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**Participatory Agricultural  
Extension:  
Experiences from West Africa**

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*This Gatekeeper Series is produced by the International Institute for Environment and Development to highlight key topics in the field of sustainable agriculture. Each paper reviews a selected issue of contemporary importance and draws preliminary conclusions of relevance to development activities. References are provided to important sources and background material.*

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# **PARTICIPATORY AGRICULTURAL EXTENSION: EXPERIENCES FROM WEST AFRICA**

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Tom Osborn

## **Introduction**

The crisis in African agriculture is reflected in its inability to provide food security for rural families and adequate food supplies for the growing urban populations. Factors that have contributed to the crisis include the:

- exclusion of women farmers from extension programmes despite their primary role in agriculture;
- promotion of inappropriate technical packages;
- inadequate national seed development and delivery systems that do not reach small farmers;
- weak links between agricultural researchers and small farmers; and,
- inflexible and under-funded extension services.

Fortunately, several positive initiatives have emerged to help counter these problems. Non-governmental organisations (NGOs) have taken an increasingly active role in agricultural extension in general and projects involving women farmers in particular. In addition, NGOs, in collaboration with other institutions, have become more responsive to farmer needs through the use of participatory methodologies that initiate work on locally defined problems and opportunities. One of the technical areas of NGO involvement surrounds the strengthening and supporting of traditional systems by which farmers select and produce seed for themselves and diffuse seed to other farmers (Osborn, 1993; Henderson and Singh, 1990). NGOs have also collaborated with agricultural researchers to assist with agricultural extension in seed technologies and other resources.

The following case study provides an example of a participatory, multi-institutional, extension approach to seed development and dissemination, involving a wide array of NGOs, agricultural researchers, farmers' groups, and the On-Farm Seed Project (OFSP). This collaborative effort offers some hope for developing a strategy to improve agricultural production and strengthen local capacities in Africa.

## **The On-Farm Seed Project**

The On-Farm Seed Project operated from 1987-1992 in Senegal and The Gambia. It used participatory methods with farmers to promote the adoption of improved methods of seed production, harvesting, processing, and storage as well as the introduction of improved varieties where appropriate. The goal was to increase both yields and labour productivity.

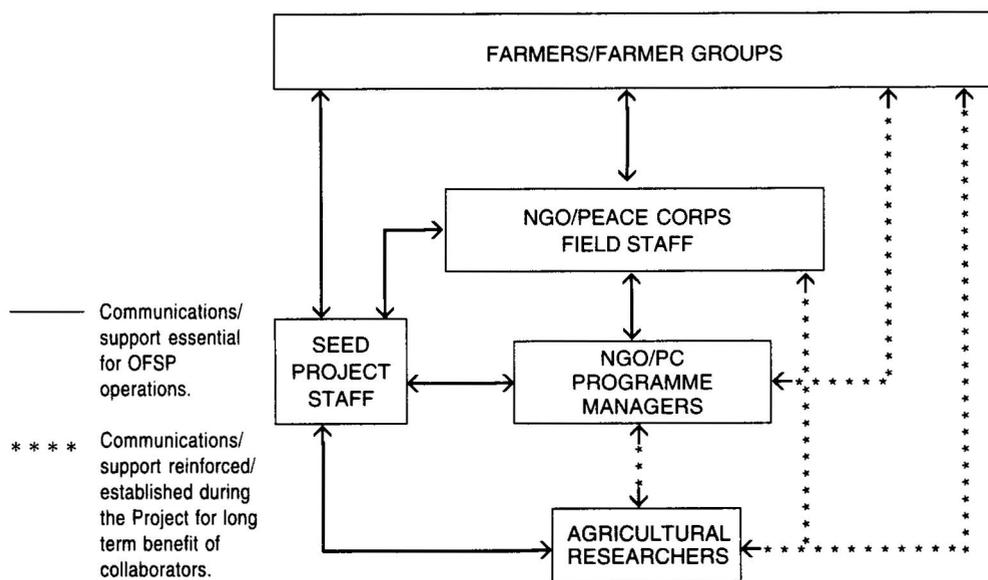
Senegal and The Gambia are both Sahelian countries characterised by frequent droughts, short rainy seasons and severe soil degradation. In both countries the farming system consists primarily of the cash crop of peanuts and food crops of millet, rice, maize, and cowpeas. Resource poor and bureaucratic extension programmes have focused on men and cash crops, to the exclusion of women and food crops. Agricultural extension has been oriented to the delivery of information to farmers centered around inappropriate high-input 'technical packages' developed on agricultural research stations (Bingen and Faye, 1985). Both countries have a growing number of NGOs that provide essential services at the village level which the government can no longer afford to supply. NGOs in The Gambia have a history of involvement in seed activities, but this was a new area for those in Senegal. For this reason, Senegal is the focus of this case study.

**Key Elements of the On-farm Seed Project Design**

- Technical assistance to NGOs and the US Peace Corps;
- Linkages between NGOs, farmers and researchers;
- Learning process approach to project development and implementation; and,
- Seed as an initial extension focus with farmers.

In Senegal, four key elements, noted above, constitute an innovative approach to reaching farmers through NGOs using a participatory approach to extension which focuses on seed-related problems and opportunities. Figure 1 illustrates the communications/support linkages of the Seed Project, its collaborators, and the linkages that should be in place when the project ends.

**Figure 1. Communications and Support Linkages of the Seed Project and Collaborators at Various Levels**



## Technical Assistance to the NGOs and the US Peace Corps

International and local NGOs have emerged as increasingly important actors in African development as national extension systems are reduced in size and scope (Osborn 1990). International and local NGOs and the Peace Corps work closely with local people in grass roots programmes. The NGOs in Senegal often lack the necessary technical and administrative skills to carry out their programmes (Gueye, 1992). This limited capacity to contribute significantly to agricultural technology development and dissemination appears to be a limitation common to NGOs throughout the world (Farrington and Bebbington, 1994).

The Seed Project was developed to help address certain technical needs of NGOs and the US Peace Corps, and to promote participatory approaches for working with farmers on seed activities (Osborn, 1992). It collaborated with these different organisations with the aim of improving their agricultural extension activities. It also provided project planning, training and technical assistance to the various organisations, and follow-up field visits directed to training farmers. The Project's assistance to each NGO and Peace Corps collaborator was designed specifically to meet their institutional needs and the priorities of the farmers with whom they worked.

Northern-based NGOs became the primary partners of the Seed Project because, in contrast with indigenous NGOs, they expressed greater interest in the project's approach and concentrated on working directly with village groups. In some cases, the Seed Project also interacted with traditional village groups (such as those based on age or gender) and other local groups which had proven their ability to work with an NGO on community development activities, such as village water supply, education or horticulture. Whether it collaborated with international or local organisations, the aim of the Seed Project was to strengthen their technical and organisation capacities to manage seed development and dissemination.

## Providing Linkages Between NGOs, Farmers and Researchers

Establishing linkages between NGOs, farmers and research institutions that could provide technical assistance was essential to respond to the full range of issues and ensure the sustainability of seed activities once the Seed Project ended (Figure 1). In Senegal, besides the Project staff themselves, the Senegalese Institute of Agricultural Research (ISRA) was the primary source of technical assistance (Osborn and Faye, 1991).

However, NGOs, farmers, and agricultural researchers have very different knowledge systems and approaches to agriculture. In Senegal the link between farmers and researchers is traditionally weak (Gueye, 1992). As is common in many national agricultural research systems, ISRA did not have a mandate to be involved in extension. Researchers were not rewarded for taking part in extension activities and the agency was constantly under severe resource limitations. To encourage greater collaboration between the ISRA researchers and the NGOs and farmers groups, the Seed Project played a facilitating role. Relationships were developed informally with interested researchers on an individual basis. Moreover, researchers interested in extension and sustainable development were involved in the Seed

Project in a way that did not interfere with their primary research responsibilities. The potential benefit of strengthening the linkages between researchers and farmers relates not only to the technical assistance that farmers can receive but also to the important input that researchers can receive from farmers which can contribute to the direction and relevance of their research.

The rationale behind this strategy was that once the technical capacity and linkages were developed between the NGOs, farmers and technical assistance, then the Seed Project should be able to move away gradually from a project planning and training role to an advisory role, providing technical advice and information to the participating communities, organisations and collaborators (Figure 1).

## Learning Process Approach to Programme Development and Implementation

Historically, development projects have operated using a 'blueprint approach' in which all objectives and activities are specifically defined and programmed at the outset. This constrains programme development, limits abilities to respond effectively to changing conditions and opportunities and learn from past experiences. In an attempt to overcome the limitations of the blueprint approach, the Seed Project adopted a 'learning process approach' to seed development and dissemination (Korten, 1980). In this approach, the orientation of the programme strategy is progressively defined during project implementation through an iterative process of communication and joint analysis between the project staff and local collaborators. In the case of the Project, the goals and objectives were defined at the outset but the content of specific activities to achieve the objectives was based on a continuous flow of information gathered from the various farmer groups. As work progressed, farmer feedback and assessments of the Project's performance determined the future direction of its activities.

In his pioneering work on public administration and process-oriented planning, Korten (1980) stressed the importance of the learning process approach in achieving long-term sustainable development rather than inappropriate and unsustainable quick-fix solutions. NGOs have developed an understanding of the process of innovation and change that differs from the blueprint approach followed by most governments and donors (Cromwell et al, 1993). Participatory methodologies were used in the context of this learning process to improve communications and understanding among all key actors, including the Seed Project staff, researchers, NGOs and farmers. The learning process approach helped the Project to integrate the important social and cultural aspects of farmer-led technology development into its own activities and those of its partners.

## Seed as an Initial Extension Focus with Farmers

Seed has long been recognised as a key input in agricultural development. Farmers have effective, traditional systems for selecting, producing, and diffusing high quality seed (Cromwell, 1990). At the village level, discussions about seed immediately engage the

interest of farmers. Hence, seed is an ideal focus for extension activities (Bal and Douglas, 1992).

The long history of NGO involvement in seed activities has been documented recently (Cromwell et al, 1992, 1993). Seed extension is unique in that it involves the integration of many disciplines and components (e.g., seed technology, agronomy and improved varieties developed by agricultural research (Osborn, 1990)). In discussions with farmers, the Seed Project paid particular attention to the specific crop varieties they used, the characteristics of those varieties, how the seeds were produced, how local seed production techniques can be improved, and the possibility of introducing appropriate improved varieties of seed into the traditional seed production system.

There are several positive effects of appropriate introduction of improved varieties. Farmers are normally interested in trying new seed, but adoption depends on how the new variety compares to what they are already using (e.g., plant characteristics, days to maturity, pest/disease resistance, yield, taste, marketability, storability, etc). Because of the decreasing and erratic rainfall in the Sahel, there is a critical need for earlier maturing varieties, since the traditional varieties often do not produce adequate yields (Lipton and Longhurst, 1989).

A key element of the seed approach is the availability of improved varieties from the NARS and/or the national seed system (Biggs, 1989). The breeding and testing of suitable new varieties, based on local selection criteria and compatible with local agricultural conditions and practices, is a vital function of NARS which should be given high research priority. Improved seed is perhaps the most important technology that the national centres can provide to farmers.

## Participatory Agricultural Extension

In the Seed Project, the participatory extension approach involves extensive dialogue with farmers to assess traditional production systems before modified practices or technologies are identified and proposed. The role of the extension agent is no longer merely 'technology transfer' but rather to facilitate a two-way exchange of information and priorities between the extensionist and farmers. This open exchange of information is a critical aspect of the learning process approach.

Improving farmers' crop yields and reducing labour is viewed as a long-term process which involves promoting small changes in existing practices and gradual introduction of new and improved technologies. For example, initial attention was focused on promoting improved rice cultivars along with a few modified practices that would increase production. Farmers only adopt new varieties and practices which they have observed and believe are advantageous. Only when initial innovations are adopted and adapted are other changes proposed. The direction and pace of change is determined by the farmers themselves.

The Three Steps in the Participatory Extension Approach:

- Step 1 - determining farmers' problems, needs and resources;

- Step 2 - developing farmer participatory demonstrations; and,
- Step 3 - soliciting farmers' reactions to demonstration results.

The seed Project approaches these steps in the following ways.

## Step 1. Determining Farmers' Problems, Needs and Resources

The Seed Project process begins by training the extension agents of the collaborating NGOs in agronomy and community data collection using Rapid and Participatory Rural Appraisal (RRA/PRA) (Freudenberger, 1992). Following training, the field staff of collaborating organisations gather information from women and men farmers through group discussions and various participatory exercises. Observations and basic agronomic data are collected in farmers' fields by the extension agents and the Project agronomist during the production season with the help of the farmers. Afterwards, the Project agronomist discusses the information with the extension agents and participating farmers to verify technical data and to develop technical recommendations.

Several case examples will help illustrate the process as it was undertaken with women and men farmers in different parts of Senegal (Boxes 1 and 2).

### **Box 1. Improving Practices of Women Rice Farmers**

The data collection with women rice farmers by the US Peace Corps revealed that traditional rice varieties were not yielding well due to the reduced rainfall of the short growing season in the Sahel. Another finding was that rice is traditionally broadcast seeded rather than row seeded. This practice results in the proliferation of weeds which rob the rice plants of light, water, nutrients, and contributes to reduced yields.

Based on the information collected, Seed Project staff concluded that farmers could potentially increase their yields by using earlier maturing varieties and by adopting row seeding (Table 1). The earlier maturing varieties had been developed by ISRA and were available at the national level, but had not reached small farmers. The results of the demonstrations and adoption of the earlier maturing varieties were dramatic since the improved varieties could mature before the rains ended and provide a higher yield than the traditional varieties. The women farmers realised 20-50% higher yields in the demonstration plots compared to their traditional varieties. The earlier harvest also provided food during the 'hungry season' when food is in short supply. These improved varieties rapidly spread in small quantities (1-2kg) from farmer to farmer through the traditional seed diffusion systems.

The row-seeding demonstrations proved to the women that they could weed between the rows sooner after planting as compared with broadcast seeded rice. Further, they could drastically reduce the amount of time they spend weeding the fields and realise higher yields. The advantages of row seeding of rice encouraged the women to seek the help of their husbands to plant the rice with their peanut seeder. In 1992 there were 258 demonstrations in 37 villages involving 1200 women with a production of 10 tons of seed in the demonstration plots. If one assumes a 20% yield increase on 5ha, from 800kg to 960kg, a farmer can provide her family with an additional 5 weeks worth of rice or sell the rice for 21,600CFA (US\$80).

## **Box 2. Increasing Millet and Cowpea Production in Drought-Prone Areas**

Data collection from millet farmers by Christian Children Fund in a zone of 300-400mm annual rainfall revealed that while the traditional varieties were well adapted, the seed quality was highly variable. In this case simple ways to test and improve seed quality were introduced that included seed testing, seed screening, and a methodology for better selection of plants for seed (Table 1). Farmers were shown how to do simple germination tests in a calabash of moist sand before planting to verify seed viability and to sieve the seed to remove small and immature seed before planting. Farmers also marked out a 20x20m seed plot in the centre of their field where they thinned the millet to one plant per hill and removed diseased plants. At harvest they selected plants for seed based on colour and vigour, disease free, high tillering, and many medium to large heads. Farmers realised 30% yield increases with this method. In 1992, 50 farmers in five villages produced 850kg of seed.

Data collection was conducted by World Vision field staff on cowpea and millet cultivation in the drought prone, food deficit, northern region of Senegal where annual rainfall is 50-250mm. It was learned that farmers were buying food grain millet in the market to use for seed. The millet sold in the market came from a higher rainfall zone and was not adapted to local conditions. Based on this finding it was decided to introduce an earlier maturing variety of millet that had been developed by ISRA (Table 1). There are several improved varieties of cowpeas developed by ISRA and the CRSP (Collaborative Research Support Project of USAID) that are earlier maturing than the traditional varieties. In collaboration with IRA these varieties were proposed to farmers.

Both the millet and cowpeas demonstrations were developed with farmers and were widely accepted. Farmers are now involved in seed production of millet and cowpeas for use in their own village and for sale at weekly markets. In 1992 there were 102 villages involved in seed activities with 1,622 participating farmers. There was a modest production of 5,800kg of millet seed and 2,400kg of cowpeas despite widespread crop failure in the area. However, in 1993, 311 villages produced 637 tonnes of cowpeas and 257 tonnes of millet for seed sale and consumption.

## **Step 2. Farmer Participatory Demonstrations**

Based on the results of Step 1, the Seed Project assists NGO collaborators in the design and implementation of on-farm demonstrations to test the proposed modified practices and new varieties. The same extension agents who conducted information collection also implement the participatory demonstrations with farmers. Workshops, at the village level, coupled with field visits are conducted with the extension agents and project managers before and during the implementation of the demonstrations. Village workshops are a way to monitor the demonstrations, to interact directly with the farmers, and to improve the technical skills of the field staff. The training workshops with farmers are conducted using a participatory rather than a directive methodology based on the principles of adult education that builds on the information gathered in Step 1. Sessions are always started by soliciting farmers' perceptions of the topics to be discussed and verifying the findings of information gathered. It is only later that additional technical information is provided to farmers.

**Table 1. On-farm Seed Project Field Activities (1992)**

Topics	World Vision	US Peace Corps	Christian Children's Fund
Location	Northern Senegal	Central and Southern Senegal	Central Senegal
Crops included in the information gathering	millet and cowpea	rice	millet
Conclusions of information gathered	test improved varieties and practices	test improved varieties and practices	improve traditional varieties
Activities	farmer training and demonstrations	farmer training and demonstrations	farmer training and demonstrations
Gender of farmers	women and men	women	men
Number of villages	102	37	5
Number of farmers	1,622	1,200	50
Production results	122ha, 8,200kg seed produced	258 demos, 10,230kg seed, ave. 20% yield increase	850kg seed produced, 30% yield increase

The demonstrations are conducted so that farmers and extension workers can compare traditional varieties and practices with improved varieties and modified practices. Each village selects its own demonstration farmers. The extension agent assists the farmers in choosing the demonstration site in the village, reviews the concepts presented in the training with the farmers, and works with them in the demonstration plot. With self-pollinated crops such as rice and cowpeas, the production from the demonstration has the added advantage that it can be used for seed the following season.

Farmer-managed demonstrations are the best way for farmers to understand proposed innovations. Participatory demonstrations also allow field agents to observe differences between farmers in terms of how different farmers adopt or adapt the proposed changes. Finally, if demonstrations are a success, participating farmers can (and often do) later assume a role in extending the innovations to other farmers.

### Step 3. Soliciting Farmers' Reactions to Demonstration Results

The third critical step in the farmer participatory extension approach involves soliciting the reaction of the farmers to the demonstrations. The extension agent collects data herself/himself from the demonstration plots and elicits feedback from each farmer on both the demonstration and traditional plots. The farmers' feedback is the best indication of the appropriateness of the modified practices and technologies.

- what did they like and dislike about the demonstration?

- was it difficult for them to fit into the timing of other operations?
- was more or less labour required? If so, by whom?
- how is the new variety different from their own varieties in terms of yield, days to maturity, taste, storability, pest resistance, etc?
- are they willing to be involved in another demonstration?
- did the demonstration generate interest among friends and neighbours?

This feedback from farmers on the demonstrations is collected on visits to the fields, field days and at meetings after harvest. In the spirit of the learning process approach, feedback from farmers helps project staff decide which practices to promote the next season. Experience suggests that for a demonstration to be successful, it must be similar to what farmers are already doing, require comparable or less labour than prior practices and provide a noticeable yield increase (at least 20%) or other benefits. Unless there are substantial benefits from the farmers' perspective, the next season they will return to their traditional varieties and practices.

## Lessons Learnt and Future Directions

The Seed Project satisfied the requirements of the USAID planning framework in terms of inputs, outputs, assumptions and indicators while using a learning process approach. In this manner, the content of the project activities was specified during the project implementation in an iterative process involving close extension agent-farmer interaction.

In the final evaluation of the Seed Project conducted in 1992 it was estimated that at least 65,000 small farmers directly or indirectly benefited from the Project in Senegal and The Gambia. The majority of the project beneficiaries were women farmers. Several thousand demonstrations were conducted with crops that include rice, millet, cowpeas and peanuts. Tens of tons of seed were produced and diffused to other farmers. Sustainable agricultural technologies and practices were put into the hands of farmers. Adoption rates for the technologies and practices introduced to farmers were over 60%. The agricultural extension efforts of the collaborating organisations were strengthened through the programme planning, staff training and technical assistance.

The positive reaction by farmers, collaborating organisations and donors resulted in the initiation of a new phase of the Seed Project, the On-Farm Productivity Enhancement Program (OFPEP, 1992-1997). The seed activities are continuing in the new programme and its focus was expanded to include soil fertility activities in Senegal, The Gambia and Uganda. Important lessons learnt from the Seed Project activities have been incorporated into the OFPEP. These relate to:

- participatory extension methodology
- technical assistance to NGOs and the US Peace Corps
- linkages between NGOs and farmers and technical assistance
- learning process approach
- seed as an initial focus with farmers

- programme limitations

## Participatory Extension Methodology

The experience of the Seed Project staff and their collaborators indicates that the most important aspect of development work in rural areas is the need to create a sense of trust and confidence between farmers and outsiders. In rural areas, villagers often expect outsiders to bestow ‘gifts’ upon them (e.g., food for work, agricultural inputs, etc). This expectation is based on their previous experiences with government projects, donors and NGOs, where hand-outs and subsidies were considered standard practice. If, however, a constructive relationship can be established with farmers through regular field visits, consultation and collaboration with local field staff, demonstrations that outsiders want to learn from them and share knowledge with them, and expectations that farmers should pay a nominal fee for services and inputs (even a few kilos of seed), then it is possible to overcome this dependency mentality. From this perspective, the Seed Project orientation is in keeping with the *Beyond Farmer First* approach which views farmer innovation and experimentation as a social and political process first, and a technical process second (Scoones and Thompson, 1994).

The Seed Project has been fortunate to have a Senegalese agronomist/plant breeder, Alphonse Faye as its National Coordinator. In addition to his excellent technical skills, Mr Faye is committed to working with and learning from farmers. Ultimately, it is African technicians working with Africans farmers who will drive the development process. The role of outsiders will be limited to helping to get the process started.

The seed technology extension approach employed by the Project has been effective in working with farmers because careful attention has given to the participatory process coupled with technical assistance. The principal lesson learnt through this experience indicates that participatory methodologies should be used not only to help outsiders understand farmers' problems and priorities, but, more importantly, to enable farmers to understand their own resource constraints and opportunities. The Seed Project extension approach required a reorientation of extension staff, who were accustomed to one-way (top-down) communication. Field staff had to learn how to listen and establish a dialogue with farmers in order to gain their confidence and gain insights into local practices and capacities. This reorientation is a long-term, continuous learning process, one that requires extension agents to view themselves as ‘field facilitators’ or ‘partners’ rather than ‘consultants’ or ‘experts’ when interacting with farmers.

In the new phase of the project, both quantitative and qualitative data collection efforts have been undertaken in order to understand farmer perceptions, resources and constraints related to soil fertility. The farm-level surveys will complement existing regional and national surveys conducted by the Senegalese Institute of Agricultural Research. These data collection activities will help OFPEP and its collaborating organisations to develop better impact assessment indicators for programme decision-making, as well as for donors.

## Technical Assistance to NGOs and the US Peace Corps

NGOs and the US Peace Corps were able to benefit from technical assistance to increase the quality of their agricultural programmes. Taking part in collaborative agricultural research and extension projects can be an effective strategy for helping NGOs better serve the needs of farmers. Because of the emphasis on training at the NGO and farmer level, activities that were initiated are more likely to be sustained. Based on the experience of the Seed Project, a collaborative framework agreement was developed for OFPEP that clearly defines the goals, objectives, activities, roles and responsibilities of each of the institutional actors. Clarification and periodic review of these elements is critical for effective collaboration over the lifetime of the programme.

## Linkages Between NGOs, Farmers and Researchers

The relationship between the Seed Project and researchers has been very fruitful. This is because of both the dedication of the individual scientists and the fact that researchers were consulted and involved in a way that did not interfere with their primary responsibilities. During the first phase of the project, technical assistance was provided by research scientists in rice, millet, cowpeas, seed and seed technology, and animal traction. Researchers provided information and seed, assisted with training and participated in field visits. NARS have been criticised for their limited impact at the farmer level despite their efforts to work with national agricultural extension systems. The Seed Project has provided a mechanism for researchers to develop a meaningful relationship directly with farmers.

The technical focus has expanded in the second phase to include the broad and complex problems of soil fertility for which technical linkages are even more crucial if the complex land management problems confronting farmers are to be addressed. Fortunately, additional agricultural researchers have expressed interest in assisting OFPEP in the areas of soil fertility, agroforestry, weed science and data analysis.

Donors also play an important role in facilitating the collaboration between NGOs and NARS. It is precisely that role that USAID is trying to fill in Senegal with the innovative project, Natural Resource Based Agricultural Research (NRBAR). NRBAR provides mechanisms through which researchers and NGOs can work together on projects of mutual interest. It begins with proposals for field activities with farmers which are developed and submitted jointly by researchers and NGOs. Once approved, these projects provide basic funding for materials, transport, and travel expenses for the researchers and the NGO staff. Perhaps most importantly, NRBAR provides the kind of credible institutional backing necessary for inter-institutional, interdisciplinary collaboration. Hence, OFPEP and its NGO partners are able to work with international and national researchers through the NRBAR project. This kind of support offers great promise for facilitating closer cooperation between research organisations and NGOs by addressing the funding and institutional constraints that sometimes block such collaboration.

## Learning Process Approach

The participatory extension methodology has been an important tool in the iterative aspect of the learning process approach to project development. The learning process approach has facilitated the full participation of all the participants in agricultural extension including Seed Project and NGO staff, researchers, extension agents and participating farmers. The free flow of information and feedback between the participants has helped to identify programme strengths and weaknesses and keep activities properly focused. There have been periodic village meetings, workshops and consultation sessions, as well as regular, planned visits to farmers' fields year after year. The result has been an increased understanding of the complex conditions under which farmers operate among the researchers and NGO staff, and a better appreciation of the capacities and capabilities of the researchers and NGO staff among the farmers. It was through the feedback of farmers that soil fertility problems were identified as an important focus for future research activities.

## Seed as an Initial Focus with Farmers

Attention to seed, a vital input for all farmers, captured the attention of both women and men farmers. Through an initial focus on seed, farmers have experienced important gains in yields and increased labour productivity. The cost of seed production by NGOs has been estimated to be far above the market value (Wiggins, 1992). Nevertheless, seed remains an important vehicle for getting new technologies and practices into the hands of farmers so that they can be tested, adapted and diffused to other farmers (Srivastava and Jaffee, 1993). Improved varieties are being diffused through traditional farmer-to-farmer channels and, in some cases, through formal marketing channels.

This emerging pattern has three phases. Phase 1 is the farmer participatory demonstrations of varieties and modified production practices that provide an exchange of information with the farmer, create a 'seed awareness' and lead to either validation or rejection of the technology by the farmer. If the technologies and or varieties are accepted, information diffusion to other farmers often occurs. After widespread acceptance of the technologies/varieties, local seed producers may be established through the farmer groups in order to provide larger quantities of seed to meet the demand during the second phase. These seed producers will receive additional supervision/training to ensure that they are producing quality seed. In addition seed producers may be involved in the evaluation of additional new varieties and technologies. In Phase 3, local seed producers may be linked directly with the source of new varieties and be assisted with marketing and storage.

## Limitations Experienced by the Seed Project

During its operation, the Seed Project worked closely with international NGOs, such as the Christian Children's Fund and World Vision, and the US Peace Corps. These organisations had a strong presence at the village level, having an agriculture programme and the interest and capacity to develop seed activities with farmers. Unfortunately, many local NGOs did not share these characteristics nor did they have the capacity to effectively use the Seed Project support. For this reason they were not able to take part in the programme.

The Seed Project functioned with only two full-time staff throughout its first phase. This placed major constraints on the programme and limited its impact. With more staff and resources, local NGOs could have been assisted. If long-term sustainability is to be assured, due consideration must be given to strengthening the capacity of local organisations to carry out this work.

## Conclusions

The role of agricultural research and extension is to help farmers solve the problems that confront them. Problem-solving with farmers requires a high degree of technical expertise, but it demands even greater understanding of the social process of farmer innovation and experimentation. A participatory approach to research and extension can provide deep insights into farmers' resource constraints and opportunities, and help identify strategies for enabling them to find sustainable solutions. The efforts of the Seed Project and its collaborators point to what can be achieved in a multi-organisational programme involving NGOs, farmers groups and NARs when there is strong institutional support to facilitate their interaction. The Seed Project is succeeding in working itself out of a job by building the human and technical capacity of the NGOs, farmers' groups and NARs.

Efforts should be made to develop strategies to strengthen such linkages in future. Participatory extension methodologies, within the context of the learning process approach, along with attention to seed and soil fertility, could be key elements of those 'farmer-first' extension programmes.

## List of Terms

<b>CRSP</b>	Collaborative Research Program of USAID
<b>ISRA</b>	Institut Senegalese de Recherche Agricole
<b>NARS</b>	National Agricultural Research System
<b>NGO</b>	Non-governmental organisation
<b>NRBAR</b>	Natural Resource Based Agricultural Research project
<b>OFPEP</b>	On-Farm Productivity Enhancement Program
<b>PVO</b>	Private Voluntary Organisation
<b>USAID</b>	United States Agency for International Development

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International  
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Sustainable Agriculture  
and Rural Livelihoods  
Programme



## The Sustainable Agriculture and Rural Livelihoods Programme

The Sustainable Agriculture and Rural Livelihoods Programme of IIED promotes and supports the development of socially and environmentally aware agriculture through policy research, training and capacity strengthening, networking and information dissemination, and advisory services.

The Programme emphasises close collaboration and consultation with a wide range of institutions in the South. Collaborative research projects are aimed at identifying the constraints and potentials of the livelihood strategies of the Third World poor who are affected by ecological, economic and social change. These initiatives focus on the development and application of participatory approaches to research and development; resource conserving technologies and practices; collective approaches to resource management; the value of wild foods and resources; rural-urban interactions; and policies and institutions that work for sustainable agriculture.

The Programme supports the exchange of field experiences through a range of formal and informal publications, including *PLA Notes (Notes on Participatory Learning and Action - formerly RRA Notes)*, the *IIED Participatory Methodology Series*, the *Working Paper Series*, and the *Gatekeeper Series*. It receives funding from the Swedish International Development Cooperation Agency, the British Department for International Development, the Danish Ministry of Foreign Affairs, the Swiss Agency for Development and Cooperation, and other diverse sources.

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