

BASELINE STUDIES OF SOME FISHING COMMUNITIES IN GHANA - A COMPARATIVE ASSESSMENT

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Abstract

The information gathered in this study was to serve as a baseline data for assessing the impact of the adoption of the Chorkor smoker - an improved fish smoking oven by selected fishing communities. Fourteen Ghanaian fishing communities were involved, and 12 or more women from each community constituted the respondents. The types of existing smoking ovens, fish smoking techniques/methods, fish marketing, profit margins, constraints, living conditions, health status and gender roles were assessed. Check lists, focus group discussions and on sight observations were applied in the collection of data. Techniques for fish smoking were similar in all the communities even though there were differences in the types of ovens and fish smoked. Most communities had circular or rectangular mud or metal ovens. Ovens in river fishing communities were smaller in capacity than those in the marine fishing areas. The sardinellas (*S. aurita* and *S. eba*) were the predominant fish smoked. Variable incomes were obtained and these were found to depend on season, market, fish quality, and scale of production. Literacy rate was low and sanitation was poor. Houses were built of cement blocks/bricks, mud, wood or cardboard. Pipe borne water was available in nine, electricity in seven, health posts in six and primary schools in 11 out of the 14 communities. The sub-urban fishing communities were found to be better off than rural fishing villages/communities.

Résumé

LOKKO PHOEBE & ANSON SALOME: *Etudes de base de quelques communautés de pêche au Ghana: Une estimation comparée.* L'information recueillie pendant cette étude, était de servir comme les données de base pour évaluer l'impact de l'adoption de l'enfumeur de Chorkor - un four de fumage de poisson amélioré utilisé par des communautés cibles de pêche. Quatorze communautés ghanéennes de pêche étaient concernées et douze ou plus de femmes de chaque communauté constituaient les personnes interrogées. Les types de four de fumage existant, les techniques/méthodes de fumage de poisson, la commercialisation de poisson, marges bénéficiaires, contraintes, conditions de vie, état sanitaire et les rôles des femmes et des hommes, étaient évalués. Liste de contrôle, discussions de groupe centrale et les observations sur place étaient appliquées dans le recueil de données. Processus pour le fumage de poisson était semblable dans toutes les communautés malgré le fait qu'il y avait des différences entre les types de fours et de poisson fumé. La plupart de communautés avaient des fours de terre ou de métal. Les fours des communautés de pêche fluviale étaient plus petits en capacité que dans les zones de pêche marine. Les sardinellas (*S. aurits* et *S. eba*) étaient les poissons fumés prédominants. Les revenus variable étaient obtenus et ceux-ci dépendaient de saison, marché, qualité de poisson et l'échelle de production. Le taux d'analphabétisme était bas et la condition sanitaire était pauvre. Les maisons étaient contruites de blocs/briques de ciment, terre, bois, ou carton. Sur les 14 communautés l'eau potable était disponible en 9, l'électricité en 7, postes médico-sociales en 6 et écoles primaires en 11. Les communautés suburbaines de pêche se montraient d'être dans une meilleure position que les communautés/villages ruraux de pêche.

Introduction

Smoking is a major method of fish processing and preservation in Ghana. It is estimated that 70-80 per cent of fish landed in Ghana is smoked (Reusse, 1968). The most successful improved oven to be constructed in Ghana is the Chorkor oven (Kagan, 1969). The Chorkor smoker consists of a rectangular clay oven made up of two compartments with a stoke hole in each compartment. A maximum of ten trays, constructed from framed wire nets, are stacked on the oven to form a chimney. Plywood is used as a covering. The Chorkor smoker has the advantage of being more efficient in its operation, having low fuel consumption and a large smoking capacity. It produces fine uniformly-smoked product (Brownell & Lopez, 1985). Fish has always been and will continue to be an important source of protein in the diet of Ghanaians. The demand for fish has escalated because of rapid population growth. This calls for maximum utilization of fish produced. Large quantities of fish catch landed in season calls for adequate facilities and expertise to handle and preserve the catch to avoid significant post-harvest losses.

The Ghana/Netherlands Regional Training and Applied Research Project on Artisanal Fish Processing in English Speaking African Countries (AFPP) extended the Chorkor smoker to 14 communities within a 10-year period. The project sought to contribute to the increased availability of and access to good quality fish products to rural populations. The project also sought to reduce post harvest losses in fisheries and to enhance the income position of the economic sector involved in artisanal fishery activities through improved fish preservation.

The communities that benefited from this extension project were Lekpongonor and Ahwiam (Anson, 1998), Mangotsonya and Ayetepa (Lokko, 1989), Tema U-Compound and Nungua (Lokko, 1990), New Galilea and Amanfro (Lokko & Dake, 1991), Langma (Lokko & Anson, 1992), Gbegbeise (Lokko & Anson, 1993), Chemuse (Lokko & Anson, 1994), Sakumono (Lokko &

Anson, 1995), Abia (Lokko & Anson, 1996), New Ningo (Lokko & Anson, 1997). A baseline study was carried out in each fishing community prior to the introduction of the Chorkor smoker. This was to establish baseline data for villages selected for the AFPP training course, which would be used for the future evaluation of the project. Important or relevant information gathered from the baseline studies is discussed in this paper.

Methodology

General organization

After 10 years, this paper looked at the baseline data of the 14 communities and assessed them. The paper compared the living conditions of these fishing communities, smoking ovens, traditional processing methods, the role of women in the fish processing industry and the profitability of the fish smoking business. The social and health status of the communities as a whole and the women fish smokers in particular were also considered.

Sample

The communities considered for the baseline studies were Ahwiam, Lekpongonor, Mangotsonya, Ayetepa, Tema U-Compound, Nungua, New Galilea, Amanfro, Langma, Gbegbeise, Chemuse, Sakumono, Abia and New Ningo. Tema U-Compound, Nungua, Gbegbeise, Chemuse and Sakumono were sub-urban communities. Ahwiam, Lekpongonor, Mangotsonya, Ayetepa, Langma and Abia were rural communities. New Galilea was a mushroom river fishing settlement and Amanfro was a settlement put up by government to resettle those displaced by the construction of the Weija Dam. New Ningo was a very big village. The criteria used for the choice of villages included distance from Accra, a fishing community with a heavy catch of fish, the Chorkor smoker should not have been formally introduced to the community and there should be the interest and willingness to adopt the new technology. Two hundred and thirty five women fish smokers were involved in the study in which at least 12 or more women

were from each community. These women were identified by their own communities as large-scale fish smokers and presented to the study team.

Data collection and analysis

Formal interviewing with a checklist based on the Participatory Rural Appraisal technique was adopted. Small focus group discussions were held with community leaders together with the women in the community for the community level data. Information on geographic location, demographic distribution of the population and the socioeconomic characteristics of the communities was collected. The household level data were collected from the fish smokers which included ethnic groupings, age and sex distribution of the population, economic activities, languages spoken, religious affiliations, literacy rate and health status. The economic activities covered mainly the fish smoking industry and other occupation of women, while the social conditions covered water supply, electricity, sewerage, schools and health resources.

There was careful revision of all information collected from the fishing communities within the 10-year period. Simple statistical tabulations (averages, percentages and crude point grading) were used in the analysis of the data collected to describe some of the salient characteristics of the fishing communities and the households. Data that could not be quantified were described.

Socioeconomic crude point grading of the social development (Rodriguez, 1995) based on three indicators - housing quality, sanitation and social amenities- was used in the assessment. Six crude points were awarded to each. In the area of housing, very poor dwelling houses were assigned either one or two points. Good housing received five or six points and a mixture of poor and good housing received four to five points. Sanitary state of the communities was assessed by observation. Specific good practices were awarded a point each. The social amenities in the communities were also graded. The presence of the following all scored a point each - pipe borne water, electricity, good drainage, toilets, schools and clin-

TABLE I
Demographic data of the fishing communities

| <i>Community</i> | <i>Year</i> | <i>Population*</i> | <i>Ethnicity</i> | <i>Region</i> | <i>Location from Accra</i> |
|------------------|-------------|--------------------|------------------|----------------|----------------------------|
| Ahwiam | 1988 | - | Dangme | Greater Accra | 69 km East |
| Lekpongkor | 1988 | - | " | " | 59 km East |
| Mangotsonya | 1989 | 871 | " | " | 60 km East |
| Ayetepa | 1989 | 1063 | " | " | 60 km East |
| Tema | 1990 | 2000 | Ewe | " | 22 km East |
| Nungua | 1990 | 1000 | Ga | " | 15 km East |
| New Galilea | 1991 | 1500 | Ga, Fante, Ada | Central Region | 15 km East |
| Amanfro | 1991 | 3500 | Hausa, Ewe, Ada | " | 15 km East |
| Langma | 1992 | 3000 | Ada, Ga | Greater Accra | 17 km East |
| Gbegbeise | 1993 | 5000 | Ga | " | 5 km East |
| Chemuse | 1994 | 3000 | Ga | " | 5 km East |
| Sakumono | 1995 | 3500 | Ada, Ewe, Akan | " | 18 km East |
| Abia | 1996 | 350 | Gbugbla | " | 55 km East |
| New Ningo | 1997 | 3600 | Dangme | " | 58 km East |

* Population figures from Ghana Statistical Services

TABLE 2
Crude point grading of social development of fishing communities

| Community | Housing score 6 points | Social amenities score 6 points | Sanitary score 6 points | Total maximum score 18 points |
|-------------|---------------------------|------------------------------------|----------------------------|----------------------------------|
| Ahwiam | 3 | 1 | 2 | 6 |
| Lekpongpor | 3 | 2 | 1 | 6 |
| Mangotsonya | 3 | 1 | 2 | 6 |
| Ayetepa | 3 | 1 | 2 | 6 |
| Tema | 1 | 4 | 1 | 6 |
| Nungua | 3 | 4 | 2 | 9 |
| New Galilea | 2 | 0 | 2 | 4 |
| Amanfro | 3 | 4 | 2 | 9 |
| Langma | 2 | 1 | 2 | 5 |
| Gbegbeise | 4 | 4 | 3 | 11 |
| Chemuse | 4 | 4 | 3 | 11 |
| Sakumono | 4 | 6 | 4 | 14 |
| Abia | 2 | 1 | 2 | 5 |
| New Ningo | 3 | 5 | 3 | 11 |

Housing score -1 = shacks and temporal structures; 6 = well-constructed houses with cement blocks or burnt bricks and aluminium or asbestos slates roof. Sanitary score - 6 = refuse disposal, clean environment, no human excreta, no stagnant water, no animal droppings, no free-roaming domestic animals. Social amenities score -6 = pipe borne water, electricity, schools, clinics, toilets and good drains.

ics. Thus the worst off communities had lower scores with higher scores for those which were relatively better off. The socioeconomic score was used to compare the conditions of the 14 communities.

Results

The fishing communities - demographic data

All the 14 fishing communities were situated in the Accra coastal plains of gently undulating grassland dotted with thorn shrubs and isolated thickets of neem trees. The land was flat with shallow or no streams flowing. The soil was loamy and suitable for growing vegetable. It was hot throughout the year with average temperature of 30°C. Relatively cooler temperatures were experienced during the rainy season. The major rainy season was between May and July each year while the minor season was from September to Novem-

ber. The hot dry season was from December to March and it corresponded to the lean fishing season. The main occupation was fishing. Fishing on Tuesdays was prohibited in all study areas. There was no farming activity at Gbegbeise, Tema U-compound and Chemuse because of the absence of farming land. There was a mix of religious activities in these fishing communities. The three main religions were Christian, traditional and Islamic. There were several festivals depending on the ethnicity of the population. The most common was the Homowo festival of the Ga-Adangmes. Table 1 shows the demographic data of the target fishing communities.

Social development

Three main types of houses were identified in the fishing communities. The first types of houses were found mainly in Chemuse, Gbegbeise,

Amanfro and Sakumono. These were very well constructed houses of cement blocks or bricks with either metal or asbestos roofing, with wooden windows and doors. Then there were houses built of mud having thatch roof, with small wooden windows and doors. These types of houses were found mainly in the rural setting in Lekpongunor, Mangotsonya, Ayetepa Ahwiam and Langma. The third group of houses was the wooden shacks and temporal structures found mainly in Tema U-compound, New Galilea and Abia. Social development indicators (Table 2) showed that Gbegbeise, Chemuse and Sakumono had the highest housing score of 4 points out of 6. Tema U-Compound, Abia and New Galilea obtained the lowest points of 1 out of 6.

bushes are sometimes used as places of convenience. Tema U-Compound and Lekpongunor had the lowest score of zero out of the total score of 6 points. Sakumono and New Ningo obtained the highest scores of 3 points each.

Pipe borne water and electricity were available in nine and seven communities, respectively, out of the 14 communities; clinics and health posts in six out of 14 communities; primary schools in 11 communities and inadequate or total absence of toilets in 13 communities. Only Sakumono had good drainage and toilet facilities.

The social development indicators showed Sakumono, New Ningo, Gbegbeise and Chemuse, all sub-urban communities, scoring the highest total crude points of 14, 11, 11 and 11, respec-

TABLE 3
Demographic data on selected women respondents

| <i>Community</i> | <i>Year</i> | <i>No. of women</i> | <i>Average age</i> | <i>Ethnicity</i> | <i>Per cent educated</i> | <i>Per cent married</i> | <i>Average No. of children</i> | <i>Other occupation</i> |
|------------------|-------------|---------------------|--------------------|------------------|--------------------------|-------------------------|--------------------------------|-------------------------|
| Ahwiam | 1988 | 12 | 15 ± 12 | Dangme | None | 85 | 7 | - |
| Lekpongnor | 1988 | 12 | 47 ± 14 | " | None | 90 | 8 | - |
| Mangotsonya | 1989 | 12 | 54 ± 10 | " | None | 92 | 6 | Farming |
| Ayetepa | 1989 | 17 | 48 ± 14 | " | None | 82 | 6 | - |
| Tema | 1990 | 12 | 46 ± 15 | Ewe | None | 67 | 7 | - |
| Nungua | 1990 | 12 | 43 ± 12 | Ga | None | 75 | 8 | - |
| New Galilea | 1991 | 12 | 37 ± 10 | Ada | None | 75 | 8 | Farming |
| Amanfro | 1991 | 12 | 46 ± 12 | Ewe | None | 92 | 7 | Trading |
| Langma | 1992 | 30 | 45 ± 11 | Ada, Ga | 3 | 83 | 7 | Farming |
| Gbegbeise | 1993 | 30 | 42 ± 16 | Ga | 3 | 50 | 7 | Trading |
| Chemuse | 1994 | 20 | 48 ± 12 | Ga | 27 | 75 | 5 | Trading |
| Sakumono | 1995 | 14 | 36 ± 16 | Ewe, Ada | 14 | 100 | 4 | Farming |
| Abia | 1996 | 20 | 40 ± 16, | Gbugbla | 15 | 100 | 5 | Farming |
| New Ningo | 1997 | 17 | 47 ± 12 | Dangme | 24 | 100 | 7 | Farming |

Sanitary conditions were very poor in all the communities. Free running domestic animals contributed to insanitary conditions in these communities. There were no drains to carry waste water and refuse was thrown directly unto the beaches or in the surrounding bushes. The beaches and

actively, out of total social indicator points of 18, whilst Abia, Langma and New Galilea scored the lowest with 5, 5 and 4 points each, respectively.

The main health problem in the communities was malaria followed by cough and colds. Diet related diseases such as hypertension, obesity

and heart disease were found to be more common in sub-urban fishing communities than in the typical fishing villages.

Fish processing and related activities

Role of women. Information on fish processing and related activities was collected from large-scale women fish smokers. Table 3 shows the demographic data on the selected women. Fish smoking was the main processing activity in all the fishing communities, and the main actors in the handling, processing and marketing of fresh and processed fish were the women. They participated in other occupations such as farming, food vending and sand winning during the lean season. Although the women were healthy, there was a general complaint about waist pains and eye problems believed to be as a result of the fish smoking.

The birth rate was high. The average number of children per respondent was eight in Lekpongunor, Nungua and New Galilea and seven in Ahwiam, Amanfro Langma, Gbegbeise and Chemuse. Sakumono had the lowest average number of four children per respondent. Literacy rate, on the other hand, was very low. All 89 respondents from 1988 to 1991 were illiterates. Of the 60 women from Langma and Gbegbeise, only 6 per cent had formal education up to the primary level. Chemuse, New Ningo, Abia and Sakumono had 27, 24, 15, and 14 per cent, respectively, of their respondents with primary school education. Of the sample interviewed, 83 per cent were married. The rest of the respondents were either single or widowed. The respondents came from five ethnic groups, which were Dangme, Ewe, Ga, Ada and Gbugbla. The lowest average age was 36 ± 14 years at Sakumono whilst the highest average age of 54 ± 10 years was at Mangotsonya.

Smoking ovens. The circular and rectangular mud and circular metal ovens were in use in all the communities except the Tema U-Compound where only the rectangular metal ovens were in use. The sizes of the mud ovens found in New Galilea and Amanfro, the two fresh-water fishing villages were

very much reduced because of the smaller catch compared to marine fishing. In Gbegbeise and Chemuse, some Chorkor Smokers were in use. The Chorkor smokers found in Gbegbeise and Chemuse were wrongly copied. The ovens were very low with very large stoke holes and heat was lost during smoking. Rain and hot weather contributed to the deterioration of the mud ovens whilst the metal ovens rusted very quickly from the sea breeze. The women in general preferred the metal ovens to the mud ones although the metal ovens were more expensive, difficult to maintain, had poor insulation and constant attention was needed during smoking for good results. The metal ovens, however, could easily be moved around or relocated.

Fish processing. The women were all experts in their chosen field of fish smoking. The smoked fish were observed to be of good quality with good colour and firmness in all the communities. The women smoked almost all the fish purchased from the fishermen. Hot smoking was carried out in all the communities except in Tema U-Compound where smaller fish such as sardines and anchovies were dry smoked. The smoked fish could be stored up to 6 months in special storage structures (Nerquaye-Tetteh & Plahar, 1992). The smoking activity increased from July to December, when a lot of smoked fish was stored and then sold in the lean season from January to May. Fish was also dried, salted and fermented in Mangotsonya, Ayetepa and Langma on a smaller scale. Dry salted tilapia (koobi) was prepared in Amanfro and New Galilea.

Economic evaluation of fish smoking activities

Marketing of smoked fish. All the respondents in the study areas agreed that market for fish was readily available. The women sometimes had to travel long distances in order to sell their fish. Some of the main marketing centres were Accra, Tema, Mamprobi, Ningo, Agboghloshie and Dodowa, all in the Greater Accra Region of Ghana. Other areas were Koforidua, Suhum, Asamankese in the Eastern Region, and Akatsi and Keta in the

Volta Region. Thus, the respondents did not explore markets in the Greater Accra Region only but studied the price trends at the various markets in the country in order to identify which market to visit at a particular time.

Incomes and profits. Incomes and profits from fish sales varied from woman to woman. Income was found to be dependent on the season, the market, the quality of fish and the scale of operation. Under unfavourable conditions, i.e. during peak fishing season or periods of glut from August to November, profit margins were between 20 to 40 per cent. During the lean season or times of fish scarcity, profits were always well over 100 per cent in the entire marine fishing communities. Profits were higher in the fresh-water fishing areas of Amanfro and New Galilea than in the marine fishing areas as consumers paid more for fresh water fish than marine fish.

Constraints to effective operation

There was lack of storage facilities during handling, marketing and distribution of smoked fish. Therefore, the fish landed must be quickly processed and sold to prevent post harvest losses.

Some common problems raised by the women were high fuel consumption for smoking, lack of improved technology to reduce drudgery, lack of credit facilities, low incomes and various health conditions.

Marketing of the processed fish was also beset with problems. Among the problems reported by the respondents were high cost of transportation, high charges of market tolls, involvement of agents in the sale of processed fish and default in payment for fish supplied on credit.

Other problems further identified from the study were low capacity smoking ovens, long smoking times, high cost of fuel, high cost of inputs, unprotected ovens (from the rain), very poor sanitary conditions, the high illiteracy rate among the women and the absence of women's groups. These problems were common to other fishing communities in Africa such as Nigeria (Akande & Oladosu, 1996), The Gambia (Kanyi & Njie, 1996) and Cameroun (Ngo Som, 1997).

Conclusion

Women were found to be very active in artisanal fishery in Ghana. Virtually all processing and marketing of the fish landed by Ghanaian fishermen were carried out by female members. The baseline data gathered from the different fishing communities over the years were quite similar. This was not surprising because fisher folk in Ghana travel to other fishing areas where they resided and worked. The baseline study of some fishing villages revealed constraints and problems facing the village community as well as the fish smoking industry. The sub-urban fishing communities were found to be better off than the typical fishing villages. It is hoped that the introduction of the Chorkor smoker would remedy some of the problems identified.

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