinkage of Credit, Labour and Marketing Relations in Traditional Marine Fishing. The Case of Purakkad (Kerala)", *Social Action*, 31, 2.
- Platteau, J.-Ph., J. Murickan, and E. Delbar, 1985. *Technology, Credit and Indebtedness in Marine Fishing—A Case Study of Three Fishing Villages in South Kerala*, Delhi: Hindustan.
- Platteau, J.-Ph., and A. Abraham, 1987. "An Inquiry into Quasi-Credit Contracts: The Role of Reciprocal Credit and Interlinked Deals in Small-scale Fishing Communities", *Journal of Development Studies*, 23, 4, July.
- Platteau, J.-Ph., and J.B. Nugent, 1989. *Contractual Relationships and their Rationale in Marine Fishing*, Cahiers de la Faculté des Sciences Economiques et Sociales, 90, Namur (Belgium).
- Platteau, J.-Ph., E. Marot, and A. Sall, forthcoming. *La rationalité des relations de production et des arrangements contractuels dans la pêche artisanale sénégalaise*, Faculty of Economics, University of Namur (book manuscript, mimeo).
- Popkin, S.L., 1988. "Public Choice and Peasant Organization", in R. Bates, (ed.), *Toward a Political Economy of Development*, Berkeley: University of California Press.
- Raj, K.N., 1979. "Keynesian Economics and Agrarian Economies", in H. Rao and P.C. Joshi, (eds.), *Reflections on Economic Development and Social Change—Essays in honour of Professor V.K.R.V. Rao*, Delhi: Allied Publishers.
- Rasmusen, E., 1989. *Games and Information—An Introduction to Game Theory*, Oxford: Basil Blackwell.
- Rothschild, M., and J. Stiglitz, 1976. "Equilibrium in Competitive Insurance Markets: An Essay on the Economics of Imperfect Information", *Quarterly Journal of Economics*, 90, 4.
- Sen, Abhijit, 1981. "Market Failure and Control of Labour Power: Towards an Explanation of 'Structure' and Change in Indian Agriculture", Parts 1 and 2, *Cambridge Journal of Economics*, 5, 3–4.
- Stiglitz, J., 1988. "Economic Organization, Information, and Development", in H. Chenery and T.N. Srinivasan, (eds.), *Handbook of Development Economics*, Amsterdam: North-Holland.
- Stiglitz, J., 1989. "Rational Peasants, Efficient Institutions, and a Theory of Rural Organization: Methodological Remarks for Development Economics", in P. Bardhan (ed.), *The Economic Theory of Agrarian Institutions*, Oxford: Clarendon Press.
- Stiglitz, J., and A. Weiss, 1981. "Credit Rationing in Markets with Imperfect Information", *American Economic Review*, 71, 3.
- Stirrat, R.L., 1973. "Fish to Market: Traders in Rural Sri Lanka", *South Asian Review*, 7, 3.

- Verdeaux, F, 1989. "Généalogie d'un phénomène de surexploitation: lagune Aby (Côte d'Ivoire), 1935-1982", *Cahiers des Sciences Humaines*, 25, 1-2.
- Wade, R., 1988. *Village Republics—Economic Conditions for Collective Action in South India*, Cambridge: Cambridge University Press.
- Yotopoulos, P. A., and S.L. Floro, 1989. "Transaction Costs and Quantity Rationing in Informal Credit Markets", Kyoto: Kyoto Institute of Economic Research, Discussion Paper, 264.

Artisanal Fishermen and Intermediaries in Mozambique

Vibe Johnsen

For obvious reasons, very little social science research has been done in Mozambique since independence. This applies even more so to the special field of fisheries, where just a handful of predominantly aid related studies have been carried out.

This situation is awkward when we know that in the late 1980s nearly 40 per cent of the country's export earnings were derived from the fishery sector (mainly shrimp). Furthermore, the country has more than 2,000 km of coastline and a relatively large resource potential.

However, in precolonial and early colonial days fishing did not play any significant role, apart from satisfying immediate subsistence requirements. Although a rich and organized trade flourished in Central Mozambique as a result of trade relations between the Mwene Motapa empire in Zimbabwe/Mozambique (and later empires in the same region), and Arab trade centres on the Mozambican coast, fish does not seem to have played any significant role in this trade.

Even after the Portuguese became more firmly established during the 20th century, no major changes seem to have taken place within artisanal fisheries. This is probably due to Portugal's own export interests, as well as the imposed division of labour between the Portuguese colonies, whereby Angola was chosen for development of the fishing sector. Thus, trawling in Mozambican waters was prohibited by the colonial power up to the mid-1960s. It was not until the beginning of the 1970s that the first few national and foreign (among others Japanese and South African) trawlers started their activities in Mozambican waters, principally involved in shrimp fishery for export purposes. Meanwhile the national supply of fish remained insufficient and a considerable part of the fish protein consumed in Mozambique was based on

imports from Angola and Portugal. These imports created consumer habits oriented towards sardines and *bacalhau* from Portugal and horse mackerel from Angola, creating a certain disapproval of locally produced fish.

This was roughly the situation at the time of independence in 1975. As a consequence of the colonial policy, the distribution channels were far better developed than the productive apparatus, i.e. the fishing fleet and the local production. At the same time, it seems that intermediaries in the traditional system of distribution did not have the same close relations to artisanal fishermen as we can find in other Third World countries.

After independence, priority was given to rehabilitation of the worn-out inherited trawler-fleet and further expansion of the modern fishery, in particular shrimp fishing for export through licenses. Although artisanal fishery continued to play a secondary role within government fisheries policy, increasing interest in the potential and development needs of artisanal fishermen, as well as fishing communities in a broad sense, has been taken from the beginning of the 1980s.

In line with the general development strategy from independence up to 1987, government policy towards the artisanal fishery sector was characterized by two main interventions. The first was the establishment of fixed prices for all sorts of fish, which were classified in three main categories according to size and species as well as type of processing. The second type of intervention was the establishment of a network of state run support and distribution centres (*Combinados Pesqueiros*) in areas affected by the abandonment of former Portuguese small entrepreneurs (*comerciantes*) and fish-dealers, as well as in other areas with difficult access to centres of supply and major markets.

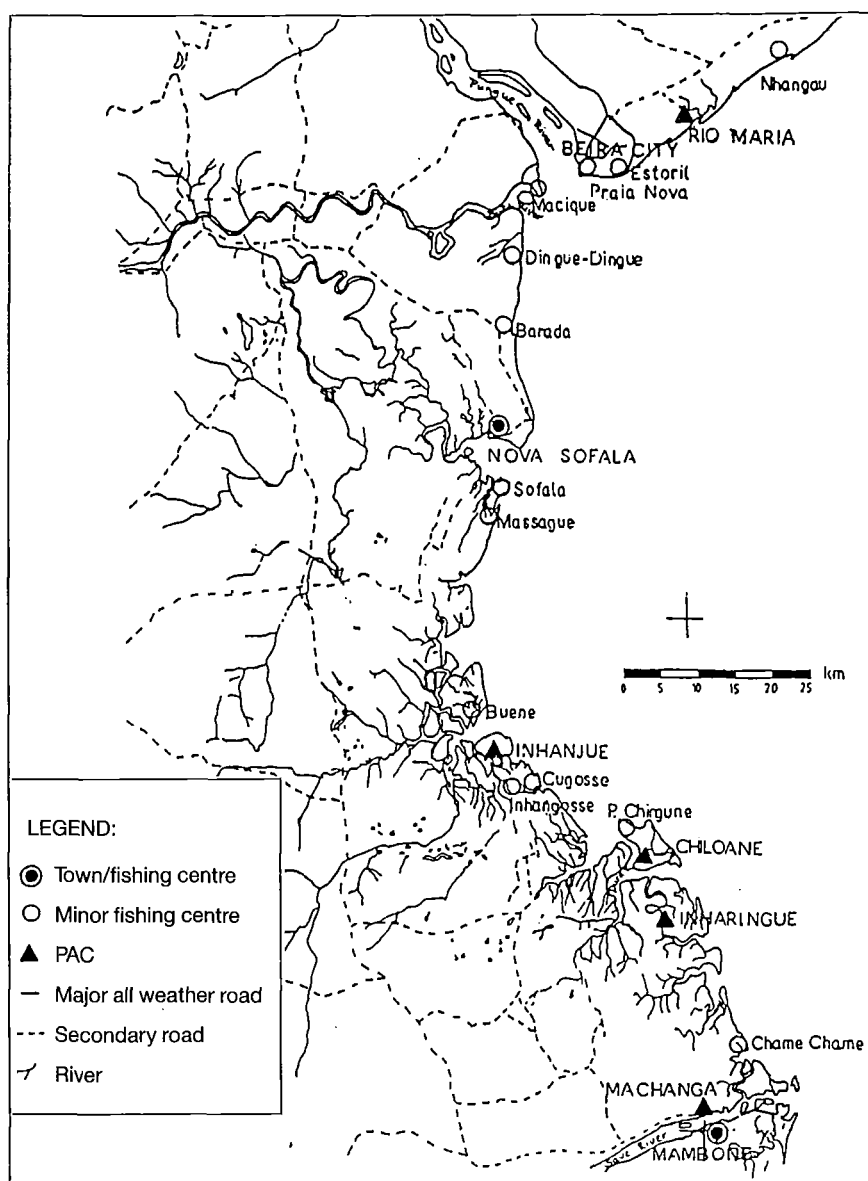
Although the purpose and idea of establishing these centres was rather general (including distribution of fish to main centres, supply of necessary inputs for artisanal fishery, service activities, experimental fishing, and extension services), the concrete activities remained by and large limited to supply and distribution activities. Even within this field the success remained limited. Thus, within few years the fixed price system, centralized planning, state control and a worsening war situation, lead to a general decrease in production and commercial activity. This was com-

bined with an increasing importance of the parallel market and the transformation of the economy into a barter economy, both within official and informal networks. Fish imports, especially from Angola, have continued since independence, although recently the quantity has been decreasing.

In 1987 an abrupt change of development policies took place after negotiations between the Mozambican government and the International Monetary Fund (IMF), resulting in the introduction of the Economic Rehabilitation Programme (*Programa de Reabilitação Económica, PRE*). The programme does not differ fundamentally from structural adjustment programmes elsewhere, implying a continuous devaluation of the national currency, liberalization of formerly controlled prices, and privatization. In turn, Mozambique has been accepted internationally as credit worthy, thereby opening up for the necessary imports that had come to an almost complete stop in 1986. However, the context in which the PRE is applied differs from most other countries, in so far as Mozambique is affected by a ruthless war in most rural areas, implying an extraordinary influx of refugees from the countryside to the major cities and coastal areas. The PRE, on the other hand, aims at motivating the peasants mainly through price incentives, while discouraging settlements in the cities by taking away a number of subsidies, also on food items.

This is, in general terms, the context in which the artisanal fishery has developed over the past and recent years. In the following I shall discuss the structure and change of the artisanal fishery sector and distribution system in central Mozambique. The focus will be on the relation between fishermen and middlemen, which—according to experience elsewhere in Africa and the Third World in general—seems crucial for the understanding of processes of development and change within artisanal fisheries.

The geographical focus is central Mozambique, with major emphasis on the main centre of fishery, distribution and redistribution of fish in Mozambique—Beira City. Beira is, with approximately half a million inhabitants, the second largest city in the country. In terms of distribution to other main centres of consumption, Beira supplies almost exclusively salted and dried fish, produced mainly by artisanal fishermen south of Beira, to five of Mozambique's ten provinces, as well as to Zimbabwe. The



Map 1. Sofala Province—Beria area. Fishing societies and centres of marketing and extension services for artisanal fishermen

greatest part of this fish is distributed through informal trade networks by mobile intermediaries through war zones by routes which bring the fish as far as 1,500 km from where it is produced.

Although the investigated area is relatively limited, and although fishing methods and organization vary from one region to the other, we believe that the tendencies presented and the conclusions drawn to a large extent also apply to other parts of Mozambique.

SOME CHARACTERISTICS OF ARTISANAL FISHERY IN CENTRAL MOZAMBIQUE

The period of greatest abundance of catches coincides with the rainy season from November to March. Although fish is said to be abundant as early as September, catches in this period continue to be relatively reduced because of strong winds, impeding the fishermen from going out.

A fisherman's census carried out in the beginning of 1990 in Sofala estimates the total number of fishermen to be 8,000. This number includes an increasing number of internal refugees escaping from war-stricken areas in the interior to the relatively safer coastal areas. One of the principal sources of survival for these groups is fish, tiny shrimps and mussels collected on the beach or caught with small nets operated by one or two persons. The prevailing fishing methods in the area are beach seining and line fishing. The catches consist mainly of small fish, categorized in Mozambique as third class fish (*hilsa kelee*) which make up an estimated 80 per cent of the total catches along the Sofala coast.

The vast majority of vessels are three to five metre long dugout canoes, but over the past decade more and more fishermen are investing in flat-bottomed wooden boats, seven to nine metres long. Furthermore, from the beginning of the 1980s there has been an increasing investment in small outboard engines (15–25 HP). Still, the motorization of artisanal fishery is almost exclusively concentrated to the city of Beira. The motorized artisanal fishery employs an estimated 10 per cent of the total number of fishermen in the area. A small proportion of the fish, principally that landed on the beaches of Beira, is sold fresh, while the rest is being salted and dried, normally by the fishermen themselves.

The rapid but geographically concentrated expansion of motorized fishery in Beira in the beginning of the 1980s is probably to a large extent a reflection of the fact that in spite of the general decline of economic activity in this period, established shopkeepers in Beira succeeded in profiting from the increasing black market trade. In order to spread risk, they sought to invest their funds outside the trading sector. For various reasons the motorized fishery was an attractive objective for investments. In the first place the security situation in rural areas became increasingly unsafe, while the coast was still relatively secure. Probably the prospective of obtaining foreign currency through the fishery and export of prawns was the strongest incentive for the investment in motorized artisanal fishery by merchants. Furthermore the expansion of modern trawling fishery, combined with the general increase in the number of artisanal fishermen due to the war, may have had negative impacts on the fish resources locally. This further motivated investments in the motorized fishery.

Implications of PRE and fishermen's strategies

Since the introduction of the Economic Rehabilitation Programme PRE, the terms of trade have followed a downward trend as seen from the perspective of the artisanal fisherman. Thus within the period from 1988 to 1990 the price of fishing equipment increased three times, whereas producer prices of fish and remunerations to crews doubled in Beira.

It should be noted, however, that the rural economic context differs somewhat from the city context, particularly in the sense that producer prices outside Beira generally reach only half the urban level. This difference is primarily a reflection of insufficient transport capacity and not of major differences in production costs. Facing these two major problems, that is deteriorating terms of trade and the rural/urban inequality, which strategies do producers apply, and which problems arise?

Particularly in the rural areas, beach seining fishermen are increasingly confronted with difficulties in recovering their costs due to deteriorating terms of exchange. One strategy applied by fishermen is to increase the number of family members in the crews. However, in the first place, male labour is relatively scarce,

because of intensive recruitment to the army, and because the Sofala coast is a traditional labour exporting area. In the second place, this particular strategy cannot alone make up for the disequilibrium, even where the crews are composed solely of relatives.

Another way to make up for the rural/urban disequilibrium is to go and sell products in Beira. But this is a relatively costly and complicated affair. Only the comparatively few producers of a certain size can go regularly to the city to sell their fish in Beira. Owners of small nets, producing on a smaller scale, can rarely afford commercializing their fish in the city. When they do go, it is principally for other purposes, like participating in a funeral, buying fishing equipment, etc.

The rural-urban disequilibrium provokes a certain migration of fishermen to the urban centre where they will continue fishing, while wives and family stay in the rural district to take care of whatever small plot of land that may still be unaffected by the war.

Others, predominantly those producing on a certain scale, are increasingly investing in transport boats, and/or in supplementing their own production by purchases from other fishermen. This tendency, which has been developing rather slowly over the latest decade, is apparently being strongly reinforced after the introduction of the PRE. Although it is much stronger in the urban than the rural areas, it is increasingly noted even in the latter.

Other strategies, which have presumably been used for centuries, aim at increasing the producer price indirectly. These strategies lie within the processing and distribution spheres. One way is that of shortening the drying period, whereby the fish will retain more humidity and therefore weigh more than properly dried fish. This leads to higher prices for the former type of fish. Another way consists in packing low value or low quality fish in the middle of the tightly packed bundles of dry fish. A third method is to add large quantities of salt, which is cheaper as well as heavier than fish, thereby increasing the relative weight. Experienced middlemen are usually aware of these strategies and make an effort to control the product and the quality. The more viable of these strategies are only accessible to a limited number of fishermen, i.e. the more privileged in economic, political or other terms.

In a situation with few credit opportunities, it seems likely that the artisanal fishery will suffer an increased exodus. In two fishing centres which I studied in some detail, I found an exodus of 30 per cent of the total number of boat- and net-owners over a period of one and a half year. In the second case I found that 21 per cent had their fishing activities paralysed between three months and one year, while 33 per cent had abandoned fishing there altogether. Thus only 46 per cent of the total number of fishermen were still active one and a half years later. As there are few options for fishing outside the fishing centres because of the security situation, periodic or permanent migration to other fishing centres is insignificant. As alternative income or employment opportunities are generally few on a local basis, the consequences are considerable, not only for those directly involved in fishing but also for those involved in processing and distribution. However, although many owners quit fishing, they are to a certain extent substituted by a new entrepreneurial group especially near the larger cities. This group primarily consists of white collar workers and former military officials, most of whom are financing their investments through bank credits.

Social conflict in the process of polarization

The combination of war and structural adjustment speeds up the process of social polarization in the fisheries. This process characterizes all parts of social and economic life in Mozambique today. In early 1990 the polarization process triggered off a wave of strikes among salaried workers never seen since independence. Open conflict of this type has not yet occurred in the fisheries. Before independence, I have only been able to trace two strikes within the artisanal fishery sector. However, as crew-members in Central and Southern Mozambique are paid by a combination of a basic salary in money and an incentive in food or other products, the employment relation is more like that of a wage labourer, than in cases where the crew is paid exclusively by shares of the catch. The latter applies primarily where there are few or no family relations between crew and owner, which is so far mainly the case in the motorized artisanal fishery.

However, social conflict does exist in the fishing sector, al-

though taking somewhat different forms than a strike. In a large city like Beira, conflicts are still rather difficult to identify, mainly because social relations are more disguised. In smaller societies in the rural areas, social relations are more transparent.

In Chiloane island, approximately one hundred kilometres south of Beira, a serious conflict developed between large-scale and small-scale fish driers. The majority of the population on the island make a living from collecting and drying the by-catch from the shrimp trawlers. A few families, mostly Indian, have over the past few years taken a dominant position in the purchase of by-catch. Paying the owners of trawlers considerable sums in advance, they get priority to buy the by-catch. Their status is manifested through their possession of many wives and houses of good quality. Furthermore, they have residences in Beira city and are involved in the long-distance trade.

Small-scale and individual by-catch driers, who are often combining this activity with line fishing, pay instantly in cash with small funds, and frequently see themselves deprived of fish in a situation with small by-catches. When one of the by-catch driers started the construction of a huge transport vessel for freighting his increasing production to Beira, opposition from small-scale driers began to be more concrete. In 1988, a group of small driers went to the *n'anga* (the diviner-healer) to ask for help. The healer later claimed that a big snake lived beneath the pile of planks, which were intended for the construction of the vessel and represented a huge value. He put fire to the snake and thereby burnt the pile of planks. Small-scale driers were satisfied with the action. Although they could not stop the expansion of the large-scale drier totally, they could at least delay the project considerably. Until today the large-scale drier has not been able to recover the loss, and the transport vessel remains an unfinished monument in the mangrove swamp.

Still, while large-scale driers purchase by-catch from the owner of the trawler, small-scale driers purchase the fish from crew-members of the trawlers who supplement their wages through the sale of by-catch. Therefore, it does not seem likely that large-scale driers, at least as long as ownership relations are separated, shall completely take over the by-catch purchases. But the balance of power between the owner of trawler/large-scale drier on the one

hand, and the trawler crew/small-scale driers on the other, is critical.

Within the artisanal fishery, the social conflicts thus still do not seem to be organized, and are instead maintained at personal levels or confined to the individual fishing unit.

DISTRIBUTION AND INTERMEDIARIES

For a perishable product like fish, quick and safe distribution is important. In combination with the fact that fishing-equipment generally requires large investments and that the fishing activity involves high risks, this leads to the development of particularly close relations between the fishermen and the intermediaries. These relations are frequently characterized as repetitive, dyadic or interlocked. They are often seen to involve a credit relationship between an intermediary and a fisherman, whereby the intermediary supplies fishing-equipment to the fisherman and the latter supplies fish to the intermediary.

The economic and social content of these relations has been the focus of an ongoing discussion among economists and anthropologists within different theoretical schools. Some of the key issues of this discussion are whether or not the relations in question imply an economic exploitation of the fishermen by the intermediaries, or whether there are mutual benefits to both parties. One of the main issues in the most recent discussions is the role of access to information and the interplay between information and repetitive deals (Alexander & Alexander, 1990; Platteau, 1989; Hill, 1986; Pollnac, 1985; Acheson, 1981).

The fact that women often are considered to play a significant role in the distribution of fish, whether as wives of fishermen or as self-organized intermediaries at wholesale level, has meant that the gender aspect has given extra spice to the discussion. Gender relations seem to be inverted in the sense that women exploit and subordinate men, especially in the latter case.

As mentioned, much emphasis seems to have been put on the analysis of the character and variation of repetitive relations. Less attention has been paid to how and why the relations concerned arise and eventually wither away. Although it is still early in the re-

search process, the Mozambican example seems to be an interesting case in this connection.

I have already pointed to the fact that in colonial days, the fish distribution network was heavily linked up to imported fish and much more vaguely to the little developed local fishery. After the Portuguese exodus during the first years of independence, government policy aimed at centralizing the distribution of fish, eliminating intermediaries who were seen as unnecessary exploiters, and putting trade under state control. Thus, the state firm for import, export and internal distribution of fish, PESCOM, was created. Besides, a limited number of large, well-established and often Indian-owned private companies were practically given a monopoly on the wholesale trade within large regions.

The PRE opened up for foreign credits, part of which were used for the import of consumer goods, which had not been seen on the Mozambican market for a long time. Raw materials for the local industry producing fishing nets were now imported, permitting an increased production. This brought about a certain stimulation of productive activity, especially around the larger cities. Furthermore, barter trade ceased to be the dominant exchange form, as the cash economy quickly gained a more important role, especially in the cities.

Along with this process, the informal street markets, considered illegal by the authorities, mushroomed from one day to another, with names like *Dumba Nengue* (confidence in the leg) and *Tchunga Moio* (heart courage). The number of mobile petty traders increased likewise. In spite of the City Council's constant attempts to eradicate the petty trade, the activity continued. Established shopkeepers and wholesale dealers saw their earlier near-monopoly situation threatened, and in an alliance with the City Council they provoked a police and military action against some of the streetmarkets in Beira. This action was returned with the population's sacking of Indian-owned shops.

As regards fish, in 1988 most established wholesale dealers had seen a drastic decrease in their trade with dried fish, which had been taken over by petty traders.

An extremely high proportion of Beira's population depends on fish trade for their livelihood. A gross "guesstimate" would suggest about one fifth of the total population. Thus, students are

commonly trading fish as a contribution to their household expenses and education, housewives may trade fish once or twice a year in order to pay school fees or other particular expenses, while skilled workers like, for example, drivers, often supplement their wages by trading fish.

Thus within the group of mobile fish intermediaries, the majority are involved for short periods or occasionally, while the minority can be considered as professional fishdealers working on a permanent basis. Within the first group two subgroups can be identified. Firstly, there are whitecollar workers, active or retired military officials, entrepreneurs (for example, boat-owners) as well as low income groups, who are engaged particularly in long-distance trade in order to finance a specific investment (a car, a boat, school-fees, etc.). It is my impression that most of these are successful because of their access to funds (whether self-generated or based on bank credit), and because of their contact network giving access to supplies and transport (for example, with military planes).

The other subgroup consists mainly of low income groups, refugees and unemployed, starting with a minimum of capital and operating primarily at short-distance level with the intention of making a living on the basis of fish trade, either as a principal or a secondary economic activity. Many of these fail for various reasons. Short-distance trade generally gives a relatively low profit, and these dealers have a weak position in relation to securing supplies in a situation with strong competition among intermediaries.

Gender relations in distribution

Contrary to what seems to be common in many other Third World countries and even in southern Mozambique, few women are involved in the distribution of fish in central and northern Mozambique. To the extent that women are involved in fish dealing in this area, women from the southern Inhambane province are significantly overrepresented in comparison to their proportion in the ethnic composition of the population. What is the reason for this ethnic bias among fish dealers?

In the first place, many of the southerners are women who have

followed their husbands migrating to central Mozambique in order to work for the railways or in the ports. With limited access to land, one of the few options left for the women to supplement their husbands meager wages has been to engage in trade. In addition to this, it should be noted that southern Mozambique has, since the end of the 19th century, been characterized as one of the major areas for supply of male labour to the South African mines. The absence of men has for long periods probably reinforced the tendency among women in the south to engage in a number of economic activities, that are dominated by men in other regions of Mozambique. Hence, women's involvement in trade has become an integrated part of the culture in the southern part of the country.

The following case shows both the potential and the limitations for the central Mozambican women involving themselves in fish-trade:

Lucia was one of the very few women I met purchasing fish on the main beach of Beira in 1988. Her husband had left her some time ago, leaving her responsible for three children and with just enough money to buy one box of fish. So she went to the beach, succeeded in buying a box of fish, and slowly expanded her activity to four boxes at a time. While at first she walked to the township where she sold the fish as the only dealer of fresh fish, the expanded activity later allowed her to hire a car.

Having gained the confidence of the boat-owners at the beach by regularly showing up and always paying cash, she succeeded in getting the privilege of receiving the fish on credit, paying the following day when returning to purchase more fish. Thereby a bargaining option was left in case of loss, even if the price was agreed upon at the time of delivery. Still, competition among fish dealers was hard at times, and occasionally she would buy petrol for the boat-owner in order to maintain priority. However, even with these means she failed now and then in periods of low catches. When I left in the beginning of the high season, she was foreseeing problems of marketing fresh fish in Beira because of abundance, and revealed concrete plans to start long-distance trade of fresh fish, preserving it with ice in insulated boxes.

When I returned in 1990, Lucia no longer appeared on the beach. However, she was still selling fish in the township, where an informal market had now developed and various fish-dealers had installed themselves. Lucia told me that she had now become the lover of one of the boat-owners at the beach. In turn, she had a guaranteed supply of fish, and he always accepted a price reduction when she occasionally suffered losses. But the relationship implied restrictions on her mobility. The boat-owner did not accept her presence on the beach purchasing fish any longer, so he re-

cruited a boy to take care of buying and selling. Neither was she allowed by him to engage in the more profitable long-distance trade. So the three insulated boxes she had purchased in the meantime remained unused. When I met her later the same year, the relationship to the boat-owner had come to an end. She had found another lover and moved to his house far from the city centre. She had, at least for the time being, stopped commercializing fish, although maintaining the idea of starting again later on.

Apart from showing some of the problems confronting Central Mozambican women when engaging in fish trade, the case gives a more general idea of the complicated relations between boat-owners and intermediaries.

Credit relations between intermediaries and fishermen

In addition to the the type of credit relation between boat-owner and intermediary referred to in the example above, intermediaries in Beira pay what may be termed a "labour rent" by pulling the beach seine-nets in order to get priority to buy fish. However, when credit in the form of provision is involved, there is a possibility for negotiating a different price than that paid by more occasional buyers paying in cash. This does not seem to be the rule, but depends to a large extent on the confidence between the partners. Most boat-owners have had one or two bad experiences with intermediaries who are buying on credit and never returning again, and there is therefore widespread reluctance to establish credit relations even in the present phase with deteriorating terms of trade.

Therefore, these types of relations are only established within the short-distance fresh fish circuit where buyers return daily and most operate on a small-scale retail basis implying low value credits and quick repayment. In contrast, within the dried fish circuit, where quantities and values are often considerable, and regular buyers appear with longer intervals and operate at wholesale level over long distances, little confidence normally exists and payment is always done at delivery, mostly in cash, or a combination of cash and cereals.

The provision of credit from fisherman to intermediary which, although restricted to the fresh fish circuit, is the most common form of credit, differs fundamentally from the credit from inter-

mediary to fisherman known from other parts of the world. One could be tempted to argue that the relations between fisherman and trader in central Mozambique are turned upside down, i.e. either that they imply exploitation of the trader by the fisherman, or that the relation expresses a superior position of the fisherman in the market. Neither the first nor the second seems to be the case.

As far as producer prices are concerned, they are generally the same as for fish traded directly in cash. Indeed, the trader seems to gain in economic terms, as there is a certain possibility to distribute an eventual loss to the fisherman. A curious fact is that in most cases where this credit form is practised, the trader does not seem to lack working capital to buy the fish. Thus the credit is not given as a response to, for example, an immediate financial necessity from the part of the intermediary.

Furthermore, the fisherman puts his resources at great risk, while the trader risks less, and must be considered more privileged than the trader paying in cash. The only and important advantage the fisherman seems to gain is a more stable market than that composed of intermediaries. His bargaining power vis-à-vis the intermediary is principally defined as a function of the competition for fish among intermediaries in general. As the competition is generally strong among traders in Beira, the fisherman has a relatively strong bargaining position.

Although central Mozambican intermediaries dry fish at wholesale level, operate with a long-term perspective, generate sufficient funds and are in a position to establish long-term credit relations through, for example, the supply of nets, very few have even tried. The basic problem seems to be the same: lack of confidence. On the other hand, many boat- and net-owners, especially of non-motorized boats, are even in a situation of crisis very sceptical to the idea of taking up loans.

Even if the number of applications, as well as the number and value of bank credits given to fishermen, has increased considerably since the introduction of the Economic Rehabilitation Programme PRE, the banks can far from satisfy the demand. Firstly, the application procedures are complicated, which excludes most illiterate artisanal fishermen from applying. Typically the bank credits have been given to owners of motorized boats. Secondly, because of difficulties in recovering the loans given in 1987 to 1989,

the Popular Development Bank (BPD) in Sofala and in other parts of the country have almost exclusively concentrated on the recovery of these loans, currently leaving many applications ungranted. The open question is to what extent this policy will generate an increase in informal loans between intermediaries and fishermen or an increased exodus of owners of motorized boats. In a medium time perspective it seems most likely that long-term credit relations shall arise.

Repetitive exchange relationships

The rather prolonged discussion of credit relations above should not overshadow the fact that the vast majority of intermediaries pay for their fish immediately and in cash. Furthermore, it should be noted that the credit systems between intermediaries and fishermen, because of their instant or very short-term nature, only to a very limited extent in themselves imply a stable or repetitive relationship. This does not mean that repetitive and informal contract relations do not exist. In fact, repetitive partnerships are much more widespread than credit relations and thus normally combined with instant cash payment. Furthermore, these repetitive deals are normally linked to purchases in larger quantities, whereas small deals generally are linked to casual purchases. In the Quelimane area, characterized by overfishing and reduced catches per fishing unit (CPUE), no repetitive deals were registered. Thus, it is likely that there is a certain interlinkage between productivity and repetitive trade partnerships.

Where repetitive deals in larger quantities take place, prices are normally reduced compared to casual deals, but this is not necessarily so. According to Alexander and Alexander (1990:15), who studied dyadic trade relations in greater detail, and whose conclusions seem widely applicable to the Mozambican case, this depends on the extent to which the partners are informed about the price-range and on the distribution of power in the relationship.

Their interesting discussion furthermore suggests that the advantages of repetitive partnerships between equal partners (in terms of power and information on price ranges) are considerable, while minimizing costs. Both profit from the quick negotiation and from a limited information flow. None of the partners give

price concessions. Contrary to the mainstream argument of new orthodox economists, that repetitive relations arise because of asymmetry in the information flow, Alexander and Alexander (1990:14) argue that one of the objectives of these relations is to create this asymmetry. They argue that intermediaries to a large extent depend on the extra profit they make during the two to three days it takes for information to become generally available when price changes take place.

At the same time they admit that if intermediaries and fishermen only involve themselves in repetitive deals, even their information shall be restricted. Therefore, they argue, both partners regularly involve themselves in small-scale deals with occasional customers. In these cases profit is not of vital interest—what is of interest is information about the lowest, or alternatively highest, possible price. This may constitute part of the explanation why a considerable number of fishdealers in central Mozambique in fact operate simultaneously at wholesale and retail level.

CONCLUSIONS

The foregoing tries to contribute to an understanding of ongoing economic and social processes within the artisanal fishery in Mozambique. The war and the PRE speeded up processes of polarization and social differentiation, manifesting itself in social conflict. However, it seems that the war puts certain limits on these processes. The extreme mobility of traders and fishermen, and the difficulties in tracing particular trading partners in a war situation, means that mutual confidence is rather low. Therefore, the process of creating long-term credits to fishermen from intermediaries is slow, if not blocked. The lack of capacity of formal banks to satisfy the apparent need of credit in the present situation of deteriorating terms of trade for producers, leads to the conclusion that the polarization and differentiation processes may slow down until the security situation in Mozambique has improved.

REFERENCES

- Acheson, J.H., 1981. "Anthropology of fishing", in *Annual Review of Anthropology*, 10.
- Alexander, Jennifer and Paul Alexander, 1990. "What's a Fair Price? The cultural construction of information in Javanese markets". Department of Anthropology, Australian National University (Unpublished paper).
- Hill, Polly, 1986. *Development Economics on Trial. The Anthropological Case for Prosecution*. Cambridge: Cambridge University Press.
- Platteau, J.-Ph. 1989. "Penetration of Capitalism and Persistence of Small-Scale Organizational Forms in Third World Fisheries", in *Development and Change*, 20, 4.
- and Anita Abraham, 1987. "An Inquiry into quasi Credit Contracts: The role of reciprocal Credit and Interlinked Deals in Small-Scale fishing Communities", *Journal of Development Studies*, 23, 4.
- Pollnac, R.B., 1985. "Social and Cultural Characteristics in Small-Scale Fishery Development", in Gerneo, M.M. (ed.): *Putting People First*. World Bank: Oxford University Press.

PART II

Artisanal Fishery Development

Limits to Aid: Some Considerations on Fisheries Development Aid Projects

Bjørn Hersoug

The fact that many fisheries projects fail is unfortunately not an invention of the press. The same conclusion is drawn by many international organizations involved in development assistance, like FAO (1984), The World Bank (1984), The Asian Development Bank and the EC (1989) as well as individual countries, referring to their experiences with bilateral aid (ODA, 1989; DANIDA, 1989; Hersoug, 1990). However, no systematic comparative study exists to prove that fisheries projects fail more often than other development projects.

Nevertheless, it seems that donors as well as recipients believe that fisheries projects are particularly difficult and risky. This is also reflected by the credit and capital situation. While credit flowed relatively freely into fisheries projects in the 1970s and early 1980s, supplies have been considerably reduced by the late 1980s. The number of "good" projects have also been reduced, leaving the donor agencies with three options; exit, change or "loyalty" (i.e. sticking to the same type of projects as before).

In this paper I shall address the paramount question: Why are fisheries projects so difficult? The argument will run along two lines; some factors are specific for the fishery sector, while others are related to development projects in general. When combined, the two sets of factors contribute to the frequent failures. In examining this issue, I shall draw partly on fisheries economics and sociology and partly on organizational theory, not being able to give due credit to either.

WHY ARE FISHERIES PROJECTS SO DIFFICULT?

Normally, there are a number of reasons why fisheries projects fail. While each particular project has its own complex history, it is still possible to point out some characteristics of the fishery sector, which generate problems of running fisheries projects. Very briefly, I will concentrate on the following:

- Characteristics attached to the resource situation
- Interdependence between the different operations (system dependency)
- Conflicting goals
- The fishery sector as a strongly politicized sector

The resource situation

Bailey and Jentoft (1990) emphasize three distinct features of the resource situation, making fishing different from the development of agriculture or industry. These are:

- The biological renewability of fish stocks
- The uncertainty of scientific data on fish stocks
- The absence of property rights governing access to these stocks

The first feature is well known from fishery biology and economics. In its pure form, the situation can be depicted as in Figure 1. A fish stock may give a sustainable yield, provided that fishing is equal to or less than the natural growth. From data on growth rates, recruitment and natural mortality, it is theoretically possible to calculate the maximum sustainable yield (MSY). By considering economic factors like the price of fish, the cost of boats, gear, fuel and labour, it is further possible to calculate the maximum economic yield (MEY). In an open access fishery, catch effort will normally increase to the point where total costs equal total income. Increasing the catch effort beyond this point will not, in the long run, yield larger catches. In tropical waters overfishing often results in a change of catch composition, where more valuable species are substituted by less valuable ones (Christy, 1987).

Even if these insights are familiar to everybody in charge of fish-

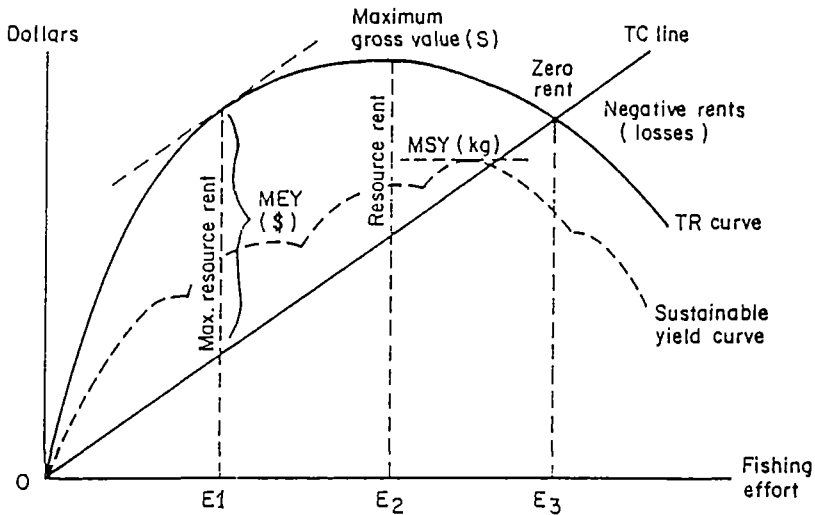


Figure 1. A bio-economic model for fisheries management

ing projects, they have been repeatedly neglected. On the basis of the advice of economists and social scientists, several fisheries projects have been started in order to improve the efficiency of a fishery, in terms of better equipment, larger boats, motors, etc. The result has very often been less catch per unit effort, reduced stocks and generally reduced profitability for the society or community involved.

On the other hand, the real world is not as simple as depicted in the figure above. The model is static, and in a dynamic model prices and costs for a number of years have to be calculated and discounted. Secondly, the model is based on a single fishery, with fishermen using the same type of gear to catch the same type of fish. In a practical project situation, we will find several groups of fishermen, fishing on different species with different types of gear. Hence, it is difficult even to construct a curve showing MSY (MEY), because as fishing proceeds, some species will probably disappear and be substituted by others. In addition, some species will fluctuate widely, according to natural variations, even on a short-term basis (Troadec, 1983). Panayotou (1982:10) concludes that an "essentially experimental (or trial and error) approach to multispecies fisheries management is probably the only option

available at the current state of knowledge and management capabilities".

Consequently, when many fisheries projects have failed in the past, the explanation may not be negligence, but simply that it is difficult to assess the resources more accurately. To complicate the situation even further, catch statistics are highly unreliable. This is partly a result of methodological deficiencies. In general, resources for training, transport and wages have been so limited, that reliable samples have been hard to obtain. Finally, corruption and the black market will influence the quality of the official figures. This uncertainty has, according to Bailey and Jentoft (1990), led to either a system of extrapolation ("same procedure as last year") or a system of total disregard of resource estimates among key politicians and administrators. When resource estimates, as, for example, in Tanzania, vary between 400,000 and 800,000 tons per year, politicians and administrators choose the figures which suit them best. For the time being, Norwegian administrators believe in the lower estimates, while the Tanzanian prefer the higher. In 1975, when Norway started with development assistance in the fishery sector, the situation was the other way around.

The main problem, however, is attached to the common property status of the fish resources. As pointed out by Gordon (1954): "Everybody's property is nobody's property." For the individual fisherman it will in the short run not be rational to catch less, because this leaves the fish to be caught by other fishermen. When fish are common property, the fishermen will increase effort in order to stay ahead of the competition. The result is overcapacity, declining profits and reduced stocks. The system can be described as "system compulsion", or to quote one of the classical contributions in the debate (Hardin 1968):

Each man is locked into a system that compels him to increase his herd without limit—in a world that is limited. Ruin is the destination towards which all men rush, each pursuing his own best interest in a society that believes in freedom of the commons. Freedom in a commons brings ruin to all.

Even if Hardin (1968) described herdsmen and common pastures, the analogy to fisheries is evident. It is, however, worthwhile to consider the preconditions for this reasoning:

- The fishermen are individual profit maximizing actors, i.e. they act out of self-interest and altruism does not enter into their calculations.
- The fishermen act strategically towards each other; their relations are characterized by competition and conflict of interests.

A number of objections have been raised to these assumptions, and hence towards the entire idea that fishing has to end in tragedy (Berkes et al., 1989; McCay and Acheson, 1990). Several anthropological studies have documented local fishing arrangements, intending to distribute gains more equally and thereby reducing effort. Examples can also be found in Africa, but at present such territorial use rights in fishing (TURFs) are under pressure from more capitalist oriented ways of fishing.

Even if the fishery does not end in tragedy, the economic result is often suboptimal because the resource rent has dissipated. The resource rent can be defined as the extra profit to the users of natural resources that exceed the "normal" return to labour and capital (Flåten, 1983; Hannesson, 1986). Referring to Figure 1 the optimal catch effort will be E_{mey} , giving the largest profit. In an open access fishery, effort will continue to increase until E_{oae} , where total costs equal total income, i.e. the resource rent is reduced to zero. Maximizing resource rent consequently requires two types of interventions. Firstly, a maximum quota has to be set in order to sustain the stock. Secondly effort has to be reduced, either by limiting the number of participants or by limiting the technical effort. (A maximum quota will itself not yield any kind of resource rent.) Normally fishermen will not impose such regulations themselves and hence the state has to impose both maximum quotas and limited entry. However, these measures have not proved very effective, and fisheries economists are now generally advocating quasi property rights. Such property rights may be handed out on an annual or a permanent basis, free of charge or sold. No matter the arrangement, the idea is to obtain security for investments and achieve a more cost efficient fishery. At the same time economists have a tendency to disregard the less pleasant side-effects, like skewed distribution on regions and individuals, problems with recruitment, etc. According to Copes

(1986), Murphy's law is also applicable in this case: "If anything can go wrong with a new fisheries management scheme, it will."

Shortly summarized: fisheries projects have to relate to a resource with special qualities, where uncertainty about the optimal level is high, and where development efforts towards one group of fishermen will not necessarily improve their situation, as long as other fishermen may reap the benefits. In some cases, development efforts in order to increase catch capacity may result in resource depletion and reduced income both for the fishermen and the society at large.

System dependency

A special feature of the fishing industry is its systemic interdependence. Fishing is closely connected with production and distribution. To mention only one example: when NORAD entered into the task of expanding the Lake Victoria fisheries, they found that the most important bottleneck was not lack of boats, gear and competence but market outlets, particularly in the larger towns in central and coastal Tanzania.

However, the interdependence extends further than fishing, production and distribution. If a fishery project is to succeed, a number of service functions have to be organized as well, i.e. construction and maintenance of boats and gear, supply of ice, fuel and spare parts, etc. Furthermore, credit arrangements have to be made, in order to make boats, gear and working capital available to the fishermen and the producers.

Special features of the commodity tend to reinforce the strong vertical interdependence. Fish is, especially in the tropics, highly perishable. If quality is to be maintained, transactions have to be made immediately. Storage of fish usually implies high costs (cooling or freezing) or losses, because of insecticides (drying or frying). In East Africa post-harvest losses up to 30 per cent are not uncommon. These features contribute to define the environmental conditions of fisheries development projects, all pointing to the need for strong vertical integration.

This does not mean that all projects have to contain every element from fishing to export, from education to credit facilities. These special conditions have to be considered on a continual

basis. The appropriate approach has been termed the "puzzle approach" (Watten, 1985), indicating the need to adjust and time the different activities. But a fully vertically integrated project is also a risky venture. If the fishery resources are nearly fully utilized, further "development" in terms of productive inputs may only increase the problems. A situation with large land based facilities, requiring an expansion of the fleet, and therefore resulting in overfishing, is well known from several projects in the 1960s and 1970s.

In a situation where the resources do not allow for further expansion, horizontal integration will be more suitable. Horizontal integration implies that projects or programs concentrate on community development, through development of alternative or additional activities. The two different development directions can be illustrated by the development of distant water fishing fleets on the one hand and integrated rural development programs on the other. Between these two extremes, we find a number of possible alternatives, depending on the resource situation. Nevertheless, a decision has to be made. According to Emmerson (1980:81):

Vertical integration encourages full-timers and increases their and the governments stake in the fishing process—for example, by building and staffing shore facilities. Horizontal integration encourages part-timers and opens the fishery as much as possible to outside opportunities. These are not mutually exclusive strategies, but there is tension between them, and official resources are likely to prove too scarce to support both in full form at the same time. Development personnel should therefore try to determine what diagonal "slant" is best during what phase of the project's operation.

However, agencies planning fisheries projects should not only consider the different links in the chain; there are also a number of conflicting goals.

Goal conflicts

In most developing countries we find four different goals set up for the fishing sector, usually repeated for most projects and programmes:

1. To increase the supplies of fish and fish products on the inter-

- nal market in order to improve the nutritional standard for the population.
2. To increase the export of fish and fish products in order to earn foreign exchange.
 3. To increase the incomes and standard of living of men and women involved in fishing, production and distribution.
 4. To increase the employment possibilities by engaging more people in fishing, production, distribution and related activities.

Both government authorities and aid agencies have a tendency to believe that all goals can be fulfilled simultaneously. According to Jentoft and Baily (1990) the goals will normally be mutually exclusive, forcing both parties to make "cruel choices", as long as fulfillment of one goal will block the success of another. Much attention has been centered on the conflict between export and internal consumption. When more fish is exported, the internal markets get less. But not necessarily; the export of shrimp from, for example, Tanzania does not imply reduced nutritional standard for the people. In Tanzania it has also been possible to raise the fishermen's income and at the same time increase the number of fishermen (FAO 1988). But the "cost" is rising prices of fish, making fish for food less available for the poorer strata of the population. For some years this conflict was "resolved" through the use of state maximum prices, but the result was a booming black market.

To what extent the different goals are mutually exclusive is therefore an empirical question. Under special circumstances, all four can be fulfilled at the same time, but the normal situation is conflict. Making priorities is difficult, especially because a different mix of priorities will result in a different use of resources and different strategies for fisheries development (Troadec, 1983).

Fisheries as a strongly politicized sector

The distribution of development aid will always imply choices. Fishing projects often involve distribution of individual goods, like boats, motors and gear, directly or indirectly through credit. The process of distribution will always imply the use of discretionary judgement, giving considerable power to the fisheries ad-

ministrators and politicians. Power may be yielded in many different ways. The distribution of goods can obviously be used in order to attract new followers or clients. This is documented very clearly in many Asian fishing nations (see, for example, Alexander, 1982). Less evident is the fact that this form of distribution also impedes change, even if it would benefit the fishing community at large. In Tanzania local politicians and administrators have "vested interests" in continuing the Norwegian commodity assistance to the fisheries, even if several studies have documented that this type of assistance has a very limited effect on the objectives of Norwegian development aid. The distribution of goods gives power to key participants—which in turn can constrain later changes.

The fishing sector is a "mine field" also because of the class relations involved. The relationship between fishermen and producer/exporter is most often unbalanced, with sharp polarizations. The strategy of evading the middlemen through the formation of cooperatives has a very mixed record, in Africa as well as in other developing countries in the Third World (Jentoft, 1985). Even if research concerning the middleman institution shows a differentiated picture of obligations and profits, the relationship is often skewed. This also applies to the countries where private enterprises play a modest role, but where party members and/or administrators are involved as "entrepreneurs". This situation means that every step within a project or programme implies a potential threat to vested interests. The room for manoeuvring is therefore limited. Changes will be met by retaliations.

It is still revealing to study the experiences of the first fisheries development project in the world, the Indo-Norwegian Project (in Kerala state), where cooperative organizations originally were a central part of the project (Pharo, 1986:79):

It was an element of sharp class struggle in the fight over the sales organization. The initiative of the project put the control mechanism in the village under strain. It should not be expected that such a confrontation could take place without using drastic means. The sales organization stood alone in a sea of private middlemen, all of them watching their position threatened by the new initiative.

These are some of the general environmental conditions influencing most fisheries projects in the Third World. But if we move from fisheries projects in general to projects within the artisanal sector (small-scale, traditional, etc.), there are even more limitations, all contributing to the complexity of planning and implementing such projects successfully.

EASY ACCESS—DIFFICULT EXIT

The small-scale or artisanal fishermen are not only restricted by the resource limitations mentioned above. Often they also have to operate within the range of 10–12 km off the coast.¹ Fish resources in this area define the maximum sustainable yield (MSY) and consequently the number of fishermen that may utilize the resources.

In most developing countries some kind of registration system of fishermen and boats has been established. However, access is free in principle unless the community has made special arrangements for local territorial use rights (TURFs), restraining outsiders from using a particular resource. A territorial use right in fisheries can to a greater or lesser extent remove the conditions of open access (Christy, 1982). TURFs have been recognized and described in a number of developing countries, being different both in scope and accomplishment (Fernando, 1985; Berkes, 1989). At present most TURF institutions are under pressure, as fishing enterprises are searching for new resources. With increasing prices on fish, as in Africa in the 1980s, the number of new fishermen, both in the artisanal and the semi-industrial sector, is steadily increasing.

According to neo-classical economic theory, fishermen will change to other occupations if they can obtain better pay there. Unfortunately, artisanal fishermen do not perform according to theory. The typical situation is easy access but difficult exit. According to Panayotou (1982) there are at least six different reasons explaining this "paradox".

First, it is difficult to sell boat and gear (to an acceptable price)

1. This is at least the situation in an East African context. In West Africa we generally find a less restricted resource situation and artisanal fishermen with greater mobility.

in times of a declining fishery. Second, the ties to the middlemen will make change of occupation difficult. Third, most artisanal fishermen live in small, remote villages where it is hard to obtain information about alternative jobs. Fourth, the acquirement of new qualifications takes time, and artisanal fishermen seldom have the means to forgo their income, even for a short time. Fifth, fishing will most often be combined with other occupational activities like farming. A transfer to the town will usually mean giving up these activities as well. Sixth, fishing is a "life style" occupation, where the occupants may have problems with changing the rhythm of life, for example, to industrial work. These reasons may explain why artisanal fishermen receive a remuneration far below their alternative income. They are "trapped" in the fisheries.

In an African context, Panayotou's picture is perhaps too bleak; especially in West Africa we can find a number of cases where artisanal fishing is a lucrative occupation. Nevertheless, most African countries accept the fact that the resource "ceiling" is reached (or very close), at least in the marine fisheries. But it may be very difficult to reduce the number of boats and fishermen. This is due to the lack of alternative employment, both in the developing countries in general as well as in the fishing communities in particular. With a population growth of 3—3.5 per cent per year, there is a permanent pressure on the fishing communities to feed and accommodate an increasing number of people. If the resources are fully utilized, there is no sense in increasing the catch effort further. Instead, measures to ensure an equitable distribution of the benefits of fishing amongst the population and to develop alternative sources of remunerative employment in the fishing villages, should be adopted.

As can be seen, projects in the field of artisanal fisheries are circumscribed by even stricter environmental conditions than the "ordinary" fisheries projects. In the language of organizational theory, we would say that the environmental conditions are extremely complex and rapidly changing. The next question then, is what policies there are to meet such challenges. In the next sections I will briefly describe the most common features of project organization used in fisheries projects as well as in other types of development aid projects.

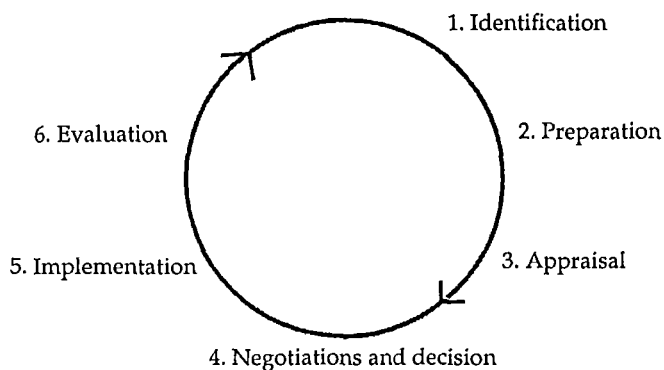


Figure 2. *The project cycle*

THE PROJECT CYCLE

Even if the term "project" carries different meanings within different disciplines, the most usual understanding within development assistance is to identify "project" with a specific *method*. Figure 2 shows the project cycle as it is currently used by the World Bank. (Other development agencies follow the same procedure, even if the structure and length of each step may vary).

As pointed out by Rondinelli (1983:308) a number of definite advantages may be achieved by granting development aid by projects. Projects are goal oriented and easy to identify. They force planners and administrators to concentrate resources and attention to a limited set of activities. Projects are also preferred because they can easily release other resources, and because they can be identified as "our" project. Furthermore, they may be analyzed in advance, warranting to some extent the safe use of resources. Projects are more easy to terminate than programmes, and the donor's risk is reduced. Projects offer advantages for the recipients too; new political priorities may be followed, aside from the usual bureaucratic practice. Finally, projects may be used to channel resources to specific target groups.

For both donors and recipients, projects are fairly easy to administer, as a set of routines normally are agreed upon. Hence projects can be controlled and monitored as part of a bureaucratic

procedure. This is probably why most aid agencies prefer to channel their resources through projects. According to de Silva (1984), projects account for 60—70 per cent of all development aid.

However, the project approach has certain drawbacks as well. The procedures are usually too rigid, too complex and too mechanical, serving mainly the task of control on behalf of the donor agency. Hvidt (1987) also mentions the fact that the costs of running projects normally are too high for the recipient country, and that local institution building has been sacrificed in order to make projects run efficiently. Both matters contribute to the non-sustainability of projects, usually demonstrated by the frequent breakdowns caused by the withdrawal of donor agencies.

In the following section I shall very briefly discuss three steps within the project cycle: planning, decision and implementation, in order to demonstrate that they all contribute to an extreme ideal of rational organizational behaviour.

Planning

Faulty planning has been suggested as a major reason why many fisheries projects fail. Bad planning refers to lack of knowledge about the cultural as well as the ecological setting. The agencies' reply to the critics has been to develop more comprehensive manuals, describing in detail what should be contained in project proposals and how the information should be presented. In the Norwegian case, NORAD's project manual specifies the request, the recipient's priorities and a description of the project, showing goals, participants, economy and a timetable. Furthermore, the plan should contain project organization and administration, and an assessment of all critical points and bottlenecks.

In NORAD as well as in other agencies, the planning tool Logical Framework Approach (LFA) has been introduced in order to make the projects more consistent and to give a more realistic view to the constraints on each step. LFA may lead to better projects, but the limitations are important: The method offers no guidelines as to questions about local participation, and what is the best and most economical way of reaching a given goal. Furthermore, there is a tendency to reduce politics to logic. A logically consistent project is no guarantee for successful implementation.

I do not argue against better preparation and improved planning, including better planning tools like LFA. But it is important to remember the limitations to these procedures. Generally, the planning process will always be restricted by a shortage of time and money. There is never time nor money to collect all the information required to make the "ideal" plan. Donor and recipient administrations, target groups as well as the general public in both countries expect immediate "action" and preferably instant results. If the planning process drags on for years, the target groups may lose confidence in and enthusiasm for the project.

Secondly, the relevant goals are often not discovered in advance. Quite the contrary, they are discovered during the process of implementation. March (1976:72) has described the situation:

The argument that goal development and choice are independent behaviourally seems clearly false. It seems to me perfectly obvious that a description that assumes goals come first and actions come later is frequently radically wrong. Human choice behaviour is at least as much a process for discovering goals as for acting on them.

If this is a correct description, the massive input of resources in most development aid organizations in order to improve the planning procedures, may be heroic, but futile. More resources should instead be channelled to the implementation, when the problems really tower up. But let us first turn to the issue of making a decision; yes or no to a project proposal.

Decision

From the outset the decision-making situation concerning most projects appears fairly simple, with one issue and two actors. In reality, the situation is much more complicated. Each of the actors is usually represented by a coalition of actors. In each project a number of different groups will be represented; each attempting to use the project for their own purposes. According to the classical analysis by Cyert and March (1963) the determination and change of goals are done by three different methods; by negotiations, by control and by autonomous adjustment. Even if this theory originally was worked out to suit business organizations, the main points also apply to public bureaucratic organizations,

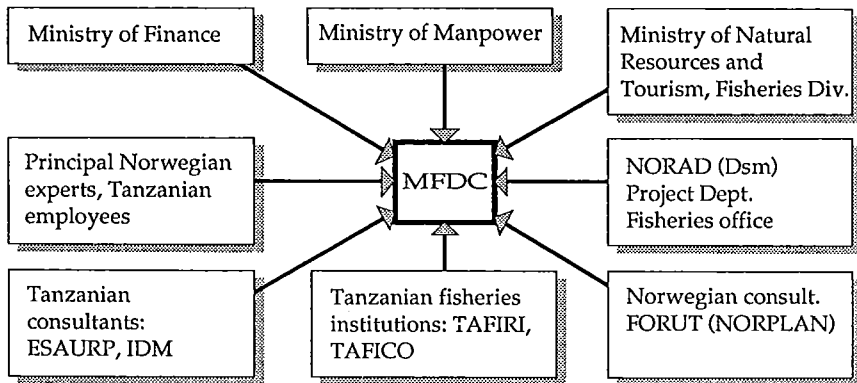


Figure 3. *Participants in the MFDC-project (Tanzania) 1987/88*

like development agencies. This means that the "simple" task of making a project decision involves a lot of coordinating work on each side. In addition, the information is fragmented and the number of viable options limited. In this situation, leaders normally opt for "satisficing" and not for the optimum solution.

After the project agreement is signed, the decision-making process becomes even more complex. A large number of practical questions have to be answered, and again the situation is different from the one described by the rational decision-making model. Usually the goals are vague, or mutually exclusive, the relationship between goals and means are unclear, and no single participant is in the position to dominate the whole decision-making process. Such a situation can be described by a "garbage can" model developed by March and Olsen (1976). Management within such a system will generally have to revert to the definition of participants and the delimitation of alternatives. The model offers no standard answers to the problem of running projects. But the insight that reality is not as rational as depicted by the original model may prove valuable. To sum up: the ideal decision-making model depicts a situation where the decision-makers are omniscient and omnipotent. In reality they have very limited information and only limited control over the environment. Again the decision-making model preferred by most development agencies is at odds with reality.

A NORAD aided fisheries project in Tanzania may exemplify this. As can be seen from Figure 3 there are a great number of different actors. They only rarely work together for the same solution. In this particular case NORAD had the money, the experts and controlled the whole project implementation process. Still, it was not possible to change the course of the project when NORAD's leadership later wished to do so, largely due to another, stronger coalition on the Tanzanian side.

Implementation

The idea that politics is divided from administration is deeply entrenched in classical administrative theory. Lack of implementation was considered as a fault in the administrative system, or as sabotage. Later, implementation has been considered a field of its own (Mayntz, 1979) and finally as a continuous process of policy change (Sabatier 1986).

In the world of development aid, deviation from the plan is common, and projects completed according to plans are exceptions. However, many developing agencies use most of their resources on planning and making an agreement, while monitoring receives rather limited attention and resources. Monitoring is required in all project manuals, but is in practice very often limited to *ad hoc*-arrangements, usually put into effect when the project is in crisis. In the 1980s, however, a more committed approach can be seen in the discussions of development aid (Cassen et al., 1986; OECD, 1985) as well as for fisheries projects in particular (UNDP, 1986; World Bank, 1984).

In order to understand the implementation process, three broad perspectives can be described (Sætren, 1983). The first concentrates on implementation as a symbolic activity. The case (the project) is not what matters, but the opportunity to present oneself. The participants are eager to create legitimacy through what is said, how it is said and to whom. The second perspective describes implementation as interest group politics. Here the formal project agreement marks no end for the competing groups. Instead, they continue to follow their own interest, depending on the resources available and the coalitions that can be made. The implementation process can therefore be seen as a continuous

negotiation process. In the third perspective implementation is a social by-product, where changes in the environment outside the control of the organizations lead to new decisions and changes in the original project. The outcome of the project is a by-product of the changes in the environment, where the actors have only limited control.

The three perspectives are supplementary and may be used to analyze the outcome of projects. But they differ to a considerable degree from the "official" understanding of monitoring. According to the FAO project manual (1986:99) monitoring is:

... primarily a management tool whereby data on what is actually happening on the ground with regard to the delivery of project inputs and their use to create outputs is fed back to the project managers on a continuing basis. By taking prompt corrective action, when necessary, the project managers can control the progress of the project and keep it "on course" in accordance with the implementation plan.

Again we find a "technical" perspective on planning and implementation. The problems of this approach can easily be demonstrated by turning to an example, familiar at least to everybody concerned with Scandinavian development organizations; the conflict between participatory and non-participatory planning and implementation. It is widely recognized that the Scandinavian aid agencies favour participatory planning as well as a process orientation. But the paradox is, as formulated by Korten (1980):

While awareness is becoming widespread that the blueprint approach is an inadequate response to the rural development problem, its assumptions and procedures continue to dominate most rural development programming.

And the same is certainly true for fisheries projects. However, the "paradox" dissolves when we focus on the limitations the aid agencies are subject to. These agencies can not freely select the project procedures they would like. Administrative procedures will all act *against* the idea of participation and process-orientation. When the non-participatory blueprint approach still is dominant in most agencies, the explanation is probably that it fulfills certain basic requirements, both to donor and recipient organizations.

CONCLUSIONS

The general idea forwarded in this paper has two aspects: On the one hand development projects within fisheries are restricted by a number of special factors. These factors, together with environmental changes, contribute to an extreme uncertainty. On the other hand, the general trend among aid agencies is to use and develop a rational decision-making model, based on clear goals, known relationships between means and ends and a large degree of control over environmental factors.

The inevitable clash between model and reality, between project plan and implementation, produces failures, projects not living up to expectations, unexpected results, etc. As shown above, the idea of participatory planning and implementation may be impossible to reconcile with the idea of a blueprint project. But a more realistic idea of how the complexities involved operate, may result in a more realistic model. Some projects demonstrate that process orientation and (limited) participation is possible. But this requires high flexibility and considerable risk to both donor and recipient agencies.

The real paradox is therefore the following: We have some ideas about how fisheries projects must be organized in order to tackle the extreme uncertainty surrounding such projects. On the other hand, these ideas are difficult or impossible to practice in aid agencies, exactly because such organizations opt for control and safe procedures. In this aspect, fisheries projects are very similar to real fishing: "You don't really know how much you are going to get before you start!"

REFERENCES

- Alexander, P., 1982. *Sri Lankan Fisherman. Rural Capitalism and Peasant Society*. Australian National University.
- Cassen, R., 1986. *Does aid work?* Oxford: Clarendon Press.
- Christy, F.T., 1982. *Territorial Use Rights in Marine Fisheries: Definitions and Conditions*. FAO Fisheries Technical Paper, 227. Rome: FAO.
- 1987. *A Re-Evaluation of Approaches to Fisheries Development: The Special Characteristics of Fisheries and the Need for Management*. Paper prepared for Agriculture Symposium, The World Bank 8–9 January, 1987.

- Copes, P., 1986. "A Critical Review of the Individual Quotas as a Device in Fisheries Management", *Land Economics*, 62, 3. University of Wisconsin.
- Cyert, R.M. & J. March, 1963. *A Behavioral Theory of the Firm*, Englewood Cliffs: Prentice Hall.
- Emmerson, Donald K., 1980. *Rethinking Artisanal Fisheries Development. Western Concepts, Asian Experiences*. World Bank Working Paper, 423.
- FAO, 1984. *A framework for the formulation and implementation of a national fishery in Tanzania*. FAO/Norway Cooperative Programme. Rome: FAO.
- 1986. *Guide for Training in the Formulation of Agricultural and Rural investment Projects*. Rome: FAO.
- 1988a. *Sri Lanka Fisheries Sector Study* FAO/AsDB-programme. Rome: FAO.
- 1988b. *Tanzania. Contribution to the formulation of a five year plan for the fisheries sector*. Joint mission report coordinated by A. Bonzon. Rome: FAO.
- 1988c. *Women in fishing communities*. Guidelines. Rome: FAO.
- Fernando, S., 1985. "The Marketing System in the Small-Scale Fishery of Sri Lanka: Does the Middleman Exploit the Fisherman?", in T. Panayotou (ed.), *Small-Scale Fisheries in Asia: Socioeconomic Analysis and Policy*. Canada: International Development Research Centre.
- Flåten, Ola, 1983. "Fiskeriplanlegging og bioøkonomisk teori", in B. Hersoug (red.), *Kan fiskerinæringa styres?* Oslo: NOVUS forlag.
- Gordon, H. S., 1954. "The Economic Theory of a Common Property Resource", *Journal of Political Economy*, 62, April.
- Hannesson, R., 1986. "Uproduktiv profittsøkning", in Brunstad og Hope (red.): *Markedsstruktur og konkurranse*. Oslo: Bedriftsøk. Forlag.
- Harding, Garret, 1968. "The tragedy of the commons", *Science*, 162.
- Hersoug, B., 1990. "Innviklet utvikling—en analyse av et norsk fiskeriprojekt i Nicaragua". *Internasjonal Politikk*, 48 (3). Oslo: NUPI.
- 1991. *Innviklet utvikling*. NFF, Universitetet i Tromsø.
- Hvidt, M., 1987. *Prosjektbistand—om prosjektet som medium for overførsel ad bistand til 3.verdens landdistrikter*. Speciale ved Geografisk Institut, Aarhus Universitet.
- Jentoft, S. 1985. *Dreams and Disillusionment: A Comparative Perspective on Fisheries Co-operatives*. Paper presented to the annual meeting of the Canadian Sociology and Anthropology Association, Montreal.
- & C. Bailey, 1990. "Hard choices in fisheries development", *Marine Policy*, July 1990.
- Korten, D.C., 1980. "Community Organization and Rural Development: A learning Process Approach", *Public Administration Review*, 40, 5.
- March, J., 1976. "The Technology of Foolishness", in J. March & J.P. Olsen (1976): *Ambiguity and choice in organizations*. Bergen: U-forlaget.
- Mayntz, R., 1979. "Public bureaucracies and policy implementation", *International Social Science Journal*, XXXI, 4.
- McCay, B., and J.M. Acheson, 1990. *The Question of the Commons*. Tucson: The University of Arizona Press.
- NORAD, 1985. *Fisheries Development*. Oslo: NORAD.

- OECD, 1985. *Report. Twenty-five years of development cooperation. A review*. Paris: OECD.
- Overseas Development Administration (ODA) (1989): *Fisheries Synthesis Report*. London: Evaluation Department.
- Panayotou, T., 1982. *Management concepts for small-scale fisheries: economic and social aspects*. FAO Fisheries Technical Paper No. 228. Rome: FAO.
- Pharo, Helge Ø., 1986. *Hjelp til selvhjelp. Det indisk-norske fiskeriprosjektets historie 1952—72*. Oslo: NUPI, Bind I og II.
- Rodinelli, D.A., 1983. Projects as instruments of development administration: a qualified defence and suggestions for improvement, in *Public Administration and Development*, Vol. 3, No. 4.
- de Silva, L., 1984. *Development Aid: A Guide to Facts and Issues*. Geneva: Third World Forum.
- Troadec, J. P., 1983. Practices and Prospects for Fisheries Development and Management: The Case of Northwest African Fisheries, in B. Rotschild (ed.): *Global Fisheries, Perspectives for the 1980s*. New York: Springer Verlag.
- UNDP, 1986. *Fisheries Development*. Review of support by the United Nations Development Programme.
- Watten, J., 1985. What should or could the Centre be used for? in NORAD (1985): *Fisheries Development*. Oslo: NORAD.
- World Bank, 1984. *Harvesting the Waters—A Review of Bank Experience with Fisheries Development*. Report No. 4984.

Men, Money and Fisheries Planning: The Case of the Northern Province of Zambia

Else Skjønberg

The present paper argues that development planners must make a special effort to come to terms with the strategic choices that their target group takes to make ends meet and enhance profits. If they do not, scarce development resources are likely to continue to be wasted on useless planning exercises and inappropriate technologies. Thus in the process of coming to grips with the dynamics of the fishing sector, fisheries sociology must have its place next to biology and gear technology. When fisheries development is being planned, implemented and/or administered the priorities of the chief actors in the sector, the cost-benefits of different fishing technologies and the flow of money within the sector and between the fishing sector and other sectors must be identified, described and analyzed. Such information must be regarded as a *minimum requirement* to adequate fisheries planning.

The present paper discusses these minimum requirements in connection with findings made during a fisheries review mission to Zambia in 1986, to the waters of Lake Tanganyika and Mweru Wa Ntipa. Here official statistics collected by the Zambian Department of Fisheries revealed high profitability of the Northern Province fisheries, yet the highly interesting statistical findings seemed to have made no impact on the on-going fisheries development planning. Neither did other basic facts about the fishing communities of the area.

FISH—A COMMON AND VALUABLE RESOURCE

The importance of the fisheries in the national economy is indicated by the fact that fishing ranks third after mining and agriculture as a major sector of employment in Zambia. 25,000 fishermen

and 30,000 others engaged in fish processing and trading are estimated to take their livelihood directly from fishing. Furthermore, another 150,000 people are assumed to derive some form of income from the industry.

The fact that *Zambian* fisheries are located in peripheral and little developed areas adds to the development potential of fishing. Fish resources represent a singular potential for employment, incomes and protein-rich food. This is the case particularly in the poor Northern Province of *Zambia*, where the productive Lake Tanganyika and Mweru Wa Ntipa already play an important role in the local social and economic life.

In 1984 the total (*Zambian*) catch from the fisheries of Lake Tanganyika and Lake Mweru Wa Ntipa was estimated to 20,000 tonnes. Though industrial (trawler) fishing takes place on Lake Tanganyika, most of the catches from this very large inland water are still brought ashore by small-scale or artisanal fishermen. Their number in the Northern Province is estimated to between 3,200 and 5,600 persons (see Table 1, page 162). The number of people gaining all or some of their livelihood from fishing, including processors, traders, boat-builders, fisheries administrators and their dependents is assumed to be up to ten times that of those engaged in production as such. If this is so, between 32,000 and 50,000 persons in the Northern Province take their livelihood from the lakes (NORAD, 1986). In addition, there are many consumers inside and outside the province. For all of them, fish is an important resource and the way this resource is administered is likely to affect their lives in some way or the other.

The Department of Fisheries is the official government body charged with the responsibility of ensuring rational exploitation of fish stocks. In the Fourth National Development Plan the overall strategy is to maximize the utilization of resources by providing economic incentives and timely and effective provision of government support and services. Preferences are, according to the Plan, to be given to artisanal fishermen. However, in practice the more capital intensive units often reap the major share of the benefit from extension services (credit and advice) and from on-going fisheries research.

To enhance local incomes and to improve on catch and quality, it becomes increasingly important that fisheries planning recog-

nizes and mediates between the contradictory interests of small- and large-scale fisheries, between small- and large-scale traders, between central and peripheral markets and between short-term commercial interests and long-term ecological needs. To strike the right balance between the various interest groups may be a delicate matter. It presupposes an adequate understanding of a complex situation. Cost-benefits, money flows and the strategic choices of fishermen and middlemen and -women are basic elements in such an understanding. They should consequently be mapped with the same detail, in depth and longitudinally, as are fish species and fish migration. If it is not, what we risk is increased pauperization among traditional fishing communities, while the profit from the sector is taken directly by capital intensive fishing units, often with their financial basis in central Zambia. This will be a development that the poor Northern Province cannot afford.

NEW EXTERNAL ATTENTION

During the past few years Zambian fisheries has received increasing attention from the private sector as well as from government and foreign donor agencies. What usually happens when change agents come in with outside intervention is well known. A major emphasis is likely to be put on persuading the target group to adopt technology and technical interventions more complex and more capital intensive than those they are already using. The outcome is usually twofold; either the intervention is without impact as people ignore the message and continue as before; or the innovations are adopted by some, something which may sharpen existing divisions of labour and of incomes in one way or the other. Outside capital often reaps most of the economic benefits of capital intensive interventions. And when this is the case, local populations are frequently marginalized or, if at all the new technology creates new jobs, they most often become part of the new proletariat. Women's interests are often overlooked and excluded altogether, and as a consequence women may lose the slight opportunities they may have had prior to the intervention to make an income.

The heavy emphasis among change agents on technical interventions and complex techniques may be caused by sheer lack of imagination (and insight) on behalf of the planners who are expected to "come up with something". Another problem is the pre-set budgets, where donor performance is measured by the size of the allocations. It may also be the logical result of an over-eager desire for rapid results, an ambition endemic to development aid with its unrealistic short-time perspective. The consequences, whatever causes, are visible along the shores of major fishing waters all over Africa. Defunct fish processing units, disintegrating harbours and piers, closed down workshops, wrecked boats and non-functioning outboard engines, concrete wells from which no water is drawn and market stands that never served their purpose are dire reminders of inadequacy and wastage. The shore lines of Lakes Tanganyika and Mweru Wa Ntupa are no exception.

THE NEED TO KNOW

In view of the scarcity of resources and the urgent need to enhance quality, past failures should be of major interest to fisheries planners and should be studied accordingly. If nothing else, they can serve as inputs into what may be defined as an on-going learning process. As far as fisheries development is concerned we still have some way to go before it is known how artisanal fisheries can be developed cost-effectively to the benefit of local fishing communities.

Anthropological literature demonstrates time and again that fishermen, like farmers, are cautious when it comes to adapting new beliefs and practices. There are, if anything, more documented cases of innovations rejected than accepted by their potential users and not without reason. Many innovations are rejected for two very sound and very obvious motivations; the innovation may be economically unprofitable, particularly in a long-term perspective where risk elements are generally greater than planners seem willing to realize. Or the innovation may be culturally or socially incompatible, breaking with existing cultural patterns or dominant group interests and jeopardizing precarious balances and social stability. In short, innovations are rarely without

cost to those who are supposed to benefit from them. It is for this reason that J.M. Acheson (1981) in his *Anthropology of fishing* states as a general rule that innovations are adopted *only* if they match the (felt) need of the adapter.

It should not be overlooked that new techniques or technology, however rational they may seem to external development agents, do not necessarily benefit fishermen or fish processors. Only if there is more fish to catch will improved practices raise aggregated outputs. If not, the outcome may be that the same amount of fish is caught in less time. But to fish "faster" may not be a felt need among fishermen for whom time may not be a scarce resource they are willing to exchange for money and invest in. Indeed, a fisherman will be a loser if his investments in boats and gear are increased and enhanced profit due to more fish does not follow suit. He will also be poorer if more efficient gears lead to biological overfishing, and innovations are followed up by conservation measures which prevent or limit the (extensive) effective use of new boats or gears. And there is the danger of economic overfishing when the market is unable to absorb enhanced catches and deflated fish prices and wastage results. Briefly, fishermen may have many reasons to be reluctant to change. From the point of view of the fisheries planning, the essential question is what are these reasons and how valid are they?

In order to predict the behaviour of fishermen and that of other actors in the sector (traders, processors, fishmongers), a first step must be to assess the cost-benefits of *existing* technologies and tools as it appears for the different sections of the target group. Present cost-benefits must then be compared to the assumed costs and benefits of the recommended changes. A basic comparison of cost-effectiveness is a minimum requirement and should be included whenever national and international development agencies make recommendations as regards development interventions, and more so in the fishing sector where the economy is and will continue to be a leading factor. A second step must be to analyze existing and assumed cost-benefits in the context of local economic priorities and preferences. Only by assessing economic factors in relation to local economic priorities and preferences will planners be able to reveal the inherent logic behind existing investment patterns and strategic choices. Although this may seem

elementary, such basic data rarely exist in reports on fisheries development. Why? Because they entail some detailed and long-term sociological studies in an industry hitherto almost exclusively dominated by the natural sciences. It may also be that social scientists have neglected the fishing sector, as well as their duty to present findings in such a way that they become accessible to development planners and administrators. Whatever the case, the fact remains that sociological data, including those on the economy of the chief actors of the fishing industry, is often non-existent or at best rudimentary.

GENERAL LACK OF INFORMATION

The general lack of sociological data was certainly the case in the Northern Province in Zambia. What was available were some very basic official statistics on catch and fish prices, and these revealed some surprising information on the sociology of the local fisheries as well as on fisheries planning and development aid. A systematic review of the literature dealing with the fisheries in the Northern Province yielded a total of 55 titles (books, articles, papers, reports, etc.).¹ In this plethora of documents only *one* paper addressed some aspects pertaining to the conditions of the fishermen, even if the amount of information was limited and the paper consequently gave little detail on the socio-economic situation of fishermen (Government of Zambia, 1985).

The main emphasis among fisheries planners on biology and technology (fish resources and gears) may account for the many failed fisheries development interventions of the Northern Province. The two lakes Lake Tanganyika and Lake Mweru Wa Ntipa have got their share of inadequate and *inappropriate* aid. The scarcity of information regarding the economic operations and financial dispositions of fishermen, processors and traders stand in sharp contrast to the many reports on how to develop the Northern Province fisheries. Only between 1980 and 1985 at least six dif-

1. The search was *inter alia* done in the FAO Fisheries Division Library, University of Lusaka Library, the Department of Fisheries Library, libraries of various donor agencies in Zambia, including the Canadian, Dutch and Norwegian agencies of international development, and the Northern Province Planning Unit.

ferent donor agencies sent their missions to Lake Tanganyika and at least six different teams of "experts" made their recommendations to the Zambian government on how to enhance local fisheries.² Common to all the reports was the emphasis on innovations and changes, particularly as regards improved technology. But only one of the reports based its recommendations on any analysis, however rudimentary, of the cost-effectiveness and cost-benefits of the present small-scale fishery (NORAD, 1986: Chap. 13-14). None of the reports seriously discussed the options available to the fishermen and the priorities that guide their strategic choices. And none gave basic sociological information about the social and economic conditions of the target group whose lives were to be "developed". Yet recommendations as to how the modernization process should advance were numerous.

WHAT AVAILABLE SOCIO-ECONOMIC DATA INDICATE

In view of the scarcity of data in general, the statistics on catch and fish prices collected by the Zambian Department of Fisheries on a regular and permanent basis attain particular significance. They seem to be the only information available about the money involved in the fisheries and consequently the only indicator as to the economic status of the sector and its individual actors. The scrutiny of existing catch-data seen in relation to information available on fish prices yielded highly unexpected results. According to the Department statistics, the fisheries both on Lake Tanganyika and on Mweru Wa Ntipa were highly profitable, as large amounts of money were made by virtually all sections of the industry!

However, in spite of the surprising fact of seemingly high profitability, neither the government nor international donor organizations seemed to make any issue of the only available statistics. It is not our contention that the statistics collected at landing stations as part of the Department of Fisheries field operations are

2. These were FAO, The World Bank, FINNIDA, the Government of Zambia (Ministry of Agriculture and Water Development), the Netherlands and NORAD.

Table 1. *Estimated number of artisanal fishermen, catch, catch value and average annual earnings from the Zambian waters of Lake Tanganyika*

Number of fishermen		Catch	Value	Average annual incomes	
Dep. Fish (1976)	Consult Rep. (1981)	(tonnes) (1985)	(Kwacha) (1986)	Dep. Fish	Consult Rep.
1,356	1,800	8,364	8.4 mill	K. 6,200	K. 4,700

necessarily correct. But they are certainly remarkable enough to deserve attention from the Zambian fisheries authorities and from donors. The essential question is whether fishing is such a profitable industry as the data indicate, or if the statistics are in fact worthless. Either alternative deserves attention.

In 1985 the total output from the artisanal fisheries of Lake Tanganyika was estimated to 8,360 tonnes, and from Lake Mweru Wa Ntipa 9,700 tonnes. Catch values in 1986 prices were 8.3 million and 9.7 million kwacha, respectively. If the catch data and the Department's estimated number of fishermen are correct, the average fisherman on Lake Tanganyika earned K. 6,200. An interim report estimates the number of fishermen to be 50 per cent higher than the figure published by the Department. If this report is correct, the average fisherman would earn an annual K. 4,700. An annual income of K. 4,200 is approximately ten times that of a Zambian farmer.

The concomitant average incomes from the artisanal fisheries on Lake Mweru Wa Ntipa are K. 4,600 (Department of Fishery) or K. 2,800 (Interim Report). Whereas Lake Tanganyika artisanal catch statistics may be biased by the considerable commercial trawler fleet that is fishing on that lake, no industrial fishing is presently carried out on Lake Mweru Wa Ntipa.

The assumption that artisanal fishermen make good profits is supported by the rudimentary economic data presented in *Socio-Economic Survey of Kaputa District* (Government of Zambia, 1985), the only sociological paper we found with some relevance for fishing communities in the North. The study covered one hundred households in the Nsama-Mkubwe area, including seven villages and one fishing camp. According to the survey, nineteen fisher-

Table 2. *Estimated number of artisanal fishermen, catch, catch value and average annual earnings on Lake Mweru Wa Ntipa*

Number of fishermen		Catch (tonnes) (1985)	Value (Kwacha) (1986)	Average annual incomes	
Dep. Fish (1976)	Consult Rep. (1981)			Dep. Fish	Consult Rep.
2,124	3,500	9,676	9.7 mill	K. 4,600	K. 2,800

Sources for both tables: a) The Department of Fisheries, Government of Zambia. b) The consultancy report *Zambian Inland Fisheries Development Project—Interim Report 1981*, which presents data based on a survey of a sample of 300 fishermen, traders and local leaders. The report suggests that the total number of fishermen may be 50 % more than indicated by the Department of Fisheries. c) NORAD, 1986. *Zambia Fisheries Development in Northern Province*. Report by a Zambian-Norwegian Fisheries Delegation. The catch figures compare well with the estimated 1980 output from the artisanal sectors in the two lakes, viz. 6.800 mt for Lake Tanganyika and 9.000 mt for Lake Mweru Wa Ntipa.

men in the sample earned more than all other respondents together (about eighty persons). The report concludes that "*incomes from fishing are overwhelmingly higher than from other activities*". While fishing was done by 46 per cent of the sample, incomes from fishing amounted to 75 per cent of the total incomes in the area surveyed.

The Fisheries Research Officer at Mpulungu Fisheries Station on Lake Tanganyika confirmed the high profitability of the small-scale fisheries (Mr. Pearce, personal communication). He estimated that a beach seine owner would earn about K. 15,000 per year after having paid off his crew. With an annual depreciation of perhaps 30 per cent his net income would be over K. 10,000. There were about hundred beach seines in the Mpulungu area in 1986. The Fisheries Research Officer estimated that 500 fishermen would own/operate light boats and earn about K. 6,000 per year, but then running costs of the light boats were considerable. Between 500 and 800 pullers, who join the fisheries without any capital, were estimated to earn an average of K. 2,140, or about five times that of an average farmer.

WHAT THE FINDINGS INDICATE

However approximate, these estimates suggest that there is money in artisanal capture fishing and that small-scale fishermen earn much more than most other Zambians. This may come as a surprise to those who have thought artisanal fishing a poor man's trade. It may still be so for most fishermen, even on Lake Tanganyika and Lake Mweru Wa Ntipa, but the data certainly suggest that there is money in the Northern Province small-scale fishing. The question is where that money is, who has it, and how does it move? If development planners were able to answer those questions, new insight could have been provided that would certainly shed light on the sociology of the industry. According to general economic theories the high profits should lead to high investment rates, in gears, boats and other equipment. Yet this does not seem to be the case, even if the number of fishermen fluctuate.

In agriculture, which has benefited from sociological research to a much larger extent than the fishing sector, it is well-known that medium- and large-scale enterprises depend to a large extent on capital from outside the (agricultural) sector, while capital raised within the sector is invested outside it (trade and communications). The same tendency can be assumed to be valid also in the fisheries. But if so, it is worth while asking how the annual 19.1 million Kwacha earned by some 5,000 or 8,000 fishermen in the Northern Province are spent. Where do the profits from fishing go and with what consequences? These are questions that should be raised by those wanting to increase the capitalization of the industry as the answer may be crucial to a rational development of the fisheries. In view of the shortage of sociological fisheries research, it is worth while to extrapolate from the scarce data that do exist and make maximum use of those that were collected during the said fisheries review mission in order to suggest some of the exciting possibilities entailed by a more sociological approach to fisheries planning.

It is likely that some men stop fishing to take up trading instead. The relative profitability of the two activities is another unknown factor which deserves thorough investigation. However, fishing and trading represent two very different ways of life. They call for different skills and talents, and equally decisive, for different net-

works. For these reasons, the transition from the one to the other may neither be easy nor likely. Yet, most fishermen may think that a trader's life is the more easy, and that his or her profits are larger than that of the fishermen. That the transition from small-scale to larger-scale fisherman or from fisherman to trader is difficult is substantiated by our finding that the most successful both among fishermen and traders are not locals. Mr. Samuka on Lake Tanganyika may be a typical case.

Although Mr Samuka was born in the Northern Province, he does not pass for a local man because of his Malawian background. It was this element of "the outsider" that other fishermen used to explain why Mr. Samuka and his extended family had succeeded in building up their considerable beach-seine fleet. In 1962 Samuka started with a boat, a beach-seine and a drag-net. Now he and his brother own a large transport boat, six fishing boats, four beach-seines, one drag-net and five outboard engines. Thirty people fish for the Samukas. The story of the Samuka further indicates that local culture may make active use of leveling mechanisms (of which witchcraft may be the most potent) to maintain social equality. If so, the conditions for and the consequences of economic success should be studied, preferably through anthropological methods.

Some fishermen may quit fishing once they have earned enough to invest in other livelihoods such as livestock, land, or minor businesses (bars, transport). Fishing may be dominated by younger men. This is particularly the case with the more profitable night fishing. Older men were said to prefer gill-netting during day time and to be in the habit of fishing for subsistence only, preferring the independence and freedom of the gill-net which can be operated by one man alone. But how profitable are the gill-nets as compared to other nets? In Lake Tanganyika less than 20 per cent of the fishermen in the Zambian waters used gill-nets, but such a figure is little to go by as it may be determined as much by the habitual shortage of nets as by local preferences.

It is not unlikely that people who can afford to fish for pleasure and subsistence do so because they have other means of livelihood. It may also be that fishing is very much age-determined in that the risky night-fishing is considered a young man's activity or perhaps that the younger men are preferred by the owners of the

fishing gear? It may also be the privilege of a man with adult sons to quit fishing altogether or at least leave the income-generating part of it to his sons. Such preferences would explain why fishing on Lake Tanganyika and Lake Mweru Wa Ntipa, high profit potentials notwithstanding, remains undercapitalized. Still, the most pertinent question regarding Northern Province fisheries is whether in fact the industry is undercapitalized. Before cost-benefit investigations have been made this remains an open question.

MIGRATION

The extreme vulnerability of certain ecosystems aggravates the lack of basic fisheries data and mocks planning procedures that seem to operate in an ecological vacuum. Lake Mweru Wa Ntipa is a reminder of the extreme adaptability as well as the changing circumstances of fishermen. Between 1967 and 1972 the number of fishermen on this very special lake increased ninefold (from 522 to 4,458) in response to a fabulous increase in the productivity of Lake Mweru Wa Ntipa (Richards, 1983). The plethora did not last long. As a result of overfishing and possibly due to natural causes, only a few hundred kilos were caught in 1986 in fishing villages like Kampinda where as much as twenty tonnes of fish were landed daily in 1974.

Fishermen's migration is another aspect that complicates the fisheries sociology and makes fisheries planning difficult. That fishermen move is nothing new. Brelsford (1955) writes about how Tabwa fishermen as far back as the 1890s moved to Luapula valley when Lake Mweru Wa Ntipa dried up and the lake became a swamp. In 1912 when the water had returned, there was once more a fishing community of some size on the lake, due *inter alia* to the return of the fishermen from Luapula because of the 1910 epidemics of sleeping sickness. The influx of fishermen to Lake Mweru Wa Ntipa in the beginning of the 1970s is explained by a series of factors. One is the closure of the Kariba fisheries (on Zambia's southern border) due to border problems. Another was falling catches in Lake Rukwa in Tanzania. When the fishermen fish in such different waters as those of Rukwa, Tanganyika and Kariba it indicates that they are prepared to

move more than 1,400 kilometres in search of better catches. What is it that triggers off such moves? What happens to the fishermen's families, and their agricultural production? What skills do migrating fishermen take with them? And how is their family economy affected? How are fish resources shared? The questions are numerous, the answers virtually nonexistent.

Some fishermen are likely to have regular migratory fishing routes, fishing in different camps and waters according to season. The extent of present-day national and international migration among fishermen is not known, but is likely to be considerable. Why Northern Province fishermen move, when they do so and with what consequences for catch results and family welfare is still unmapped ground. Yet, knowledge of fishermen's migration may be just as important, if not *more* so, than knowledge of the movement of the fish when it comes to enhancing local profits and increasing catch results, and fish-migration has received quite some attention from researchers and fisheries planners.

Migration of fishermen certainly contributes to make fisheries planning, management and development more difficult. Some fishermen-migration is managed by the authorities, but this does not necessarily mean that more information concerning extent or consequences is available. The Msumbu national park bordering on Lake Tanganyika is opened up to fishermen from May to October. During this period fishermen and their families come in great numbers (3,000 persons have been mentioned) to settle temporarily in the park. Who the temporary camp dwellers are, how space in the camp and in the in-shore waters is shared between various fishing teams and with what results is not known.

It is, of course, not only ecological factors that may change the fishermen's options almost from one day to the next. Kashikishi on Lake Mweru used to be a thriving fishing village with a thriving fishing trade. Fresh fish was regularly picked up by insulated lorries and carried on hardly passable tracks to the main road system and to the insatiable markets in the Copperbelt. The trade abruptly stopped when a Canadian aid-financed feeder road around Lake Mweru Wa Ntipa was completed. New roads, which incidentally also made Kashikishi more accessible than before, made other landing places even more attractive as they were closer to the Copperbelt. As a consequence, the lorries stopped buying fish

from Kashikishi. Which were the consequences for this small fishing community? Or should this question be dismissed as just another unplanned side-effect of a development programme that failed to take the socio-economic context of its recommendations into consideration?

OTHER MOVES

In the Zambian part of Lake Tanganyika the kapenta fisheries are at their best from June to August, something which fishermen from other areas (and countries) take advantage of. So do the large-scale commercial fishing companies, as this is the time when also trawlers fish in shallow water. Rarely are the contradictory interests of the small- and large-scale fisheries more clearly juxtaposed than at this time of the year, when the different communities compete for the same fish resources on the same fishing grounds. As can be expected, antagonism runs high. Though regulations deny trawlers the right to shallow water fishing, such regulations are of little impact when enforcement is absent. However, from a fisheries planning point of view such conflicting interests and antagonism is likely to influence fishermen's priorities and behaviour, whether they operate on a small- or large-scale.

Northern Province fishermen have many options when they decide how to spend their time and money. Some fishermen, and more so traders, cross national boundaries in search of better profits, legally and illegally. No discussion on the human factor in the Northern Zambian fisheries can avoid mentioning the role of smuggling in the area. There is, and probably has been ever since the establishment of the borders, a thriving if clandestine trade between Zaïre, Tanzania and Zambia. The latter is very much on the receiving end, as profits are high on goods delivered in Zambia while Zambia have little goods to offer in return. The illegal cross-border traffic includes fresh and processed fish as well as fishing equipment. From a fisheries development point of view the consequences of the smuggling are not necessarily negative. As long as the poorly developed Zambian infrastructure prevents the fishing communities from renewing and expanding their equipment through legal channels, the present smuggling in the

North fills a definite need and is likely to continue. The smuggling racket may explain part of the siphoning off of fishing profits in the North. What is essential in the context of the present paper is that the economy of the smuggling trade may be the missing link that may shed light on the Northern Province fisheries economics. Again, research is called for that tackles the interconnections between the fishing sector and the other sectors.

THE IMPORTANT ROLE OF AGRICULTURE

The agricultural sector is another sector which is closely linked to the fisheries and where needs and priorities influence financial dispositions and the time small-scale fishermen spend on fishing. This is certainly the case in Northern Zambia where most fishing families have small holdings which they cultivate during the rainy season. Some do it on a large scale, like the Samuka family already referred to.

According to the socio-economic study in the Nsama-Mkubwe area where 45 per cent of the households surveyed were fishing, cassava was grown by 81 per cent, maize by 62 per cent and rice and groundnuts by 22 per cent (Government of Zambia, 1985). The average household got 16 per cent of its (cash) income from agriculture. Average fields under cultivation were less than one hectare.

It may be that fishing-households cultivate smaller fields than other families, but not necessarily so. As it is the women who are the main crop producers, fishing or no fishing may not be all that decisive. More important may be whether the household has access to male labour during planting, weeding and harvest times. In the Northern Province, like in rural Zambia generally, more than one of three households are female-headed. As such they differ from fishing households which necessarily will have male members, as capture fishing is virtually an all-male activity. Fishing households in the Northern Province may have easier access to cash than other rural households and may consequently better afford to hire agricultural labour. But whether they do so and to what degree profits from the fisheries are ploughed into Northern Province agriculture is another unknown factor, which may yield

information of relevance to investment rates and other dispositions in the fishing sector.

The kapenta fisheries in the Zambian waters of Lake Tanganyika are well suited to a dual economy of fishing and agriculture. It is in the slack agricultural season that the kapenta fishery reaches its peak, to dwindle off with the onsets of the rain and the time to plant, that is at a time when shortage of labour may be a production constraint in the agricultural sector. Considered separately from agriculture, the slack fishing season may appear as a development problem by fisheries planners and administrators. But this is not necessarily so, as fishing and agriculture supplement each other seasonally as well as nutritionally. To introduce fishing techniques that keep men on the water during the peak agricultural season may consequently destroy the nutritional basis in many a fishing community, even if individual incomes may increase. Any plan on the part of the fisheries authorities to promote all year fishing by encouraging the exploitation of new species should not proceed without a thorough study of the role of agriculture in the fishing communities. As yet no such study providing basic data on the interlinkages between agriculture and fishing in the North seems to exist, and if it does, it has certainly not been made use of by Zambian authorities or international aid organizations who focus on fisheries development of Lakes Tanganyika and Mweru Wa Ntipa.

FISHERIES AS A DEVELOPMENT RESOURCE

What may appear rational from a fisheries planner's point of view, engulfed in data on stocks and fisheries biology, may be highly irrational from the point of view of the fishermen. The fishermen have to choose their behavioural strategy from a variety of options, many of which are determined by factors outside the fishing sector, and not the least important, it is the fishermen who will have to live with the consequences of their choices not only this year but also in the future. This paper indicates some of the options and dilemmas that face local fishermen in the Northern Province of Zambia. But official fisheries planning also entails obligations to a wider public, including the national consumer. To make

optimum use of fish as a development resource, the sectoral approach to fisheries development has to be transcended by the Zambian government and by donor agents alike. Fish cannot be considered only a local resource, but also as a national resource, financially and, equally important, from a nutritional point of view.

According to a 1974 survey of nutritional status in the Northern Province, 30 per cent of the children were malnourished (UNDP/FAO, 1984). By 1984 this already very high rate malnutrition had risen to 40 per cent. In a sample covering 5.2 per cent of all the children under five years of age, 25 per cent were static in weight and 15 per cent actually losing weight. At the same time Northern Province exports a very considerable amount of fish to central Zambia. This paradox poses a singular challenge to development planners. How can local needs be coupled to local resources?

The economic imbalance that exists between the market economy and subsistence society is highlighted by the situation in Kaputa District. With its 44,600 inhabitants Kaputa district is one of the poorest in Zambia. The district lacks in the most basic infrastructure, including electricity, running water, maize mills and storage facilities. Yet the district includes the important Nsumbu fisheries on Lake Tanganyika and the whole of Lake Mweru Wa Ntipa, for many years the most productive lake in Zambia. A rough estimate indicates that the first hand value of the 1985 catches in Kaputa would be in the range of 11.5 million Kwacha or about 1,000 Kwacha per household. A fish levy of about 2 per cent payable on exported fish is charged by the rural council. If 50 per cent of the fish caught in the district is sold outside the district and the levy is paid in full (which, in fact, it is not), the levy would give the council an annual income of over 100,000 Kwacha. This would go a long way in meeting some of the most pressing local needs. Yet Kaputa is desperately poor.

CONCLUSION

Above, rudimentary data have been interpreted to shed light on a variety of aspects of fisheries development in Northern Province of Zambia. The aim has not been to describe the industry in detail, but to call attention to the need of understanding the economy of

present-day fishing and its interlinkage to other sectors and industries, before interventions are recommended and implemented. Fish is certainly a vital part of the fishing industry, but so are fishermen. As human beings they live in a world that extends far beyond the fishing sector as such. It is this wider context that fisheries developers and administrators have failed to bring into their horizon. And it is here that future research must be prioritized if we are to succeed in modernizing the sector and enhancing profits without jeopardizing the other benefits inherent in the way the present fishing industry is organized. If planning continues to be based on the propensities of fish to the total neglect of fishermen, fisheries development efforts are likely to continue to come to naught. In the endeavour to extend available data-bases the economy of the industry must be identified, described and analyzed at individual, local and district levels. This is a minimum requirement. The main actors' strategic choices must furthermore be identified and analyzed in the wider context within which they live and work. When this is done we may succeed in planning and developing fisheries projects that do not primarily leave their mark in the form of skeletons of inappropriate technology scattered on beaches and landing places all over the Third World.

REFERENCES

- Acheson, J.M., 1981. "Anthropology of Fishing", *Annual Review of Anthropology*, 10.
- Brelsford, V.V., 1955. *The Problem of Mweru wa'Ntipa*. Lusaka, Zambia: Department of Fisheries Report.
- Government of Zambia, 1985. *Socio-Economic Survey, Kaputa District, Nsama-Mukubwe Area*. PPU Paper, 13. Kasama Northern Province: Provincial Planning Unit.
- Government of Zambia, 1986. *The Nutrition Surveillance Programme. Evaluation Report*. Lusaka, Zambia: Ministry of Health. The Nutrition Unit.
- NORAD, 1986. *Zambia Fisheries Development in the Northern Province*. Report by a Zambian-Norwegian Fisheries Delegation.
- Richards, D.R.P., 1983. *The Fisheries of Lake Mweru Wantipa*. Lusaka, Zambia: Department of Fisheries Report.

When is a Fishing Man a Fisherman?

Artisanal Fishery Development in Guinea-Bissau

Mette Bækgaard and Henrik Overballe

Field visits were made to different places in the country. When visiting the island of Bubaque, the delegation was, among other things, invited to the local "Presidente de Comite de Estado". At this meeting a number of local fishermen arrived, who were actually not invited, and asked to see the delegation. The fishermen explained their situation. The marketing of the catch was a big problem as only the local market was available. Many fishermen had stopped fishing, and many were only fishing as a part-time activity because of the marketing problems. If outlets were available the catches could increase. Another problem was lack of equipment and motors. As a natural consequence of these problems, guidelines were laid down for what would later become the project. (Larsson, 1984:2, authors' translation)

The year is 1976. The mission is Swedish, with money to spend, but in need of the right location to place a project that will correspond to the emerging tendencies within development aid, emphasizing popular participation and community development. And there they were: poor fishermen asking for support all by themselves. Emerging miraculously from nowhere to the delight of the mission.

But how were the members of the delegation to know, following the simple induction that where there is water there is fish; where there is fish there are fishermen—that, in fact, the people they met were *not* fishermen. The men asking for support and fishing material were real—but they were not fishermen. They knew how to fish, but did it only occasionally when it suited their needs. And they did not intend to change this.

In the present paper we shall try to unfold some of the constraints to the development of the artisanal fishery in the Bijagós

archipelago in Guinea-Bissau¹. Our aim is to show why, on the one hand, it is not at all obvious that people living on islands surrounded by rich fishing waters will inevitably be fishermen, and, on the other hand, why it is equally not obvious that they will become so just because a development project is around trying to persuade them.

THE BIJAGÓS SOCIETY

To do so we shall first give an account of the social structure of the Bijagós society, as well as a description of their economy. This might seem a bit irrelevant for the issue of artisanal fishery development at hand, but we hope to demonstrate that to the Bijagós everything is closely interconnected, and that this interconnection actually constitutes the main socio-economic constraint to the development of artisanal fishery in the archipelago.

The history of the Bijagós

The Bijagós people live in the archipelago of the same name, some 60 km off the coast of Guinea-Bissau. The archipelago consists of about 30 islands, of which 19 are populated. The total population of the islands is currently around 20,000, and 90 per cent of these are Bijagós.

Although very little is known about the origin of the Bijagós and their early history, it is generally accepted that they originally inhabited the coastal area of mainland Guinea-Bissau.² However, during the period 1250–1350 they were literally driven into the sea and to the nearby islands by the invading Biafadas—they themselves fleeing from assailing Mandinkas from the expanding Mali empire.

In the first period following their exodus, the Bijagós developed

-
1. The background is fieldwork in the area, done while being employed on an artisanal fisheries project located on the island of Bubaque, but covering the whole archipelago. The fieldwork was performed back in 1983–1985, but recent information leads us to believe that the following description and analysis holds true today as well.
 2. For a more detailed account of the discussion concerning the origin of the Bijagós, see A.T. da Mota 1947.

a particular model of society completely distinct from all the neighbouring peoples. This model was economically founded partly on the extremely rich ecology of the islands and partly on piracy and warfare. During this period the Bijagós earned a reputation for being cruel and fierce pirates, attacking all vessels encountered at sea—including the big Portuguese caravels emerging in the area from around 1450. They also raided the coastal villages on the mainland, stealing foodstuffs and taking prisoners. These were later sold as slaves to the Portuguese. The fact that the men spent so much of their time at war, away from the villages, may be one of the main reasons for the development of a gender-based parallel division of all institutions in their society. Only after the Portuguese succeeded in gaining military control over the colony at the end of the last century, was the pillaging and piracy of the Bijagós put to an end. It was probably from then on that agriculture gained its influence on the islands, and became the most important economic activity in the archipelago.

Social organization

The Bijagós live in small villages, with 100–200 inhabitants. The villages are independent entities, politically as well as economically. In former times the villages on some of the islands had common chiefs, but the last chief died in 1984 and was not succeeded.

Kinship and age-groups are the basic principles of the social organization. The society is organized in four matrilinear clans. Formally, the founding clan of the village controls the land, but there are no restrictions to the peoples' use of or right to arable land.

The male and the female age-group systems are parallel. The most important divisions are between children, unmarried and uninitiated adolescents, initiated and marriageable adults and old people. In former times the initiation lasted several years and the young initiates were secluded in the forest, learning how to survive without the support of a village. Today the government has decided that the initiation must only last four months—the reason being that it is a threat to production as well as education³. Each of

3. This restriction on the duration on the seclusion period applies to all ethnic groups in Guinea-Bissau.

the four age-groups represent a set of rights and obligations, with the rights increasing and the duties decreasing with age. If one becomes an old person in the Bijagós society, one becomes a member of the council of elders and has the right to ask almost any type of favour from the other members of the society.

In principle each village has a chief, chosen by the old men and women. The chief is always a man, who must be a member of the founding clan of the village. He should also in principle come from another village. However, many villages appoint a person from within their own village to act as chief, either because it is not possible to find or agree on a suitable external candidate (and it is crucial to decide on the right person, as the post is lifelong, and the chief can not be disposed of) or because the village can not afford the elaborate and costly ceremonies accompanying the installation of a new chief.

Even though the authority of the chief is great and his decisions in principle indisputable, his real power is modified by the council of the old women and men, the *grandeza*. The men and the women have their separate *grandeza*, but in appointing the new chief the two have to agree.

One of the basic principles in the social organization of the Bijagós is the stress on the necessity of sharing, of hospitality and of redistribution. It is a way to maintain positive and peaceful relations with the ancestors and between people living in the village.

The *grandeza* is where the age-hierarchy and the sexual segregation of the society is expressed. The societal principle—and especially in relation to the *grandeza*—is that the younger owes not only respect, but also goods and services to the elders. An older man or woman is always allowed to ask for almost anything from a younger person, including work, food, drink, and money. In this way the *grandeza* is not only the actual institution, the council, where decisions are taken and disputes settled, but also a principle of the elders' power in relation to the younger. This means that the *grandeza* can order the young to perform certain tasks, for instance when ceremonies are to be carried out. The young are then obliged to clear more land for agriculture, to produce more palm oil, to tap more wine—or to catch more fish.

An important group in connection with these obligations are the young men not yet initiated, the so-called *kabaros*, who are said to be the guardians of the villages in times of war. They used to be the defenders of the villages against attacks from the outside, but are today the ones who are called upon for jobs like clearing paths, clearing and cultivating fields for old people without family, arranging wine for meetings, etc. Together with the young girls, also awaiting their initiation, they form the principal work force on which the *grandeza* can draw.

At the same time the *grandeza* is a symbol of sexual segregation, in that the men and the women have their separate councils. This is a situation known also from other non-stratified societies, but it is a major organizing principle among the Bijagós. It means that the men have as little to do with the women's affairs as the women with the men's, and may account for the loose family structure existing. This parallel system, which is extended also to religious matters where men and women perform most of their ceremonies without the presence of the opposite sex, implies that a man hardly ever will tell a woman what to do or vice versa.

Divorce is very common and does not seem traumatic as in our society. In fact, after the children are weaned there seems to be no rule as to where the children should live—though the most common is, after all, that they live with either both or one of their parents. They may, however, also live with their grandparents, uncles, aunts or friends of the parents for a large part of their childhood and youth.

The segregation between men and women is also expressed in economic and productive relations. There are only a few economic activities—of these most notably agriculture—where men and women do work together. Apart from agriculture, however, there is very little cooperation between the sexes. This also means that their economies are separate. The women are "holding the key" to the granary, although she cannot sell any rice without the consent of the husband. Similarly, if the man or the woman is in possession of for instance cash, other family members have, in the outset, no access to it. Actually, the Bijagós are rather secretive about their personal economic situation, even though, as mentioned, there is a social emphasis on sharing and redistribution and a sus-

picion towards any kind of accumulation. This may be a result of the recent options for earning cash from the sales of palm nuts, cashew nuts as well as fish—a possibility that did not exist in the traditional subsistence economy of the Bijagós.

The economy

A fundamental feature of Portuguese colonial policy, in particular in Guinea-Bissau, was a remarkable lack of efforts to develop the rural areas. As regards the Bijagós, who in addition were avoided as much as possible due to their reputation for being hostile, wild, and dangerous, this led to a large degree of isolation from modern society and economy⁴. They were, rightly, forced to pay taxes and hence to trade with their neighbours and the Portuguese, but the basic economy of the Bijagós continued unchanged during the entire colonial period. Only after independence in 1974 have serious attempts to involve the Bijagós in the modern economy been made. Today the Bijagós find themselves in a situation of profound change, economic as well as cultural. However, in most respects the economy must still be considered “traditional”, particularly in the more remote islands.

The traditional economy of the Bijagós is almost entirely based on subsistence production and can be characterized as diversified in the true sense of the word. Since their arrival at the islands, the Bijagós have adapted extremely well to the rich ecology of the archipelago.

Most of the islands are covered completely with dense forest, containing a great variety of edible plants and trees as well as plentiful game; the tidal mangrove swamps encompassing the islands are rich in shellfish; and the surrounding sea abundant with both pelagic and demersal fish species.

In the course of time the Bijagós have learnt to make the most out of the affluence of nature. They have achieved expert knowledge of all the existing possibilities and can change confidently between different alternatives without much effort.

As there are no specialized non-productive groups, no need to

4. According to A.T. da Mota the Bijagós were reputed slave traders (da Mota 1947:22).

produce any surplus has existed in traditional Bijagós society. Food is cultivated, hunted, gathered, or fished to be consumed directly by the producer and her or his family. The economy of the Bijagós is, consequently, clearly *underproductive*⁵. Until very recently no external political or internal socio-economic developments entailed any significant changes in this pattern, which could be termed the "Bijagós-way-of-life".

In fact, as is evident from the above description, traditional Bijagós society comes close to be what Marshall Sahlins has termed "the Original Affluent Society" (Sahlins 1974:1-39). There is, however, a catch in it. As a consequence of the Bijagós way of life, no specialization *within* each system of production has developed to cope with increasing demands. This implies, ironically, that while possessing knowledge of all possible ways of exploiting nature, the Bijagós in most cases have only a limited knowledge of how to increase productive capacity within each individual sector. With regard to the most important activity, agriculture, it is evident that the Bijagós are poor farmers. And as regards fishing, it is equally evident that the Bijagós are poor fishermen.

In the present situation, where external demands are increasingly being put on the Bijagós, it is obvious that they have no means with which to defend themselves and their particular culture. Nature might still be generous and plentiful, but affluent *society* is not on the agenda any more. The isolation has been broken and the Bijagós, without real skills to compete with, are exposed to the merciless influx of modern society and probably doomed to have their traditional culture destroyed.

There is little doubt that the increasing external influence and demands must be held responsible for the fact that agriculture has become more important during the past 50 years, and today constitutes by far the most important economic activity in the Bijagós society. The most important crop cultivated is rice. This, however,

5. This renders great flexibility to the Bijagós, who easily can increase production when greater demand is anticipated by putting more effort—i.e. manpower—into it. This is the case, for instance, when the great ceremonies related to the initiation-rites—the *fanado*—are going to be celebrated, and a great amount of food is needed. Young men belonging to the *kabaro* age group are then ordered to cultivate extra rice fields by the *grandeza* especially for this purpose.

is a relatively new phenomenon. Old Bijagós people will tell you that when they were young they only rarely ate rice. "Old fashioned" crops such as beans, *Mancarra Bijagós* and yam are still cultivated, but are clearly subordinate to rice production in importance.

In many cases the family plots are situated on another island. Consequently, it is common that the entire village migrates to the island that is to be cultivated, and live there in a temporary village during the whole agricultural season (i.e. from May/June to November/December, depending on the start of the rain). In agriculture men and women are depending on each other. The men cut down the trees and the dry palm leaves, and burn the fields.⁶ The women then prepare the fields for sowing, which is done by men and women together. The tending of the fields—i.e. weeding, and chasing birds, monkeys and rats—in the period between clearing/sowing and harvesting is almost solely done by women and children, who have to spend most of their time in the fields during the last months of the agricultural cycle. The harvest is done by the family as a group.

As is evident from the above, agricultural production demands a lot from the Bijagós. The results obtained are, however, not commensurate with the efforts put into cultivation. Yields are modest, and noxious animals—especially weaver-birds, monkeys, and rats—prey on the fields and in many cases succeed in reducing the output substantially. It is not uncommon for a family to lose more than 50 per cent of the crop to these animals. Agricultural production alone does not suffice for subsistence in Bijagós society, and fishing is an important alternative.

FISHERIES IN GUINEA-BISSAU

Fishing resources in Guinea-Bissau are known to be rich. According to Galli and Jones (1987:130), the Ministry of Planning in 1980

6. The palm trees are not cut down as they are the source of two products of major importance to the Bijagós: Palm wine and palm kernels. When the burning takes place the lower parts of the palms are protected against the fire.

calculated a potential of 200,000 or more tonnes per year, including oysters, shrimps and other seafood. They also mention that the World Bank superseded this estimate with the figure of 300,000, and that the Bank noted that foreign fishing vessels were taking advantage of Guinea-Bissau's inability to defend its offshore rights. Rough estimates indicate that these boats netted over 90,000 tonnes in 1979, while Guinea-Bissau only produced 7,400 tonnes.

Furthermore, the fishery sector may be developed to have a major impact on the external balance of payment. The fishery sector now contributes around 6 million USD in licences and fees, equivalent to one-third of the total exports of goods from Guinea-Bissau. Considerable room for improvements exists, encompassing aspects like improved surveillance and higher prices. In the short run, industrial fisheries and joint ventures will have the greatest and most immediate potential. A tripling of foreign exchange earnings is believed to be a reasonable goal to aim for in fisheries. (Carneiro et al., 1987)

At present, moreover, there seems to be no serious pressure on the fish resources, and the Guinean government has been very keen on trying to develop the national fishery, both within the industrial sector and the artisanal fishery.

FISHING IN THE BIJAGÓS

Fishing is almost exclusively performed by men in Bijagós society. It is the women's work to preserve the fish, by salting, drying, and smoking it. Besides this, the women gather mussels, crabs and oysters on the beach at low tide.

The contemporary fishing techniques employed by the Bijagós are both traditional and modern. Although modern equipment such as nets and hooks have been introduced gradually by Portuguese and—especially—seasonal Nhominca fishermen from Senegal, the traditional techniques and equipment are still in common use in the archipelago. Originally, fishing was concentrated on demersal species caught in three different ways: One was by harpooning the bigger fish utilizing a two meter long

spear with one point (*kanhaku*) or three points (*n'hapenbo*)⁷. This kind of fishing is not very common today. A second was by trapping fish at low tide. This is still quite common. A shallow area is enclosed with stakes (70–100 cm) constituting a fence that prevents the fish from escaping when the tide goes low. The use of such *gamboas* is still widespread and very much appreciated by the Bijagós. When it has been constructed it does not demand much effort to do the fishing, apart from maintenance once in a while and picking up the fish at low tide. However, the catch is normally modest⁸. Trapping is also sometimes performed by using conical baskets that are placed strategically to catch the fish following the tide out. The third traditional technique is that of scaring the fish by using a "net" made from palm leaves. This *noguba* has very fine "meshes" and has a length of five to ten meters. It is dragged slowly through the water by a group of people agitating the water and thus pushing the small fish in front of them into shallow waters. The fish are then collected by members of the fishing group. The *noguba* is not very common today.

With the introduction of nets, lead and line, new possibilities were created in fishing. By far the most important and widely used fishing gear among the Bijagós, is the casting net. Some Bijagós are quite skilled in using such nets, but catches are normally small as the Bijagós rarely spend more time fishing than what is needed to cover the immediate needs of the family. Adding to this, the Bijagós tend to avoid fishing with the casting net at low tide due to the considerable risk of being stung by poisonous rays—*pis areia*—abounding in the shallow waters surrounding the islands.

The most productive fishing technique—the beach seine—is at the same time the most demanding as regards organization and gear. This technique was originally introduced in the archipelago by the Nhominca fishermen, and is presently being heavily sup-

7. According to Scantamburlo, the *kanhaku* was also used for catching big pelagic fish such as shark and swordfish (Scantamburlo 1978:29). It is hard to imagine, though, how it was possible for the Bijagós fisherman to harpoon such rapid fish in the open sea...

8. *Gamboas* of impressive length are sometimes constructed by the initiates undergoing the seclusion period. However, such giant traps are normally not maintained properly and, consequently, decay rapidly. Silva describes a type of *gamboa* constructed with stones (Silva 1978:28).

ported and promoted by the Swedish fishing project operating in the archipelago. The technique demands a fairly large group of 10–12 or more persons. Most commonly the fishing group operates from dugouts, intercepting pelagic fish such as mullet (*tainha*). When a school of fish is detected it is encircled with the net. To do this, it is necessary to place two or more persons in the relatively shallow water to hold the seine. Other members of the group also have to enter the water in front of the net, to make a noise and scare the fish into the seine. When the net surrounds the fish, the ends are dragged to the beach where the group hauls in the gear with fish. As mullet is abundant in the waters, the catch can be very good. Most often, however, the catch is modest⁹. The crew is generally paid half the catch, which is divided equally between the crew-members. The owner keeps the other half for himself and the boat. As the beach seine technique demands both vessel and net, very few Bijagós can afford to start this type of fishing by themselves. The fishing project has distributed around 150 seines and outboard motors (Volvo U-22), in addition to some Nhominca-type vessels, all on credit. Most likely, the number of existing beach seines owned by Bijagós is limited to these.

Other types of modern fishing techniques employed by Bijagós are long-lining and angling. Several Swedish master fishermen employed by the project have tried to introduce pound net fishing, but without positive results.

With the introduction of modern fishing tackle and equipment such as beach-seines, outboard motors and Nhominca-type vessels, important changes in the relationship between the producer and the community have emerged. First of all, the means of production today tend to be private property. Normally the vessel owner is also the owner of the outboard motor, the nets, etc. As stated above, few if any vessel owners have been able to buy their outboard engines and beach seines in cash. The equipment has been obtained on credit from the fishing project. As the fishing tackle and the rest of the equipment is private property, the village has no claims on it and, hence, no claims on the catch.

9. According to the project's statistics in 1984/85, the average monthly catch sold by Bijagós to the project was 416 kg. In contrast to this, the average monthly catch sold by Nhominças to the project was 1,090 kg.

At the same time, however, the vessel owner has to find a crew to be able to fish within the same village population. As described above, it takes at least 10–12 men to carry out beach seining. Only if the vessel owner were a *homem grande* (i.e. member of the *grand-eza*)—would he be in a position to command labour power, but we know of no *homem grande* who is actually fishing¹⁰. This means that the vessel owner himself has to seek out and persuade the men who are to form the crew of the boat. Most often the crew will be made up of his sons (who cannot refuse) and brothers and/or age-mates. But, evidently, he is dependent on their availability and propensity from trip to trip. Apart from his sons, the rest of the crew do not owe him their labour power, and examples of vessel owners having considerable difficulties to persuade enough men to fish with them after a couple of unsuccessful trips are many. Other factors are working to the disadvantage of the owner in this respect. First of all, according to his contract with the project he has to pay instalments on his debt on motor and nets. This is normally deducted from the catch before dividing it between the crew members. If he feels obliged to pay, this may also have a negative effect on the inclination of his crew to follow him. Secondly, the chance that the fishing trip will become a failure is rather high, because of limited knowledge concerning where fish is and the poor craftsmanship of the crew.

It appears, then, that even if private ownership of the means of production seems to imply that major decisions rest with the owner, he is, nevertheless, depending on quite a few persons' willingness to cooperate with him in order to put his equipment to work.

As indicated above, there are also other actors on the artisanal fishing scene of the Bijagós archipelago. For generations, Senegalese canoe fishermen have been exploiting these waters, and in recent years even Ghanaian fishermen have been working there.

Most of these people are only fishing in the archipelago for parts of the year. When the agricultural season approaches, they return to the villages in their home country to participate in agriculture.

10. *Homen Grandes* do not have to do anything, as they will have their needs fulfilled simply by claiming them from the other age-groups.

The majority are Serér people, known as Nhomincas, from the Sine-Saloum area in Senegal.

The Nhomincas are seasonal "professional" fishermen. They are extremely skilled, and are most often fishing with drift-nets, catching the bigger pelagic species such as *barracuda*. They are far superior to the Bijagós, both as regards fishing techniques and efficiency. They exploit more distant waters, and catch larger quantities and more valuable species of fish. The drying of fish—often on one of the uninhabited islands—is also a big business for the Nhomincas.

Some young Bijagós men work as crew-members on the Nhominka canoes in return for a small amount of money or fish, and thus learn both the techniques and how to identify fishing grounds. But normally the Nhomincas are fishing in family groups, with the owner of the canoe and gear being the family head, fishing with his brothers and sons.

Until recently it was not possible for the Nhomincas to use the Guinean *pesos* they earned by selling their catch, because very few of the goods needed by the fishermen were available in Guinea-Bissau and the *peso* could not be used outside the country. Instead they bought palm oil from the Bijagós and took it back to Senegal to sell it there. Nowadays, however, it is possible to buy most of the things needed in Guinea-Bissau and often cheaper than in Senegal. The adoption of the Nhomincas clearly shows the potential within artisanal fisheries also for the Bijagós.

THE PROJECT

The SIDA Artisanal Fisheries Development Project started operations at Bubaque in 1978. The project provided fishing equipment, pirogues and outboard motors on a credit scheme, and an ice plant and transport vessels to preserve the catch and distribute it to the capital Bissau.

The objectives of the project were two-fold. On the one hand, it was to improve the standard of living of the Bijagós fishermen and the population in general, and on the other, it was to increase the availability of fresh fish for consumption in the country, mainly in the capital.

This was to be brought about by a development of the artisanal fisheries in the archipelago. With the provision of the equipment and outboard motors, the possibilities for increasing the production beyond mere subsistence was there, but the project was never able to achieve even its more modest goals. The production goals were always well above what was actually achieved, and normally it was the Senegalese fishermen, the Nhomincas, who were landing the fish marketed by the project.

The most important reasons for the lack of increased production among the national fishermen is evident from the description of the social and economic structure of the Bijagós given above, which clearly indicates that the project was conceived on false premises. It was thought that people living on islands surrounded by rich fishing waters would be fishermen, but this was, as we have shown, not the case. This does not mean that the islanders did not know how to fish. On the contrary, the different master fishermen who have been working in the project all claim that there was nothing to be taught to the Bijagós as long as they were introduced to the basics of a new technology. What it does mean is that a fishery beyond what was necessary to fulfil the immediate needs of the individual, the family or the village, was not on the Bijagós' agenda.

It was evident that people were aware of the possibilities, but equally evident that no Bijagós had come to depend on the fishing for his own and his family's support. It seems, then, that the ups and downs of the project in relation to production were mostly determined by the availability of certain goods, which made fishing worth while to the Bijagós. In the history of the project it has become evident that the relation between the price of fish and fuel for the outboards has been crucial, as has the availability of consumer goods to be obtained in exchange for the fish. In cases where the price for the fish increased, the landings increased correspondingly, until the price of fuel caught up again and made the fishing expeditions less lucrative. The same was experienced when rumours circulated that the project had sugar, blankets, nails or other coveted items in exchange for fish.

At one point in the history of the project, a division was made between a commercial and a development component. This was, of course, due to the realisation that the influence of the project on

the living conditions on the islands was negligible. The creation of the development section was an attempt to bring about a greater harmony between the efforts of the project and the needs of the population in general. A number of studies on social and economic conditions were carried out, but the influence on the actual organization of the project was minimal.

WHEN WILL THE FISHING MEN BECOME FISHERMEN?

The failure of the project in question should, as we have shown, not be taken to imply that the Bijagós are resistant to external influence, but, rather, that they are/were in a position to influence development themselves.

As long as the natural conditions, or the ecology, of the islands can sustain what is considered necessary to pursue "the Bijagós way of life", they see no reason to increase efforts in fishing, with consequences such as market dependence and indebtedness. Adding to this, fishing is considered to be potentially rewarding but it is also thought to be a very dangerous and tough way of earning ones livelihood¹¹.

Having said this, things are now changing. Most importantly, it has become increasingly necessary for the Bijagós to obtain cash to cover their needs. As we have mentioned in the description of the agricultural system, the islands are far from ideal for rice cultivation, and the output is not sufficient for covering even basic needs. Because agriculture demands so much labour and time, and gives such a meagre outcome, one would expect that at least some Bijagós would give up agriculture and concentrate on fishing.

In order to try to "force" people to invest more time in fishery at

11. Referring to an interesting debate in MAST, it appears that the Bijagós case gives support to the position held by Paul Jorion, that "*...no one ever becomes a full-time maritime fisherman other than under duress; necessity and necessity alone can force any one to exercise such a tough, dangerous and economically risky activity.*" (Jorion 1988:152-153, italics by the author), as opposed to the position held by Nukunya, who claims that "the risk element is never a factor seriously considered by the fishermen themselves... They do so because they like it and know that the financial returns are good." (Nukunya 1989:171).

the expense of agriculture, the project tried to exchange rice for fish. Although the initiative was very much appreciated, it did not mean that people stopped growing their own rice. First of all, there was no reason to believe that the project would be able to provide a stable and sufficient supply of rice. On the other hand, one apparently can never get too much rice. Growing some and buying some seemed a perfect solution, at least to the majority of the fishing men and their families.

Today, moreover, Guinea-Bissau like other African countries is undergoing an economic policy of "structural adjustment", where rice is available on the market at high prices. This will make room for entrepreneurs and full-time fishermen, but the question is still whether the Bijagós will change their mind about fishing being a dangerous and demanding undertaking, and thus whether increased efforts in the sector will be considered worth while.

One of the reasons mentioned by the fishing men themselves for low investments of time and labour in the sector, is that the population of fish decreases during the rainy season, and that it is dangerous to go fishing—at least in smaller boats—in the rain and the wind. Hence fishing is considered a dry season activity, and as such it will not come into conflict with agricultural activities.

Another reason is that it is not possible to depend on the market for the supply of rice for the family and other dependents of the fisherman. For most people it would be outright dangerous to abandon agriculture. It would, so to speak, be like putting all the eggs in one basket.

As we have seen in the description of the social organization of the Bijagós, however, the elders are able to command the work of the young, and to ask them to do things for the village as a whole. The question is, then, why this has not prompted a specialization? Why did the elders not "appoint" someone to be the provider of products from something he or she was good at, for instance fishing? Why did they not decide that this or that person should be the provider of fish to the village? Most importantly, this is related to the condition that no economic activity was (or was allowed to be) crucial for the sake of continued social control from the part of the elders.

The situation is, then, that there are no "professional" or full-time fishermen in the archipelago, apart from the Nhomincas. "Anyone" among the Bijagós can at certain times do the fishing, for himself, for his family, or for the village—and do something quite different for the rest of the year.

If we are to speak about a "Bijagós way of life", it is obvious that working as a full-time, or even part-time, fisherman does not easily fit. To the Bijagós it appears a much better choice to stick to the diversified economy and then intensify the effort when cash is needed.

This situation prompts a contradiction, a conflict of interests between the older and the younger Bijagós. As it is the younger who have access to the outside world, they are also the ones who are now demanding a change. The possibilities to earn cash outside the "local" economy provide them with a chance to avoid paying their obligations (through the *grandeza*) to the elders. And even though the elders can—and do—threaten with revenge once the *kabaros* are to be initiated, the whole system is obviously in a process of change. You may still pay respect, you do still need the community of the village, but the door is open. Likewise, the development of artisanal fishing is favouring younger male individuals at the expense of the community, thus disuniting the group—and seriously weakening the position of women in the Bijagós society. It is obvious that the social structure, the organization of the villages and the age-group system are not able to handle a situation where the possibilities to break free become more and more numerous, to the extent that one can now talk about a private, individual economy.

The scenario is a society with a rudimentary specialization, which is founded on inclination and talent combined with a demand to specialize in order to enter a new economic reality. This pressure is, of course, not only the result of efforts made to develop the fishery sector, but also an effect of the overall changes taking place in contemporary Guinean society.

It seems, then, that the condition for the development of the fisheries in the Bijagós society is a "destruction" of the social and economic organization of the same society and of its cultural institutions. Only when the contradictions between the interests of

particularly the young and the old start to unfold, will specialization come about and with it the possibilities for individuals to engage more whole-heartedly in fishing.

REFERENCES

- Carneiro, D. et al., 1987. *Guinea-Bissau: Economic Difficulties and Prospects for Structural Adjustments*. Stockholm: SIDA.
- Galli, R.E. and J. Jones, 1987. *Guinea-Bissau. Politics, Economics and Society*. London: Frances Pinter.
- Jorion, P., 1988. "Going Out or Staying Home: Migration Strategies Among Xwla and Anlo-Ewe Fishermen", *Maritime Anthropological Studies*, 1, 2.
- Larsson, S., 1984. *Kust- och Flodfiskeprogrammet i Guinea-Bissau—en bakgrundsbeskrivning*. Göteborg: Fiskeristyrelsen.
- Mota, A.T. da, 1947. "Prefácio", in A.J. Santos Lima, *Organização Económica e Social dos Bijagós*. Lisboa: Centro de Estudos de Guiné Portuguesa.
- Nukunya, G.K., 1989. "The Anlo-Ewe and Full-Time Marine Fishing: Another View", *Maritime Anthropological Studies*, 2, 2.
- Sahlins, M., 1974. *Stone Age Economics*, London: Tavistock Publications.
- Scantamburlo, L., 1978. "The Ethnography of the Bijagós People of the Island of Bubaque." Master thesis. Michigan: Wayne State University.
- Silva, D. de Melo, 1978. *Relatório sobre o grupo étnico Bijagó da Guiné-Bissau*, Stockholm: SIDA.

Management of Small-Scale Fisheries: Is it Possible?

Ossi V. Lindqvist and Hannu Mölsä

An exhaustive definition of small-scale vs. large-scale fisheries is not possible, but here it is sufficient to say that generally small-scale fisheries are labour intensive, while the large-scale fisheries use capital intensive methods, in developing as well as in developed countries. These differences have bearing on the management of fisheries and also on the training of fisheries managers. The two kinds of fisheries often carry somewhat different roles in the national or regional economies. The following discussion is based on our experience with African small-scale fisheries, mostly in inland situations.

The traditional implicit or explicit aim of fisheries management has been the prevention of overfishing (cf. Russell, 1931), thus preserving the resource for long-term use (for the many definitions of 'overfishing', see Wilson, 1982). This approach culminated in the concept of Maximum Sustainable Yield (MSY) (cf. Beverton & Holt, 1957; Gulland, 1969). A more recent explicit concern has been the prevention of overcapitalization (Clark, 1977), which first was applied to commercial fisheries, but which could apply also in the context of small-scale fisheries. In overcapitalization, the investments used in fisheries may under certain circumstances become excessive in relation to the (marginal) benefits obtained, and some alternative national or local economic activities may be deprived of capital and/or manpower. Both of these conditions, prevention of overfishing and prevention of overcapitalization, are said to emanate from the so-called 'common property' nature of fishery resources, which Cycon (1986:2) refers to as the 'western model' of fisheries management.

The management philosophy of fisheries has undergone many modifications and developed new regulatory dimensions. Already in 1978, Gulland (1978:1) stated that "the age of simplicity is over, whether in the use of simple objectives like maximum sus-

tainable yield or of simple single-species, constant-environment population models". Yet fisheries management by MSY is still the most widely used method, at least implicitly, in the world's fisheries (Barber, 1988).

Thus the past management methods have evolved with the sole aim of managing fish stocks, often in the context of marine and large-scale fisheries. Management by stock assessment has excluded the special characters of each fishery, the fishermen and their social behaviour as well as the society, all of which affect the outcome and performance of the fishery. Often the fishermen have been treated as a rather homogeneous group of people (for example, as shown in the expression of numbers of fishermen/km²) without regard to the high diversity in their individual aims and strategies (cf. Smith & McKelvey, 1986). The local features, and demands, of small-scale fisheries and fishermen in relation to fisheries management have received too little attention in fisheries studies, maybe with the exception of some anthropological literature that often, however, covers examples mostly from outside Africa and usually from maritime conditions (cf. McCay, 1978; Acheson, 1981).

The following is an attempt at delineating at least some of the problems that beset small-scale fisheries and their development. The basic question stands: is it possible to manage small-scale fisheries? And, if possible, which way and for what purpose? And finally: is it feasible to manage small-scale fisheries? An implicit problem here deals with the kind of training the fisheries managers' need in current situations. Understanding the basic characteristics of the small-scale fisheries may alone give guidance about their management possibilities.

SOME GENERAL CHARACTERISTICS OF SMALL-SCALE FISHERIES

In most cases the small-scale fisheries are scattered and they include large numbers of fishermen and fishing units over a large physical area. For instance, the estimated total number of fishermen at Lake Tanganyika is 36,000 along a shoreline length of about 1,500 km (Lindqvist & Mikkola, 1989:51). Well over 90 per cent of

the Lake Tanganyika fishermen work in the small-scale fishery, and the number of coastal canoe fishing units is at least 10,000. Similarly, in Zambia in the late 1970s and early 1980s, the total number of fishermen was estimated at between 23,000 and 30,000, scattered over ten major fisheries (Lindqvist & Hayward, 1985:37). In the Zambian province of Luapula the local fisheries (Lakes Mweru, Bangweulu and Mweru Wa Ntipa, and the Luapula River) function as a source of new capital for investments outside the fisheries (Lindqvist & Hayward, 1985:59), although more recent heavy increases in the price of fishing gear and the overall cost of fishing may have changed this situation (cf. Lindqvist et al., 1986:4). Generally the fishermen in artisanal fisheries obtain relatively low incomes, although the average income level may not deviate much from the local rural averages. (But there are also examples of fishermen with relatively high incomes; in this respect the fishermen show diversity.) The low average incomes and low catches make it possible for the fisheries to absorb large numbers of fishermen (cf. Lindqvist & Hayward, 1985:8).

The industrial fisheries are more concentrated and appear as restricted fishing units; in inland Africa, industrial fisheries have developed only at some large lakes (Lake Tanganyika, Lake Malawi, Lake Kariba) where they mostly catch the pelagic stock, with some exceptions at Lake Malawi. On Lake Tanganyika, the number of industrial fishing units (purse-seiners) was 58 in 1988 (Lindqvist & Mikkola, 1989:51). Similarly, the infrastructure serving the industrial fisheries is usually more concentrated and 'visible', and involves company investments (for example, processing facilities) that may well exceed those of the entire fishing fleet. In this sense, the industrial fisheries face less flexibility (for example, in terms of port facilities) at least in inland situations but very often also in marine coastal areas.

The scattered distribution described above may also work as a constraint for the development of artisanal fisheries (Mikkola, 1986:246). One such factor is the high mobility of fishermen. This mobility may be daily, seasonal or annual in nature, depending on the circumstances. The small-scale fishermen are often 'generalists' in their fishing strategy (Smith & McKelvey, 1986), which implies that their overall costs of switching from one mode of fishing to another, or from area to area, are lower than those of specialists

(for example, industrial fishermen). The fishermen may be hard to reach by the fisheries management, but, at the same time, their mobility leads to other problems such as fishermen's absence from the family over long periods of time or from local political representation (cf. Acheson, 1981:277). For instance, such local political matters as access to fishing rights are crucial to the fishermen. The ownership of boats and fishing-gear may vary greatly, and in some fisheries most fishing may be done by hired hands for an absentee owner (Lindqvist & Hayward, 1985:9). Fish-trade and processing in many artisanal societies are often in the hands of women, and this applies all over Africa but particularly in Western Africa (cf. Lindqvist et al., 1986: Annex 3 and 4).

The environment that both artisanal and industrial fishermen are facing is uncertain by nature (cf. Acheson, 1981), which may involve uncertainty regarding the ecological and physical environment, the fisheries administration, as well as the fish-market. The prey after which the fishermen go is 'invisible' (Palsson, 1979), though not totally invisible to a skilled fisherman. Technical innovations may also add to this uncertainty, especially if they affect fishermen's relative competitive ability. Thus new innovations are often resisted but they may also be adopted quickly if their benefits are visibly matched to the needs of fishermen, with examples given by Acheson (1981:294).

The small-scale fishermen work in variable ecological and physical circumstances; fishing is a dangerous occupation, and in most cultures it is considered a male activity. To cope with the ecological uncertainty, small-scale fishermen often harvest multispecies stocks, which is the result of the lower switching costs of those fisheries. The industrial fishing companies often target their fishing activities on pelagic fish or other species whose catching costs follow a favourable cost/benefit ratio. A source of uncertainty is that many pelagic fish stocks are migratory in nature or their production is dependent upon special physical conditions, for example, upwelling (Cury & Roy, 1989). In some cases industrial fisheries more or less compete with the artisanal fisheries for the same fish stock, even in the very same area. The shallow water fish populations (often demersal) are usually less migratory than the pelagic ones, but they may not survive heavy harvesting pressure to the same extent as many of the pelagic stocks and species,

which is the result of their different ecological strategy (or evolutionary strategy of survival). Similarly, many fishermen in Africa, as well as elsewhere, may have to resort to work outside the fisheries (for example, in agriculture) part of the time, which is another way of coping with the uncertainty resulting from fluctuations in catches or changes in fish-markets.

Fishing as an occupation, be it large-scale or small-scale, may be better compared with hunting than with agriculture. Thus it also selects for a certain type of personality for fishermen with at least some risk-seeking properties and an independent character (cf. Poggie, 1980). Fishing activity as such (in the same way as hunting) gives a certain satisfaction, which may induce the fishermen to accept lower income levels than would otherwise be possible and make them less prone to leave the fishery. This satisfaction bonus also makes a direct economic evaluation of the fisheries more complicated (Smith, 1981).

The nature of fishery makes certain investment policies risk-prone. In agriculture we generally expect a positive correlation between investments (input) and yield and especially long-term yield, but such a condition may not always apply in fisheries (cf. Lindqvist & Hayward, 1985:66). This kind of assumption may have been a basic flaw in many fisheries development projects. For instance, improper targeting of investments may lead to higher short-term yields but may endanger the long-term future of the fishery through overfishing and/or overcapitalization.

In the artisanal sector, capital investments are low and the harvesting costs reduced, and thus this sector often produces better cost/benefit relations in terms of food output compared to the industrial sector (Dioury, 1985:16). The industrial sector, in turn, may enjoy the benefits of better command of the existing commercial market and processing facilities as well as active use of the existing infrastructure.

Yet the artisanal sector is also gradually becoming more dependent on outside inputs, which may be domestic (for example, timber for boat building) or carry a heavy foreign exchange component (for example, kerosene, nylon gill-netting material, fuel, etc.). Thus the small-scale fisheries are being gradually drawn into the regional and national cash economy, although the fishery may still be far removed from 'pure' market economy (Anderson,

1981:283). This situation has several consequences: first, the cost of fishing tends to follow the changes in the price of external inputs, which again may be heavily influenced by the overall economic situation in the country. Secondly, the need for credit to fishermen and the need for proper credit management also become important. Fishermen often prefer to work with their relatives or have economic dealings with them, which helps to spread the risks and uncertainties. The fishermen's relations with the fish-traders come in many forms, but often it involves many more social and economic dimensions in addition to exchange of fish for money or barter (cf. Anderson, 1981:282).

Finally, small-scale fisheries have many behavioural features that are based on tradition or established habits or local culture, related to the skills in fish catching, information sharing, division of fishing rights, command of marketing channels, etc., which tend to cover a complex social and economic web within the fishery itself and with its relations with the outsiders. The structure of this web may in its details be very dynamic, which may often be the simple result of fishermen's and fish-traders' high mobility and extensive information network. That is, such fisheries may contain a lot of invisible information that is not readily available to outsiders and that cannot be obtained by mere asking. Such information may be crucial for the management of the fishery; misreading such information or neglecting it may become a source of friction or even mismanagement of the fishery. One should note that fishermen, because of their mobile way of life, may have little formal education, but their success as fishermen may be more dependent on their ability to 'see' the invisible prey and their ability to use the invisible information, in the current ecological, social, and economic environment.

Thus the fisheries management philosophy based on assumed 'common property' and 'open access' situations (the so-called 'western model') may not work in many African artisanal fisheries as such, unless the complex social and economic webs are also considered. There are apparently many invisible ways whereby the competition between fishermen are regulated, which should not be overlooked with respect to management. There are examples from elsewhere in the world that speak to this effect; for instance McCoy (1978), describing the Newfoundland fishermen's

relationships with the government, noted that the fishermen's ability to adapt to changing environments was limited because the government took the task of defining the fishermen's problems from outside and also carrying out the solutions.

WHY MANAGEMENT?

As discussed earlier, the immediate history of fisheries management, at least in the developed world, started with a strong biological bias that emphasized solely the (static) state of the fish stocks as the management target. The concept of Maximum Sustainable Yield (MSY) has drawn criticism especially since the mid-1970s (cf. Larkin, 1977; Lindqvist, 1977) for various reasons, which later led to the developments of the concepts like Optimum Sustainable Yield (OSY), or Maximum Economic Yield (MEY) that aimed at correcting the inherent deficiencies of MSY (Cunningham, 1981; Cunningham et al., 1985). Later it has been noted that both of these new concepts remain similarly undefined and elusive when sought to be utilized in practice (cf. Cunningham et al., 1985). Anyway, the increasing importance of economics in fisheries regulation has been gradually accepted especially in the 1980s (cf. Crutchfield, 1961; Cunningham, 1983).

The 1970s may be called a decade of strategic decision-making, when the concepts of 'strategy' and 'tactics' were borrowed into fisheries as planning and policy development tools (for example, Rothschild, 1973; MacKenzie, 1974; Gerhardsen, 1977); acting as a means of coping with the dynamic and often unpredictable nature of fisheries. The same era also emphasized the importance of planning at large in fisheries development, which, in our opinion, sometimes appeared more important than the actual implementation of the plans themselves.

Later in the 1980s, the earlier more unified picture and trends in fisheries management are becoming more diversified, and more attention is being given to such matters as the general socio-economic and socio-cultural state of the target group (cf. Groth, 1981; Pollnac, 1981; Pringle, 1985); to the physical and ecologic environment at large where the fishery is operating, including 'conflict management' (cf. Regier & Grima, 1985; Vanderpuye, 1985); to

fish and ecosystem conservation (Ribbink, 1987); or to the very management environment where fisheries scientists and managers have to work (Sissenwine, 1984; Regier & Grima, 1985; Hilborn, 1987), which has also been termed 'political ecology' (Chapman, 1989). At the same time, a more holistic view of the fisheries management is emerging, that pays attention to the entire production chain from fish (in water) to the consumer and customer (cf. Bostock et al., 1987) as an essential part of any fishery management strategy.

Considering the fisheries management situation in inland Africa, first nearly all of the major and most of the minor fisheries have been targets of various types of development projects, in most cases with external assistance. Thus these fisheries often have been managed very intermittently, either by external projects or by the local fisheries authorities. Secondly, in many countries fisheries management is seriously constrained by shortage of manpower, by lack of physical means of covering and monitoring the fisheries, and by deficiencies in the fisheries infrastructure at large. Such deficiencies may include for instance paucity of extension services to the fisheries through the production chain from the stage of catching the fish to its processing and handling. Thirdly, and as a consequence of these, many artisanal fisheries have been virtually unmanaged most of the time, which actually testifies to the inner strength of those fisheries and their internal socio-economic structures as well as the functions of the market (cf. Lindqvist & Hayward, 1985:66). In this sense, those artisanal fisheries have been and still are 'self-regulated'. Often the main (and only) management action by the fisheries administration has been collection of catch statistics, although even here there may be major gaps depending on the capability of the fisheries management to monitor the fisheries.

In the development projects that aim at supporting the small-scale fisheries, the target group is often the fishing community itself, while in the industrial or large-scale projects the main target is the consumer, often in cities located far from the fisheries themselves (cf. Jensen, 1989). In the former projects, the aims are expressed as higher standard of living, provision of new jobs, community development through cooperatives, integrated rural development, etc. In the industrial-scale development projects the

final target is often production of cheap protein for better nutrition, etc. These aims are often strongly contradictory. The producer (fisherman) needs a higher price for his fish or he has to get more fish through higher efficiency (and capitalization), which in turn may totally exclude some other fishermen through lowered catch per unit effort, unless untapped stocks are readily available. The urban consumer, in contrast, wants relatively cheap fish and in quantity; high supply also works towards lower prices (cf. Lindqvist & Hayward, 1985:66-67), considering also the fact that fish is highly perishable.

In the 1970s, and even later, some governments in Africa had strict price regulations for fish in order to maintain the prices 'reasonably' low for the consumer. In the long run this distorted the fish-markets and actually affected negatively on the availability of fish. Some fisheries actually moved back towards a subsistence type of fishery (that is, fish were mostly caught for one's own consumption only). One consequence of the unified price level was that aquaculture development suffered or came to a halt.

The main management actions used in regulation of fishing generally aim at increasing the cost of fishing (by closed seasons, closed areas, gear restrictions, licensing, etc.), which are supposed to work towards preservation of the stock (cf. Cunningham et al., 1985). Yet governments may also subsidize some sectors or activities in the fisheries or the infrastructure serving it, with the aim of decreasing the cost of fishing or improving its relative profitability. These two actions may also be a source of conflict.

There are few theoretical publications on the management methods or 'philosophies' practised in African inland fisheries. Although there have been many trends and dogmas in past decades, no systematic account exists of the past successes and failures. In most cases the management actions have been rather patchy, possibly modified by short-term development projects that in most cases have addressed some limited sectors of the fishery only. The industrial fisheries have often been the sole development targets mainly because of their higher visibility and because technically they appear easier to manage and 'develop'. This has sometimes worked against the interests of the artisanal sector (cf. Bailey et al., 1986; Jensen, 1989). Although the monitoring and management of fish stocks are important as such (Gul-

land, 1983), they alone may not be sufficient for successful long-term management of the fishery resource. Stock assessment as a technical task is often easier to perform also by outside managers or scientists who are not well versed in the local social and economic matters.

Yet in many cases the artisanal fisheries are being managed, not directly, but indirectly. One common factor regulating the fisheries especially in inland situations is the availability of various supplies, for example, netting materials, kerosene, fuel, boats, spare parts, etc. Shortage of nylon-netting alone can lessen the catch per effort to such a low level that the fishery can maintain large numbers of fishermen in the fishery, although explicit documentation to this effect is lacking. (Recently we have learned that dense-meshed mosquito nets are becoming more common, for example, at Lake Victoria because of the high cost of regular nylon nets.) Management of mesh sizes may be difficult if proper gill-nets are simply not available or their price is excessive unless the government wants to intervene through subsidies. Thus changes in the availability of various supplies may affect the internal structure of fisheries, and especially the small-scale sector.

Another factor that often has a pronounced regulatory effect on the artisanal fishery is the infrastructure serving it. (The industrial fisheries require developed infrastructure already from the outset, before making any investments in fishing-fleet or facilities.) Poor accessibility may hamper marketing efforts and the fishermen's income level remains low. Fish is a perishable product, and in many fisheries the best gains are achieved not through increased fishing efforts but by decreasing the fish spoilage. Good access roads to a fishery can improve its position in relation to the markets, which at least in the short-term can benefit the fisherman. Yet there are examples where the building of roads and other infrastructure have created only short-term benefits, because the result has been an increased fishing pressure and eventual overfishing and overcapitalization, that is, a boom-and-bust type fishery. An example of such effects is the Kafue floodplain fishery in Zambia in the 1970s and early 1980s (Lindqvist & Hayward, 1985:19–20).

A common lesson here is that the fisheries may not benefit at all from 'partial' management and development efforts unless the dynamism of the system is also taken into account. Yet in practice,

most fisheries development work necessarily takes place in a piecemeal way, which emphasizes the need for an adaptive nature for the fisheries management (cf. Walters, 1986). This alternative management view is one in which we recognize that fisheries are aiming at a moving target that is biological, but it could be applied equally well to targets that are economic and social. Thus there is a need for a truly adaptive approach towards fisheries management (Walters & Hilborn, 1976; Walters & Hilborn, 1978; Walters, 1986). The adaptive management system has two elements, first, a monitoring system to measure the efforts and catches with an estimate of the current status of the stock, and secondly, a response system that enables us to increase or decrease effort according to biological and economic variables (Hilborn & Sibert, 1988). This new approach is well applicable in the management of small-scale fisheries, although it should be complemented by cooperation and participation by the local communities in management actions.

In most of sub-Saharan Africa, the human population densities are relatively low and the untapped potential of natural fisheries is still considerable; labour is expensive, but the natural waters still come 'cheap'. This may be analogous to the situation in African agriculture, whereby extensive methods still enjoy an economic advantage except in places or countries where the population density is high enough (Binswanger & Pingali, 1988). The same factors may at least partially explain the strength of the artisanal fishery sector and the slow development of aquaculture in sub-Saharan Africa.

WHAT KIND OF TRAINING FOR FISHERIES MANAGERS?

What has been said about the characteristics of small-scale fisheries in general and the problems in their management in particular, gives some clues as to what kind of fisheries managers are needed and what kind of training and education is required.

To our knowledge, there does not exist any concise presentation of the management manpower in African fisheries. The total number of people employed in the management/training sector of African fisheries is unknown. By our personal experience, there is

great variation in this respect between individual countries, which is partly correlated with the extent and importance of their respective fisheries. Several nations run fisheries schools or fisheries development centres for the training of fishermen and technicians in the various aspects of fishing, gear technology, fish processing and trade, extension work, and such aspects. Often the extension workers are also trained or given additional training in such schools. The Fisheries Departments, which in different countries come under different ministries, may be well staffed in total numbers, but often the great majority are technical personnel and 'fish scouts', whose main task may be collection of catch statistics and/or fish levies. The Fisheries Department's work is often handicapped by a general shortage of operating funds and proper equipment. In a few countries the fisheries management sector is administratively separated from fisheries research.

There seems to be an overall shortage, although to a varying degree in different countries, of personnel with university graduate degrees in fisheries or related sciences for fisheries management (DANIDA, 1989:56). At the academic level, few African universities include fisheries and fisheries management in their curricula; usually the fisheries people have a background training in biology, zoology, marine biology, or other such studies, sometimes complemented by additional studies overseas.

The upper level managers in the fisheries aiming at successfully improving the small-scale fisheries have to be aware of a multitude of problems. Yet, because of the limited numbers of personnel available, a problem concerning the degree of specialization of each employee arises. It is probable, and confirmed by our experience, that fisheries managers and scientists in Africa have to be 'generalists' in their skills and management actions. This applies to both the management, research, and training (extension) sectors in fisheries. Acquisition of narrow skills may not serve the fisheries and the nation best except in very exceptional cases where a person's skills can truly be used profitably over long periods of time. The generalist strategy can be justified in practice by the fact that each fishery station is actually responsible for numerous practical problems that may fall outside the managers' formal training, the fisheries managers and scientists may have to

work as counterparts in fisheries development projects in various roles, and, finally, the fisheries administration at the national level also has the responsibility of formulating fisheries development strategies and appropriate fisheries laws and regulations.

Thus for the understanding and management of the complex nature of the artisanal fishing and fishing communities, the managers' and scientists' training should have a broad coverage but without forgetting the obvious benefits of practical and first-hand experience in fishing and fisheries. We feel that the traditional stock and catch approach alone is not sufficient, although sometimes necessary, for the small-scale fisheries development, nor for any wider national purposes. There is need for a dynamic management which is able to handle the fluctuations in fish resources as well as the technical, social and economic changes in the fishermen's environment (cf. Walters, 1986). The increasing importance of especially economics in fisheries management is being commonly emphasized (Panayotou, 1982; Wilson, 1982; Cunningham, 1983; Cycon, 1986), in contrast to the earlier, more biologically oriented, approach.

In the field work, the fisheries management will also meet the tremendous cultural diversity that is so common in Africa; there are nowhere 'pure' fisheries but local cultures, languages, traditions and habits all intertwine in the practice of the artisanal fisheries.

A basic managerial problem that affects both the data collection and the implementation of management decisions in small-scale fisheries is the scattered physical distribution of fishermen in the fisheries areas (cf. Mikkola, 1986). This scattered distribution also applies to the fish-trade, which often is also small-scale. It is a common problem that there are great difficulties in obtaining even rough estimates on the numbers of fishermen, types and numbers of fishing gear used, size and composition of catches, and other such features, without truly excessive costs. Some remote areas may not be reached by fisheries administration at all, except at long intervals. These problems may be compounded by the management's low motivation towards their work, the personnel may be poorly paid, or their training and education is not fully suitable for the task. The 'cooking' of the catch figures is quite common.

This affects the overall reliability of data on fish landings, not to mention the fishing effort, which is usually even more difficult to calculate or estimate.

The managerial decisions and national level planning must be based on realistic data. In Tanzania, for instance, basic data on catch, effort and fish prices is currently gathered in an integrated matter, but there is a demand for more applied research and statistics on aspects like investment costs, input capability, price margins, economic product flows, etc. (Bonzon, 1988:66). Getz & Bergh (1988:259–260) also concluded that in the long run the most appropriate management policy is determined by socio-political considerations rather than by a precise analysis of the fish stocks only. According to Gulland (1983:4), all the managerial parameters should be available at different development stages of fishery, called the 'under-development', 'growth' and 'over-development' stage.

Developing the information system on the natural resources and on socio-economic conditions of fisheries should be included in the training for regional and district officers as well as for headquarters staff. This can be organized partly as on-the-job training (Bonzon, 1988:66).

CONCLUSIONS

The need for fish is increasing all over Africa and the fishing pressure in their fisheries is increasing. Similarly, the need for fisheries management is increasing, especially after the formation of the EEZs for the coastal countries but also in inland situations. This puts new demands on successful fisheries management, and new ways that are locally applicable have to be found and tested. 'Adaptive management' is a new approach but also other approaches need attention, including self-management by fishermen's organizations (Hannesson & Kurien, 1988). Whatever the approach, the task ahead is not easy or simple. But still the basic tenet is that also in fisheries management the cost of managing should be related to the long-term benefits thus accrued, though in practice the costs may be easier to calculate than the benefits.

REFERENCES

- Acheson, J.M., 1981. "Anthropology of fishing", *Annual Review of Anthropology*, 10.
- Bailey, C., D. Cycon & M. Morris, 1986. "Fisheries development in the third world: The role of international agencies", *World Development*, 14 (10/11).
- Barber, W.E., 1988. "Maximum sustainable yield lives on", *North American Journal of Fisheries Management*, 8.
- Beverton, R.J.H. & S.J. Holt, 1957. "On the dynamics of exploited fish populations", *U.K. Min. Agr. & Fish. Fish. Invest.*, (Ser. 2), 19.
- Binswanger, H. & P. Pingali, 1988. "Technological priorities for farming in sub-Saharan Africa", *The World Bank Research Observer*, 3 (1).
- Bonzon, A., 1988. *Contribution to the formulation of a five year plan for the fisheries sector. Tanzania. Technical Cooperation Programme. FI:TCP/URT/6763.* Rome: FAO.
- Bostock, T.W., D.J. Walker & C.D. Wood, 1987. "Reduction of losses in cured fish in the tropics—guide for extension workers", ODA: Tropical Development and Research Institute.
- Chapman, M.D., 1989. "The political ecology of fisheries depletion in Amazonia", *Environmental Conservation*, 16 (4).
- Clark, C., 1977. "Overcapitalization in commercial fisheries: symptoms, causes, and cures", *Environmental Biology of Fishes*, 2 (1).
- Crutchfield, J.A., 1961. "An economic evaluation of alternative methods of fishery regulation", *Journal of Law and Economics*, 4.
- Cunningham, S., 1981. "The evolution of objectives of fisheries management during the 1970s" *Ocean Management*, 6.
- 1983. "The increasing importance of economics in fisheries regulation", *Journal of Agricultural Economics*, 34 (1).
- M.R. Dunn and D. Whitmarsh, 1985. *Fisheries Economics. An Introduction.* London: Mansell Publishing Ltd.
- Cury, P. & C. Roy, 1989. "Optimal environmental window and pelagic fish recruitment success in upwelling area", *Canadian Journal of Fisheries and Aquatic Sciences*, 46.
- Cycon, D.E., 1986. "Managing fisheries in developing nations: a plea for appropriate development", *Natural Resources Journal*, 26.
- DANIDA, 1989. *Environmental Issues in Fisheries Development. A Strategy for Fisheries Development.* Copenhagen: Ministry of Foreign Affairs.
- Dioury, F., 1985. "Insights on the developmental aspects and future importance of artisanal fisheries", *ICLARM Newsletter*, 8 (3).
- Gerhardsen, G.M., 1977. "Strategies for development projects in small-scale fisheries", *FAO Fisheries Circular*, 713.
- Getz, W.M. & M.O. Bergh, 1988. "Quota setting in stochastic fisheries", in Wooster, W.S. (ed.) *Fishery Science and Management. Objectives and Limitations.* Lecture Notes on Coastal and Estuarine Studies, 28.
- Groth, P.G., 1981. "Effective use of socio-cultural data in fisheries management: a case study", *Fisheries*, 6 (2).

- Gulland, J.A., 1969. "Manual of Methods for Fish Stock Assessment. Part 1. Fish Population Analysis", *FAO Manuals in Fisheries Science*, 4.
- 1978. "Fishery management: new strategies for new conditions", *Transactions of the American Fisheries Society*, 107 (1).
- 1983. "Stock assessment: why?" *FAO Fisheries Circular*, 759.
- Hannesson, R. & J. Kurien, 1988. "Studies on the role of fishermen's organizations in fisheries management", *FAO Fisheries Technical Paper*, 300.
- Hilborn, R., 1987. "Living with uncertainty in resource management", *North American Journal of Fisheries Management*, 7 (1).
- & J. Sibert, 1988. "Adaptive management of developing fisheries", *Marine Policy*, 12.
- Jensen, J.G., 1989. "Fisheries development—some points of view based on experience from DANIDA financed projects." 5th Annual Coordination Meeting of Fisheries Development Advisers, 28–29 June, 1989. Brussels.
- Larkin, P.A., 1977. "An epitaph for the concept of maximum sustainable yield", *Transactions of the American Fisheries Society*, 106.
- Lindqvist, O.V., 1977. "On the principles of management strategies of crayfish and fish populations" *Freshwater Crayfish*, 3.
- and P.B. Hayward, 1985. *Investment Plan Task Force. Annex Fisheries. Zambian Ministry of Agriculture and Water Development. Planning Division.*
- and H. Mikkola, 1989. *Lake Tanganyika: Review of limnology, stock assessment, biology of fishes and fisheries.* Finland Funds-in-Trust GCP/RAF/229/FIN. Rome: FAO.
- H. Mölsä, M. Rajasilta & V.M. Kanondo, 1986. "Fisheries development in the province of Luapula, Zambia", in *Report of a Finnish mission to Luapula Province in August–September 1986.* Helsinki: FINNIDA.
- McCay, B.J., 1978. "Systems ecology, people ecology, and the anthropology of fishing communities", *Human Ecology*, 6 (4).
- MacKenzie, W.C., 1974. "Conceptual aspects of strategic planning for fishery management and development", *Journal of the Fisheries Research Board of Canada*, 31.
- Mikkola, H., 1986. "External aid in African fisheries", *Aqua Fennica*, 16 (2).
- Pálsson, G., 1979. "The invisible prey; towards the visualization of an anthropological category", *Rapport från Nordisk forskarkurs i fiskerisociologi.* Reykjavik.
- Panayotou, T., 1982. "Management concepts for small-scale fisheries: economic and social aspects", *FAO Fisheries Technical Paper*, 228.
- Poggie, J.J., Jr., 1980. "Small-scale fishermen's psychocultural characteristics and cooperative formation", *Anthropological Quarterly*, 53.
- Pollnac, R.B., 1981. "Sociocultural aspects of developing small-scale fisheries: delivering services to the poor." *World Bank Staff Working Paper*, 490.
- Pringle, J.D., 1985. "The human factor in fishery resource management", *Canadian Journal of Fisheries and Aquatic Sciences*, 42.
- Regier, H.A. & A.P. Grima, 1985. "Fishery resource allocation: an exploratory essay", *Canadian Journal of Fisheries and Aquatic Sciences*, 42.

- Ribbink, A.J., 1987. "African lakes and their fishes: conservation scenarios and suggestions", *Environmental Biology of Fishes*, 19 (1).
- Rotschild, B.J., 1973. "Questions of Strategy in fishery management and development", *Journal of the Fisheries Research Board of Canada*, 30.
- Russell, E.S., 1931. "Theoretical considerations on the 'overfishing' problem", *Journal du Conseil, Conseil International pour L'Exploration de la Mer*, 6.
- Sissenwine, M.P., 1984. "The uncertain environment of fishery scientists and managers", *Marine Resource Economics*, 1 (1).
- Smith, C.L., 1981. "Satisfaction bonus from salmon fishing: implications for economic evaluation." *Land Economics*, 57.
- & R. McKelvey, 1986. "Specialist and generalist: roles for coping with variability", *North American Journal of Fisheries Management*, 6 (2).
- Vanderpuye, C.J., 1985. "Evaluation guidelines for rational planning and management of tropical and subtropical inland fisheries under constraints from other uses of land and water resources: Africa", *FAO Fisheries Circular*, 789.
- Walters, C. 1986. *Adaptive Management of Renewable Resources*. New York: Macmillan Publishing Co.
- & R. Hilborn, 1976. "Adaptive control of fishing systems", *Journal of the Fisheries Research Board of Canada*, 33.
- & R. Hilborn, 1978. "Ecological optimization and adaptive management", *Annual Review of Ecology and Systematics*, 9.
- Wilson, J.A., 1982. "The economical management of multispecies fisheries", *Land Economics*, 58 (4).

Resource Management and Artisanal Fisheries: Relevance and Conditions

Poul Degnbol

Resource management is often seen as a prerequisite to or as an important component of development. Resource assessment and management programmes have taken a fair share of the awareness and project funds given to the fisheries sector, including the artisanal sector. This has, unfortunately, often happened on the basis of very little reflection on the relevance in the specific context.

One of the reasons for this is the background of the developers—government employees and developing agencies and their experts do more or less consciously take the management tradition of the north Atlantic as a reference to be pursued, the problems and concepts of northern Europe are projected into an artisanal fishery in Africa. This tendency is further strengthened by the increasing awareness of the political importance of environmental issues—resource management is believed to be a green concept and it does in any case no harm, it is not so liable to kick back on a donor or a government agency as a rusty iceplant or overinvestment in fishing capacity might do.

But it may be questioned whether resource assessment and management, as it is practiced, is an innocent activity and whether it by default is something that needs to be done in any fishing context. This is especially the case when dealing with artisanal fisheries. The problem may not be whether resource assessment and management is relevant, but whether our concept of resources and their management, on which development assistance is based, is adequate in an artisanal context. Resource management—as the regulation of the mobilization of natural potentials by society—must be seen within the general framework of culture/nature interactions, that is, adequate management must take its form and contents according to the specific character of these interactions. Universal concepts of resources and management are

not operational. The nature of culture/nature interactions varies between various fisheries and this variation must be reflected in our concepts.

The present paper sets out by looking into the concepts of resources and their management in an artisanal context. Three examples, all from situations of dramatic changes, are used as illustration: the Ghanaian canoe fishery which has gone through a rapid development involving an expansion of the resource base, the Lake Victoria artisanal fishery, which has been through an adaptation to a completely changed natural environment and the artisanal fishery of a new lake, Lake Kariba, which is an adaptation of a riverine fishing tradition which has gone through the biological ups and downs of new lake development. This forms the basis for a discussion of the relevance and conditions for resource management in an artisanal context.

THE RESOURCE CONCEPT AND THE BASIC CHARACTERISTICS OF RESOURCES

Nature does not contain any "natural" resources. Society doesn't either. A resource is a natural potential which has been mobilized for utilization by society through technological, economic and social development. A fish population becomes a resource when technical methods have been developed to exploit it and when these methods are applicable in the economic and social context in which the fishery operates. That part of the central Atlantic tuna populations which occasionally moves close to shore is a resource for the Ghanaian canoe fleet, but the major part of the tuna populations is not due to technological limitations. When the triggerfish emerged off Ghana in the late 1960s it was not a resource, not because of technological limitations, but due to cultural limitations; nobody wanted to eat it and it happened that accidental catches were dumped at sea.

A resource for the fishery is thus defined through the development of nature/society interactions. The consequence is, that specific qualities of the resource are based on both natural and societal aspects. It is—without falling into the pitfalls of natural determinism or the opposite—important to underline that nature

does provide potentials, limitations and quality as a substratum for technological and social development, and this is of course the rationale for resource management in the widest sense. The adaptability of society does at the same time involve a *shift* in the resource base—new potentials are exploited and thus converted to resources and resources may be left to be just potentials. But the resource base is not just shifted through a change in exploitation pattern, the resource is *changed* as a result of exploitation. This is a key characteristic of fish resources in a management context: that they change through exploitation. Several such effects have been demonstrated, the most important (in a socio-economic context) being:

1. Change in catch per unit effort (decrease in catch by increased exploitation level).
2. Change in mean size in catch (decrease in mean size of each species by increased exploitation level).
3. Change in species composition (larger dominance of smaller species and decrease in number of species by increased exploitation level. These effects are especially prominent in tropical multispecies fisheries).

For a very clear illustration of these effects in an African inland context the reader is referred to the developments in Lake Malawi since the introduction of small-scale pair trawlers in 1968, which are well documented (Turner, 1977a, 1977b; Tweddle and Magasa, 1989). It is unfortunate that the socio-economic aspects of this development have not been monitored on the same level of detail as the biological aspects.

These effects are general—the resource reacts to the total exploitation, not by fishery or sector. The change in the resource induced by one fishery is experienced by all fisheries. This is another important characteristic of fish resources.

On the socio-economic level these effects are translated into:

1. Change in ratio between income/production and cost/work invested (decrease in marginal net income with increase in effort)
2. Change in price and/or market (decrease in price per unit and in some cases change to other consumer groups)

3. Change in price and/or market, cultural acceptability (decrease in price per unit, change to other consumer groups, in extreme cases market outlet problems).

Adaptation to these changes may involve technology, processing, distribution and acceptability. These adaptations may include a shift in the resource base through a change in exploitation pattern, which again results in new changes in the resource and so on. The resource is thus perpetually shifted and changed and *the specific nature of these shifts and changes in the resource can not be reduced to either side of the culture/nature interaction.*

The common nature of the resource changes do distort these interactions on the single fishery level. Changes in socio-economic conditions are met in all sectors utilizing a common resource independently of the exploitation level exerted by each sector. Socio-economic interactions between the artisanal and the industrial sector mediated through the technical interaction on a common resource is a key justification for resource assessments and management in connection with the artisanal sector.

One of the eurocentric biases of developers and resource managers is the belief that the changes in resources described above are of universal importance. In tropical environments both growth and natural mortality rates tend to be much higher than in temperate environments, and the balance between natural mortality and growth (the M/K ratio) tends to be shifted towards larger dominance of natural mortality (Pauly, 1989). This has important implications for the dynamics of the resource and subsequently for management. Especially for smaller sized species, which tend to have the highest natural mortality rates, this means that the time scale of fishing activities (the time needed to exert a certain fishing pressure with a given effort) is long compared to the biological processes. Changes in the resource induced by fishing are insignificant or not as important in affecting the fishery as natural changes. This type of species may at the same time exhibit other biological characteristics which allows them to expand and exploit favourable environmental conditions whenever such conditions are present—a strategy which is often labelled opportunistic. Examples of profound importance to African artisanal fisheries are the clupeid stocks in the upwelling zones off west Africa and

Namibia and several species of the large floodplains. In these cases, the resource appears to be driven solely or at least mainly by nature. This, of course, has important implications for management.

The case with opportunistic species is also an example of the fact that classical models of fish resources have excluded certain factors, such as hydrographic changes or recruitment, from modelling. This externalization of certain aspects of reality is partly due to the fact that the significance of some of these aspects is believed to be small in the environment for which classical models were developed (Europe and North America), and partly to the complexity of the problems encountered in modelling.

There are other examples of resource changes, which are important in tropical stocks and which are not internalized in classical models (Larkin, 1982; Pauly, 1989). One has already been referred to above—that multispecies resources change in composition as a result of exploitation. The failure of classical models to internalize such effects does in practice lead to such effects being neglected and, as the worst consequence, to management based on a resource concept which is out of touch with reality.

RESOURCE MANAGEMENT

Resource management ideally represents an adaptation to the fact that natural potentials are limited and qualitative and that these potentials from the outset have common availability. If some socio-economic targets are to be met, proper respect must be paid to these properties of resources. Resource management, in the present paper, is used in the narrow sense of regulation of the exploitation of the resource which is based on the limitations and qualities of natural potentials, not in the wider sense which includes all adaptations to the biological environment within the fishery. Resource management is the regulation of the mobilization of a natural resource by society in order to achieve some *objective*. It is the objective which is the core of resource management.

In the classical (European) management tradition the objective may on face value be related to some aspect of the resource and its physical yield (thus resource management) such as to secure sus-

tainability, to obtain maximum yield or to achieve a certain composition of the yield in terms of size or species. The European tradition stops at this apparently resource related objective—some variant of maximum sustainable yield is still the key concept and objective even if its interpretation and the exact method of its estimation is subject to continuous revision and heated debates. The concept and its follower, an objective basically indifferent to society in solely referring to the physical aspect of the resource, has been imposed on numerous fisheries development projects including projects targeting at the artisanal sector. Achievement of some variant of maximum sustainable yield is still the most important *raison d'être* for resource assessment activities and resource management.

There are of course social justifications for this kind of objectives—to maximize food supply and secure food stability. The problem is that these objectives are understood and imposed as some kind of self evident target to be achieved universally, although social in character unrelated to society. Variants including economical considerations (MEY) and even social aspects (MScY) have been introduced in an artisanal context. MScY has been defined as "the level of catch and corresponding effort which provides the best possible solution to social problems given the policy objectives and all possible alternatives" (Panayotou, 1982). The chain of thought in these concepts follows their historical development: an increasing number of socio-economic aspects are piled on top of classical biological models and some parameter—social or physical—is maximized. Any objective which can be quantified can, in principle, be analyzed and the conditions for its fulfillment calculated. But the approach is still to implement external interference in order to maximize something which is understood to be desirable by agents outside the artisanal fishing community. The approach and the objectives are from the outset alien to the fishing community.

The abstract and alien character of these objectives is reflected in the means by which management is implemented—through government agencies and more by restrictions, control and prosecution than by support and cooperation. Indirect means—for instance the regulation of the economical environment for the fishery in such a way that investments in effort are kept at the right

level—are also external to the fishery, but do operate through mechanisms recognized by the community and room is left for initiative and flexibility in the sector.

Resource management as such is not alien to artisanal fishing communities. Some regulation of resource exploitation has been claimed to have been the rule rather than the exception (Panayotou, 1982). Such regulation may more often be inadvertent than intentional (Klee 1980) and is most widespread in the form of property rights. Intentional management may include communal adherence to closed seasons or areas or exclusive rights to utilize certain types of gear.

Regulations have in many cases been reduced or broken down as a result of recent development—immigration of other fishing populations with more efficient technology (for instance lagoon fisheries in Ivory Coast invaded by other artisanal fishermen utilizing purse seines (Scudder and Conelly, 1985), development of industrial fleets with overlapping resource base, accelerated technological development within the artisanal community or rapid changes in the biological environment.

Scudder and Conelly (1985) found that nineteen of thirty-six artisanal fishing societies in Africa were reported to have some kind of management strategies of which only two cases were in the intentional category. They are aware that the actual incidence of management strategies is larger, but underreported in the files and they suggest that one of the major reasons for underreporting may be colonial bias against water tenure. This suggestion may indicate another reason why classical resource management practices have failed in so many cases in artisanal contexts: the starting point for European management is that fish resources are subject to common access and management must utilize means to achieve production objectives while maintaining common access. The result is that resource assessment models and derived management is concerned with manipulation of gear specifications and effort in a common access environment. It is, on background of property formerly being the important regulatory tool in artisanal fisheries, a bit paradoxical that the common property of fishing potentials is seen as the major problem today also in an artisanal context (Meany, 1987; Christy, 1987).

The need to distinguish between intentional and inadvertent

management has already suggested that it may be difficult to distinguish between resource management and other types of adaptation in the artisanal context—and it is probably not necessary either. Migratory fishing patterns are of course an adaptation to changing fishing opportunities. But they are also due to systematic patterns of closed seasons, and property rights which are key elements in the regulation of several aspects of social life of which resource management is only of minor importance.

It is questionable to which extent former regulation practices within the artisanal community can be revitalized or are adequate as a starting point for present regulation. There are reasons why these regulations were discontinued. These reasons may still be valid and the situation may in any case have changed so much that former regulation practices are completely out of tune in the present context.

THREE EXAMPLES OF ADAPTATION AND MANAGEMENT PROBLEMS IN DYNAMIC SITUATIONS

In order to relate the discussion to more practical considerations, we will briefly look into three different examples of adoption and management problems in dynamic situations, namely the canoe fisheries in Ghana, the artisanal fisheries of Lake Victoria and the Gwembe Tonga of Lake Kariba.

The canoe fishery of Ghana

The canoe fishery of Ghana has been through a very significant development since the early 1960s. Catches have increased from 30,000–40,000 to 150,000 t/year and the number of fishermen directly involved has increased from 50,000–60,000 to 108,000 (Haakonsen, 1988). At the same time, this increase represents an increase in productivity from 0.6 t/fisherman/year to 1.4 t/fisherman/year. The basis has been a shift in resource base to include the clupeids (sardinellas and anchovetas) through technological change. It is interesting that this development has taken place within the artisanal community by modifications of technology with a long tradition, the only, but of course crucial, element of

genuinely new technology added being outboard motors. Larger canoes are now being used, but based on former basic designs and craftsmanship, and the purse seines presently employed represent modifications to gears formerly used as set or drift nets. The natural potentials have changed during the period concerned (the sardinella stock was at low levels in the early 1970s, triggerfish came up as a major stock in the late 1960s), but these changes have been temporary and due to natural causes; they have if anything been of negative significance for the canoe fishery and have thus not been stepping-stones for development as has been the case in Lake Victoria (see below). The basis for the development does thus seem to be the coexistence of a fishing community which was able to adapt technologically and economically to expanded exploitation through motorization and an unexploited potential which could be reached through this development. One outstanding aspect of the Ghanaian canoe fishery is that it has been able to increase its share of total catches at the expense of the industrial sector, and it is also technologically and economically highly competitive compared to the so-called "semi-industrial" fleet of wooden inshore trawlers.

The major resources presently exploited by the canoe fleet belong to the group of smaller relatively short-lived species labelled opportunistic above. The recruitment to the clupeid stocks is dependent on the upwelling. The clupeids do, furthermore, migrate alongshore and in-offshore in a yearly pattern which makes them inaccessible to the fishery most of the year. It does thus not seem to be unreasonable to implement an opportunistic strategy—to put maximum effort available into the fishery whenever the stock is present and to leave it to nature to take care of closed seasons through migration and to expand recruitment when the upwelling is optimal. There is of course a limit to this kind of strategy—at high levels of sufficiently efficient effort it may be possible to run into recruitment overfishing even in a short fishing season on an opportunistic stock—but it is improbable that the artisanal fleet will be able to develop to that level, both for technical and economic reasons.

There are clear benefits in terms of simultaneous maximization and stabilization of catches and incomes by implementing a migratory and opportunistic fishing strategy when exploiting migra-

tory and opportunistic stocks. This is exactly what the Ghanaian canoe fishermen have done, and this strategy replaces further need for management. It is detrimental to the fishery when government agencies tries to interfere through restrictions on migration or import restrictions on certain materials for gear construction.

One positive role of external agents could be to remove such unwarranted hindrances and regulations based on unjustified assumptions concerning the stocks. A second positive role could be to assist in avoiding that development in other sectors has negative impacts on the canoe fishery. The major task is here to look into the technical interaction between the artisanal and the industrial fleets. It seems that parts of the industrial fleet are interacting with the canoe fleet but the extent and the importance of this is not well known due to insufficient catch statistics. It is obvious that all development and management of the industrial fleet must be based on a knowledge of consequences for the artisanal fleet, and it is possible that significant support could be given to the canoe fleet through improved management of the industrial fleet.

The artisanal fisheries of Lake Victoria

Lake Victoria is an outstanding example of rapid and profound changes in fish stocks in a large ecosystem and the ability of the artisanal fishing community to adapt rapidly to these changes on all levels—technologically, socially and economically. The changes are due to the explosion in the stock of *Lates niloticus* in the late 1970s and early 1980s following its artificial introduction into the lake twenty years earlier. These changes are induced by man but external to the artisanal fishing community. The development has so far been one of expansion, and adaptation under such circumstances is in several ways accompanied by fewer complications. The development has, on the other hand, taken place on the basis of a species which is new to the lake and very different from other species known to the fishing community before, both in terms of technology (catch techniques, processing, transport) and in terms of consumer preferences. The development and its socio-economic ramifications has been reviewed recently (Reynolds and Greboval, 1988).

The pre-Lates niloticus situation was characterized by a gradual regression: the resources showed signs of overexploitation and the value of catches was decreasing in spite of constant catch volume due to species replacement, while investments and operating costs were increasing in connection with technological development. Technological development was partly aimed at expansion of the resource base through exploitation of more (and less valuable) fish stocks, partly at catching smaller specimens of the species already exploited. Mesh sizes in the gill-net fishery were gradually decreasing. This trend was connected to a gradual change from subsistence/part time fishing activity to commercial operation. This has been explained by an inflow of population into the fishing-sector (through part-time fishermen expanding to full time and through an increased number of persons) due to the scarcity of agricultural land, lack of alternative employment opportunities and specialization in fisheries by certain ethnic groups (Greboval, 1989). Biological overexploitation in terms of overfishing of the preferred fish species was further aggravated by the inelasticity of prices towards size. The price inelasticity was an important factor in the gradual decrease in mesh size. This combination of socio-economic factors in relation to a gill-net fishery on fish species with low fecundity and high size of maturation has resulted in biological overfishing in terms of recruitment overfishing of the larger species and subsequent species replacement similar to the development demonstrated in Lake Malawi. Catches in the 1970s were around 100,000 t/year and appr. 50,000 fishermen were directly involved in the fishery.

Governmental management was on a very low level, mesh size regulations were not enforced and there was no control of effort. No reference has been found to intentional customary management or management through proprietary rights. The decrease in mesh size as a response to stock depletion and price inelasticity and the increased use of efficient gear seem to have taken place without interference.

The development in the 1980s has been the opposite: catches have been increasing up to present levels in the 300,000–400,000 t/year range and the number of fishermen directly involved has been estimated to have increased to appr. 95,000, an expansion

which nearly exclusively has taken place on artisanal basis but with a strengthening of commercialization (Greboval, 1989). Mesh sizes in the dominating gill net fishery have increased considerably and one major *Tilapia* stock (*O. niloticus*) has recovered and now gives the basis for an important yield. Consumers have accepted the new fish and distribution has spread from being coastal to regional distribution. Profitability has become very high in all activities related to fishing. It is no wonder that one of the local names for the Nile perch means "saviour".

The artisanal fishing community has been able to efficiently exploit newly developed opportunities. The outstanding problem is what the reaction will be once the expansion trend stops. The Lates population cannot continue to grow forever and it is probable that it is close to its maximum level now. It may even be reduced somehow due to natural causes, as was seen in Lake Kyoga where a similar development has taken place. The present artisanal community does not practice any regulation of access and it is probable—judging from the present high profitability level—that considerable effort may be added after maximum stock size and maximum yield has been attained. The next step in the absence of any kind of management is reduction in mesh sizes, increased effort targeting at *O. niloticus* and a repetition of the pre-Lates development may be experienced. This recession will be on a higher overall level, but the population involved has increased accordingly and the consequences of the recession will be much larger on a regional basis.

Practical resource management, governmental as well as customary, has been nearly absent and whatever may have been present before has not been strengthened by the recent expansion. It seems that some future control of both overall effort and its composition (mesh sizes, etc.) is necessary if a serious reversal in the present trend including decreasing catches, employment and incomes is to be avoided. The problem is that experience during the pre-Lates period shows that the governments will have large difficulties in enforcing traditional means of direct regulation and it is not obvious how alternatives can be developed—possible customary regulation is now extinct and may be impossible to revitalize as a starting point because the new situation is very differ-

ent. It is difficult to avoid being pessimistic about the possibilities for finding practical means of regulation that are acceptable by the fishery or even could work on a participatory basis.

The Gwembe Tonga of Lake Kariba

The Gwembe Tonga of the Zambezi, today Lake Kariba, have experienced a development similar to the Lake Victoria development, but on a less spectacular level and the recession period already started twenty years ago.

Lake Kariba was established through dam construction and the lake was filled by 1963. Before that time the Gwembe Tonga were fishing on a subsistence level with techniques well adapted to the riverine environment and species. Considerable government support was given to assist the displaced Tonga in becoming lake fishermen. This support included both regulation (limited access of non-displaced, closed seasons), infrastructure (roads, landing sites, transport boat service) and technology (gill-nets, boats). The Tonga utilized these inputs and a fishing boom developed during the years of the filling of the lake. Immediately after, catches amounted to 2,500 t/year at the peak. But by the mid 1960s the initial productive period, which is always found after establishment of a new lake, was over and catches had declined to 1,000 t/year. This coincided with partial withdrawal of initial support, opening up of the fishery to foreigners and introduction of outboard motors. The situation was further aggravated on the (then) Rhodesian side by fluctuating regulations and changing borders for access rights imposed by authorities who were out of touch with the fishing community. The overall result was that the communities to a large degree reverted to agriculture and the number of active fishermen decreased from appr. 3,500 to 1,000 (Bourdillon et al., 1985).

External management did assist, rather by creating a beneficial general environment than by direct management, during the upsurge period, but the problems of the recession period were aggravated considerably by the failure of government to understand this situation and to act accordingly. Government acted as if the upsurge was to continue and irrelevant regulations were added on top. It would have been important for government in this situa-

tion to monitor the resource base closely and to adjust all interference once the decreasing trend started. It must be added that the upsurge-decline pattern of newly established lakes was known to resource biologists at the time and was to be expected on the basis of current knowledge.

RESOURCE MANAGEMENT: RELEVANCE AND CONDITIONS

The examples have illustrated some of the complexities in resource utilization and its development within artisanal fishing communities in Africa. But the intention has mainly been to demonstrate some points emerging from these complexities concerning the limitations, relevance and conditions for resource management.

The problem that resources are limited and that they change through exploitation must be dealt with in some way or other in a situation of change where there is a drive for increased exploitation. There are some cases where external assistance for this task may be necessary:

1. when there have been attempts of management imposed on the artisanal fishery through licensing, import prohibition of certain mesh sizes, etc. Such attempts may be based on very limited information on the resources and the fishery. In these cases, resource assessments and subsequent changes in management are necessary simply in order to clear up former interactions, either to provide the basis for abandoning them altogether or at least to revise them in light of better information on both the resource and the socio-economic conditions. These situations call for assessment of the common resources and interaction, but direct management may only need be targeted at the industrial sector.
2. when there is technical interaction between two or more fisheries which are not or only loosely coupled on the socio-economic level—typically between industrial and artisanal fisheries. Any development of the industrial fishery must in these cases necessarily be based on thorough considerations of the consequences for the artisanal fishery mediated through

- the common resource. The decrease in catch per unit effort experienced by artisanal fleets as a consequence of development in other sectors may be detrimental even if overall effort levels for maximum sustainable yield (MSY) are not surpassed.
3. when accelerated development is introduced in the artisanal sector, such as motorization. Whatever the objectives of such development, it is necessary to assist the artisanal sector in handling the new relationship with the resource base unless new potentials can be mobilized to form the biological basis for the development.
 4. when conditions are changing radically due to factors external to the fishery such as in Lake Victoria and Lake Kariba.
 5. when changes are introduced in fragile or labile ecosystems such as the large lakes, coral reefs and mangrove areas.

The most important assistance to the artisanal sector in some of these cases may be given by interfering outside the sector or simply by discontinuing harmful interference. But the need for direct assistance with resource management in the artisanal sector will still remain in some cases—for instance the Lake Victoria fishery during the recession that is likely to come.

The difficulty is that traditional (European) means of resource management through external agents have failed in most cases, mainly just because they are imposed from outside and not in accord with the community. It is difficult to come up with new models. It is obvious that objectives and means must be acceptable to the artisanal community, and they must be acceptable to a degree allowing management to be based on active participation. Scudder and Conelly (1985), in a riverine context, advocate increased use of limited access on the basis of local participation. One model they suggest for local participation is "Local shareholders organizations" or similar structures based on a variant of common resource ownership. They claim the concept of shares to be *culturally congruent* in many fishing communities, also in the case of increasing commercialization, and this is the key to the potential of these models as opposed to cooperatives and village committees. Some practical experience involving adaptive research is needed before this model can be judged. The model may be difficult to im-

plement for the marine fisheries and the fisheries of the larger lakes.

The best way to introduce management in an artisanal context may be not to introduce it at all, but to assist in creating an environment which is supportive to intentional or inadvertent management by the fishing communities. This may prove extremely difficult, but it may be the only possibility available.

The first step is taken when developers and managers have become open to the idea that artisanal fishermen do have a good feeling of the condition and the dynamics of the resources they are dependent on and that they are innovative and adaptive both technologically and in terms of management (Scudder, 1980). They may, however, need assistance when they are up against forces external to themselves such as competitive fleets, floodplain regulation, rapid integration in a market economy or some donor wanting to dump a number of outboard motors.

REFERENCES

- Alexander, P. 1980. "Customary law and the evaluation of coastal zone management", *ICLARM Newsletter*, 3.
- Bourdillon, M.F.C, A.P.Cheater and M.W. Murphree, 1985. *Studies of fishing on Lake Kariba*, Mambo Occasional Papers—Socio-economic Series, 20. Mambo Press, Gweru, Zimbabwe.
- Christy, F.T., 1987. *A re-evaluation of approaches to fisheries development: the special characteristics of fisheries and the need for management*. Symposium on the exploitation and management of marine fishery resources in Southeast Asia. Indo-Pacific Fishery Commission, RAPA report, 1987/10. Bangkok: FAO.
- Greboval, D. 1989. *Managing the new fisheries of Lake Victoria: Major socio-economic issues*. Technical Document of the UNDP/FAO Regional Project for Inland Fisheries Planning Development and Management in Eastern/Central/Southern Africa. RAF/87/099—TD/04/89. Rome: FAO.
- Haakonsen, J.M., 1988. "Socio-economic aspects of Ghana's canoe fisheries", in J.M. Haakonsen (ed.), *Recent developments of the artisanal fisheries in Ghana*. IDAF Working paper, 21, FAO/DANIDA/NORAD.
- Klee, G.A. (ed.), 1980. *World systems of traditional resource management*. New York: John Wiley.
- Larkin, P.A., 1982. "Directions for future research in tropical multispecies fisheries", in D. Pauly and G.I. Murphy (eds.), *Theory and management of tropical fisheries: ICLARM Conference Proceedings*, 9.

- Meany, T.F., 1987. *Resource rent, common property and fisheries management: an economic perspective*. Symposium on the exploitation and management of marine fishery resources in Southeast Asia. Indo-Pacific Fishery Commission, RAPA report: 1987/10. Bangkok: FAO.
- Panayotou, T., 1982. *Management concepts for small-scale fisheries: economic and social aspects*. FAO Fisheries Technical Paper, 228.
- Pauly, D., 1989. "Biology and management of tropical marine fisheries", *Resource management and optimization*, 6.
- Reynolds, J.E. and D.F.Greboval, 1988. *Socio-economic effects of the evolution of Nile perch fisheries in Lake Victoria: a review*. CIFA Tech. Pap., 17.
- Scudder, T., 1980. "River-basin development and local initiative in African savanna environments", in Harris, D.R. (ed.) *Human ecology in savanna environments*. London: Acad Pr.
- Scudder, T. and T. Conelly, 1985. *Management systems for riverine fisheries*. FAO Fish. Tech. Pap., 263.
- Turner, J., 1977a. *Changes in the size structure of Cichlid populations of Lake Malawi resulting from bottom trawling*. J. Fish. Res. Board Can., 34.
- Turner, J., 1977b. *Some effects of demersal trawling in Lake Malawi (Lake Nyasa) from 1968 to 1974*. J. Fish Biol., 10.
- Tweddle, D and J. Magasa, 1989. *Assessment of multispecies cichlid fisheries of the Southeast Arm of Lake Malawi, Africa*. J. Cons. int. Explor. Mer, 45.

LIST OF PARTICIPANTS

Mette Bækgaard, Department of Ethnography and Social Anthropology, University of Århus, Denmark.

Marie-Christine Cormier-Salem, Institut Français de Recherche Scientifique pour le Développement en Coopération (ORSTOM), Montpellier, France (participated with paper only).

Poul Degnbol, Danish Institute for Fisheries and Marine Research, Hirtshals, Denmark.

Mariteuw Chimère Diaw, Centre de Recherches Océanographiques de Dakar-Thiaroye (CRODT), Senegal.

Siri Gerrard, Norwegian College of Fishery Science, University of Tromsø, Norway.

Jan M. Haakonsen, International Development Consultant, Oslo, Norway.

Bjørn Hersoug, Norwegian College of Fishery Science, University of Tromsø, Norway.

Vibe Johnsen, Danish International Development Agency (DANIDA), Maputo, Mozambique.

Eyolf Jul-Larsen, Centre for Development Studies, University of Bergen, Norway.

Ossi Lindqvist, Department of Applied Zoology, University of Kuopio, Finland.

Hannu Mölsä, Department of Applied Zoology, University of Kuopio, Finland.

Henrik Overballe, International Development Consultant, Århus, Denmark.

Jean-Philippe Platteau, Facultés Universitaires Notre-Dame de la Paix, Faculté des Sciences Economiques et Sociales, Namur, Belgium (participated with paper only).

Gísli Pálsson, Faculty of Social Sciences, University of Iceland, Reykjavik, Iceland.

Jens Revold, Norwegian College of Fishery Science, University of Tromsø, Norway.

Else Skjønberg, Women in Development Consulting, Oslo, Norway.

Inge Tvedten, Scandinavian Institute of African Studies, Uppsala, Sweden.

John Watten, Foundation for Applied Research at the University of Tromsø (FORUT), Norway.

Prudence Woodford Berger, Development Study Unit, University of Stockholm, Sweden.

Carel Zwollo, International Development Consultant, Amsterdam, The Netherlands.

NOTES ON THE CONTRIBUTORS

Mette Bækgaard is a research fellow at the Department of Ethnography and Social Anthropology, University of Århus, Denmark. She is presently working on a Ph.D. on West African Mandinka women. Mette Bækgaard has carried out extensive field work in Guinea-Bissau and the Gambia, and has been employed as a project anthropologist and a consultant in fisheries projects in several African countries. She is the author and co-author of several articles and reports.

Poul Degnbol is a fisheries biologist, working with resource assessment and management at the Danish Institute of Fisheries and Marine Research in Hirtshals. He started his African experience with research on Lake Malawi and has since been associated with a range of fisheries projects in Africa and Asia related to fisheries management and resource evaluation.

Mariteuw Chimère Diaw is a researcher at the Institut Sénégalaise de Recherches Agronomiques (ISRA) based at the Centre de Recherches Océanographiques in Dakar-Thiaroye (CRODT), where he is the coordinator of a project studying the socio-economic conditions among fishermen in Casamance. Trained as a sociologist at Michigan State University, he is currently pursuing a Ph.D. in anthropology at the Université Laval in Quebec City, Canada.

Jan Monte Verde Haakonsen is an anthropologist trained at Purdue University in Indiana and McGill University in Montreal. He has been based for more than a decade in Africa, working for the Swedish agency for research cooperation (SAREC) and UNICEF in Somalia, and for a FAO-executed artisanal fisheries development programme covering 20 countries in West Africa. He is currently an international development consultant based in Oslo, Norway.

Bjørn Hersoug is a sociologist, with an M.A. in planning and regional policy. Since 1980 he has been associated with the Norwegian College of Fishery Science at the University of Tromsø, currently as a professor and head of the Institute of Fisheries Organizations and Maritime Law. He has in his research been particularly concerned with management organizations and development of fisheries. Since 1985 he has worked as a consultant for NORAD and other agencies, mainly in East Africa and Central America.

Vibe Johnsen is a human geographer working as a social scientist at the Institute for Development of Small-Scale Fisheries under the State Secretariat for Fisheries in Maputo, Mozambique. She is also working on a Ph.D. thesis under the Institute of Geography at the Roskilde University Centre in Denmark. Her research focuses on the interrelationship between fishermen and intermediaries in post-colonial Mozambique.

Eyolf Jul-Larsen is a social anthropologist, and presently engaged as a researcher at the Centre for Development Studies, University of Bergen, Norway. He has worked in several African countries (Mali, Kenya and Angola) both as a researcher, as an advisor to various government authorities and for various aid institutions. His field of study has been particularly linked to processes of change in artisanal fishing communities. Since August 1990 he has worked with a larger research project entitled "The Popo Fishery in Congo in a Regional Perspective".

Ossi V. Lindqvist is professor in the Department of Applied Zoology at the University of Kuopio, Finland, with major interests in fisheries and aquaculture. He lectures in fisheries economics and sociology, and has long experience in fisheries development and research, mainly from Eastern Africa.

Hannu Mölsä is acting associate professor in the Department of Applied Zoology at the University of Kuopio in Finland, teaching and conducting research in fisheries and aquaculture. Since 1986, he has been directing the M.Sc. training programme in fisheries for African students, which has brought him into contact with various fisheries development and education projects, especially in Eastern Africa.

Henrik Overballe is presently finishing a thesis for the Ph.D. degree in Anthropology at the University of Århus, Denmark. He has spent extensive field work periods among Mandinka people in Guinea-Bissau and Senegambia. Working as a consultant, he has made a number of studies and evaluations of fishery projects in Lusophone Africa and Sierra Leone. He is the author and co-author of several articles, research reports and consultancy reports.

Jean-Philippe Platteau is an economist and professor at the University of Namur, Belgium. His main field of specialization is development economics. One of his centres of interest has been the study of economic organization of fishermen communities as well as the process of change under way in these communities. In-depth studies have been conducted in south India and in Senegal. He has written several books and numerous articles in academic journals.

Else Skjønberg is a sociologist with extensive research experience from South Asia and East and Southern Africa. She has also worked as an aid administrator. For the past six years she has been the coordinator of WIDCO—Women in Development Consulting—Norway. Her special fields are rural development and gender issues as well as fisheries sociology. Skjønberg has published two books on rural development, from Sri Lanka and Zambia. For the latter she was awarded the 1989 Best Book of the Year World Hunger Media Award.

Inge Tvedten is an anthropologist by training, and is currently research fellow at the Chr. Michelsen Institute (Department of Social Science and Development) in Bergen, Norway. He has done applied research related to the artisanal fishery sector as a socio-economic advisor in the Ministry of Fisheries (Department of Artisanal Fisheries) in Angola, and through sector analyses carried out for Scandinavian aid institutions in Guinea-Bissau, Botswana and Namibia. His current research is particularly related to the role of intermediaries and the implications of economic liberalization through structural adjustment programmes for the artisanal fishery sector.

