



Weighing peanut forage during the Kiri joint experiment in 2017, photo by Amagana Djimé

Improving the living conditions of local communities through Participatory Innovation Development

Forging a partnership between farmers, agricultural advisers and researchers in order to promote farmer-led innovation in agro-ecological intensification

Assétou KANOUTE, Bourama DIAKITE, Souleymane DIARRA, Samba TRAORE, Dommo TIMBELY and N’Famara SOUMARE

COLLABORATIVE
CROP RESEARCH
PROGRAM

McKNIGHT FOUNDATION



KIT Royal
Tropical
Institute

PROLINNOVA
PROmoting Local INNOVATION
in ecologically-oriented digital agriculture and natural resource management



Introduction

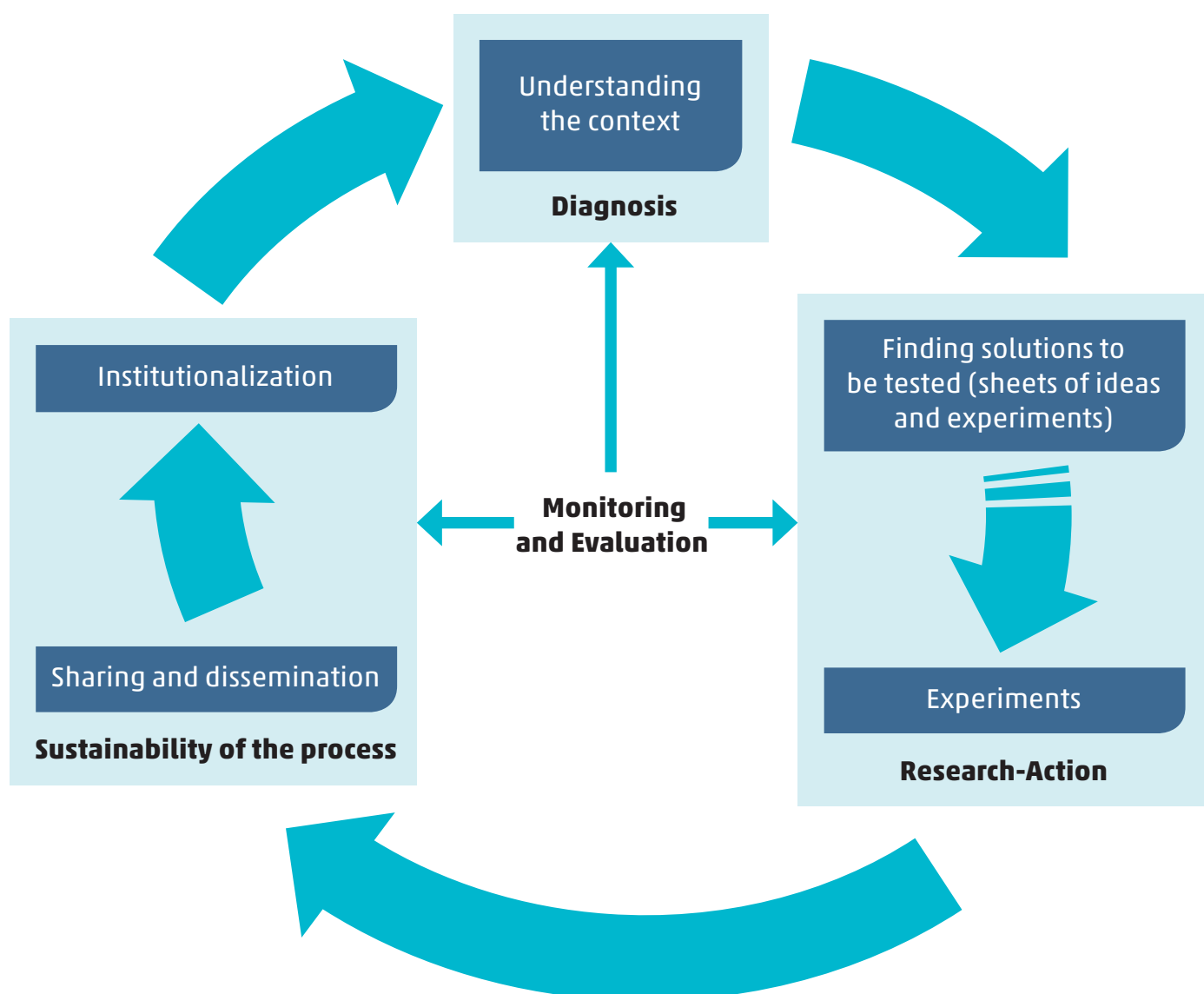
The intervention areas of the Farmers' Research Network (FaReNe) project in the Ségou and Mopti regions are experiencing food insecurity problems caused by poor soil fertility. It was to tackle this problem that the Participatory Innovation Development (PID) approach has been used in order to identify and enhance the value of local knowledge in the field of agro-ecological intensification. It is an approach that stimulates the creativity of the farming community to contribute to the improvement of its own living conditions. It is based on a multi-stakeholder partnership that includes farmers, agricultural advisors and researchers. It is an approach that puts the innovative farmer at the heart of the process.

The PID process cycle includes the following key phases (Figure 1):

- 1 Understanding the context of the situation on the ground.
- 2 Research-Action.
- 3 Sustainability of the process.

The monitoring and evaluation of the process is an interdisciplinary activity, carried out in parallel with the progress of the PID process.

Figure 1 | The Process Cycle



Understanding the context of the situation on the ground

Participatory Innovation Development

The Participatory Innovation Development process involves several steps, as follows: (i) the identification and training of the investigating agents at the partner structure level (Rural Technical Support Service Officers and the Association des Organisations Professionnelles Paysannes or Association of Farmers' Professional Organizations) (ii) identification of innovative practices with farmers on the ground; (iii) workshops to review, analyse and select the most relevant practices that meet the criteria for characterizing a farmer's innovation; (iv) joint experimentation; (v) the capitalization and dissemination of farmers' innovations. As part of the FaReNe project, a technical team is in charge of the technical support of the process. It is comprised of the Association of Professional Farmers' Organizations (AOPP), the Association for the Development of Production Activities and Training (ADAF Gallè), the Institute of Rural Economy (IER) and the National Directorate of Agriculture (DNA).

Identification and training of investigating agents

This professional training concerns the concepts, the principles and the methodology of Participatory Innovation Development (PID). The technical team members are the trainers and they divide the training modules up among themselves. There were eight investigating agents from both regions, with two technicians and two AOPP farmer managers per region. After the training, four groups of two people were formed (a technician and a farmer leader) and sent to the field in search of good farming practices in the field of agro-ecological intensification with questionnaires for the characterization of farmers and of their practices. Each group was tasked with reporting back ten practices to be considered for the DPI process.

Feedback and discussion of the information collected by investigating agents

A day of feedback and discussion was organized between the FaReNe technical team and the investigating agents in order to share the information that had been collected. Each practice was analysed in accordance with the criteria of *viability* and *desirability*. An innovation is deemed to be of a desirable type when it is sustainable as well as socially, environmentally and economically acceptable, in addition to being technically sound. It is desirable when it is adaptable, when it makes good use of the available and accessible (low cost) local resources and is based on an efficient use of time and resources. This exercise makes it possible to identify deficiencies as regards the criteria for analysing farmers' innovations and to retain those that meet the aforementioned criteria and proceed to rate them.

In this case, the innovations selected for support were mainly carried out by village groups and were the following:

- Organizational innovation around several activities: recovery of degraded land, purchase and rental of oxen for ploughing, and fish farming in Nabougou (Ségou circle)
- Organizational innovation for the sustainable promotion of the shea butter sector in San
- Doumnokéné de Kiri (Koro) organizational innovation focused on the recovery of degraded lands
- Organizational innovation focused on the advocacy for protection and natural regeneration in Bénébourou (Koro)
- Rotation of millet/fonio in order to control Striga weed in Térédougou (Koro)
- Peanut seeding techniques in furrows in Nampasso

Research-Action

Joint Experiments

Improvement solutions were proposed during a local brainstorming session in which village group members participated with the facilitation of the technical team. During this session, the analysis of the innovation was carried out by associating the members of the group who identified the constraints, before seeking solutions through the brainstorming session.

After a consensus was reached around the constraints and appropriate solutions, an experimental set-up was developed with the support of the researcher. This set-up must be simple while respecting scientific rigour (see Frame 1). The objectives of the experiment, the expected results and the indicators, with the periods of data collection in relation to the variables, were defined, as well as the activities necessary for implementing the experiment. Both an action plan and an implementation were then developed, and the experimental farmers were identified on a voluntary basis but also according to their capacities to conduct the experiment in compliance with the instructions given.

Farmers were tasked with collecting information in accordance with the agreed periodicity employing a simple tool that had been mutually agreed. According to the agreed period, they also had to meet from time to time to take stock of the progress of activities under the direction of a designated official. The technical team met the farmers at least once to supervise them and ensure the smooth running of activities by providing support-advice according to the constraints identified. At the end of the campaign, a review of the entire process was carried out between the technical team members and the experimental farmers, the data was analysed, and the results were shared with the village community, who also had their say in discussing the results. When sharing these results, the issues raised by their analysis were discussed and may lead to further experimentation.

Frame 1 | Arrangement of the Field Experiment Carried Out in Kiri

Title: Evaluation of crop performance (sesame, cowpea, maize and sorghum) on a reclaimed plot in Kiri

Within the framework of innovation improvement, the cooperative conducted a joint experiment with the support of the project to evaluate crop performance on the reclaimed plot in Kiri.

Village: Kiri; Name of the district: Koro;
Name of the region: Mopti;
Name of group: Doumnokéné;
Number of people per group:
Men: 30
Women: 50
Soil type: sandy loam
Location: Located southwest of Koro in the Sahelian zone of Mali

Objective: To evaluate the performance of sorghum, sesame, cowpea and maize crops in terms of productivity and the effect on the income of the organization's producers using a recovered piece of land.

Arrangement of the Field Experiment: Simple test arranged in a Fisher's Completely Randomized Block Arrangement with 9 blocks. All experiments involving the same block will be sown on the same day. The basic plots for each crop consist of four lines of 8 m long or 24 m². The entire plot will be harvested in order to minimize extrapolation errors.

Size of the total plot for joint experimentation: ½ hectare
Size of the basic parcels: 24 m²
Number of blocks/groups: 9
Species and varieties: Sesame S42 (2 kilos); Kôrbalen Cowpeas (10 kilos); Brico maize (10 kilos) and Seguifa sorghum (6 kilos)
The parameters to evaluate
1) Density at maturity, 2) Weight of the grains (Kg), 3) Weight of the straw (Kg)

Impact on agro-ecological intensification: Through joint experimentation, the yield for producers increased from 233 kg/ha to 537 kg/ha, an increase of 43%

Sustainability of the process

Dissemination of results

The capitalization of farmers' innovations is part of the process and contributes to a better dissemination of the results. All the stakeholders involved take part in the implementation. Experimental farmers can provide pictures as well as data collected throughout the process. The technical team members centralize the data and draw up reports, produce the technical sheets, posters, scientific articles and documents for symposiums.

The results dissemination strategy involves several actions. Intra and inter-network exchanges make it possible to share the results between farmers and other participants. Local radio stations often participate in these exchanges by reporting and promoting the results. Posters and written articles are shared with the public through participation in forums and colloquiums.

Analysis of the roles of stakeholders in the PID process

In the PID process, and within the framework of the multi-stakeholder partnership, the Association des Organisations Professionnelles Paysannes (Association of Professional Farmers Organizations) (AOPP) ensures the mobilization of farmers within the groups and the dissemination of results in its network; the Institut d'Économie Rurale (Rural Economy Institute) (IER) supervises the scientific rigour of joint experiments in the field by proposing experimental protocols and

analysing the results. It also carries out the scientific validation of the data sheets on farmers' innovations to be disseminated. The Direction Nationale de l'Agriculture (National Directorate of Agriculture) (DNA) handles dissemination of the results from joint experiments. The Association pour le Développement des Activités de Production et de Formation (Association for the Development of Production and Training Activities) (ADAF / Gallè) ensures the coordination of activities and also contributes to the dissemination of the results of the project.

The innovative farmers, through their creativity, have demonstrated their leadership in the joint experimentation, but the innovations selected in the framework of the FaReNe project were carried forward by the farmers' groups. One manager was however designated in order to provide leadership within the framework of the joint experiment.

The farmers involved in the experimentation are those who contribute to the improvement of agricultural innovation by volunteering to take part in the implementation of the joint experiment.

The other farmers take part in the analysis of the constraints of innovation and the proposal of solutions for improvement; they take part in the selection of the farmers involved in the experimentation (because volunteering alone is not enough to qualify farmers to take part) and in the validation of the results of the joint experiment.

Network exchange visit in Kiri in 2016 by Diakité Bourama



The Results

There were eight investigators, made up of technical service agents and farmer leaders, and these were divided into four pairs, two (2) per region. Of the forty practices identified, six were selected as innovative following the analysis. The joint experiment was conducted on four of the six proposals selected as a result of this analysis.

In Kiri, a Dogon village located in the Koro circle on the Koro-Ouahigouya axis (Burkina Faso), the innovation focused on the recovery of degraded lands by digging in organic matter. The experiment consisted in improving the contribution of organic fertilization and diversifying into other crops.

New questions have sparked new experiments over the years. For example, in Nampasso, a village in the Bla district, the innovation was focussed on a crop protection technique and boosting productivity by growing peanuts in furrows. Experiments carried out during the first year consisted in associating peanut and millet crops together, with the same objectives and in accordance with the same crop protection technique. After the first year dedicated to solving nutritional concerns, dual-use sorghum (grain for human consumption and straw for animal feed) was introduced to replace millet in the crop association.

A newsletter has been launched, and two posters were published in order to disseminate experiences: one on the performance of peanuts in combination with sesame and cowpeas grown under the Senegalia Senegal (gum arabic trees) in Nabougou, and the other on the performance of sesame crops in association with cowpeas, dual-purpose sorghum, peanuts and maize on recovered plots in Kiri.

At the end of each campaign, meetings for exchanging ideas were organized within the networks in order to share the results with the members of the group, the local technical services and local elected representatives, with the assistance of FaReNe's technical team. Inter-network meetings were also organized aimed at sharing the results of the networks. Technical services and regional elected representatives were involved in these exchanges, in a campaign of raising awareness of the achievements (in terms of concrete results) of the approach, aimed at integrating agricultural development strategies, both at the regional as well as national level.

Challenges encountered and solutions

The institutionalization of the PID approach is a formidable challenge, because it is a slow and complex process that requires multiple levels of decision-making. This is why the current strategy consists in raising awareness at all levels of decision-making by soliciting their participation in the different sessions and result-sharing exchanges. Observation visits are often organized for them in order to make it possible to see concrete evidence of progress, but most often these actions do not affect the decision-makers in the structures concerned.

Testimony of Souleymane POUDIOUGOU, innovative farmer in Pogonon (Koro district)

The PID process values the farmer and promotes him by encouraging him to identify and to seek out solutions that take into account the constraints that are imposed on him. Today we realized that a farmer's creativity is a precious resource and that we are an integral part of the process.

In terms of solutions, the organization of workshops, designed to raise awareness among the decision-makers of the concrete results achieved by the PID approach, is aimed at garnering their support in taking the approach into account when formulating the national strategies for agricultural development. This garnering of support should be the subject of joint action taken during the workshop by identifying key stakeholders and defining their roles in the change process.

The joint experiments carried out in the groups make it possible to create networks which are already frameworks for mutual learning among farmers, agricultural advisors and researchers. The practices tested are references that some producers of the same network or other networks do not hesitate to test in their field, but it is very difficult to assess the level of innovation adoption on a larger scale.

The adoption of innovations takes place as a result of exchanges within networks or inter-network exchange visits. In order to ensure a better monitoring of the level of innovation adoption, the mechanism to be put in place could be discussed during exchanges, by encouraging different networks to provide information in the form developed for this purpose. The information to be provided will relate to jointly adopted indicators, pooling periods and data sharing frameworks.

Lessons learned

PID is an approach that starts from the farmer's solution and not from his problem. It therefore emphasizes the farmer by appealing to his knowledge and encouraging creativity and sharing of such knowledge.

The success of the experiment process depends on the involvement of the various stakeholders (farmers, agricultural advisers and researchers) and their willingness to play their full roles. For example, the choice of a farmer experimenter is based on volunteering and the ability of the individual to conduct the experiment whilst respecting the instructions.

PID puts the farmer at the heart of research and development since he is at the beginning and the end of the innovation process, which starts from his knowledge and improves at his request. He is also the central element in the improvement process because he is the leader in implementing the experiment. The resulting improved innovation is shared with the producers. Adopting the principles of the PID approach and criteria for characterizing farmers' innovation is considered easier than that of conventional research technology.

Publication February 2019

Contributors: Assétou Kanouté, Bangali Siaka, Bourama Diakité, Dommo Timbely, Djibrillou Koura, Genevieve Audet-Bélanger, Laurens van Veldhuizen, M'Famara Soumare, Ouattara Do Christophe, Ouédraogo M. Mathieu, Samba Traore, Sigué Hamadé, Souleymane Diarra, Tasséré Ouedraogo, Traoré Oumarou Mahamane

This publication is the result of the project *Strengthening Farmer-led Research Networks for agroecological intensification in Burkina Faso and Mali* (FaReNe) which has been possible and has been realized through the Collaborative Crop Research Program (CCRP) of the

McKnight Foundation and under the aegis of Prolinnova. The project aims to reinforce and support the research networks managed by the producers in the environment of which the small farmers carry out joint experimentations directed by the producers in collaboration with researchers for agro-ecological intensification. All that is based on local knowledge and local innovations. The following publication would not have been possible without the active participation of the partners of FaReNe. The Royal Tropical Institute took care of the facilitation of the workshop process of the writing and general editing of the document.

Design: Anita Simons <https://symsign.nl>