PERCEPTIONS OF RICE FARMERS OF THE NATIONAL AGRICULTURAL EXTENSION PROGRAM IN THE CASAMANCE, SENEGAL

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Abstract
The agricultural extension program of Senegal, a national government initiative since 1985 based on the Training and Visit (T&V) approach, was studied in the Casamance with respect to rice, the main agricultural crop of the country and the region. A sample of 1,004 rice farmers in the two districts that make up the Casamance was personally interviewed to determine their perceptions about the extension program. A small percentage of farmers recalled participating in rice production meetings, knew the subject matter topics discussed, and viewed agents favorably. The majority of farmers preferred radio over agents and neighbors for rice production information. Although farmers passed on information gained from meetings and encouraged others to attend, they did not reach the number recommended by the T&V approach.

Introduction
Rice is the staple food of Senegal and accounts for 40% of the diet of the country’s population of 6.9 million people. Even though the population of Senegal is essentially rural and largely involved in rice production, the country has an annual deficit of 50,000 metric tons of rice. To overcome this deficit, the government has undertaken agricultural extension programs to assist rice farmers in adopting new technology for increasing the yield and total output of rice.

Rice Farming in the Casamance
The Casamance, in the southern part of Senegal, is the main rice growing area of the country. Two major ethnic groups, the Joola and the Mandinka, are involved in rice production. The Joola has a very old rice cultivation tradition dating back to 300 AD and a cultural identity with the crop (Linares, 1970). Wealth is gauged by who produces the most rice and who has the oldest rice stocks in their granaries. The Joola is the predominant ethnic group in the Ziguinchor Region of the Casamance. Joola men and women work together in the rice fields, and also raise cash crops. Men plough the soil and women plant seeds or plantlets (seedlings). On the other hand in the Kolda region, which is dominated by the Mandinka, women are responsible for rice production while men are responsible for cash crop production.

A number of constraints have been identified in rice production in Senegal. The total area planted to rice has drastically declined compared with other crops due to decreased rainfall, increasing soil erosion, and declining soil...
fertility. Limitations in new technology adoption can be traced to the low level of technical knowledge and skills of farmers and the non-availability of bank loans due to the high risk associated with agricultural credit, the writing off of farm loans, and/or denial of new loans (United States Agency for International Development, 1991). Kite, Keita and Thiam (1992) found that recommended rice production technology was not being followed by a large number of farmers in the Casamance. For example, only 13% of farm households in Ziguinchor and 27% in Kolda used chemical fertilizers. Animal power is limited in Ziguinchor due to low draft ownership (Kite et al, 1992) and steep land (Linares, 1984). This opens up the possibility of small power tillers (SOMIVAC, 1987).

Senegal’s Extension Service

According to the categorization suggested by Baxter, Slade and Howell (1989) the extension service in Senegal has utilized three different organizational approaches over the last 35 years: (a) Animation Rurale or rural mobilization, (b) commodity-oriented extension, and (c) the Ministry of Agriculture’s government extension service. Animation Rurale lasted only about four years. It focused on the sensitization and education of farmers in community development. Commodity-oriented extension was similar to project-type extension, promoting the production of cash crops for export. The government approach began in 1985 as part of the country’s new agricultural policy and was called the National Agricultural Extension Program (NAEP).

NAEP is unique in that it has a small administrative and technical component at the top and conducts its programs essentially through field extension staff of the National Agricultural Service (NAS) and volunteers of non-governmental organizations (NGOs), providing its collaborators with transport, office supplies, and staff allowances.

Thirty extension agents work in NAEP in the Casamance Region. All agents are men and range in age from 24 to 51 years. Although the agents are from many ethnic groups, the predominant ethnic groups are the Joola and the Fulani. None of the agents has a University college education. Most have achieved a three-year secondary agriculture school education. Though their educational level seems low, most of them have considerable experience in agricultural extension, averaging 16 years, and being involved with NAEP for an average of 3 years. The majority of the extension agents know the languages used by the farmers.

NAEP used the French edition of the World Bank’s Training and Visit Extension System (T&V) as an operating framework (Benor & Baxter, 1988). Like most developing countries, Senegal adopted T&V to secure funding from the World Bank to financially support its agricultural extension program (Dejene, 1989).

The basic strategy of T&V is to get farmers to adopt improved agricultural technologies through an educational process. The concept was that professional extension agents would receive training in specific, seasonally-appropriate crop production practices. These agents would then make individual visits twice a month to a select group of contact farmers to educate them in those practices. In turn, each contact farmer was expected to communicate the information received from the extension agent to ten other neighbors, thus achieving a multiplier effect (Dejene, 1989). Benor and Baxter (1988) posit that this kind of farmer-to-farmer extension is more cost-effective than the conventional extension service, and can help develop local leadership and self-confidence, and promote technology adoption.

Studies to determine the effectiveness of T&V conducted in several countries in Asia and sub-Saharan Africa have yielded mixed results. Mazur and Titiola (1992) conducted a comparative study of T&V in Asian and African countries and found that it was more effective and efficient in Asia. Country-specific studies in Africa have documented shortcomings. Dejene (1989) observed that the T&V communication network in Ethiopia which was
to be used to disseminate information to non-contact farmers in the community equivalent to ten times the number of contact farmers did not work as expected. Moreover, as many as 25% of the contact farmers did not gain requisite knowledge and skills. In Cameroon, Tchouama and Steele (1997) found that after five years of T&V implementation only 30% of sample respondents reported contact with their village extension worker, and a majority of these had difficulty applying the extension worker’s recommendations. In a study of T&V in Nigeria, Asiabaka and Bamisile (1992) determined that extension agents had favorable attitudes and considered their work challenging, but lack of communication skills, insufficient transportation facilities, and cultural differences detracted from their effectiveness. Diamond’s (1994) study in Swaziland found that a modified version of T&V offered the best structure for that country’s needs. Kite et al. (1992) studied the implementation of T&V in Senegal and found that most farmers were aware of the recommendations for fertilizers and other inputs, and used family members (60%) as a source of technical knowledge to a greater extent than extension agents (30%).

This study was conducted to add to the understanding of T&V in the National Agricultural Extension Program of Senegal’s Casamance Region, specifically focusing on farmers’ perceptions of the program.

**Purpose and Objectives**

The primary purpose of the study was to assess how effectively the twin goals of farmer participation and information diffusion in T&V were being accomplished in the Casamance Region. Specific objectives were to determine (a) personal and farming characteristics of rice farmers, (b) farmers’ perceptions of rice production meetings and technology learned, and (c) the use of information sources by, and information diffusion patterns of rice farmers.

**Methodology**

**Population**

The target population was rice growers in the Casamance belonging to the two major ethnic groups, Joola and Mandinka. The field study was restricted to the Department of Bignona in the Ziguinchor Region and the Department of Sedhiou in the Kolda Region due to poor roads and constraints on the researcher.

**Instrumentation**

The questionnaire used for data collection was developed by the lead author. It was written in English, and translated and administered in French, the official language in Senegal. It included questions focused on the study objectives.

Three validation steps were involved. First, the instrument was reviewed by the researcher’s graduate committee. A second review was done by an expert in social science surveys with 15 years of experience in the local area in collaboration with the researcher and his committee chair. Finally, an on-site pilot study was conducted by the researcher under the supervision of his committee chair. Ten interviewers were hired and trained for this purpose. They interviewed 50 farmers in each of the two regions, over a ten-day period. Pilot study locations were randomly selected from villages where there were NAEP participants.

**Sampling**

The study used a sample of 1,016 households equally distributed among the two departments (Bignona and Sedhiou). The researcher chose to oversample to ensure that findings could be generalized to all rice growers in the Casamance at the lowest margin of error.

A list of all villages involved in the NAEP was obtained at the time of the pilot study (January 1995). A table of random numbers was used to select villages. Two arrondissements each were randomly selected from Bignona and Sedhiou.
districts. A rural community was chosen from each of the arrondissements in Bignona; in Sedhiou a total of three communities had to be selected because of lower participation in NAEP. A total of six villages was finally selected in Bignona, and nine villages in Sedhiou. All farm households in the selected villages were included for interviewing regardless of their participation in NAEP.

Data Collection

The same ten interviewers hired for the pilot study did the actual survey. They were selected for their experience in survey work and knowledge of local languages. All interviewers attended a meeting with the researcher during which the questionnaire was explained once again, and precise instructions were given to ensure that valid information was gathered. Since females are in charge of rice cultivation, women, if present at the time the interviewer called on them, were the preferred subjects. If not available, husbands could be interviewed. In Bignona, where men and women work together in all agricultural activities, the questionnaire could be administered to either the man or the woman of the household depending on who was home at the time. Each interviewer completed five interviews in a day, on average.

Findings

Characteristics of Farmers

Usable survey responses totaled 1,004. Major ethnic groups to which respondents belonged were Joola (68%) and Mandinka (26%). Islam was the dominant religion (997 or 98%); a small number were Christian (15 or 1%) and traditional African (4). Most respondents were married (89%). There were nearly twice as many males (64%) as females (36%). As many as 8 out of 10 respondents had never attended school. Of those who went to school, 12% did so at the elementary level (1-6 years), and 8% at high school. Average age of respondents was 48 years, male respondents 53 years, and female respondents 42 years. Average number of years of formal school was only 1.03 years. Males had more schooling than females (1.79 years vs. .26 years).

Younger respondents had more schooling than older respondents. Respondents between the age of 15 and 30 years had an average of 2.49 years of formal education, those between 31 and 50 years had an average of 1.89 years, and those beyond 50 years of age had less than a year of formal education.

Three fourths of the respondents owned rice land. The remaining 25% rented or borrowed from husbands, brothers, fathers, or other relatives. Nearly 90% of the renters/borrowers were from the Kolda region. The average size of rice fields was 1.5 hectares, with little difference between the two regions. Besides rice, a majority of the respondents grew other crops. This pattern was found to be more prevalent in Kolda than Ziguinchor.

Farmers’ Perceptions of Rice Production Meetings

The farmers were asked if they had ever attended informational meetings concerning rice production practices and who organized the meetings they attended. Twenty-nine percent of the respondents recalled attending meetings organized by the NAEP, projects of parastatal bodies, and NGOs as shown in Table 1. Most of the participation was in parastatal-organized meetings (52%) followed by NGO-organized meetings (41%), and NAEP-organized meetings (7%).

Farmers were asked if they personally knew the person who organized the meetings. The majority (97%) of them personally knew the extension agents who organized meetings, but did not know how NAEP was organized. They tended to associate agents with the local level organization of parastatals (48%) and NGOs (44%), rather than with the NAEP (8%). Knowledge of NAEP was greater in Ziguinchor (68%) than in Kolda (32%).
Farmers were asked to recall the specific topics discussed at rice production meetings. A variety of topics was indicated by respondents ranging from chemical fertilizers (167 or 63%) to the use of draft animals for cultivation (96 or 36%). All topics mentioned are shown in Table 2.

Farmers who recalled participating in meetings (n=288) were also asked if they liked the meetings and why. Ninety-three percent (268) said that they liked the rice meetings. Reasons for liking meetings were: useful topics were presented (93%); agents openly discussed problems (18%); agents were knowledgeable (12%); have good relationships with agents (5%). Reasons for not liking meetings were: did not learn anything useful (12 respondents); agents did not openly discuss problems (7 respondents).

<table>
<thead>
<tr>
<th>Region</th>
<th>Parastatals (Projects)(^a)</th>
<th>NGOs</th>
<th>NAEP</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Ziguinchor</td>
<td>108</td>
<td>72</td>
<td>52</td>
<td>45</td>
</tr>
<tr>
<td>Kolda</td>
<td>43</td>
<td>28</td>
<td>64</td>
<td>55</td>
</tr>
<tr>
<td>Casamance</td>
<td>151</td>
<td>100(52)(^b)</td>
<td>116</td>
<td>100(41)(^b)</td>
</tr>
</tbody>
</table>

\(^a\) Government-sponsored water management projects since 1989  
\(^b\) % of farmers who attended meetings

Table 2

Meeting Topics Reported by Rice Farmers.

<table>
<thead>
<tr>
<th>Subject Matter</th>
<th>Frequency of Mention</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical fertilizers</td>
<td>167</td>
<td>63</td>
</tr>
<tr>
<td>Planting in rows</td>
<td>154</td>
<td>58</td>
</tr>
<tr>
<td>Improved seeds</td>
<td>149</td>
<td>56</td>
</tr>
<tr>
<td>Composting techniques</td>
<td>117</td>
<td>44</td>
</tr>
<tr>
<td>Plowing techniques (flat plowing)</td>
<td>115</td>
<td>43</td>
</tr>
<tr>
<td>Weed control techniques</td>
<td>111</td>
<td>42</td>
</tr>
<tr>
<td>Draft animals for cultivation</td>
<td>96</td>
<td>36</td>
</tr>
</tbody>
</table>
Table 3.

Rice Production Information Sources Used by Farmers.

<table>
<thead>
<tr>
<th>Region</th>
<th>Radio</th>
<th>Neighbors</th>
<th>Agents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Ziguinchor</td>
<td>232</td>
<td>54</td>
<td>103</td>
</tr>
<tr>
<td>Kolda</td>
<td>198</td>
<td>46</td>
<td>179</td>
</tr>
<tr>
<td>Casamance</td>
<td>430</td>
<td>100(43)*</td>
<td>282</td>
</tr>
</tbody>
</table>

*% of all respondents

Farmers were asked to respond to the following questions: a) Did you encourage some of your neighbors or friends to attend meetings? b) How many persons? c) How many females? d) How many males? Seventy-seven percent (200) of those who participated in rice meetings reported that they encouraged other persons to attend meetings. Ninety-five percent (190) of these respondents reported that each of them encouraged about 12 other persons (7 females and 5 males) to attend. While males tended to encourage both males and females, females tended to encourage more females than males, perhaps reflecting traditional norms. This pattern was found in both regions, and was statistically significant by gender (F=11.29, p=.001).

Conclusions, Implications, and Recommendations

The majority of rice farmers in the Casamance were married males, having a low level of education, and belonging to the Joola ethnic group. One-third of the farmers were female and had a lower level of education than males. The fact that all extension agents in the region are males could hinder communication between extension agents and female farmers in a traditional, male-dominated culture. The fact that females had practically little or no education increases communication barriers.

Since the formal education level of farmers was very low, the extension program should focus on raising farmers’ awareness and should involve them in program development. This involvement could help stimulate self-awakening attitude changes among farmers regarding agricultural practices that could be beneficial to them. This recommendation is supported by Diamond (1994), “… people at the local level should have major input in the extension program planning process”. (p. 76)

Participants of farmers in rice production meetings were low – only one-fourth had attended meetings organized by extension. However, those who did participate were able to recall topics discussed at meetings. They viewed extension agents associated with these meetings favorably for their technical competence and openness in discussing problems.

Radio was the most used information source for rice production. However, only 40% of the country’s population is reported to have access to personal radios. The preference for this medium suggests the potential to enlarge and enhance the use of radio through focused programming, and more rural broadcast time at times that are convenient to farmers.

Participants in rice production meetings encouraged their friends and neighbors to also attend. Under T&V, it is recommended that participating or contact farmers inform and teach at least 10 other farmers. Efforts need to be made to emphasize this aspect of the program which goes beyond encouragement. In this regard, younger farmers, who are more educated, should be involved to a greater extent in contacting their peers. In addition, female farmers should be motivated to inform as many
women as possible because they communicate more among themselves than with men.

One area of future research is the selection of contact farmers. Under T&V, these individuals are responsible to teach at least ten other people. Leadership characteristics of contact farmers with respect to diffusion of learned knowledge is an important area of investigation. Another research focus could be radio ownership in the area to determine how more people can be reached by rural radio broadcasting. A third area of investigation is the socioeconomic characteristics of those who inform others about rice meetings and the relationships that exist between the informant and the informed. This will help agents target specific categories of people in extension work.

References


