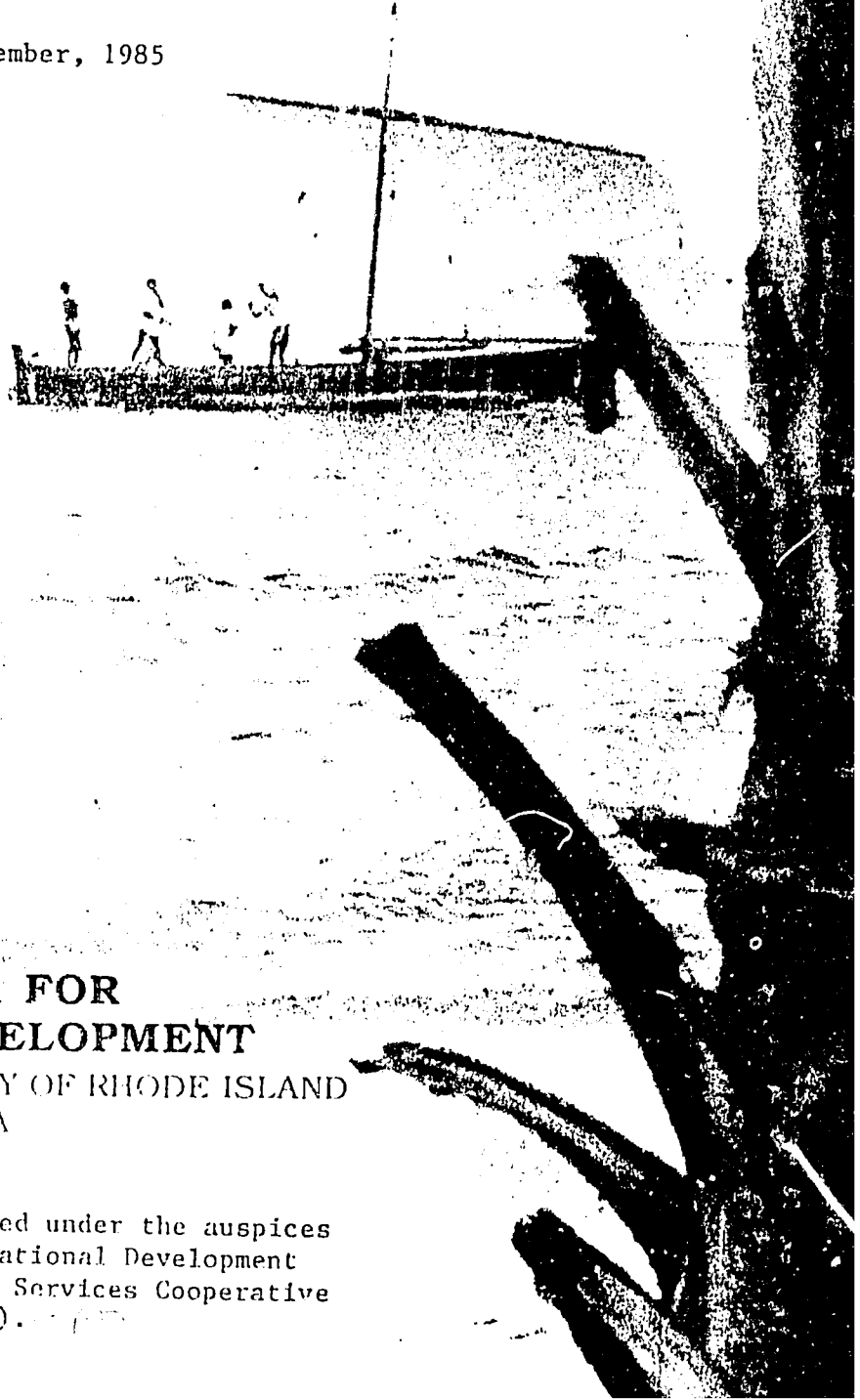


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SOCIOCULTURAL ISSUES IN
WEST AFRICAN FISHERIES DEVELOPMENT

By
Richard B. Pollnac

December, 1985



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Sociocultural Issues in
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PREFACE

This report is a revision of Anthropology Working Paper No. 43, "Sociocultural Aspects of Small-Scale Fisheries Development in West Africa" (January 1984), including information published in the past two years. The recommendations are substantially the same, but more urgent due to the deteriorating food situation in Africa. A version of this paper was presented as a part of the Symposium on Small-Scale Fisheries: Perspectives on Widespread Issues and Questions, 84th Annual Meeting of the American Anthropological Association, Washington, D.C. (December 4-8, 1985).

Sociocultural Issues in West African Fisheries Development

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INTRODUCTION

The focus of this paper is on the role of social and cultural variables in the development of the small-scale fishery in coastal West Africa. The small-scale marine fisheries of West Africa provide approximately 70 percent of the total marine production (Lawson and Robinson 1983 a,b), ranging from a low of about 30 percent in Ivory Coast to 99 percent in Guinea (Table 1). Practically all of the small-scale fishermen's catch is consumed locally, thus providing an important, high quality protein input to a population where the overall per capita consumption of fish is about twice as much as that for red meat (Sutinen, Pollnac, and Josserand 1981).

In all but two of the West African coastal countries considered in this paper, fish provides over 40 percent of the total animal protein consumed (Table 2). Further, in most of these countries the coastal areas are relatively more densely populated than the inland areas, giving increased significance to the role of marine fish in helping to alleviate food shortages and improve nutrition (Everett 1984). In terms of employment, the small-scale fishery provides work for about one-quarter of a million fishermen, not including the many women and men involved in processing, distribution, and retailing of the catch.

In addition to the relative importance of fish in West Africa, three additional facts argue for development of the small-scale marine fishery. The first is that a significant proportion of available fish in the 14 countries considered as a whole is imported. Using figures from provisional food balance sheets (FAO 1984:174) we find that imports make up 47 percent of available fish and fishery products (average production plus imports 1979-1981). Intra-regional trade accounts for only about 15 percent of these imports, with Senegal and the Canary Islands being the biggest suppliers (Robinson and Crispoldi 1984). The greater proportion of imports is found in the lower section of West Africa, from Liberia to the south, with Nigeria accounting for the majority. Some of the northern countries with significant imports (e.g., Mauritania and Senegal) merely hold or process the fish prior to export (Robinson and Crispoldi 1984). This should be considered in light of the fact that Mauritania and Senegal are among the countries designated as suffering from abnormal food shortages (FAO 1985).

¹For purposes of this paper, "Coastal West Africa" includes all coastal countries from Mauritania in the north to Cameroon in the south.

Table 1. Artisanal Fisheries Sector^a

	Marine Artisanal Landings '000c ^b	Percent of Total Production	Percent of Marine Production	No. of Canoes	Percent of Motorization	No. of Fishermen
Mauritania	21.0	65	75	300	50	1,750
Senegal	194.0	75	80	4,104	55	24,900
The Gambia	11.0	80	100	1,044	65 ^e	2,362
Cape Verde	8.0	75	75	980	20	2,670
Guinea Bissau	1.0	15	15	650	25	3,000
Guinea	18.0	90	100	1,700	20	7,500
Sierra Leone	32.5	65	95	(3,000)	10	(5,000)
Liberia	5.0	40	60	800	20	4,200
Ivory Coast	21.0	30	35	3,000	..	(15,000)
Ghana	142.0	60	75	7,000	58	84,000
Togo	5.0	50	85	235	70	2,300 ^d
Benin	4.0	15	90	339	20	2,500
Nigeria ^c	95.0	60	85	(10,000)		(50,000)
Cameroon	20.0	35	50	3,500	..	12,000

^aAdapted from Lawson and Robinson 1983b. Figures in parenthesis are CECAF estimates.

^bArtisanal landings include also semi-industrial fisheries. Canoes and fishermen exclude data for semi-industrial sector.

^cOnly the numbers of powered canoes is indicated, because the unpowered canoes (amounting to some 100,000 according to official estimates) include a very large number of small canoes used only for occasional subsistence fishing in brackishwater areas. The rate of motorization for fishing canoes is, however, believed to be high.

^dOut of which 1,500 Ghanaian fishermen.

^eCECAF 1984.

Table 2. Fish as food and fish imports in West Africa.

	<u>Fish as percent of animal protein</u>	<u>Fish imports² 1000 MT live weight</u>	<u>Per capita² supply of fish kg/year</u>
Mauritania	15	76.5	16.2
Senegal	53	16.7	24.7
Gambia	44	16.3	23.2
Cape Verde	53	0.5	23.7
Guinea Bissau	22	0.4	5.1
Guinea	41	12.0	6.1
Sierra Leone	72	12.2	18.0
Liberia	47	20.7	16.1
Ivory Coast	44	123.4	19.5
Ghana	68	35.7	19.0
Togo	61	20.3	10.9
Benin	49	7.0	8.5
Nigeria	52	795.3	16.3
Cameroon	45	17.7	10.7

¹ from Robinson and Crispoldi (1984)

² Average 1979-1981 from FAO (1984)

Second, although the fishery in this region is heavily exploited, FAO figures for both 1982 and 1983 (Posner 1985 and FAO Personal Communication) indicate that total marine capture (both foreign and national) was about 71 percent of potential off Northwest Africa and 63 percent of potential in the Gulf of Guinea. Finally, a significant proportion of the catch in the region was caught by foreign fleets (about 58 percent in 1982 and 54 percent in 1983). There is, however, great variation in percent of foreign catch between the Gulf of Guinea and off Northwest coast of Africa. In the Gulf of Guinea the foreign catch was only about four percent of the total, while off Northwest Africa it was 74 percent in 1982 and 69 percent in 1983.

In sum, the region being considered is one in which fish plays an important role in the diet, and fishing provides a significant amount of productive employment for coastal peoples. Although the fishery is not exploited to its fullest potential and over half the capture is landed by foreign fleets, imports make up almost fifty percent of the available fish and fishery products. There thus seems to be sufficient justification for a fishery development program in the region which would have as its objectives increasing both the national share of the harvest and employment in the fishery, decreasing the percentage of imports and increasing the amount of fish available to the people of this region.

Changes aimed at achieving these objectives are ongoing or are being planned for West Africa (Everett 1984). Many of these changes involve social and cultural considerations--the topic of this paper. Among these changes are: (1) proposed improvements in harvesting and

processing technologies, (2) exploitation of new or under-utilized species, (3) management of the fishery, including small-scale/industrial conflicts, and (4) institutional changes proposed to facilitate other "improvements" in the small-scale fishing sector.

BACKGROUND

SOCIO-ECONOMIC CONTEXT Table 3 provides a general summary of important social indicators for West African coastal countries. The table clearly indicates the extreme poverty of the region. Per capita GNP is extremely low in the region as a whole. Only three of the fourteen countries exceed the average of 700 Dollars (U.S.) reported for all less developed countries (Kent and Haub 1985), and most are much lower. Infant mortality, which is a good indicator of quality of life in general, is also quite high when compared with the developed world average of 18 per thousand and the LDC average of 90 (Kent and Haub 1985). A recent calculation of the Physical Quality of Life Index for 150 countries placed all countries in Table 3, except for Ghana and Cape Verde, in the lower 20 percent. Ghana was ranked 39th and Cape Verde 62nd (Morris 1979). This index, which captures the essentials of "basic needs", is based on infant mortality, life expectancy, and basic literacy--three variables related to a host of factors associated with economic development.

Although Table 3 is based on country-wide statistics, it is possible to make some inferences concerning relationships between items in the table and fishery development. First, it is clear that the low literacy rate impacts on fishery development programs. There is some evidence to suggest that fishermen may actually be below the national average with respect to literacy. Gladwin (1970) notes that Ghanaian fishermen tend to be less Westernized than other Ghanians. Noting that while over 50 percent of the individuals over 15 years of age in Cape Coast can speak English, only one of the 200 fishermen he interviewed could. He suggests that this may be due to the fact that fishing is not considered a suitable occupation for the educated; thus the occupation selects against English speakers. This low literacy rate indicates that communications aimed at fishermen will have to be oral, not written, indicating the need for development of an extensive extension service. Further, it will be necessary to locate credible, literate fishermen to act as record keepers where necessary (e.g., in fishermen's associations).

Road density is another social indicator that will impact development programs. Low road density suggests that there will be relatively isolated fishing villages which will be hard to reach with development programs. Further, road density is an aspect of infrastructure that impacts the distribution of fish. Regions with low densities can probably absorb less product than those with high densities. Projects planned for countries with low densities should make sure that transportation links to major markets are adequate.

Table 3. Key Social Indicators in Coastal West Africa

Country	Per Capita ^d GNP 1983 U.S. \$	Percent Literate (age 15 and over) ^b	Life Expectancy at Age One (years) ^b	Infant Mortality Rate per 1000 Live births ^d	Km of Roads Per Km ² of Total Land (Percent) ^a	Percent of Total Population Urban (1980) ^c	Percent Avg. Annual Growth Rate of Urban Areas (1970-1980) ^c
Mauritania	440	11	45.7	137	.6	23	8.6
Senegal	440	8	51.3	141	7.1	25	3.3
The Gambia	290	10	51.7	193	-	21 ^d	5.0
Cape Verde	360	37	53.3	77	-	20 ^d	-
Guinea Bissau	180	5	46.9	143	8.9	27 ^d	4.3
Guinea	300	9	48.7	147	3.1	18	5.5
Sierra Leone	380	10	49.9	200	10.3	25	5.6
Liberia	470	10	52.5	112	7.2	33	5.6
Ivory Coast	720	20	51.6	122	14.2	38	8.5
Ghana	320	25	55.8	107	13.5	36	5.1
Togo	280	16	45.9	113	12.5	20	6.6
Benin	290	20	49.3	149	2.4	14	3.9
Nigeria	760	25	49.0	105	11.6	20	4.7
Cameroon	800	19	46.5	117	6.1	35	7.5

^aSource: Food Problems and Prospects in Sub-Saharan Africa: The Decade of the 1980's, U.S.D.A. (1980).

^bSource: M. S. Morris, Measuring the Condition of the World's Poor, Pergamon Press (1979).

^cSource: Accelerated Development in Sub-Saharan Africa, The World Bank (1981).

^dSource: 1985 World Population Data Sheet, Population Reference Bureau (April 1985).

Finally, with respect to Table 3, it is clear that the rate of urbanization is relatively high in most of the countries. This trend has been noted as part of the problem negatively affecting food production in Africa. Fishery developments based on technologies that are restricted to areas with well developed infrastructures (usually urban areas) tend to exacerbate the urbanization problem. Nevertheless, since many of the larger urban areas in West Africa are located in coastal regions, development of the marine fishery could help provide animal protein to the urban dwellers with a minimum of infrastructure for distribution. Careful analyses need to be conducted, however, to determine the relative balance between these conflicting needs.

THE SMALL-SCALE FISHERY

The Harvesting Sector

Fishing vessels and gear Small-scale fishing vessels vary a great deal in both size and complexity. Many are dugout canoes constructed from a single log, ranging in length from about 4 to 10 meters. Larger canoes (12-18 meters), most of which are patterned after the famous Ghanaian (Fanti) canoes, are traditionally constructed of a single log with sides extended upward by the addition of planks. In areas where large trees are becoming scarce, the canoes are constructed entirely from planks. Many of these small-scale vessels are powered by oar and sail, but an increasing number were motorized during the late 1960's and early 1970's (Table 1). For example, in Togo the percentage of motorized small-scale fishing vessels increased from 16 to 79 percent during the ten-year period from 1967 to 1977 (CECAF 1979). There are clear indications of a reversal in this trend, however. Statistics published in 1979 (Everett 1979) indicate higher levels of motorization than Table 1. In six cases where comparable data are available, five show decreases in percent motorized. In some cases the decrease is minor (e.g., Guinea, where percent motorized dropped from 23 to 20 percent), but in others it is major (e.g., Ghana, where percent motorized dropped from 87 to 58 percent). The average decrease is 12 percent (see Table 3). Lawson and Robinson (1983a,b) attribute the changes in Ghana to a lack of foreign exchange which has resulted in a lack of spare parts and replacement motors. A similar situation is reported for Guinea Bissau (CECAF 1984). With respect to a motorization project in Senegal, Brainerd (1984a) indicates that after project inputs of engines and spare parts ceased, project activities did not generate enough income to purchase supplies. Everett (1984) reports that affected artisanal fishermen in Ghana have continued fishing, using paddles where necessary. CECAF (1984) notes that in some areas fishing activities have decreased drastically due to the high cost and scarcity of fuel. A CECAF project is now looking into converting existing canoes to sail propulsion.

The small-scale fishery in some countries (e.g., Ghana) is beginning to merge with the industrial fishery in a way not seen in other West African countries. This is due to the introduction of small (10 meter and under) trawlers. This small trawler fishery contrasts with the traditional small-scale fishery in that the trawlers are too

large to land their catches at most of the coastal fishing villages and towns, a fact that is of considerable importance with respect to plans to increase the size of this fleet.

Table 3. Apparent changes in percent of artisanal fleet motorized as reflected in statistics published in 1979 and 1983.

<u>Country</u>	<u>% Motorized Time One*</u>	<u>% Motorized Time Two**</u>	<u>Change</u>
Senegal	63	55	-08%
Guinea	23	20	-03%
Sierra Leone	22	10	-12%
Ghana	87	58	-29%
Togo	79 ^a	70	-09%
Benin	20	20	00

*From Everett (1979)

**From Lawson and Robinson (1983b)

^aFrom "La peche au Togo et la planification de son developpement" in CEEAF/TECH/79/14 (1979).

Finally, inshore harvesting techniques such as beach seining, collecting shellfish along the shore and among the mangroves, setting fish traps (cf. Doyi 1984), and deploying cast nets in the shallows are also widely practiced along the West African Coast. In several West African countries, especially Benin, Ghana, and the Ivory Coast, fish attraction devices in the form of vegetation such as tree branches or bushes are stuck into lagoon or estuary bottoms. These "brush parks" are fished with nets, traps, or hook and line and are reported to provide rather large yields (Welcomme and Kapetsky 1981).

Fishing work groups Number of crew in the various vessels used in West Africa varies according to vessel size and fishing gear. For example, small, non-motorized vessels fishing with lines operate with an average of three fishermen. The traditional, unmotorized Ghanaian canoe, which is operated all along the West African coast, carries a crew of from five to seven when net fishing. The larger, motorized canoes carry crews as large as fourteen (twelve is the average) for net fishing. The 11 to 12 meter purse seining pirogues of Senegal are often accompanied by a larger (up to 15 meter) pirogue for handling the net and carrying the large catch. These boats are crewed by up to twenty men (CECAF 1984). Some fishermen (e.g., the Anglo (Ewe) of Ghana and Togo) fish principally with beach seines which are operated by about thirty adult men (Nukunya 1969). Finally, small-scale, inshore harvesting by hand or with the use of traps is usually an activity performed by individuals. Women and children are frequently involved in this activity.

Seasonality of fishing Available data suggest that in many West African countries fishing is a seasonal occupation for many fishermen. For example, in Guinea Bissau the majority of the fishermen are also farmers, and the planting and harvesting seasons affect the timing of fishing (Brainerd 1984b, Hochet 1979). In some areas of Sierra Leone men fish during the peak period and engage in other activities such as farming and petty trading during the off-season. Some recently published statistics from Sierra Leone may serve to indicate the magnitude of this phenomenon. During the peak fishing season of 1981, Tombo (one of the largest fishing villages in the country) had more than 7000 inhabitants. This population fell to about 5300 during the off-season (Kotnik 1982). It is important to note that about 90 percent of the inhabitants of Tombo are engaged in the fishery. This seasonality of fishing makes it difficult to arrive at accurate estimates of numbers of fishermen. The most recent unpublished FAO statistics, where available, allow one to estimate that approximately one-third of the fishermen are part-time, ranging from only 8 percent in the Gambia (1977) to a full 45 percent in Sierra Leone (1979). Sometimes the full-time, part-time distinction among fishermen follows ethnic lines in West Africa. For example, in Liberia Ghanaians tend to be full-time fishermen. Kru, Grebo, Vai, and Bassa fish only part time and engage in other occupations such as working on oceangoing vessels (especially the Kru) or farming (Akerle 1979).

Migrating fishermen Ghanaian fishermen are especially difficult to enumerate because of the traditionally high number of fishermen who migrate to the shores of other countries to fish. The author has encountered Ghanaian fishermen as far north as the Gambia (January 1982), and others report them as far south as the Congo (Lawson and Robinson 1983b). In many cases they return to Ghana (Berron 1977; Nukunya 1969), but some settle in their adopted country (Lawson and Robinson 1983b). It is important to note that some of these "Ghanaian" fishermen are Ewe who reside in southern Togo as well as southeastern Ghana. Sierra Leone forced the Ghanaian fishermen to leave their country in the early 1970s to open up opportunities for their own people.

The fishermen of Sierra Leone also migrate. This has resulted in problems determining the exact number of active artisanal fishermen. Some fishermen establish a home with a wife in each fishing area, but the majority maintain only one home and live with friends while fishing away from home. During the rainy season in Sierra Leone Temne wives associated with the lower-profit bonga fishing operations sometimes migrate with their husbands to other fishing grounds (Kotnik 1982). Wives and younger children also migrate with the Ewe from Ghana (Berron 1977). Senegalese fishermen also seasonally migrate to both Mauritania and Guinea Bissau (Hochet 1979; Epler 1983). Finally, Everett (1984) reports that the artisanal shrimp fishery of Cameroon is dominated by fishermen from Nigeria along with some from Benin, Togo, and Ghana.

Ownership patterns Throughout West Africa the small-scale fishing fleet is characterized by owner-operators. These owner-operated vessels are often crewed by a group of kinsmen. Cost of small-scale vessels, motors, and gear is such that individual fishermen can realistically

expect that with proper planning they will be able to own a vessel of their own some day. As the boats, motors, and gear become more sophisticated, however, money-lenders play an increasingly important role in financing the fishermen. In many cases, successful female primary buyers assume the additional role of moneylender, thus increasing their control over the fishermen and insuring themselves a steady supply of fish. It is reported that in some areas, especially close to major towns, the incidence of non-fishermen owners is increasing. This is to be expected as profits as well as costs of equipment increase. This phenomena was clearly evident in the Ghanaian semi-industrial, small-trawler fleet (10 meters and under) during the 1970s where it was reported that the majority of vessels were not owned by fishermen (Christensen 1977). There has been a reversal of this trend in Ghana, however. As the industrial and semi-industrial fishery was hurt by a lack of imported inputs, a sellers' market for fish emerged, resulting in improved economic status among the artisanal fishermen and a concurrent decrease in the status of the middlemen/financier (Lawson and Robinson 1983b).

In other West African countries, however, the increase of non-fishermen owners as seen in Ghana in the 1970s continues. For example, in Sierra Leone, especially in the more urban area close to Freetown, a system of ownership is developing which is referred to as the "sleeping fisherman." "Sleeping fishermen" are owners who do not fish--they hire crews. As fishing grows more profitable, it is expected that these non-fishermen owners will increase in number, resulting in a "new class" of person in the fishing industry as well as increasing social stratification in the fishing communities. Kotnik (1982) writes that in the herring and bonga fishing sector in Tombo, boat owners possess between one and five vessels. Some 14 percent of these owners are mostly widowed women, over 50 years of age, who own one or two boats (Kotnik 1981).

Lay systems Distribution of catch among fishermen varies somewhat from society to society, but the primary determinant of the lay system appears to be the scale of the technology. With respect to the simpler, unmotorized canoes, the shares are divided equally with one share going to the boat, one to the net (if used), and one each to the crew of fishermen. As the technology becomes more costly, larger shares are allocated for equipment replacement and repair. For example, the Fanti using the large motorized canoes first deduct expenses (petrol, etc.), give one share to each of the 9 to 14 crew members, one-half to one share to non-fishermen owners, one to two shares to the boat, two to three to the net, and three to four to the motor. The larger shares for equipment are from the most recent report (Christensen 1982), suggesting that equipment shares are increasing. There are, however, some deviations from this type of share system. For example, Epler (1983) reports that the most prevalent system in Guinea Bissau is payment of a monthly wage. Kotnik (1982) describes an unusual variation on the share system for Tombo (Sierra Leone). There she reports that owners are responsible for feeding and lodging the workers and that the crew is free to dispose of Saturday's catch. In most areas of West Africa, irregardless of equipment type, a small share of the catch (e.g., several fish for home consumption) is given to women or children who help unload the vessel.

Small-scale Marketing and Distribution

Handling and processing CEEAF Project estimates indicate that the small-scale fishermen produce some 60 to 70 percent of the total weight of the fish landed by locally based vessels in West Africa. One of the great problems, however, is the lack of adequate fish handling facilities at small-scale fish landing places. In most areas fish are handled, processed, and marketed at beach locations which frequently lack basic facilities such as hygienic areas for cleaning, washing, and sorting of fish, as well as running water and ice supplies. It has been estimated that problems in handling due to lack of facilities cause losses as high as 20 to 40 percent of landings prior to reaching the consumer.

Due to this shortage of adequate landing and processing facilities, most fish landed by the artisanal fleet have been traditionally processed by smoking. Some drying and salting also occurs as well as other infrequently used preservation techniques. In some countries such as Sierra Leone and Senegal, raised platforms are used which are less effective than the improved smoking ovens with six or seven racks which are used in Nigeria and Ghana (Linsenmeyer 1976). The less efficient smoking techniques result in greater fuel consumption. In some West African countries (e.g., Sierra Leone) pressure on the forest resources has resulted in woodcutters being required to travel further and further to obtain wood. This has resulted in increased costs to the processors as well as concern regarding the status of the woodlands. It is important to note that in some cases specialists associated with the processing industry may not be of the same ethnic group as the fishermen. For example, in Tombo, Sierra Leone, the woodcutters are Fullah, and most of the fishermen are Temne.

A relatively large number of fish processors, often family firms composed of fishermen's kin, handle the catches of the sometimes isolated small producers. Other middlemen (usually females) collect these small-scale catches and distribute them to inland markets where they are purchased by either retailers for local sale or other middlemen who distribute the product to more remote areas. In most areas smoked fish are preferred for their taste and role in traditional recipes.

The role of women in processing and distributing the small-scale fishermen's catch should not be underestimated. For example, in Tombo, Sierra Leone, this essential female labor can only be acquired through marriage. Fully 77 percent of the Temne women in this fishing community are living in polygynous households (e.g., where the husband has more than one wife), and wealthier boat owners have more than four wives (Kotnik 1982). The need for more female labor is clearly related to the level of production. Hendrix (1984) suggests that increased production and the consequent need for more female labor influenced Tombo's shift from a predominantly monogamous, Christian community to a predominantly polygynous, Islamic community over the past 25 years (polygyny is allowed under Islamic law).

Marketing The general method for marketing the artisanal catch in almost all West African countries is that upon landing, the fish are

sold to middlemen, usually a woman who is either the fisherman's wife, kin, or an unrelated entrepreneur. These women are frequently referred to as fish mummies. In Tombo, Sierra Leone, 85 percent of the female fish buyers are attached to specific vessels or fishermen (normally two to three boats) and are expected to buy only from them (Kotnik 1982). Similarly, Akerele (1979) writes that in Liberia there is one fish mammy for every two fishermen, roughly the same ratio reported for Ghana. Unrelated female entrepreneurs are beginning to dominate the wholesale and retail trade as a result of their role in financing the more expensive motorized technology that is beginning to dominate the small-scale fishery. In Sierra Leone it is reported that the proportion of male middlemen is beginning to increase. In Liberia, Lebanese merchants gained control of the fish cold storage depots as the industrialized fishery began to supply more frozen fish (Akerele 1979), and in Nigeria men already play a dominant role in fish marketing (Lawson 1980). In Senegal, and to a limited extent in Ghana and Sierra Leone, some buyers are organized into marketing cooperatives.

Pricing of fish Little information is available concerning prices paid to fishermen. It is reported that in Ghana each village or town along the coast has a head fish buyer who is elected by the others. She meets the first vessel to reach the beach and bargains with the captain concerning the price to be paid. The price decided upon becomes the base price for the day. The decision is based upon factors such as size of catch, species of fish, and size of catch on previous days (Christensen 1982, Quinn 1978). Price per pan (selling units are tin pans) decreases late in the day due to restricted time for selling and processing. Additionally, if subsequent landings are much larger or smaller than the initial landing, prices can vary as much as 50 percent in either direction. Nevertheless, the base price is usually honored. This pattern of basing prices for the day on initial landings is also practiced in Sierra Leone where drops in prices near the end of the day were also recorded. Other levels of middlemen (e.g., in the wholesale and retail markets) set prices based on an evaluation of the state of the market in the various towns where they sell their fish (see Quinn 1978).

In Senegal the recently organized marketing cooperatives set the prices. Fishermen selling outside the cooperatives are at the mercy of market forces. In Tombo, Sierra Leone, Kotnik (1982) writes that pricing is set on an individual basis, being controlled only by supply and demand. In an attempt to stabilize prices in Sierra Leone, however, fish trading women formed a marketing organization in 1976. The organization established rules governing marketing areas and days for fish from various points of origin. The rules are not compulsory, but since they function to stabilize prices by preventing the flooding of specific markets with fish, members of the organization tend to comply. The organization can also fine members if they fail to comply (Kotnik 1982). Not all fish traders belong to this organization.

It is reported that the Offices des Peches Maritimes holds a monopoly over wholesale fish marketing in Guinea where the national government sets prices and profit margins (Guinean Country Paper, 1978). One informant, however, reported that traditional middlewomen can still

be found buying and selling fish in Guinea. In Benin, the Societe Nationale d'Armement et de Peche attempts to enforce fish prices set by the Minister of Commerce. It is important to note that as many as seven trading functionaries can be involved in the marketing chain in West Africa (Lawson 1980).

Inland Distribution The best available information concerning the distribution and marketing of marine fish at inland locations is from Ghana. There, coastal buyers travel to inland towns where they sell to retailers. In some cases the inland retailers are coastal people who have been set up in the business by the coastal buyer (Schwimmer 1979) and thus form distinct ethnic groups in the inland locations. In Sierra Leone there are several channels for distributing fish from the fishing villages to customers in other parts of the country. Kotnik (1982) writes that each processor has relationships with two to four customers who buy regularly from them. The customers are mostly Temne women who are related to the processor. Many of these buyers are professional marketing women who sell the fish to other wholesalers or retailers. In a minority of the cases (10 percent) the fish are marketed by the processor's co-wife who stays in the provinces.

The introduction of frozen fish technology has not completely eliminated these traditional systems. In one town close to an inland terminal for frozen fish distributed by the Ghana Fishing Corporation, fish wholesalers smoke the thawed frozen fish and sell it through the traditional retailers. Further, the traditional coastal supply system still accounts for a good proportion of the fish distributed to inland locations (Schwimmer 1979). In other West African countries (e.g., Sierra Leone, Togo, Nigeria, Liberia, and Ivory Coast) frozen fish from the industrial fleet are also bought and smoked by middlemen for further distribution suggesting that the traditional processing industry can readily adapt to the new technology while at the same time provide a product preferred by the consumer. In Liberia, head fish mummies buy fish from depots scattered around the country and distribute it through sub-mummies who retail the fish in local markets. Each head mammy deals with between 5 and 15 sub-mummies (Akerle 1979). In Nigeria it is reported that up to one-third of frozen imports are either sun-dried, smoked, or deep-fried somewhere in the distribution chain (Moen 1983).

SOCIAL AND CULTURAL ASPECTS OF DEVELOPMENT

Various aspects of the society and culture of the small-scale fishermen of West Africa are discussed in previous sections. The purpose of this section is to highlight social and cultural factors which may either facilitate or impede development efforts.

ETHNIC DIVERSITY The small-scale fishermen in West Africa come from a wide variety of ethnic groups. In each country two, three, or more ethnic groups are involved in the coastal fishery (Sutinen, Pollnac and Josserand 1981). In some cases (e.g., Tombo, Sierra Leone) up to four distinct ethnic groups are involved in the fishery in a single fishing

community (Kotnik 1982). An examination of Murdock's map of ethnic groups of Africa (1959) indicates that there are some 47 distinct ethnic groups living along the West African coastline from Mauritania to Cameroon. If we take into consideration all groups living within a fifty-mile wide band along the coast, we could easily double this number. This diversity has many implications for development. Project design is often influenced by intergroup differences, and the identification of these differences during the early stages of planning can help reduce potential problems and make it possible to arrive at more realistic cost estimates (cf. Cochrane 1979).

It has been noted that ethnic factors are related to "...preference for certain species, certain fishing techniques, a certain type of vessel, a certain type of relation among fishermen and between fishermen and traders" (CECAF 1980:3). This type of variability occurs within specific countries as well as throughout the region.

The most important implication of this diversity, however, is that no single, unitary approach to fishery development can be applied with a reasonable chance for success along this coastline--it will not be possible to develop a package that can be applied to all regions. This restriction is valid not only for the region, but also for specific countries, as there is also intra-country ethnic diversity.

COMMUNICATION Turning to potential project impacts it is important to consider the operationally relevant aspects of ethnic diversity. Of primary concern in a development project is the establishment of communication with the target group as a means of obtaining grassroots input to project design--a critical factor in project success (Morss, et al 1976; Mickelwait et al 1979). Most ethnic groups along the coast speak mutually unintelligible languages; thus, establishment of communication will be a difficult process. Use of acceptable lingua francas is possible in some areas, but care must be taken due to regional variations in lingua francas and differential attitudes towards available languages. Many studies have indicated that the most effective communications are conducted in the native language (cf. Pollnac and Sutinen 1980).

Literacy rates also impact effectiveness of communication in development projects. It was noted above that the literacy rate for this region is relatively low. There are also indications that the literacy rate for fishermen is lower than the national average in some areas. This low rate of literacy in combination with linguistic diversity suggests that great care be used in the structuring of communications in development projects. For example, extension procedures appropriate in one area may be inappropriate in another community in the same country; hence, careful analyses of the distributions of literacy and linguistic abilities must be built into projects.

PROPERTY RIGHTS The ethnic diversity of the West African coast is also reflected in its variability in social organization. Of primary concern

to development project planners are aspects of social organization influencing rights to property or group membership. In general, rights to property or group membership descend through females (matrilineal), males (patrilineal), or both (bilateral). Along the West African coast there are groups which manifest all three of these patterns in addition to one other: duolineal, where different rights are held by the patrilineage and matrilineage. Several studies (e.g., Poewe 1978; Douglas 1971) have demonstrated the differential receptivity to economic development manifested by societies which vary in terms of inheritance patterns. For example, matrilineal societies are ill-adapted to some conditions of economic development, and the shift to a patrilineal or bilateral system is often accompanied by resistance on the part of the group losing power (the matrilineage). Many West African social groups are matrilineal, but these strains may not develop due to the predominant form of division of labor--another social variable related to ethnic diversity.

DIVISION OF LABOR As discussed above in the section on the artisanal fishery, in West African fishing communities males generally fish, and females process and distribute the product. Some authors (e.g., Christensen 1982) suggest that the female role of fish trader results in their being the primary element of economic stability in some fishing societies. Males fish intermittently, while females work year-round. Lawson (1980) notes that the pivotal role of women in the functioning of many artisanal fisheries in West Africa is due to the fact that they are so involved in the industry not only at the wholesale, retail, and processing levels, but are also the main financiers of fishermen and other traders. She further notes that women play a crucial socially cohesive role in many fishing communities--a role that is particularly important in societies where the fishermen are migratory and absent from home for extended periods of time. Kotnik (1982) emphasizes the important role played by women in the small-scale fishery in Tombo, Sierra Leone. Programs which maintain this division of labor will probably encounter less resistance than programs which reduce the economic role of females. In many countries female processors and distributors have adapted to the industrialized fishery by purchasing frozen fish, smoking them, and distributing them through the traditional network. In part, this was made possible by the fact that cold stores are not as widespread as the traditional trade networks. Perhaps a larger contribution to this adaptation, however, was made by the fact that smoked fish plays a large role in traditional diets. Changes in traditional diets and/or increasing efficiency in the distribution of industrial catches may displace these women in the future. One very real threat to their future, however, is the fishermen's cooperative.

The fishermen's cooperative is given an important role in small-scale fishery development by most West African governments (Lanning and Hotta 1980). The fishermen's cooperative is often viewed as a technique for eliminating exploitation by middlemen. If this becomes the goal of the cooperative movement in West Africa, female fish processors and vendors could be displaced. In areas where fishermen are related to the middlemen, the movement would probably be resisted; but in other areas, the effects on a relatively large, economically productive sector of the population would be disastrous.

Some development programs (e.g., in Senegal and Sierra Leone) are coping with this potential problem by encouraging the establishment of women's marketing and processing cooperatives. In Sierra Leone the Tombo Women's Cooperative Society, founded in 1981, has increasing membership, significant savings, and is involved in the introduction of improved processing and marketing techniques (Kotnik 1982). One can only speculate concerning the disaster that would have followed an attempt to introduce a male-centered fishermen's marketing cooperative into this area. Such foolish attempts have been made in development programs in other areas in the past, and they still occasionally occur.

DISTRIBUTION OF WEALTH AND POWER The distribution of wealth and power differs within and between the various ethnic groups along the coast. Some societies are relatively egalitarian with little differences between individuals with respect to wealth and power. Other societies, with a tradition of hierarchical organization and social stratification, manifest marked variance with respect to access to wealth and power among individuals. Development programs targeted at helping the poorest of the poor must be differently structured in these different societies. In communities where there is differential access due to tradition, procedures should be developed which will equalize access without arousing resistance on the part of the traditional elite. This is not necessary in the more egalitarian societies.

Development projects may also have an effect on the distribution of wealth between ethnic groups in a single country's coastal region. For example, Lawson and Robinson (1983a) report that in Ghana different ethnic groups use specific gears and nets; e.g., the Ewe use beach seines, the Ga lines, and new entrants, Fanti, and Ga practice poly/ali netting. These same ethnic groups are reported to manifest similar differences in fishing in other places where they have migrated along the coast (e.g., Ivory Coast, see Berron 1977). Epler (1983) reports that in Guinea Bissau, the Manjaco use traps and nets but no boats; the Felupe use cast nets, longlines and dugouts, while the Senegalese migrant fishermen (Nhiominka) use nets and large motorized boats. In Liberia the Fanti migrant fishermen are full-time and use relatively large vessels with motors, while the local Kru, Grebo and a few Vai and Bassa are part-time fishermen who use small, unmotorized vessels (Akerle 1979). Finally, in Sierra Leone Krabacher (1983) reports that along the Sherbro Coast the modern "Ghanaian style" fishing technology is used almost exclusively by Temne who migrated from other areas of the country, while the local Sherbro fishermen use unmotorized dugout canoes which are smaller and employ fewer crew members. The Temne tend to be full-time fishermen, in contrast to the Sherbo who often practice small-scale farming. In these multi-ethnic settings changes which would improve or restrict the use of specific gears or types of fishing would thus differentially impact different ethnic groups--a result that could lead to or further exacerbate inter-group tensions.

SOCIAL ORGANIZATION OF WORK The traditional social organization of work varies from society to society and has great potential influence on the success of fishery development programs (cf. Pollnac 1982 & 1985). For

example, crew size, which is traditionally large in some West African societies (e.g., Ghana), can be influenced by technological changes. If technological improvements are made which can eliminate some crew members, there may be social forces which will keep the crew at its traditional level, thus reducing the efficiency of the new technology. This is especially true in areas where crew are usually kinsmen as in much of West Africa. For example, one report notes that the strength of the family structure has resulted in a preference for labor intensive systems in some regions (CECAF 1980). In these regions crews are reported to be about twice as large as necessary with only a little over one-half the crew working on a given day. Participants in these systems note that the procedure supplies an income to a maximum number of men of the "family." Introduction of changes which would reduce the numbers of crewmen in areas of scarce alternative employment would increase unemployment, a phenomena which has other negative implications such as increasing tendencies to move to urban areas.

In some regions (e.g., parts of Ghana and Ivory Coast), traditional systems of leadership once served (and in some cases still serve) to control and manage the fishery (CECAF 1980; Lawson 1980; Lawson and Robinson 1983a,b). Kapetsky (1981) reports that among these traditional controls one finds the setting of fishing seasons, control of entry to the occupation, gear regulations, and site and time allocation. Although these systems are decreasing in importance, an analysis of their past and present structures may be of use in designing systems of management that would be locally acceptable. In some cases it may be determined that the traditional system can be rejuvenated and used without alteration. It is important to note, however, that the influence of the "Chief Fisherman" declined along with the introduction of motorization due to the fact that motorized vessels can travel farther and land catches at sites where the traditional leader has little or no power. Recent evidence, however, suggests that the "Chief Fisherman" is once again playing an important role (Lawson and Robinson 1983a,b), but not without some problems (Lawson 1980).

Another aspect of the social organization of work which can be influenced by technological change in West Africa is the owner-worker relationship. In most of West Africa's small-scale fishing communities the owner is also a fisherman, and he usually uses kinsmen as crew members. As technology becomes more sophisticated and expensive, small-scale owner-operators are usually not in a position to be able to finance the new technology, and the number of non-fishermen owners increases. These new ownership patterns result in greater social stratification which can result in social unrest. Sometimes the new technology is rejected when fishermen foresee its potentially negative effects. These problems, where present, can be overcome through the use of financing techniques which will allow the industry to stay in the hands of traditional fishermen (e.g., producer cooperatives, subsidized loans from development banks, etc.).

BELIEF SYSTEMS Ideological systems often determine specific aspects of the types of development opportunities that will be acceptable to the target population (cf. Cochrane 1979). The belief systems vary

considerably among the ethnic groups fishing the coast of West Africa, and prior to project development, a preliminary assessment should be made of attitudes, beliefs, and values relevant to project parameters (cf. Pollnac 1976, 1982). Failure to account for these cultural differences can result in the failure of technologically well conceived projects. For example, Lawson and Robinson (1983a) write that in the period from 1952 to 1954 fishermen in a number of communities along the coast believed that motorized fishing vessels were not approved by the sea gods; thus, they feared the consequences of using motors, hindering their introduction for a brief period of time. Statistics show that mechanization overcame this obstacle, but other innovations lacking the immediate and clearly demonstrable economic benefits of mechanization may not be able to cope with this type of opposition.

DISTRIBUTION OF FISHERMEN IN RELATION TO INFRASTRUCTURE The present distribution of fishing communities along the West African coastline is adapted to existing technology and infrastructure (e.g., landing facilities, processing and distribution networks). Technological improvements, such as increased vessel size, may be restricted to areas with adequate facilities (as with the semi-industrial trawlers in Ghana). If the new technologies are so effective that they can respond more efficiently to demand, they may replace the older, less efficient technologies. Although this is desirable in most situations, these changes may result in underemployment in rural areas which lack adequate infrastructure (this includes most of the coastline) and stimulate increased rural to urban migration. Rural to urban migration is a factor recognized as having a negative impact on food production in Africa, and development programs should reverse, not exacerbate, this phenomena. Table 3 indicates that the level of rural to urban migration is already excessive in West Africa.

MOBILITY PATTERNS Some ethnic groups in West Africa are already well known for the geographic mobility of their fishermen (e.g., the Fanti and the Anglo (Ewe)). Other fishermen are not as extensively mobile, but many do migrate from area to area in response to availability of resources. Some migrate from fishing to farming areas depending on the season. These mobility patterns affect access to fishermen as well as development of adequate data gathering systems (e.g., as basic as determining the number of fishermen); thus, knowledge of the specific mobility patterns of different ethnic groups must be taken into account in designing fishery development programs. These migratory patterns also are important considerations for planning the development of processing and storage methods as well as the construction of feeder roads. Cold storage facilities, ice plants, and feeder roads may prove uneconomic in settlements where they will be utilized only during a brief fishing season (Brainerd 1983).

Another important aspect of mobility patterns is migration both in and out of the fishery. It has been noted that there is a tendency for people to drift in and out of artisanal fishing depending on the season and profits to be had from other occupations (CECAF 1980). Lawson (1980) reports that throughout the region fishermen tend to move from

the artisanal to the industrial fishery whenever the opportunity to do so arises. She attributes this to either better earnings or the attraction of the urban setting where most industrial fisheries are located. In Ghana, for example, migration of the young out of the artisanal fishery has resulted in a relatively high average age for artisanal fishermen (45 years). This contrasts with Senegal where the more remunerative fishery has attracted the young, resulting in a fishery where most participants are under thirty years of age (CECAF 1980). Studies need to be conducted throughout the region to assess factors contributing to movement in and out of the fishery, especially since this movement appears to be related to the more general problem of urbanization.

COMPETING DEMANDS OF FARMING AND FISHING Available data suggest that fishing is a seasonal occupation for about one-third of the fishermen in most West African countries. Depending on the region and traditional practices, they either prepare the land and/or plant during the planting season and fish when the agricultural work is completed. In some areas (e.g., as reported for Sierra Leone), the sowing season quite fortunately coincides with the slack fishing period. In others, such as the Ivory Coast (CECAF 1980), there is an age structure to fishing and farming. Young men fish using gear provided by older men who farm. The catch is shared with the older farmer, and as young fishermen become older, they eventually obtain fishing units of their own and inherit the elder's land. They then allow younger men to use their fishing gear under the same arrangement. Thus, fishing and farming is integrated by an age structured system. It is reported, however, that out-migration of the young to other occupations and urban areas is in the process of destroying this system (CECAF 1980).

Generally, it appears that fishermen from the more rural areas spend more time farming than those near or in more urban areas. Nevertheless, fishermen residing in towns are reported to practice some subsistence agriculture (e.g., in Guinea Bissau, Hochet 1979). There also appears to be a relationship between migrant status, scale of the technology (e.g., level of capital investment), and full-time fishing. In Liberia the Fanti migrants, who use larger scale technology, are the full-time fishermen in contrast to the local fishermen (Akerelé 1979). Likewise, along the Sherbro Coast of Sierra Leone the migrant Temne employ the more capital intensive gear full-time, while the local Sherbro use unmotorized dugouts and fish only part-time (Krabacher 1983).

Krabacher (1983) notes that in Sierra Leone full-time fishermen become closely tied to the purchase economy for food; thus, when shortages occur in the marketplace they do not have the farm or household gardens to fall back on that the part-time fishermen frequently rely on. He notes that this could result in a dietary disadvantage in areas subject to shortages--a phenomena that occurs frequently in West Africa. It is also important to note that changes in fishing patterns (e.g., fishing further out at sea) which will alter the seasonality of fishing may have a negative impact on the time devoted to agriculture. Twelve of the thirteen coastal countries (excluding Cape Verde) we are

concerned with here had negative average annual growth rates of total agricultural production per capita during the decade 1969-1979 (World Bank 1981). It is therefore suggested that prior to project implementation distributions of fisherman/farmer combinations be determined and analyses conducted to determine national impacts of proposed changes.

ADVANTAGES OF SMALL-SCALE FISHERY DEVELOPMENT

The small-scale marine fishery should be targeted for expansion for several reasons. First, the coastal areas and/or the immediate hinterland are the most densely populated in most of these countries, hence requiring shorter distribution chains for marine fish. Second, the small-scale fishery labor is intensive; it employs 250,000 fishermen plus the women, men, and children involved in the processing and distribution of the catch. Third, the small-scale fishery produces some 70 percent of the total marine production with fishermen distributed along the coast in both rural and urban areas, providing fish primarily for local consumption; thus, it does not contribute to the urbanization problem. Information presented by Everett (1979) expands the rationale for development of the small-scale fishery. He presents a comparison of costs and benefits of small-scale and industrial fishing development which was prepared by CIDA. His table is reproduced here (Table 4).

Table 4. Subjective Assessment of Benefits to Development of Small-scale Rather Than Industrial Fisheries

	Small-scale	Industrial
creates:	employment	unemployment
uses:	modest local investment	substantial foreign investment
are:	decentralized, in villages	centralized in towns
uses:	simple technology	complicated technology
exploits:	abundant coastal resources	poor offshore resources
produces:	high quality fresh fish	poorer quality stored fish
provides:	products for local markets	for export
consumes:	little energy	much energy
causes:	little pollution	substantial pollution
affects:	beneficially social habits	detrimentally social habits

Source: Everett (1979) adapted from an unpublished CIDA document.

Everett (1979) indicates that the overall benefits of the small-scale fishery in Table 4 are to a certain extent exaggerated, but admits that small-scale fisheries do deserve a high priority in fishery development. In some cases, e.g., fishing great depths or rough waters or supplying large urban areas or processing facilities, the industrial fishery is clearly more efficient. Jarrold and Everett (1978) conducted an economic and socio-political analysis of the returns of unmotorized

canoes (handliners) and semi-industrial handliners, purse seiners, and trawlers in Senegal. The analysis indicated that the semi-industrial trawler and purse seiner gave the most favorable returns in terms of overall benefits to the nation. In setting development priorities, however, factors such as these should be weighted in a cost benefit analysis to arrive at the best mixture for the country involved.

Another proponent of small-scale fisheries development, however, provides a persuasive argument against trawlers for Third World fisheries. Claireux (1985) supports the claim that the introduction of trawlers will exacerbate the urbanization problem because of the scarcity of harbors and adds some other considerations. He calculates that a 45-meter trawler which employs eighteen men costs as much as 300 diesel engine equipped dories which would employ 1,200 men and catch twice the amount of fish. The investment per trawler worker would be 33 times as high, and a single trawler's fuel consumption would be seven to ten times higher than the fuel consumed by the 300 dories. Finally, he makes the points that the trawler would probably be imported and difficult to maintain, and its harvest would be more likely to be exported.

Finally, Brainerd's analyses of motorization of small-scale fishing vessels in Senegal indicates that while the non-motorized canoe has the highest profit margin, its total profit is lower than the motorized canoe because of a smaller total catch. His analyses of motorized canoes with surrounding gill nets or purse seines indicates that both operations are economically viable (Brainerd 1984a).

Hence, canoe motorization can provide benefits to both the fishermen and the nation. It maintains employment in rural areas with a modest investment and increases both the income of the small fishermen and the supply of fresh fish. Further, semi-industrial vessels often need landing facilities found only in urban areas, thus resulting either in underemployment in the rural area or the migration of fishermen to urban centers. As noted elsewhere in this report, employment in rural areas is a positive factor due to the problems associated with increasing urbanization in Africa. Further, rural fishermen often grow at least some subsistence crops, thus contributing to the availability of plant food as well as animal protein in an area of the world suffering from food deficits.

These observations, in combination with the fact that percent of motorization is decreasing due to lack of foreign exchange, unavailability of replacement engines and spare parts and the high cost of petroleum products, suggests that something must be done to reverse this trend. The CECAF projects aimed at the re-introduction of sail technology (CECAF 1984) are important but cannot be considered as a total replacement for lost motor power. There will doubtless be an important role for sail powered vessels in the evolving small-scale fishery of West Africa, but motorization will also be required to enable the various nation states to replace growing fishery product imports with national production and to harvest a much larger share of the fish found off their coastlines.

SUMMARY AND CONCLUSIONS

The West African coastal countries discussed in this paper include some of the least developed countries in the world. Eight of the fourteen countries were classified as countries affected by abnormal food shortages throughout most of 1984. The number was only reduced to three at the end of 1984 (FAO 1985). Literacy rates and per capita GNP are exceptionally low. Over one-half of the countries had per capita GNPs of less than \$400 (U.S.) in 1983. In comparison with other less developed countries, overall population growth and infant mortality are high (Kent and Haub 1985). Urbanization is also increasing at an alarming rate, pulling people away from food producing activities in the countryside.

With respect to fish, we find that fish provide over 40 percent of total animal protein consumed in 12 of the 14 countries. In one of the two exceptions (Mauritania) fish is not part of the traditional diet, and in the other (Guinea Bissau) most fish captured is consumed near the landing places due to inadequate infrastructure for transporting it inland (CECAF 1984). Although the marine fishery is heavily exploited, it has not yet reached its potential, especially with respect to the coastal countries. Over one-half of the harvesting of these waters is accomplished by foreign fleets. That there is room for expansion of national production is evidenced by the fact that in the region as a whole 47 percent of the fish available for consumption was imported (average for 1979-1981), and intra-regional trade accounted for only about 15 percent of these imports. Paradoxically, much of the fish exported by these countries, as well as the fish caught by foreigners off West Africa, goes to developed countries where in some cases it is converted to pet and livestock feed. As Kent (1985) notes, this is fish which could feed needy people who reside in areas close to the fishery. He also suggests that foreign exchange earned by these exports is typically diverted to purchase luxury foods and other products in demand by elites rather than low cost nutritive food for the needy. For example, over half of Mauritania's relatively scarce foreign exchange which is devoted to food was spent on refined sugar imports in 1981.

In sum, the data indicate a need for the development of the small-scale fishery in West Africa. National production can be increased by reversing the trend indicating decreased motorization and by the re-introduction of sail power where appropriate. More efficient processing and distribution techniques could also lead to reduction of post-harvest losses, hence increasing fish available to consumers. All of these needs are recognized by fishery development experts as evidenced by ongoing projects in the region. The inputs into the area, however, do not seem to be sufficient. All inputs, however, would be more effectively utilized if the sociocultural diversity, as well as the commonalities, were adequately addressed in project design.

REFERENCES CITED

- Akerele, O.
1979 Women and the Fishing Industry in Liberia. ATRCW/SDD/79/04, United Nations Economic Commission for Africa.
- Berron, H.
1977 Ghanaian fishermen in Ivory Coast. Marit. Pol. Mgmt. 4:209-214.
- Brainerd, T. R.
1984a Lessons from Fisheries Development in West Africa: Artisanal Fisheries, Senegal. ICMRD Working Paper #13. Kingston, RI: ICMRD, URI.
1984b Lessons from Fisheries Development in West Africa: Artisanal Fisheries, Guinea Bissau. ICMRD Working Paper #12. Kingston, RI: ICMRD, URI.
1983 Some issues in the development of the artisanal fishery in West Africa. Paper prepared for presentation at the 26th Annual Meeting of the African Studies Association, Boston, December 1983.
- CECAF
1984 An Account of Some Recent Work with Small-Scale Fishery Development in the CECAF Region. CECAF/INT/81/014.
1980 Report of the Ad Hoc Working Group on Artisanal Fisheries. CECAF/TECH/80/28 (En): Dakar.
1979 La Peche au Togo et la Planification de son development. in Report of the Ad Hoc Working Group on Fishery Planning. CECAF/TECH/79/14 (En), Dakar.
- Christensen, J. B.
1982 Problems resulting from technological change; the case of the Fanti Fishermen in Ghana. in J. Maiolo & M. Orbach (eds.) Modernization and Marine Fisheries Policy. Ann Arbor, Mich.: Ann Arbor Science Publishers.
1977 Motor power and woman power: technological and economic change among the Fanti fishermen of Ghana. in M. Estellie Smith (ed.) Those Who Live From the Sea. New York: West Publishing Co.
- Claireaux, H.
1985 The dory and small-scale fishermen in the Third World. Marine Policy 9:250-252.
- Cochrane, G.
1979 The Cultural Appraisal of Development Projects. N.Y.: Praeger Publishers.

- Douglas, M.
1971 Is Matriliny Doomed in Africa? in Man in Africa (M. Douglas & P. Kaberry, eds.), Garden City: Anchor Books.
- Doyi, B. Anum
1984 Catalogue of Small-Scale Fishing Gear of Ghana. Rome: UNFAO.
- Epler, B.
1983 The fisheries of Guinea Bissau. ICMRD Working Paper #7. Kingston, RI: ICMRD, URI.
- Everett, G. V.
1984 An Overview of Current Development Trends in the CECAF Region. CECAF/TECH/84/58, Dakar.
1979 Some observations on small-scale fisheries in the CECAF Region. in Report of the Ad Hoc Working Group on Fishery Planning. CECAF/TECH/79/14/(En), Dakar.
- FAO (Food and Agricultural Organization of the United Nations)
1984 Yearbook of Fishery Statistics 1983 (Vol. 57). Rome: UNFAO.
1985 World Food Report 1985. Rome: UNFAO.
- Gladwin, H.
1970 Decision making in the Cape Coast (Fante) Fishing and Fish Marketing System. Ph.D. Dissertation, Stanford University.
- Hendrix, M. K.
1984 Technology and Tradition in West African Maritime Fisheries: Tombo, Sierra Leone. ICMRD Working Paper #8. Kingston, RI: ICMRD, URI.
- Hochet, A.
1979 Preliminary Socio-Economic Study for Small-scale Fisheries Project in The Region of Cacheu. (Manuscript, Guinea-Bissau).
- Jarrold, R. M. and G. V. Everett
1978 Formulation of alternative strategies for development of the marine fisheries in the CECAF Region. Paper prepared for the CIDA/FAO/CECAF Seminar on Fishery.
- Kent, G.
1985 Fisheries and undernutrition. Ecology of Food and Nutrition 16:281-294.
- Kent, M. M. and C. Haub
1985 1985 World Population Data Sheet. Washington, DC: Population Reference Bureau.

- Kapetsky, J. M.
1981 The Artisanal Fisheries of Coastal Lagoons and Estuaries in the CEEAF Region: Their Importance Relative to Other Fisheries and Some Considerations for their Management and Development. CEEAF/TECH/81/36, Dakar
- Kotnik, A.
1982 Women in Small-Scale Fisheries: The Case of Tombo Village, Sierra Leone. Contribution No. 2, Fisheries Pilot Project Tombo.

1981 A Demographic and Infrastructural Profile of the Tombo Fishing Village in Sierra Leone. Contribution No. 1, Fisheries Pilot Project Tombo.
- Krabacher, T. S.
1983 Fish, diet, and change along the Sherbro Coast of Sierra Leone. Paper prepared for presentation at the Annual Meetings of the Association of American Geographers, Denver, Colorado.
- Lamming, G. N. and M. Hotta
1980 Fishermen's Cooperative in West Africa. CEEAF/TECH/79/17 (En), Dakar.
- Lawson, R.
1980 Proposals to CEEAF for enhancing the development of small-scale fisheries in the region. Annex 3, CEEAF/TECH/80/28 (En): Dakar.
- Lawson, R. and M. A. Robinson
1983a The needs and possibilities for the management of canoe fisheries in the CEEAF region. CEEAF/TECH/83/47 (En): Dakar.

1983b Artisanal fisheries in West Africa. Marine Policy 7 (October): 279-290.
- Linsenmeyer, D. A.
1976 Economic Analysis of Alternative Strategies For the Development of Sierra Leone Marine Fisheries. Working Paper No. 18, Department of Agriculture Economics, Michigan State University.
- Mickelwait, D., C. Sweet, and E. R. Morse
1979 New Directions in Development: a Study of U.S. AID. Boulder: Westview Press.
- Moen, Eil
1983 Cured Fish: Market Patterns and Prospects. FAO Fisheries Technical Paper No. 233. Rome: UNFAO.

- Morris, M. D.
1979 Measuring the Condition of the World's Poor. New York: Pergamon Press.
- Morss, E. R., et al
1976 Strategies for Small Farmer Development (Two Volumes) Boulder: Westview Press.
- Murdock, G. P.
1959 Africa: Its Peoples and Their Culture History. New York: McGraw-Hill Book Co., Inc., 1959.
- Nukunya, G. K.
1969 Kinship and Marriage among the Anlo Ewe. London: Athlone Press.
- Poewe, K. O.
1978 Religion, Matriliney, and Change: Jehova's Witnesses and Seventh Day Adventists in Luapula, Zambia. American Ethnologist 5:303-321.
- Pollnac, R. B.
1985 Social and cultural characteristics in small-scale fisheries development. in (M. M. Cernea, Ed.) Putting People First: Sociological Variables in Rural Development. New York: Oxford University Press.
- 1982 Sociocultural aspects of technological and institutional change among small-scale fishermen. in (J. Maiolo & M. Orbach, eds.) Modernization and Marine Fisheries Policy. Ann Arbor: Ann Arbor Science Publishers.
- Pollnac, R. B. and J. Sutinen
1980 Economic, Social and Cultural Aspects of Stock Assessment for Tropical Small Scale Fisheries (Saul Saila and Phil Rodel, eds.) International Center for Marine Resource Development, University of Rhode Island.
- Posner, G. S.
1985 A Look at Africa: the fisheries sector. Unpublished Ms.
- Quinn, N.
1978 Do Mfantese Fish Sellers Estimate Probabilities in Their Heads? American Ethnologist 5: 206-226.
- Robinson, M. A. and A. Crispoldi
1984 Estimated Trade and Consumption of Fish and Fishery Products in the CEEAF Area. CEEAF/TECH/84/85, Dakar.
- Schwimmer, B.
1979 Market Structure and Social Organization in a Ghanaian Marketing System. American Ethnologist 6: 682-701.

- Simoons, F. J.
1974 Rejection of Fish as Human Food in Africa. Ecology of Food and Nutrition 3: 89-105
- Sutinen, J., R. Pollnac, and H. Josserand
1981 The Fisheries of West Africa and Prospects for Development. ICMRD Working Paper No. 6. Kingston, RI: I.C.M.R.D.
- U.S. Department of Agriculture
1980 Food Problems and Prospects in Sub-Saharan Africa.
- Welcomme, R. L. and J. K. Kapetsky
1981 Acadjas: The brush park fisheries of Benin, West Africa. ICLARM Newsletter 4 (No. 4):3-4.
- World Bank
1981 Accelerated Development in Subsaharan Africa. Washington, DC: The World Bank.