Facilitating Change in Senegalese Rice Production:
Learning Serer Women Farmers’ Decision Making

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Abstract

Extension education has evolved from being a process of dissemination of information, to a process of actively advocating for change, to facilitating the change process. To be a facilitator of the change process requires deeper knowledge of the internal dynamics of a community and the factors impacting people’s decision making. The purpose of this case study is to describe an extension education program in which the extension educator’s role was as a facilitator in the change process. Using Rogers’ innovation-decision process as the conceptual framework, ethnographic research techniques were used over three growing seasons to collect data revealing the factors impacting this process in women farmers. The rice production system is described as well as the major findings on factors impacting the five steps of the innovation decision process. The process of facilitating change in this case study is described leading to conclusions of what is required to be an effective facilitator of change for sustainable development. The paper advocates developing new competencies and teaching new skills to the next generation of extension educators so that they can be effective advisors to farmers strengthening the feedback loops in the research process.

Introduction

One of the challenges we in the field of extension education face moving into the 21st century is the search to make development sustainable. There are too many examples of development efforts which collapsed when funding ceased or international consultants returned home. The key to sustainability lies within the people and communities being acted upon. (See Cernea, 1985; Pretty, 1998; Swanson, 1984).

Extension education has evolved from being a process of dissemination of information, to a process of actively advocating for change, to facilitating the change process. (See Boone, 1989; McDermott, 1987; Rasmussen, 1989; Rogers, 1983; Shaner, Philipp, and Schmehl, 1981). The skills required to accomplish these different roles are not the same. The extent to which one has intimate knowledge of the people and communities within which one works also will vary. To be a facilitator of the change process requires a deeper knowledge of the internal dynamics of a community and the factors impacting people’s decision making. The role of facilitator or advisor implies active participation on the part of the extension educator to learn from the farmer. The challenges in the day-to-day decision making by the farmer must be known so that changes or ideas can be presented to the farmer which address their situation. A standardized recommendation may be irrelevant but in facilitating change a standard recommendation can be adapted in collaboration with farmers to increase the probability of sustainable change.

Purpose

The purpose of this case study is to describe an extension education program in which the extension educator’s role was as a facilitator in the change process. The specific objective uses Rogers’ innovation-decision process as the...
conceputal framework to describe the process revealing the factors which guide, direct, or influence a farmer’s innovation-decision process in relation to a rice extension program. There are four parts to this paper. To begin, this paper presents the interaction during the implementation of a rice extension education program in Senegal. Secondly, the factors unveiled which impact the farmers innovation-decision process are described. This is followed by a description of the role of the facilitator in the process. Finally, a reflection on the educational importance of this case study is presented.

Method

This study used an interpretive research paradigm. The researcher was participant observer during three growing seasons serving as the extension educator in two communities. Since the subject matter studied included human interaction and experience, as well as process variables, ethnographic research techniques were used to conduct the study.

Throughout the growing season, weekly visits were made to the rice fields. The author, as a Peace Corps Volunteer, lived in the villages year-round allowing the process for gathering information to be iterative. Specific research methods used by the author were personal interviews with farmers, network analysis, time allocation studies, group interviews for pre- and post-season planning and evaluation, and observation.

Rice Extension Program

The rice extension program was a joint effort between Peace Corps/Senegal and Winrock International Institute for Agricultural Development funded by the United States Agency for International Development. The goal of this project was to provide poor farmers with improved crop varieties, better agronomic practices, and simple methods of production, storage, and distribution of seeds (Bragantini & Schillinger, 1992). Winrock provided technical assistance and the initial supply of improved rice seed. For its part, Peace Corps/Senegal provided trained individuals who served as the extension educator at the village level. The objectives of the program were: 1) to use improved seed varieties and improved seed production and handling techniques in crop production systems; and 2) to increase production of secondary crops (rice, manioc, sweet potatoes, and others) in appropriate crop rotation or inter-cropping schemes. The end to meeting these objectives was to demonstrate through on-farm comparison plots, the new rice variety and rice cultivation practices with small groups of farmers in the villages where Peace Corps Volunteers were living and/or working.

The Peace Corps Volunteers followed an established set of activities as part of the extension program. In year one, the volunteer conducted a baseline data survey with five pre-selected farmers. The baseline data survey served two purposes: to become familiar with the cultivation of rice in that community and to collect data on the varieties of rice grown in the communities participating in the survey. This information allowed the technical consultant and volunteer to learn the characteristics of rice grown and the ecology in that locale so as to select a rice variety to introduce and to have a basis of comparison between the new rice variety’s performance and the local varieties. During the first year, data were collected only on the traditional variety. With this information, a decision was made on which of four new rice varieties to introduce into the cropping system for that locale.

The communities in this study direct-seeded their rice. The choice of a new rice variety for this upland, rain-fed production system was DJ12-519 which was developed in Senegal. For direct-seeded rice, the emphasis of the extension program was seeding on-line with an animal-drawn planter. For women who could not plant with an animal-drawn seeder, a metal rake was designed as an alternate method to assist with planting the rice on-line. The rake could be dragged across the field marking furrows into which the rice seed was sown. In addition, a weeding schedule was promoted. If a farmer weeded her field twice, the weeding should be done 15- and 40-days post-emergence. If the
farmer weeded only once, then it should be 25-
days post-emergence.

In year two, the on-farm comparison plots were
established. The rice farmers who participated
in the baseline data survey were given seed of
the rice variety DJ12-519. The volunteer
assisted the farmer to establish side-by-side plots
of the new rice and a traditional variety using
one kilogram of seed. Throughout the growing
season, the volunteer was responsible for
collecting data on both plots using the baseline
data survey form used the previous year. During
the second year, a larger number farmers were
recruited to participate in the baseline data
survey with the expectation that each of them
would receive a kilogram of the new rice variety
the following year.

Results

Using Rogers’ 5-step innovation-decision
process as the framework for monitoring the
change as it occurred within the communities,
this study began to reveal the factors impacting
the women’s choices in the village rice
production system. This framework permitted
the extension educator to learn more about these
factors and begin facilitating the decisions made
across three growing seasons with respect to the
rice production activities in the communities.

Both communities in this study were
predominantly Serer. The Serer are
agriculturalists combining livestock with crops
and permanent fields with bush fallow rotations
in a carefully balanced, highly productive
system (United States Department of the Army,
1974). The communities grew peanuts, millet,
sorghum, corn, and rice. Families shared
responsibility for the production of peanuts,
millet, sorghum, and corn. Rice was a crop
which the women worked. The rice fields
averaged 806 m² in size but contained two or
three varieties of rice. Women made the
decision as to the variety of rice placement
based on the soil characteristics (i.e., too hard to
work before the first rain) or water level (i.e.,
standing water during the growing season). The
rice plots were transformed into well-water
irrigated, market gardens of tomatoes,
peppers, onions, eggplant, and okra after the rice
was harvested.

The exchange of knowledge was facilitated by
the organizational structure of the village. Each
of the communities had a women’s group with
elected officers. The volunteer’s entree into the
village was made through the women’s group
selecting five individuals to be the first
participants in the program. The officers were
generally direct relatives or related by marriage
to the village chiefs of the communities.

Women in the communities shared rice seed and
each variety carried the name of the woman who
passed the seed onto others. The exception to
this was the variety introduced during a Chinese
project 20 years earlier which was referred to
just as Chinois. When a farmer was interested in
a different variety of rice with a particular
characteristic--such as a very short-cycle-- the
women shared the knowledge. Most of the
knowledge in the current extension education
program was not new. The Chinese had
demonstrated seeding on-line and introduced a
dwarf, short-cycle, high yielding rice variety
previously. SODEVA, a program of the
Government of Senegal, re-iterated the use of
animal-drawn planters for rice ten years earlier.
This program reinforced these ideas as factors in
the persuasion step to follow. Working as an
extension educator in the communities, the
volunteer became a new source of information
for the new rice variety called Djibilor or DJ12-
519 and was also expected to answer broader
questions on other varieties of rice.

At the end of the first growing season, armed
with the information from the baseline data
survey and several months of observations, the
first group meeting was held with the women.
Previously we worked individually in the rice
fields as measurements and observations were
taken. But a group meeting was held to discuss
the introduction of the new rice variety and their
concerns with the program. The first concern
raised by the women was the change in the
climate of the area. The rainfall pattern was
changing. They recognized the decrease in the
amount of rainfall as well as the timing of the
rains. The ten year average of rainfall was 674
mm from 1982 to 1992 falling on an average
of 44 days during the rainy season. The need was raised to have a rice variety better adapted to this change in rainfall.

The farmers who agreed to participate in the program had similar issues affecting their decision making during the persuasion step. With less rainfall, they wanted access to a rice variety that better matched the change in rainfall pattern. A variety which added to their already multi-variety fields was seen as advantageous. A major concern for the women was the vegetative growth pattern of the rice. The women had work responsibilities with the peanuts and millet. Collectively, the farmers voiced two concerns about whether or not to try the new rice variety. An early variety may flower before they had time to weed the fields resulting in them damaging the grain as it formed when they did move to weed the fields. The second, again an issue of timing, dealt with the need to keep birds away from the rice. The women in one community had their rice fields in a distant location. If they were still busy with the work in the peanuts and millet, the children could not walk that far to spend the day in the fields. In this case, the community selected fields closer to the village for the trial so that the children could go to the fields and keep the birds away.

The persuasion step showed the contrast between the two communities. The women in the village where the volunteer lived were already sowing their rice fields with oxen-drawn planters. This system had been working for the past five years at least. The arrangement was that all fields were prepared in April. The men sowed the millet in May prior to the rains. The women would then plant the rice, also prior to the rains. This left the animals and planters available for the men to plant peanuts when the first rains began. The second community had yet to establish this pattern. The men waited longer before sowing the millet. The women needed to establish the window of opportunity to use the animals and planters for sowing the rice prior to the start of the rains.

The decision step was difficult to document in this case. Although the factors that affected the persuasion step were discussed with the women, the artificial structure of only allowing five farmers per year to establish comparison plots severely limited participation in the program. It was during the second year that it became apparent, using network analysis, that one of three clans in the community did not have a single participating farmer. The fact that the volunteer was placed within the compound of the village chief and that all the farmers in the program were blood relatives or in-laws reinforced the power structure of the community.

The implementation step was straightforward once the decision to participate in the program was made. The 10 women involved in both communities for the first year of the program made the decision when to plant the rice. Each farmer also chose the traditional rice variety she wanted used in the comparison plot. A unique aspect of these communities was the fact that Serers are matriarchal. Whereas an assumption was made that the husband would participate in planting the rice, it was actually a son or grandson that eventually escorted his mother or grandmother to the field to sow the rice. Some sons also had a role in the harvest. In the few cases where the field was harvested on the same day using a scythe, the son or grandson harvested the rice. The other way of harvesting rice was done by the women themselves; in this case, a farmer moved across the field harvesting the rice one panicle at a time requiring several days to complete the task.

The confirmation step of the innovation-decision process was impacted by five factors. The side-by-side comparison plots permitted the women to make their own observations of the differences between the DJ12-519 and their traditional variety. The weekly visits to the field by the volunteer allowed for discussions and observations to be made with the women throughout the growing season. For example, observations of a fungal infestation in a traditional variety which did not affect the DJ12-519 is a case in point. Another time the discussion centered on the lodging of the rice in one half of the field but not in the other half sown with DJ12-519. It provided an opportunity for the women to pose questions during the season instead of after the fact during a post-
harvest meeting. The acceptance of the new variety is demonstrated by the average increase of 234% in surface area planted in DJ12-519 during the third year of the study; individual farmers enlarged their DJ12-519 areas by 180 to 306%.

The harvests in the first year of the trials had the biggest impact on the confirmation step of the farmers. In the first year of the trials, yields ranged from 25 to 144 kilograms of rice harvested for one kilogram of seed planted. The change in variety and cultivation practices resulted in increased levels of production in both communities as shown in the table below.

<table>
<thead>
<tr>
<th>Standardized Average Yield of Rice (kg/ha)</th>
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<tbody>
<tr>
<td>Traditional rice variety broadcast seeded</td>
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<tr>
<td>Traditional rice variety seeded on-line</td>
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<tr>
<td>DJ12-519 variety seaweed on-line</td>
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</tbody>
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Seeding on-line using a traditional rice variety resulted in a 44% increase in average yield. Using the DJ12-519 variety, seeded on-line, resulted in an 88% increase in yield over traditional varieties, broadcast seeded; and a 30% increase in yield over traditional varieties seeded on-line. The yield was a major factor on the decision-making but not the only factor contributing to confirmation of DJ12-519 rice production.

A devaluation of the currency in 1994 and a change in monetary policy impacted the household cash resources and therefore a need for higher rice production. Rice has become a staple in the diets of the Serer communities. The ability to have rice at the midday meal to replace millet is indicative of wealth. In 1992, a 50-kilogram sack of rice, smuggled across the border from The Gambia to the south cost 5,500 francs CFA. After the changes in 1994, that same 50-kilogram sack of rice could only be purchased from a city to the north and was priced at 9,250 francs CFA. The impact that this had on households with limited cash sources made it imperative for the women to increase rice production as a way of decreasing the purchases of imported rice and using up scarce cash required for other household needs.

The farmers after the first season gained first hand knowledge of DJ12-519. They saw it as a plausible alternative for their rice fields given that it had a shorter growth cycle and could provide rice for a household earlier in the season. The introduction of DJ12-519 did not become a replacement for the traditional rice. The most flavorful rices mentioned by the women were the late maturing varieties that required more water. Although DJ12-519 had the advantage of producing more, the desire to maintain production of at least a small area of the better flavored varieties of rice continued the practice of having a field of a mixture of rice varieties.

Facilitating change

This extension education program was designed to assist the women farmers with their rice production. The tendency was to think all farmers needed to switch to DJ12-519 rice given its yield potential. The program advocated reallocation of labor from weeding to planting on-line and for the men to take a larger role in rice production. As the extension educator, a personal bias was to keep the decision-making with the women. The role to assume then would be to feed farmers information to allow them to make the best decisions. In addition, the volunteer was a feedback loop to individuals working with rice on a national level to access other information for the women.

Over three growing seasons, I gradually began to appreciate the manner through which the women could be helped. The new rice variety could produce more and sooner in the season. It would relieve a family’s need to dispense scarce cash for purchased rice. DJ12-519 would never replace the traditional rice varieties which were better tasting and harvested later—and therefore stretched out the period of time before a family needed to purchase rice. The DJ12-519, being more drought tolerant, provided a greater cushion during times of sporadic rainfall. It added flexibility to the complex planting patterns women practiced in their rice plots.

The economic changes the communities
experienced had a major impact on the innovation decision process. As Schnieder (1986) suggests Africans are economizers. The changes in monetary policies increased the need for local rice production due to a doubling in the price of rice but with no increase in cash income for the farmers to purchase rice. Therefore, the people’s preference for rice over millet impels them to modify their current production practices to increase yields. Given the scarce resources available to the women, the development strategy needed to keep the cost to the farmer as low as possible. The advance of one kilogram of seed was practical for the women with the only expectation being they should return one kilogram of seed after their first harvest which was passed on to other women in the community.

The rice extension education program had been planned for the national level, but a key to sustainable change was found within the communities as women voiced their concerns regarding the recommended changes revealing the innovation-decision process of the women. Their concern began with the growing cycle of the rice. A short-cycled variety interfered with their work in millet and peanut fields; a long-cycled rice delayed harvest and the transition of their rice fields into vegetable gardens. The availability of the children to sit in the rice field to scare away birds was also a factor in the decision to plant the new rice variety.

The value of seeding rice on-line was recognized by the women. Expending more labor at planting time would reduce the labor required later to weed a broadcast-seeded field. In both communities, men controlled the use of the oxen and planters. The villages differed in that men in only one village provided the necessary window of opportunity for the women to use the oxen and planter in the rice fields prior to the rains. Serers are matriarchal so in the community that did seed on-line, it was not the husbands who helped their wives with planting rice, the women turned to a son or grandson to accomplish the task.

The new rice variety played a role in management of household resources. DJ12-519 was a 100-day rice variety and a high producer. It complemented the other rice varieties used in the communities selected for length of growing season, productivity, and flavor. In addition, with a devaluation of the currency, it became imperative at the household-level to produce more rice to decrease purchases of imported rice which used scarce cash required for other needs.

Conclusions

To be effective facilitators of change, extension educators need to acquire a new set of tools. Learning the factors that impact the innovation decision process of the Serer farmers could not be accomplished through passive observations. The process of facilitating change begins with the entry of an extension educator into a community. A level of interaction with the community must be reached beyond the meetings where an educational program is conducted. To do this, a new set of tools permitting extension educators to obtain an in-depth understanding about how people in different cultures and environments make decisions is required. Using the tools available through the social sciences such as network analysis, time allocation studies, in-depth interviews and not just survey questionnaires will assist the extension educators in learning about the communities they serve. Intimate interaction with farmers, such as occurred in this case study, discloses how change impacts the work of farmers and internal dynamics of community systems. Monitoring this change and participating in the discussions to address the concerns within the community is one avenue to ensure the sustainability through facilitating the farmers’ innovation decision process.

Educational Importance

The importance of this case study is two-fold. First it points to the need to develop within the next generation of extension educators new competencies necessary to be facilitators of change. The skills required of this cohort are methods to enter the field, interact with farmers, and learn the factors impacting the innovation-decision process. This holds true for expatriates in the field as well as for university-educated nationals born and raised in the capital city but
now working at the village level. It is imperative that extension educators understand the thought process of the farmers in order to facilitate change. Teaching the skills necessary to follow the process, in addition to the methods of introducing change, should be an integral part of the education programs for extension educators. Secondly, this case study reflects that to facilitate change, understanding the thought process is the first step to a) facilitating the thinking process of a farmer on her/his terms and b) assuming the role of advisor to the farmer, who is the key to sustainable development. An advisor cannot be of service when the factors impacting a farmer’s decisions are unknown. How to address the concerns facing the farmer remains problematic if the extension educator does not know what knowledge needs to be brought into the decision making process. The knowledge gained by being an advisor, with an intimate knowledge of the innovation decision process of farmers, will only strengthen the role extension educators serve as feedback loops into the research process on behalf of and by the farmers.

References


