

Extension contact and professional competencies needed by extension agents in the Central Region of Ghana for effective transfer of fish-processing technologies to small-scale women in fish processing

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ABSTRACT

This study assessed the current status of agricultural information support to women in small-scale fish smoking in the Central Region of Ghana. It also determined the competencies needed by extension agents for effective technology delivery in fish processing. The study involved 46 extension agents and 150 women fish processors in the study area. Descriptive statistics were used in the data analysis. The results showed that information and training support for fish processors in the region were inadequate. The extension staff as well as funds and other resources (e.g., training materials) were inadequate to make the extension work effective, despite the conclusion that extension agents in the coastal districts had positive attitude to work with fish processors. The degree of adoption of recommended fish-processing practices by fish processors in the Central Region ranged between slight to moderate only (2–3.5 on a 5-point Likert scale). The areas where relatively higher levels of adoption were recorded were more technical (e.g., the construction and use of Chorkor ovens and smoking trays) as opposed to the management-related skills such as financial management, credit acquisition, workings of cooperatives, and time management. Extension agents in the coastal districts of the Central Region indicated medium to high needs for expertise in the management-related skills in fish processing. These were financial management, hygienic handling of wet fish, management of storage pests, credit acquisition, workings of cooperatives, storage of wet fish, group dynamics, and record keeping.

RÉSUMÉ

OKORLEY, E. L., KWARTENG, J. A. & ANNOR-FREMPONG, F. K.: *Contact de vulgarisation et les compétences professionnelles exigées par les vulgarisateurs dans la région centrale du Ghana pour le transfert efficace des technologies de traitement de poisson aux femmes peu importantes dans le traitement de poisson.* Cet étude évaluait l'état actuel du soutien d'information agricole aux femmes dans le fumage de poisson peu important dans la région centrale du Ghana. Il déterminait également les compétences exigées par les vulgarisateurs pour la livraison efficace de technologie de traitement de poisson. L'étude entraînait 46 vulgarisateurs et 150 femmes transformatrices de poisson dans la zone de l'étude. Les statistiques descriptives étaient utilisées dans l'analyse de données. Les résultats montraient que l'information et le soutien de formation pour les transformateurs de poisson dans la région sont inadéquates. Il y a l'insuffisance de vulgarisateurs, de fonds et d'autres ressources (ex. les matières de formation) pour rendre le travail de vulgarisateurs efficace malgré la conclusion que les vulgarisateurs dans les districts côtiers ont l'attitude positive de travailler avec les transformateurs de poisson. Le niveau d'adoption de pratiques conseillées pour le traitement de poisson par les transformateurs de poisson dans la région centrale variait entre petit et moyen seulement (2-3.5 sur la graduation Likert de 5-point). Les zones où les niveaux d'adoption relativement plus élevés étaient enregistrés étaient plus techniques (ex. la construction et utilisation de four de Chorkor et de plateau de fumage) par opposition aux compétences liées à la gestion telles que la gestion financière, acquisition de crédit, rouages de coopératives et économie de temps. Les vulgarisateurs de districts côtiers de région centrale indiquaient les besoins entre moyen et élevé pour la connaissance et les compétences dans les compétences liées à la gestion de traitement de poisson. Elles sont la gestion financière, manement hygiénique de poisson frais,

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Introduction

The Population Census Data (1984) indicate that 53 per cent of the people in agriculture in the Central Region of Ghana are women. One very important agro-enterprise in the region is fish processing. Fishing, which is one of the important industries in the region, provides employment for most of the coastal dwellers. Most people in the enterprise are women who are involved in the processing and preservation of fish.

There is now a growing concern that priority should be given to the food-processing industry in Ghana. One reason is that export earnings from this industry is substantial. For example, in 1994, export earnings from fish and seafood were \$11.4 million US dollars (Adam, 1994). There is also the argument that, despite the country's insufficiency in food production, several tonnes of agricultural food produce are wasted through post-harvest losses. For example, it is estimated that about 100,000 t of fish go to waste annually in Ghana through bad handling and unhygienic treatment, as well as the absence of improved technologies for preserving and processing fish (Mensah, 1997). It is, therefore, very important for Agricultural Extension Services to concentrate their efforts on helping the fish-processing industry in the region to survive.

With the current high demand for high quality processed fish for the domestic and export markets, it is necessary to determine the current state of information and training support provided by extension services to these agro-processors. This will enable proper planning and design of remedial extension activities for the fisheries sub-sector in Ghana.

The development of fish-processing technologies entails training which ensures that extension agents acquire the needed competencies to improve their effectiveness.

contrôle d'insectes ravageurs de stockage, acquisition de crédit, rouages de coopératives, stockage de poisson frais, la dynamique de groupe et l'enregistrement d'information.

Hurtling (1974) indicated that the required competencies can be identified and educational programmes conceived for participants to develop them. Results of a study by Gholamreza (1993) suggest that almost all the professional competencies should be learned or developed after extension agents are employed. This will require an articulated continuing education programme which addresses the specific professional needs of agents. Need assessment of this kind serves as a tool that minimizes risk and paints the picture needed by programme planners to ensure relevancy.

The overall purpose of the study was to assess the current status of agricultural information support to women processing fish in the Central Region of Ghana. The specific objectives of the study were as follows: to determine the status of agricultural extension education being provided to fish processors based on the perceptions of agricultural extension agents (AEAs) in the coastal districts of the Central Region; to examine the perceptions of AEAs about working with women in agro-processing; to identify technologies transferred by AEAs to fish processors in the region; to assess the adoption of recommended fish-processing technologies by the fish processors; and to determine the competencies needed by AEAs in the Central Region for effective transfer of fish-processing technologies.

Methodology

A descriptive survey was used for the study. The study investigated the production constraints and training needs of selected women fish processors (based on fishing intensity) in fishing towns along the coastal strip of the Central Region of Ghana. The Region covers a total land area of about 9,826 km², with about 3,144 km² under cultivation and

borders the Atlantic Ocean to the South. It has a population of about 1,114,233 with about 690,000 being in agriculture (Population Census Data, 1984). Farming and fishing are the main occupation of the inhabitants.

A stratified random sample, based on the scale and the extent of fishing, was used to select 150 women fish processors from the five districts of the Central Region of Ghana. These were the Komenda-Edina-Eguafo-Abrem (KEEA), Cape Coast, Mfantiman, Gomoa and Ewutu-Efutu-Senya Districts. Through consultations with the District Agricultural Extension and Fisheries Departments, key informants who were themselves women fish processors were identified and selected for focus group discussions. The informants comprised leaders of co-operatives and representatives of fish processors, and active fish processors as judged by the Fisheries Department. In addition, each of the 46 AEAs in the five selected districts were given a questionnaire to complete for the study. Validated questionnaires were developed and used for data collection. A participatory approach was used in the group discussions to generate the qualitative information. Descriptive statistics involving the use of means, percentages, frequencies, and standard deviations were used in describing and summarizing the nominal data. All differences were tested at $P < 0.05$.

Results and discussion

Extension contact and training as reported by fish processors

The study showed that 21 per cent of fish processors were aware of extension agents in their area. Ten per cent of the fish processors indicated that they had contacts with extension agents. Out of this contact group, 6 per cent claimed to have actually had some training in fish processing from extension agents. Many of the women (77.3 %) said they got their information from other fish processors. Twenty-one per cent of the fish processors indicated that their source of information on fish processing was the Department of Fisheries of Ministry of Food and Agriculture (MOFA). Eighty-seven per cent of the fish processors, however, expressed the desire to have extension contact (Table 1).

Extension contact and training as reported by extension agents (AEAs)

The study showed that 65 per cent of extension agents had some contact with women agro-processors, while only 47.5 per cent of them visited the fish processors. Ninety-two and a half per cent of AEAs expressed their willingness to work with women in fish processing. All the AEAs indicated that they had gone through some training in fish processing. Eighty-seven and a half per cent also indicated that they had attended

TABLE 1

Extension Contact and Training as Reported by Fish Processors

| <i>Parameter</i> | <i>Frequency</i> | <i>Percent</i> |
|---|------------------|----------------|
| Women who were aware of extension agents in their area | 32 | 21.3 |
| Women in contact with extension agents | 15 | 10.0 |
| Women who have had some extension training | 9 | 6.0 |
| Other sources of information other than the Extension Department of MOFA: | | |
| - Other fish processors | 116 | 77.3 |
| - Fisheries Department of MOFA | 32 | 21.3 |
| - Self (personal experience) | 2 | 1.4 |
| Women who wanted to have contact with extension agents | 130 | 86.7 |

$n = 150$

between one and three training programmes in fish processing. This number of training programmes is inadequate for effective extension work in fish processing. Okafor *et al.* (1989) argued that a planned staff development programme administered through continuous in-service training provides the change agent with an opportunity to develop a sense of purpose and commitment to duty, to broaden his perception and understanding of clientele and the socio-cultural environment, and to improve skills as well as gain more knowledge and mastery of field, teaching techniques and processes.

The results showed that 47.5 per cent of extension agents claimed to have visited fish processors (Table 1). This was rather on the higher side when compared with the 10 per cent of women who claimed to have been in contact with extension agents (Table 2). These results make sense because the number of extension agents in the study area was few (46). This has been a chronic problem of agricultural extension in Africa. The extension agent: farmer ratio in Africa is estimated at 1:1,800 (Swanson, Farmer & Bahal, 1990). It is, therefore, not surprising that 47.5 per cent (19) AEAs could only contact 10 per cent of the fish processors.

The extent to which a farmer is aware of, and in contact with the MOFA and its extension agents is usually a general indicator of the level of success of that farmer. From the analysis so far, the results

imply that extension work with fish processors in the Central Region of Ghana is inadequate. It is, therefore, not surprising that the heads of the Departments of Agricultural Extension, Women in Agricultural Development (WIAD), and Fisheries gave the perceived success rates of their activities with fish processors as between 31-40, 21-30, and 21-30 per cent, respectively.

The reasons given as possible explanation for the low success rates of the extension activities of the Departments of Agricultural Extension, WIAD, and Fisheries were as follows:

- (i) Inadequate number of staff to reach fish processors. For example, only two technical personnel were responsible for all WIAD activities in the whole Central Region. There were no WIAD representatives or development officers at the district level.
- (ii) Financial constraints (inadequate budgetary allocation from government).
- (iii) Inadequate material support (input and training materials needed to support the technologies).
- (iv) Conservativeness of fish processors.
- (v) Inadequate and/or untimely credit facilities for fish processors, making adoption of some technologies difficult (e.g., use of Chorkor Smoker).
- (vi) Mistrust and suspicion among fish processors about the relevance of

TABLE 2

Extension Contact and Training as Reported by Extension Agents (AEAs)

| <i>Parameter</i> | <i>Frequency</i> | <i>Percent</i> |
|---|------------------|----------------|
| AEAs who had ever worked with women agro-processors | 26 | 65.0 |
| AEAs who were contacting fish processors | 19 | 47.5 |
| AEAs who would like to work with women in fish processing | 37 | 92.5 |
| AEAs who have had some training in fish processing | | |
| 1 - 3 times | 35 | 87.5 |
| 4 - 6 times | 5 | 12.5 |

n = 40

cooperatives, thus making activities of cooperatives ineffective.

- (vii) Uncoordinated activities of government agencies (WIAD, Agricultural Extension and Fisheries), and some non-governmental organizations (e.g., 31st December Women's Movement and World Vision International, Ghana).

Perception of AEs about women fish processors

The results in Table 3 show that most AEs (65 %) in the study disagreed that women should be advised by female AEs only. They did not see anything wrong with male AEs teaching women fish processors. As to whether women processors would or would not like male AEs teaching them, about 22.5 per cent were uncertain; and so they "somewhat agreed" that women fish processors would not like male AEs to teach them. About 52 per cent disagreed with the notion that women fish processors would not like male AEs, whereas 20 per cent of the extension agents opined that male AEs cannot successfully teach women fish processing skills. Majority of them (60 %) agreed that male AEs can successfully teach the women.

This trend suggests that both fish processors

and AEs generally agree with the propriety of male AEs teaching female fish processors. Consequently, the extension agent and the women fish processors are in the right framework to work as partners.

Technologies transferred to women fish processors by AEs and the level of adoption

Table 4 shows that many of the AEs in contact with fish processors have had some training in the following areas of fish processing: construction of Chorkor Smoker (oven) (73.7%), construction of smoking trays (68.4%); use of Chorkor Smoker (oven) (84.2%), maintenance of Chorkor Smoker (63.2%), and use of smoking trays (78.9%). The rest were maintenance of smoking trays (68.4%), proper or hygienic handling of wet fish (63.2%), fish-processing techniques (68.4%), and record keeping (73.7%).

The results further showed that for the subject areas in fish processing where AEs had been trained, a corresponding large number of AEs had imparted the knowledge or skill to fish processors (Table 4).

Another observation was that in subject areas where more extension agents had been trained, the degrees of adoption of the information by the fish processors were relatively higher. This implies that if more extension agents are trained in fish

TABLE 3

Perception of AEs about Women Fish Processors

| <i>Perception</i> | <i>Frequency of degree of agreement/disagreement*</i> | | | | | <i>Mean</i> | <i>SD</i> |
|---|---|--------------|-------------|--------------|--------------|-------------|-----------|
| | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> | | |
| Advising women should be done by female AEs only | 9 (22.5) | 17 (42.5) | 1 (2.0) | 3 (7.0) | 10 (25.0) | 2.70 | 1.54 |
| It is inappropriate for male AEA to teach women fish processors | 8 (20.0) | 16 (40.0) | 3 (7.0) | 6 (15.0) | 7 (17.5) | 2.70 | 1.42 |
| Women processors would not like male AEs to teach them | 6 (15.0) | 15 (37.5) | 9 (22.5) | 8 (20.0) | 2 (5.0) | 2.65 | 1.23 |
| Male AEs can successfully teach women fish processors | 1 (2.5) | 7 (17.5) | 8 (20.0) | 12 (30.0) | 12 (30.0) | 3.68 | 1.16 |

*Scale: 1=strongly disagree, 2=disagree, 3=somewhat agree, 4=agree, 5=strongly agree. Numbers in "()" are in percentages. (n=40)

TABLE 4

Technologies Transferred to Women Fish Processors by AEAs and the Level of Adoption (As Reported by AEAs)

| Training areas | AEAs who have had some training (n=19) | | AEAs who have taught women fish processors (n=19) | | Degree of adoption by fish processors Mean* |
|--------------------------------|--|------|---|------|--|
| | Freq. | (%) | Freq. | (%) | |
| Construction of Chorkor Smoker | 14 | 73.7 | 16 | 84.2 | 3.5 |
| Construction of smoking trays | 13 | 68.4 | 15 | 78.9 | 3.1 |
| Use of Chorkor Smoker | 16 | 84.2 | 15 | 78.9 | 3.5 |
| Maintenance of Chorkor Smoker | 12 | 63.2 | 15 | 78.9 | 2.9 |
| Use of smoking trays | 15 | 78.9 | 15 | 78.9 | 3.1 |
| Maintenance of smoking trays | 13 | 68.4 | 12 | 63.2 | 2.9 |
| Hygienic handling of wet fish | 12 | 63.2 | 10 | 52.6 | 3.3 |
| Processing techniques | 13 | 68.4 | 15 | 78.9 | 3.4 |
| Storage of wet fish | 8 | 42.1 | 9 | 47.4 | 2.3 |
| Management of storage pests | 6 | 31.6 | 10 | 52.6 | 3.0 |
| Marketing strategies | 4 | 21.1 | 5 | 26.3 | 3.0 |
| Fish packaging | 6 | 31.6 | 7 | 36.8 | 2.6 |
| Record keeping | 14 | 73.7 | 14 | 73.7 | 2.3 |
| Time management | 3 | 15.8 | 8 | 42.1 | 2.2 |
| Workings of co-operatives | 9 | 47.4 | 16 | 84.2 | 2.6 |
| Credit acquisition | 5 | 26.3 | 14 | 73.7 | 2.6 |
| Financial management | 4 | 21.1 | 8 | 42.1 | 2.3 |

Means* were calculated on the basis of a five-point Likert scale: 1=not using at all, 2=slight usage, 3=moderate usage, 4=high usage, 5=very high usage. (n=150 fish processors)

processing, a corresponding large number of AEAs may transfer the information to the fish processors, and consequently more processors may use the information.

This supports Arnon's (1981) assertion that the extension agent is a professional on his own and as such needs to be competent in certain fields if he is to carry out assigned roles effectively (Arnon, 1981). He emphasised the need for all extension services to have sufficient number of trained people who understand the new technologies developed by research, and can demonstrate these new practices to the best of their ability to ensure that farmers would benefit.

From the results (Table 4), it can be observed that the degree of adoption of fish-processing practices ranged from slight to moderate. The exception was the construction and use of Chorkor

Smoker (oven) which registered relatively higher adoption. This relatively low level of adoption of fish-processing technologies by women fish processors could be because the fish processors were not receiving adequate training from trained and competent extension agents.

Concerning the AEAs competence, it was observed (Table 4) that in the area of operations of cooperatives and credit acquisition (84.2 and 73.7 %, respectively), many AEAs managed to share information with the processors, but the degree of adoption of the practices by the fish processors was relatively low (2.6 on a 5-point Likert scale in each case). One possible explanation for this anomaly could be that since only few AEAs had had training on workings of cooperatives and credit acquisition (i.e., 47.4 and 26.3 %, respectively), probably majority of those

who taught the women were incompetent in those subject areas. Hence, their desire for higher competence in those training areas (Table 5).

AEAs' perceived competency needs in specific training areas in the coastal districts of the Central Region

The results clearly point out that agricultural extension has a big task to perform if it is to make significant impact on the lives of fish processors whose processing technologies ranged between slight and medium (Table 4). This requires the training of AEAs in specific skills and knowledge needed in fish processing to make them competent and confident to deal with the fish processors.

TABLE 5

Ranking of AEAs' Perceived Competency Needed in Specific Training Areas in the Coastal Central Region

| <i>Competency area</i> | <i>Mean competence level</i> | <i>Standard deviation</i> |
|--|------------------------------|---------------------------|
| Financial management | 4.25 | 0.90 |
| Hygienic handling of wet fish | 4.08 | 1.16 |
| Management of storage pests | 4.05 | 1.06 |
| Use of variety of teaching methods | 4.03 | 0.97 |
| Credit acquisition | 3.95 | 1.04 |
| Time management | 3.93 | 1.01 |
| Workings of co-operatives | 3.90 | 1.06 |
| Techniques in determining needs | 3.90 | 1.08 |
| Marketing strategies | 3.90 | 1.13 |
| Storage of wet fish | 3.90 | 1.22 |
| Group dynamics | 3.83 | 0.90 |
| Record keeping | 3.80 | 1.32 |
| Construction of Chorkor Smoker (oven) | 3.73 | 1.01 |
| Use of Chorkor Smoker (oven) | 3.73 | 1.15 |
| Maintenance of Chorkor Smoker (oven) | 3.73 | 1.22 |
| Processing techniques | 3.70 | 1.14 |
| Fish packaging | 3.63 | 1.13 |
| Construction of smoking trays | 3.60 | 0.98 |
| Use of smoking trays | 3.60 | 1.17 |
| Maintenance of smoking trays | 3.60 | 1.28 |
| Developing good working relationship | 3.55 | 1.09 |

Scale:1=none needed, 2=low level needed, 3=medium level needed, 4= high level needed, 5= very high level needed. (n = 40)

According to Youdeowei & Kwarteng (1995), training is useful only when it is designed to meet training needs, and is offered to people who will benefit from it. They defined training needs as the competence that must be acquired by people to enable them perform their jobs at the optimal level.

Table 5 indicates that AEAs in the coastal district of the Central Region need more than medium level of competence in all the training areas. The results in Table 5 also showed some similarities when compared with those in Table 4. It was observed that the competency areas needed by most of the AEAs were the areas they had little training in; therefore, not much was transferred to fish processors.

Financial management, proper handling of wet fish (hygiene), management of storage pests, credit acquisition, workings of co-operatives, storage of wet fish, group dynamics, and record keeping were the areas where AEAs needed more training (Table 5). The competency areas mentioned were not different from what was found in the lower-half of Table 4 where AEAs who had had training were few and consequently the degree of adoption of the technologies was low.

Therefore, as a matter of urgency and priority, it is very important that AEAs in the coastal district of the Central Region be trained properly in the areas where their competencies are lower. This will enable them to acquire the necessary competence and confidence as early as possible to visit and train more fish processors to enhance the adoption of the fish-processing technologies. As Knox (1971) aptly put it, "in every general learning situation, a sense of competence occurs when there is an awareness of personal mastery: the

realisation by the person that a specialised degree of knowledge or level of performance has been attained that is acceptable by personal and/or social standards”.

Conclusion

It was clearly indicated that extension contact and training offered to fish processors by MOFA in the Central Region was inadequate. Reasons given by heads of WIAD, Fisheries, and Agricultural Extension for the low performance of MOFA in addressing the needs of fish processors were essentially inadequate funds and staff. Inadequate materials for staff training, poor coordination among the Directorates of MOFA, and lack of credit for fish processors to enable them use modern technologies were the other reasons that were emphasized. Extension agents in the coastal district of the Central Region had positive attitude towards working with women in fish processing. The AEAs believed they could work harmoniously with women fish processors as partners in development. The construction and use of Chorkor ovens and smoking trays were the most important technologies that many AEAs claimed to have had training in and had transferred to fish processors.

The results generally showed that the degree of adoption of fish-processing practices ranged from slight to moderate adoption only. It was also observed that in subject areas where more extension agents claimed to have had training, the adoption levels were relatively higher amongst the fish processors. The AEAs in the coastal districts of the Central Region need more competence in fish-processing technologies to assist fish processors better. The most important competency areas that AEAs in the coastal districts of the Central Region need to be trained in as a matter of priority are financial management, proper handling of wet fish, management of storage pests, credit acquisition techniques, operations of cooperatives, storage of wet fish, group dynamics, and record keeping. In general,

the areas are management oriented.

Recommendations -

The role of Agricultural Extension Services in supporting women in fish processing in the Central Region of Ghana must be strengthened to sustain the industry. The Government must assist MOFA to address the problem of inadequate funds and limited manpower in activities concerning the training of fish processors. There should be a WIAD Development Officer in every district to co-ordinate the activities of MOFA and NGOs in addressing the needs of fish processors at the district level. Extension agents in the coastal districts of the Central Region of Ghana should be given more training in fish-processing technologies. The training should focus more on the management-oriented aspects of the technologies. Extension agents should encourage and assist fish processors to form and manage cooperatives in a manner that will qualify them for loans from Commercial Banks. The District Assemblies can also create revolving funds for fish processors in a form of small seasonal loans. This will enable them to take advantage of the modern fish-processing technologies that need relatively higher initial capital.

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