CONTRIBUTION OF INFORMATION CHANNELS TO ADOPTION OF AQUACULTURE TECHNOLOGIES AMONG FISH FARMERS IN ANAMBRA STATE AND IMPLICATION FOR TRAINING

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ABSTRACT

A Study on contribution of information channels to adoption of aquaculture technologies was carried out in Anambra State. A total of 144 respondents were sampled with questionnaire in 2005 to generate data which was analysed with descriptive statistical tools. Contact methods constitute the dominant sources of information to fish farmers while mass methods are grossly under utilized. Extension agents and State ADP championed information dissemination to respondents to attain 67.8% adoption. However, information were found to be less effective to meet fish farmers need for high productivity, thus creating doubt on reliability and accuracy of information. By implication, both fish farmers and EAs need training to improve their knowledge on aquaculture technologies. It entails strengthening linkage between fisheries research and extension for active participation in MTRM and FNT for easy access to information and practical knowledge. This should be supported by public-private partnership for promotion and sponsorship of aquaculture technologies in the mass media with other ICTs like tape, VCD, VHS, SMS and GSM for effective coverage and service delivery to fish farmers.

Keywords: adoption, aquaculture, technologies, training

INTRODUCTION

Stagnation and decline in capture fisheries has put pressure in fish farming as an alternative to meet increase in fish demand. Intensification of aquaculture practice is associated with progress in technologies, efficient extension delivery and economic benefit to operators mostly in Asian countries that dominate fish farming. This is an indication that effective agricultural extension service delivery is sine qua non to agricultural development of any country. According to Asiabaka (2008), dissemination of agricultural information and practices are central roles of agricultural extension. Extension ensures that proven technologies are disseminated to fish farmers for adoption in production process.

In view of this, Ekong (2003) define technology as ways of applying scientific and organized knowledge to practical task (in this case fish farming). Dissemination of proven technologies is a communication process of sharing and distributing information to target audience to bridge gap in knowledge and bring change in attitude and skill of the end users. This is established in study by Talukdar and Sontaki (2005) where extension participation correlated with adoption of technologies in fish culture practice among fish

farmers in India. Also, Ahmed *et al* (1995) found that intensive information dissemination and training on technologies have positive effect on adoption rate of aquaculture technologies. Extension delivery depends on mastery of information process and technical competency on the subject matter for effective transfer of technology to fish farmers for application. In support of this, Ogunwale (2004) opined that for agricultural extension agents to fulfill their roles and tasks, they must have adequate technical knowledge to solve farmers' problems, have accurate information and supported with training. Hence, emerging view of extension is not that of service delivery or system, but of knowledge and information support function for adoption of innovations to improve standard of living of people.

Adoption is the decision to apply an innovation/technology and to continue to use it (Ekong, 2003). It is the last phase in the five stages of adoption process otherwise express as adoption behaviour in this study. Therefore relevance and contribution of research and technology to increase fish production is subject to its adoption by the fish farmer in production process. Effort to increase fish production from aquaculture lead to packaging of material and non-material technologies in 12 extension guide series by the National Institute for Freshwater Fisheries Research (NIFFR) and disseminated to farmers through the State Agricultural Development Programmes (ADPs). Some of the technologies include culture system, pond site selection, pond culture, hybrid fish species, feeding practice, culture practice, fertilizer application, use of conventional feed, stocking density/rate, water quality management, live fish transportation with oxygen bag, cultivable fish species, hatchery fingerling and pond water depth and feeding practices

In spite of this effort, 5.3% contribution of aquaculture to fish production and 2.2% growth rate in the past decade is poor and minimal to reverse the trend in high fish food importation, which is now Nigeria's main source of fish supply. In addition is reported fall in agriculture technologies levels of adoption and scanty studies in aquaculture adoption. In view of this, the study aims at determining level aquaculture technologies adoption among fish farmers in Anambra State. Specific objectives are to examine sources of information, determine effectiveness of information sources and implications of study on training.

METHODOLOGY

The study was carried out in Anambra State, southeast geo-political zone of Nigeria. In line with the four administrative structure of State Agricultural Development Programmes (ADP), 12 LGAs out of 21 LGAs in State (3 in each ADP zone) were purposively selected for the study. The selected 12 LGAs are Ogbaru, Ihiala, and Ekusigo (Onitsha zone), Anyamelu, Oyi, and Anambra West (Anambra zone), Awka North, Awka South, and Awka Central (Awka zone), Orumba North, Orumba South and Aguata (Aguata zone).

In absence of data on sample population, the researchers adopted convince sampling method from Eboh (1998) to determine sample size. With this method, 12 fish farmers were randomly chosen from each of the selected 12 LGAs to get a sample size of 144 respondents for the study. Questionnaires were distributed to fish farmers with the help of extension agents to generate data for the study in the months of May to August, 2005. Data collected were analysed with percentage and frequency counts as presented below.

RESULTS AND DISCUSSION
        Entries in table one relates to adoption behaviour of respondents on the 15 technologies under investigation. Majority of the fish farmers (67.8%) claim to have accepted the technologies whereas 32.2% are yet to adopt. The finding is in conformity with the results of report by Ifejika *et al* (2007a), Talukdar and Sontaki (2005) and Sevilleja (2000). The 32.2% response on no adoption comprises of not aware (10.9%), heard but never use (18.4%) and rejection after use (2.9%). Ekong (2003) attributed 'acceptance and rejection' of innovation by farmers to incompatible experiences, while Oladele (2005) established extension contacts as foremost factor leading to discontinuance use of technology by farmers. Low awareness and interest on technologies is a sign of passive and weak information dissemination due low promotion of technologies. Out of 15 technologies examined, level of usage was relatively high on 11 whereas 4 recorded low usage among the fish farmers. Technologies with low acceptance include pond site selection, practice of poly-culture, stocking density/rate and access to improve fish seed from hatchery. These technologies have serious consequences on fish growth, productivity and economic benefit derived by the fish farmers. Implication of finding on adoption behaviour suggests that fish farmers need training and promotion for awareness creation to motivate interest and increase levels of technologies usage/adoption in the State.   This is challenge to State government on proper funding of fishery aquaculture as public goods to benefit the people.

Table 1:Adoption behaviour of fish farmers (N = 144)

Adoption behaviour	%
Not aware	10.9
Heard but never use	18.4
Rejected after use	2.9
Still using Technology	67.8

Table 3: Agencies use as information sources

Agencies	%
NGOs	1.6
Min. of Agriculture	7.4
Research Institute	0.5
ADP	66.4
No contact with agency	24.1

Table 2: Information sources on adoption of technologies

Information sources	%
Friends	3.3
Extension agents	69.5
Farmers meeting	21.8
Extension guide	2.7
Seminar	0.9
Radio	0.7
Television	0.1
Newspapers	1

Table 4: Multiple response on effectiveness of information

Effectiveness	%
Timely contact	11.9
Adequate content	12.4
Clarity of message	13
Not effective	**62.3**
Aggregate effectiveness	**37.7**

Data on table two indicates that contact methods of communication (73.8%) are popular sources of information sharing and distribution, while mass methods (26.2%) are grossly under utilized to reach out to fish farmers. Studies by Ejembi *et al* (2006) is in agreement with the result on high use of face to face methods to receive information by farmers compared to mass methods. The popular sources of information to the respondents are extension agents (69.5%) and association of fish farmers (21.8%) whereas radio and television were least used to receive information on aquaculture technologies. Study by Ajayi (2003) agreed on the use of extension agents and farmers meeting as information sources. On low use of mass methods, Ifejika *et al* (2007b) and Odika and Criscent (2008) attributed it to low content of agriculture and fishery in mass media programmes. It can be said that under-utilization of mass methods to disseminate information is responsible for low awareness of aquaculture technologies and to large extent slow growth and development in the country. By implication, extension agents require regular training for reliable and accurate technology transfer to fish farmers. It entails strengthening research-extension linkage for active participation in MTRM and FNT meeting supported by public-private partnership for promotion and sponsorship of aquaculture technologies in the mass media.

Data on table three shows agencies involvement in the dissemination of aquaculture technologies to respondents in the study area. The State ADP (66.4%) is foremost in advancement of aquaculture to fish farmers. This is followed by little contribution from State Ministry of Agriculture (7.4%), NGOs (1.6%) and Research Institution (0.5%). The result on ADP is in line with Bolorunduro *et al* (2004) study in Niger Sate but differ on 30%-70% use of Fishery Research Institute as found in study by Ifejika *et al* (2007a). Difference observed on contribution of Fisheries Research is attributed to distance and low participation in monthly technology review meeting (MTRM) and forth nightly training (FNT) meeting in the State. NGOs are emerging private extension providers that should be mainstreamed and maximize to reach out to rural fish farmers. Bouis *et al* (2000) study in Bangladesh proved that NGOs supported aquaculture development through extension services. Claim by 24.1% of the respondents on no access to agencies is an indication of weak extension contacts and inadequate coverage linked to shortage of agricultural extension personnel particularly in fishery. This is confirmed in high ratio of extension agent to farmer put at 1:2000 see Arokoya (2003). With increasing number and dimensions of practice in aquaculture, reliance on contact methods for sustainable extension delivery and effective coverage of fish farmers is in doubt.

Response in table four is on effectiveness of information channels, which is measured by adequate content, timely contact and clarity of message is in agreement with Anderson and Feder (2004). The aggregate effectiveness of information is low with 39.3% response whereas vast majority (61.7%) claims ineffectiveness of information to meet their need. Effectiveness of information to fish farmers is weak in terms of timely contact (11.9%), adequate content (12.4%) and clarity of message (13.0%). The result validates Asiabaka (2008) statement that ineffectiveness of extension services can be seen from the caliber and low levels of education of extension workers leading to distortion and misinterpretation of messages to farmers. This is supported by Agwu and Chah (2007) verdict that high ratio of extension agents will obviously affect effectiveness and efficiency of extension delivery through village extension agents. Conventional mass

methods of television,   radio, should be supported with video compact disk (VCD), tape recorders, GSMs, SMS, and VHS   for wide reach and coverage.

CONCLUSION AND RECOMMENDATIONS:
The slow pace of aquaculture development has linkage with information dissemination to support adoption of technologies. Contributions of extension agents and the State ADP are weakened by ineffectiveness of information to satisfy fish farmers need. It entails adequate training of extension personnel, information packaging in modern ICTs and collaboration with fishery research institutes to bridge the gap in knowledge. Hence, State government and private partnership advocacy are needed for financial support to achieve this task and boost fish farming in the state.

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