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FARMERS' PARTICIPATION  
IN ACTION/RESEARCH ON LIVESTOCK  
CASE STUDY OF PEASANT CATTLE FATTENING  
IN THE UPPER CASAMANCE, SENEGAL

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## **RESUME**

**La participation des éleveurs dans la mise en oeuvre d'une opération de recherche/développement en Haute Casamance est discutée.**

**Le rôle des agropasteurs dans le processus de recherche s'est manifesté sous différentes formes :**

- 1) leur engagement à participer,**
- 2) la mobilisation de leur capital, main-d'oeuvre et intrants pour l'exécution de l'opération,**
- 3) la gestion de l'opération et la collection des données.**

**L'implication des paysans dans le processus de recherche a contribué à élargir leurs connaissances sur les techniques d'élevage et de culture.**

**Les éleveurs ont eu à modifier le parquet technologique qui leur était proposé en vue de l'adapter à leurs besoins et leurs contraintes.**

**En conséquence, les chercheurs ont acquis une meilleure compréhension des objectifs et des contraintes des agropasteurs, ce qui leur a permis de mettre en place des activités de recherches complémentaires.**

## AHSTRACT

The following is a discussion of farmers participation in the implementation of a research/action study on livestock in Upper Casamance, Senegal. The role of farmers in the research process takes different forms: a) their commitment to participate; b) the involvement of their capital, labor and inputs in the operation; c) the management of the operation; iv) the collection of data and the participation in different research activities. Their involvement in the research process enabled them to acquire a greater knowledge in animal husbandry and cropping practices. The farmers modified the proposed package in order to make it more adapted to their needs and constraints, which then allowed the scientists to better understand farmers objectives, strategies and constraints and to design complimentary research activities.

Keywords: Livestock Research/Action, Farmers Participation, Peasant Fattening Models.

## INTRODUCTION

Previously, many agricultural research efforts intended to develop new technologies to improve the efficiency of production systems and farmers welfare did not bring about expected significant changes in African countries which are still facing the widening gap between food production and increasing food demand.

Approaches to agricultural research in the design and implementation of appropriate technology for sustained development has markedly evolved. More emphasis is being put on the development of innovations with consideration to the farmers actual circumstances. On-farm agricultural research has gained popularity as a necessary compliment to conventional approaches. "National and international agricultural research institutions have come to the consensus that technologies intended for small farmers should be identified, designed and evaluated within the context of systems practiced by farmers themselves (Malton and King, 1984). This agreement resulted from the observation of the low adoption rate of technologies developed under a controlled environment without the testing and evaluation in the farmers environment.

It is also widely accepted that farmers should be involved in all phases, the design, implementation and evaluation, of technology development. However, how and what farmers should contribute and what the impact of their participation are still pertinent issues which merit further elaboration. Methodologies for on-farm livestock research and farmers involvement in technology development are still at their early stage of development. Therefore, an important step towards a more efficient use of research includes the conviction of scientists and decision makers of the values of such an approach to research.

On the basis of information gained through a research/action grant, this paper discusses issues of farmers' participation in on-farm, livestock research, evaluating the technical, financial, and social feasibility of which is

currently peasant fattening models. This paper is a preliminary analysis of the impact of farmers' contribution in the research carried out in the Upper Casamance of Senegal, thanks to supporting funds from the African Development Foundation (ADF).

The second section of this paper provides background information on the livestock production system in the Upper Casamance. The research problem, defined in the third and fourth sections, describes the experimental design. Farmers participation and the impact of their involvement in the research implementation are assessed in section five and six respectively.

## 1. BACKGROUND INFORMATION: THE LIVESTOCK PRODUCTION SYSTEM IN THE UPPER CASAMANCE.

The region of Upper Casamance, situated in Southern Senegal, is endowed with important national resources: land and water, making it an area with high agropastoral potential. It covers 17,718 km<sup>2</sup>, out of which only 24% are under cultivation. The mean annual rainfall is relatively high (900 mm).

The farming system in the Upper Casamance is characterized by a completely intertwined and closely integrated crop and livestock production sub-system. Many crops (cotton, groundnut, millet, sorghum, maize, rice, etc.) are grown and many livestock species (cattle, sheep, goats, equines, poultry) are raised. The integration of the livestock and crop production sectors is facilitated by the convenient symbiotic interactions of these two components. The crop sector receives animal power and manure while the livestock sector benefits from crop residues. The 244,739 inhabitants of the rural Upper Casamance secure their subsistence needs from cropping and animal husbandry activities.

The ruminant population in the Upper Casamance is made up of 312,000 heads of trypanotolerant NDama cattle and 248,000 heads of Djallonke sheep and goats. Livestock contribute a great deal to the welfare of farmers through their main functions as:

- o sources of auto-consumed goods: milk, meat;
- o capital assets;
- o source of cash revenues; and
- o input to the crop sector: power, manure.

The livestock sector in the Upper Casamance is characterized by:

- o the wide variety of species raised;
- o the diversity of farmers objectives for livestock rearing;
- o the extensive management system with low level of inputs;
- o the modicity of farmers financial status;
- o the hostility of the physical environment;
- o the seasonality of natural resources availability, and the seasonality of levels of performance achieved;
- o the production circumstances of high risk; and
- o the individual ownership of animals which are grazed on natural pastures communally accessible.

Despite its natural resources endowment, the livestock productivity in the Upper Casamance is plagued by important ecological, biological and

socio-economic constraints. Although more gifted than the northern Senegalese zones with regards to the vegetal biomass and water resources, seasonality in feed quality and quantity and insufficient watering facilities are major constraints facing the livestock sector. Internal (trypanosomiasis, round worms) and external parasites, tick-borne diseases and infectious diseases (anthrax, hemorrhagic septicemia) are major health problems. In addition, management practices, such as excessive milk offtake and reduced grazing time, coupled with the low level of supplemental feedings, have adverse effects on the overall herd productivity. The lack of infrastructure and communication means and the relative weakness of technical assistance to farmers are, in part, responsible for the farmers low level of knowledge on improved production techniques.

Past research efforts undertaken in the Upper Casamance remained removed from farmers' problems and realities. Research activities were conducted in a controlled environment--on station. The ignorance of the structure and functioning of the livestock system and farmer objectives, strategies and production circumstances were more conducive to a slower pace in new technology development and adoption. In addition, the lack of creative interaction between research institutions, development agencies and farmers has been an important factor constraining farmers from acquiring new knowledge, and enabling them to remove or alleviate problems they are facing.

Up to 1985, development efforts paid little attention to the livestock sector in the Upper Casamance. Cotton production was, until recently, the major concern of decision makers.

## II. DEFINITION OF THE RESEARCH PROBLEM.

A diagnostic of the livestock production system in the Upper Casamance resulted in the identification of avenues to improve the productivity of this sector and, therefore, farmers revenues and welfare (Fall, 1988). Devised alternative solutions address the dry season feed restriction, changes in management practices and institutional issues. Suggested alterations of the management system include the development of small scale peasant fattening models of cattle.

Peasant cattle fattening is widely practiced in the central and western regions of Senegal (Sine Saloum, Dakar) where the availability of crop residues and agro-industrial byproducts and high meat prices make these operations financially profitable (FAYE, 1986). With consideration to the available resources, animals, feed and labor, and the growing demand of red meat, farmers in the Upper Casamance were assumed to have at their disposal the resource base required to develop improved management practices such as cattle fattening. The validity of this assumption is shared by many individual farmers, farmers organizations or Non-Governmental organizations who strive to run or to encourage such enterprises in the Upper Casamance.

The adoption of small scale fattening schemes, not yet popular in the Upper Casamance, could bring about substantial beneficial effects to farmers' production--efficiency and revenues. Such advantages emanate from:

- o the use of farm crop residues or local agro-industrial byproducts;
- o the generation of additional financial revenues;
- o the improved crop yield through the utilization of better quality manure produced by fattened animals;
- o the utilization of labor, otherwise idle, in productive activities; and
- o the improvement of farmers' organizations and knowledge through their new technological experience.

Past research on cattle fattening in Senegal was undertaken on-station, with breeds other than the NDama cattle and with a different feed resource base. This type of research was supposed to support large scale "industrial" feed lots, regarded as the last stage of the stratification model. This in fact is the actual framework used for the development of cattle productions in Senegal. However, knowledge is poor when it comes to the evaluation of the technical, financial and social feasibility of peasant fattening models.

As a result of research conducted without farmers' participation, individuals' and farmers' associations are lacking information and knowledge they can resort to when they want to initiate or to enhance the efficiency of fattening enterprises. Consequently, they often raise questions and issues such as:

- o What are the expected responses of the NDama cattle under an improved management using local resources?
- o When and how to operate a fattening operation?
- o What is the appropriate animal choice for fattening?
- o What is the most appropriate feed system?
- o How costs, access to different inputs and market prices affect the profitability of fattening operations?

Responses to such questions and issues are essential in order for farmers to plan and implement successful small scale feed lots.

### III. THE RESEARCH OBJECTIVES.

The objectives of the research are:

1. to evaluate the financial and technical feasibility of peasant fattening operations;
2. to study the livestock marketing system in the Upper Casamance;
3. to estimate NDama cattle carcass yield;
4. to study farmers organizations; and
5. to evaluate the impact of farmers' participation in the research.

## VI. EXPECTED RESEARCH OUTPUTS.

Knowledge gained on NDama cattle performances and the levels of profitability achieved under different management **systems** and **resources** bases will help farmers to more efficiently conduct fattening operations for the maximization of their revenues. As a result, development agencies **will** have at their disposal valuable information which would enable them to **provide** farmers with solid technical **advice**. Currently, rural **credit** agencies are reluctant to finance livestock-related activities because of high risks involved in this sector. The results of this study on the profitability of peasant fattening operations will **contribute** to assuring them that it is financially solid to support such peasant enterprises. Above all, the direct involvement of farmers in the research process and their permanent interaction with scientists will not **only** broaden their knowledge on animal and cropping practices but also will enable scientists to gain an indepth understanding of farmers' objectives, strategies and **constraints**.

## V. METHODOLOGY.

### The Research Themes

Five major interrelated themes are identified to **evaluate** the peasant fattening models:

1. Technical performances: specifically biological performances such as weight gains **according** to such factors as the feeding system, animal choices and the length of the operation.
2. Financial performances: the analysis of the **cost** and benefits of fattening operations in order to **evaluate** its financial profitability.
3. Cattle marketing system: the analysis of the seasonality of cattle selling prices.
4. The measurement of the NDama cattle **carcass** yields in order to **evaluate** meat gains obtained through fattening.
5. Farmers' organizations and the social impact of **peasant** fattening models.

### The Research Approach

The Research/Action approach to this study has been used as the conceptual framework to conduct the study. Research activities take place on-farm with the direct involvement of farmers. They fully **manage their** own operation, either on an individual or group basis and receive **advice** from **scientists**. Methods used by researchers to gather information **include**: close monitoring, rapid surveys, groups discussions, key respondent and workshops.

### Sampling of Research Sites and Fattening Workshops

It has been pointed out that a statistically sound experimental **design** for on-farm livestock research is **difficult** to set up. Research sites and farmers are usually selected on the **basis** of subjective criteria. **This**, however, does not invalidate the research (Van Eys, 1985).

In this research, five fattening workshops scattered in four villages and totaling 91 animals were selected for **monitoring**. The **choice** was made on the basis of **accessibility** to villages, farmers' **receptiveness** and the possibilities of sound monitoring.

### Identification of participants

Farmers who were selected to participate in the research were already operating fattening enterprises on an individual or **cooperative** basis. They had varying degrees of experience and knowledge on cattle fattening practices and technical assistance.

The "Groupement d'Interet Economique: (GIE)" is the new formula for efficient farmers organizations in rural Senegal. The New **Agricultural Policies**, geared towards the realization of the stated objective of **national food security**, put greater emphasis on the roles of peasant organizations. The state attempts to exert less influence in this sector and subsequently places more emphasis on farmers' responsibilities through **GIE's** in terms of access to **credit**, acquisition of agricultural inputs and equipment, as well as the marketing of commodities.

Three **GIE's** in villages of Dialambere, Medina Koundie and Medina Yorofoula made up the sample of **cooperatives** selected for monitoring. This sample is also extended to two individual farmers privately **running** their **small business**.

The **GIE** of Dialambere and Medina Doundie have a mixed composition of males and females, while the **GIE** of Medina Yoro Foula is entirely made up of females who had had no previous experience in running **such** operations. In Dialambere and Medina Koundie, animals were communally managed by selected members of the **GIE**. In Medina Yoro Foula, **each** group of three members of the **GIE** are in charge of two animals in their own compound.

### Evaluation of Biological Performances

A monitoring scheme has been **designed** and implemented to gather data on technical performances obtained in fattening workshops. Observations pertain to:

- o animal liveweight: weights of animals are measured at the **onset**, halfway and at the end of the **operation**;
- o feed **consumption**: quantities of distributed feedstuffs as well as residues are measured on a weekly basis;
- o the total quantities of manure produced by animals **during** the process are evaluated in sample stalls.
- o animal liveweight and **carcass** weight are measured on a weekly basis at the slaughter **house** in Kolda.

### Measurements of Financial and Social Variables

The monitoring scheme also allowed the collection of data pertaining to socio-economic aspects of the enterprise **such** as data on the cattle marketing system, prices of inputs and farmers organizations **include**:



- o livestock marketing data: Enumerators are recruited to collect data on weekly livestock markets; the number of animals presented in the market, the number of animals sold, their category and selling price are recorded.
- o all types of inputs and their origin (either purchased or produced on-farm) and their prices are collected.
- o discussions with farmers provide us with information related to their organization: structure, function, decision making process, division of labor and constraints.

## VI. FARMERS' PARTICIPATION.

The direct involvement of farmers is a key element of the **research/action** approach to the study. What, how, and when farmers **contribute** (Kirby at Maltou, 1984) and the impact of their involvement are essential aspects of farmers participation to on-farm livestock research for appropriate technology development and a wide dissemination. Farmers have a stock of knowledge which should be acknowledged and utilized as valuable inputs for the design, implementation and evaluation of innovations addressing their production constraints. It requires that farmers be regarded as real partners in order for their participation to be meaningful in this process.

In this study, farmers voluntarily agreed to participate in the research before they became involved in the research implementation.

### Farmers' Commitment

One of the most important aspects of the farmers' contribution is their willingness to **participate** and to invest their capital, labor and time in the research. The CRZ had a long tradition of working with farmers in the Upper Casamance. As a result, a mutual trust has grown **between the two** partners. This facilitated obtaining the commitment of farmers to participate despite the inconveniences of the research activities **such as valuable time** lost collecting data during critical periods of the year.

In this research, during the planning phase, a **series** of discussion sessions allowed scientists to explain to farmers the research objectives and experimental design.

### Farmers Participation in the Research Implementation

Farmers have been mainly involved in research activities dealing with the evaluation of fattening operations. Studies of the livestock marketing system and of carcass yield were conducted by qualified enumerators.

Farmers were enthusiastic to participate in the formulation and distribution of rations, in the collection of data, and in the evaluation of the technology during the course of the active process and during the dissemination workshop.

## Ration formulation and feeding

Many feed resources can be used in the Upper Casamance for cattle fattening purposes including: cottonseed, groundnut hay, cereals, bran and various roughage. According to a full stall feeding system of management as devised by the CRZ/Kolda, rations were formulated with consideration to available resource at each site. Rations composed of different proportions of cereal brans, cottonseeds and ordinary salt would supplement roughages, cereals, straw, groundnut and hay to meet all the nutrient requirements of animals.

Demonstration sessions were organized to show farmers how to mix different ingredients. Available baskets, cans and buckets were used to measure quantities of feedstuffs needed for the ration mixing and distribution. After the demonstration, designated farmers were put in charge of the daily mixing of the concentrate, and the weighing of the ration distributed as well as the quantification of residues after consumption. All data were recorded by farmers who were trained for such tasks.

## Measurement of biological performances

- o Animals are periodically weighed with an electronic scale. The handling of animals and the weighing are executed by farmers who were taught to use the scale;
- o Farmers also intervened in the extraction and the quantification of the total manure produced in stalls;
- o The scientists set the diagnosis of diseases affecting animals and apply a treatment with the assistance of farmers. Some farmers who, trained in basic veterinary practices, help treat animals and apply prophylactic measures such vaccination and hygienic actions. At each occasion, the etiology, mode of dissemination and treatment of the encountered affection is explained to farmers as well as methods to prevent it.

## Measurement of other inputs

Prices of inputs (feedstuffs, drugs, etc.) and purchasing prices of animals are recorded by selected enumerators among farmers. They also collect data on labor inputs to fattening activities with a questionnaire formulated by scientists.

## Participation in the dissemination workshop

Farmers seldom have opportunities to exchange experience and information. Most workshops dealing with farmers' problems are held without their participation. In these cases, it is the scientists who attempt to express farmers' objectives, strategies and constraints with their own biases.

More than 50 farmers were invited to a workshop on fattening operations, giving them the opportunity to exchange experience and information with researchers and extension agents. Major issues elected for discussion were: a) the planning of the operation; b) the feeding system; c) the marketing of animals; d) health problems; and e) the role of various agencies intervening in the sector. Two major categories of farmers composed the panel: 1) farmers running a small

scale feed-lots enterprises; and 2) those who did not have such experiences. The workshop was conducted in their own language which facilitated interesting interactions and enriching discussions on issues cited above.

### The Impact of Farmers Participation

The involvement of farmers in the research process yielded three remarkable outputs: 1) the increase of farmers knowledge in animal and cropping practices leading to a more efficient use of resources; 1) the modification of the recommended package by farmers according to their needs and production constraints; and 3) the design of complimentary research activities by scientists and a better understanding of strategies adopted by farmers to meet their goals.

#### Increase in Farmers Knowledge

In the traditional cattle management system in the Upper Casamance, dry season feed supplementation is not practiced on a broad basis, and if it happens to occur, it is performed at low levels. The objective of dry season supplemental feeding is to improve the herd survival rate. In the current research, animals stressed by the dry season feed restriction are given priority in the utilization of scarce feedstuffs such as groundnut hay. For example, draught animals may receive green leaves of 'bane'-pterocarpus ericeaneus. A dramatic change in the perception of the benefits of the dry season supplementation has been a positive outcome, brought about by their participation in the research process. The farmers usually state that they could not believe that such levels of animal performances could be achieved in the dry season by supplementing their feed. They also realized that dry season supplementation, in addition to its original functions to improve survival rates, could be extended to alternative productive purposes such as fattening for improved productivity.

Many farmers were not familiar with the use of cereals brans for cattle feeding. These resources are usually consumed by poultry, equine and sometimes lactating cows one week after calving. In the research, farmers found alternative uses for important quantities of cereal brans produced by the domestic cereal processing.

- o The demonstration of the mixing of different ingredients which make up the ration has been beneficial to farmers. They extended this practice by using ordinary salt solutions on dry roughage in order to improve their palatability and then ingestion.
- o Farmers have been very sensitive to the weight measurements. At each weighing session they remember the animal's previous performance. This enables them to judge the efficiency of their feeding system on the basis of the animal liveweight evolution. They also are able to relate the weight decrease or increase to a particular factor. Farmers were therefore able to correct the deficient fact under the supervision of scientists.

- o During the dissemination workshop it was noticeable that many farmers were not acquainted with certain feeding techniques. They were amazed to learn that urea could be used as a non protein source of nitrogen which also improves the utilization of roughages. They however, experienced fatal toxicities of animals which accidentally consumed urea destined to cereal fields.
- o For the majority of farmers it was the first time they had heard of using animal byproducts such as bones and blood for feeding purposes. Many of them had difficulty believing that silage techniques were an important means to store and preserve high quality forage for future use.
- o Farmers were reluctant to use the better quality manure for cropping as recommended by the research team. In the traditional system, animal dung is deposited in the field throughout the year and sometimes the fields are burnt before ploughing. Whether they are burnt or not, the practice of direct manuring is conducive to high losses of nitrogen and organic matter due to the deteriorating effect caused by the sun and the termite invasion. In Medina Koundie, The farmers first tested the effect of the manure produced by fattened animal in stalls, on saplings and then in their communally owned garden. Positive results observed in the garden in terms of improved yields convinced farmers to use the manure in their cereal fields. In the first year of monitoring, we observed that great quantities of manure remained in the stalls. Once they were convinced of the beneficial effects of this resource on cereal yield through their own trials, they began to plan the mode of distribution of manure among cooperative members. This was done before the initiation of the following fattening operation.
- o Farmers adopted and appreciated the beneficial effects of hygienic measures recommended by scientists. In general, farmers are not familiar with new habitats of animals which may result in new affections. The regular cleaning of stalls and the periodic replacement of the litter were recommended measures to lower humidity in order to prevent parasite development.

### Modification of the Technology

Farmers are the source of technology or they can adjust proposed packages to fit their physical and socioeconomic environment. This is illustrated by the farmers attitudes in Djalambere and Medina Koundie.

Farmers changed the animal management from a full staff feeding system to a

implementation of rigorous on-farm livestock research. However, the appreciable qualitative information obtained through this approach may offset such inconveniences. Further elaboration is needed for the development of methodologies and criteria for evaluation, not only of the technology but also of researchers involved in such activities.

3. Farmers participation in the research process has the additional advantage of enabling them to modify the proposed innovation according to their objectives and production circumstances. It is therefore obvious that scientists should give priority to the better understanding of the farmers objectives and strategies. Ongoing communication between farmers and scientists throughout the research process is an important means for scientist to become more acquainted to the complexities of the livestock

Farmers both in Djalambe and Medina Koundie opted not to dispose of the animals at the end of the operation but rather decided to use them for traction purposes. Two major goals were pursued in doing so. First, ploughing is a high energy demanding operation. Well fed animals, in able working conditions, are required to plough heavy soils. In the traditional feed process, draught animals are usually in poor physical shape during the critical ploughing period of the year and are unable to meet high energy demands. Farmers that realized animals which were originally raised to sell could also be used for ploughing. Second, most of the cooperative members did not own draught animals and were faced with the difficulties of land preparation. The cooperative decided to support them by providing them, on a temporary basis, with fattened animals during the ploughing period. In Medina Koundie, Djalambe no cost was incurred by members who benefited from the services of animals. In both cases, this system may be advantageous from the member or group standpoint since it generates cash revenues to the cooperative or allows increased crop production for members. It may be argued, however, that these advantages could be offset by the eventual reduced selling prices of animals from the drop of weight because of the workload or the sale of the animal at an inappropriate time. Scientists will have to assess advantages and inconveniences of both management systems according to the cooperative specificities.

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### Complementary Research Activities

Regarding the modifications of farmers' strategy, scientists thought that it was necessary to implement complimentary research activities. This would enable them to take into account all outputs for a comprehensive evaluation of the technological package being tested by farmers. Since fattened animals were used for draught purposes, data were needed on animal performances in the field. From a financial analysis perspective, the leasing cost of the animal may be appropriate to evaluate, as well as the benefits relinquished by postponing the selling time and utilizing the animal for ploughing. In the case of Djalambe where no cost was incurred by members who benefited from the animal power, it is necessary to evaluate gains in terms of additional crop production which was generated by utilizing the animals for traction.

A monitoring of draught animals has been set up to evaluate their working time, surface of land ploughed and velocity. These variables are measured in two groups of animals: a "treated" group which benefited from supplemental feeding in the dry season; and a "control" group which was raised on an extensive mode with supplementation.

### CONCLUSIONS

1. On farm livestock research is a valuable complement of conventional livestock research. It not only rapidly utilizes and enhances farmers knowledge for the adaptation of new technologies but also enables the farmers' relevant evaluation of innovations intended to alleviate their production constraints.
2. The diversity of the farmers' objectives in running livestock related activities and the various animal outputs (power, manure, meat, milk) some of which are non-marketed, intermediate products used as input to the closely integrated crop sector, are serious constraints to the design and

implementation of rigorous on-farm livestock research. However, the appreciable qualitative information obtained through this approach may offset such inconveniences. Further elaboration is needed for the development of methodologies and criteria for evaluation, not only of the technology but also of researchers involved in such activities.

3. Farmers participation in the research process has the additional advantage of enabling them to modify the proposed innovation according to their objectives and production circumstances. It is therefore obvious that scientists should give priority to the better understanding of the farmers objectives and strategies. Ongoing communication between farmers and scientists throughout the research process is an important means for scientist to become more acquainted to the complexities of the livestock production system. This subsequently will enable them to design more appropriate innovations.
4. The management system of on-farm livestock research is an important aspect of the approach. When farmers own the animals, assume responsibility for inputs and consequently endure all the risks, they are no longer under the researcher's control and therefore, can change strategies and alter the innovations as they desire. This is an important means to evaluate the performance of the technology when used by farmers and to identify ways of adapting it to enhance its efficiency and greater dissemination.
5. The experimental design should be flexible enough in order to adjust research activities to the farmer's changing management strategies. This requires that a permanent and close communication be established between farmers and scientists and for the latter to detect, at the appropriate moment, changes which can affect the analysis of the research results.
6. The dissemination workshop is a key component of the research activities. It is an important tool for farmers to exchange experiences and information and for scientists to become more familiar with farmers' concerns. The utilization of their language in the workshop facilitates the exchange of ideas.

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