

Agroecological fight against pests of the *katche* and *toura* (cowpea) beans in the Djougou region (Benin)

Outdoor Laboratories for agrobiodiversity (LHM), initiated by the association BEDE (Biodiversity, Exchanges, and Diffusion of Experiences), was established with the Foundation for Citizen Science and two joint Research Units of Montpellier (Centre d'écologie fonctionnelle et évolutive - Centre for functional and evolutionary ecology, and INNOVATION). The Outdoor Laboratories create collaborations in the field between the agricultural world and the research sphere for dynamic management and enhancement of biodiversity in peasant agroecology. These collaborations are implemented from the questions that farmers arise in Mediterranean, Saharan and sub-Saharan lands. This review summarizes the approach adopted and the first results from two years of collaboration. It was structured in such a way as to compare different experiences Outdoor Laboratories.

Other experiences of the Outdoor Laboratories:

- ◆ Autonomous water management of arboriculture in the Minervois (France);
- ◆ Democratization of peasant agroecological research in the Lodevois and Larzac (France);
- ◆ Diversifying peasant grapevine varieties and seedlings in the Minervois (France);
- ◆ Economic enhancement of the biodiversity of date palms in Mzab (Algeria)
- ◆ Enhancement of fig biodiversity in Beni Maouche, Bejaia wilaya (Algeria);

Peasant Farmer Organization › **Organization of Peasants for Sustainable Agriculture (ORAD)**

Started in › **2009**

Beginning of collaboration with BEDE › **2007**

Scientific institution › **University of Abomey-Calavi**

LHM workshop › **August 25, 2014, Djougou (Benin)**

Master's Thesis › **Cowpea resistance to pests (Adonis Babalakoun)**

Presentation and context

In the Kpayeroun village, situated in the north of Benin (Djougou municipality), the main crops are yams, manioc, the cowpeas (*Vigna unguiculata*) and sorghum. Founded in 2009, ORAD (Organization of Peasants for Sustainable Agriculture) is composed of farmers from the village (around 45 members) who have noted the economic and ecological limits of conventional agriculture through their experiences with cotton, and decided to implicate themselves in agroecology. They wish to develop sustainable agriculture based on protecting farmer seeds, maintaining subsistence family agriculture, and promoting ecological agriculture. ORAD acts at the village level, but more and more people are interested in their work, and they are considered a focal point for agroecology in the region.

Collaborative process

► WHAT ARE THE PEASANT DYNAMICS IN THE AREA?

In 2007, the national farmer union of Benin (SYNPA/ Synergie Paysanne) took part in an international conference in Bamako on the privatization of seeds, organized by the National Coordination of Peasant farmer Organizations (CNOP) of Mali, BEDE, and the International Institute for Environment and Development (IIED).

In March 2009, Omer Agoligan represented the SYNPA during a regional exchange organized by BEDE and the Senegalese Association of Farmer Seed Producers (ASPSP). As part of creating a network via farmer exchanges accompanied by BEDE, in November 2009 in Mali, he

participated in a collective farmer evaluation of participatory research on cereal selection. At this meeting, the participants decided to create a network of agroecological farms to preserve and enhance agricultural biodiversity and to sensitize their local communities to the latter (see 'Improved varieties are not always the best', BEDE, December 2009). Omer Agoligan initiated a reconversion process on his farm and certain members of his village followed.

➤ WHAT ARE THE QUESTIONS FARMERS ARE ASKING TO THEMSELVES AND TO RESEARCHERS?

In October 2013, the leaders of ORAD conducted an inquiry of farmers engaged in agroecology. In answering the question: 'In agriculture without synthetic chemical fertilizers and pesticides, in which we are engaged, what difficulties do you encounter for which you do not find solutions?' the challenge of pests and diseases of cowpeas (*Vigna unguiculata*) was recurrent, and raised the necessity of research support. The Outdoor Laboratory project was thus built on this African bean (niebe, in Wolof) and its pests.

➤ HOW RESEARCHERS HAVE JOINED THIS INITIATIVE?

Dr Jeanne Zoundjhekon, professor of plant genetics at the University of Abomey-Calavi, has worked for several years with civil society in Benin and West Africa, where she is committed to defending the genetic heritage of Africa. She has collaborated with BEDE for over 15 years on issues linked to agricultural biodiversity, food sovereignty, and biosecurity.

➤ STEPS IN THIS COMMON APPROACH:

◆ In December 2013, a first meeting was held in Kpayeroun with ORAD, BEDE, professor Jeanne Zoundjhekon, and one of her Master's students, to define their collaboration. The first actions to be carried out fit the desire expressed by farmers, concerning pests of cowpeas, emphasizing their genetic diversity, specialty of her laboratory.

◆ In May 2014, 6 sites (plots) were identified by ORAD farmers to plant 6 varieties: ORAD farmers and the student sowed 4 early varieties of *Katche* with a short life cycle in May and June 2014. At the beginning of August, the same varieties were resown, and two varieties of *Toura* were added, with one (*Toura Pera*) having a long life cycle (90 days).

◆ At the end of August, the researchers (Dr. Zoundjhekon and Dr. Joly, a plant geneticist, a partner in coordinating the Outdoor Laboratories project), accompanied members of ORAD and BEDE on a visit to the trial plots with a new student (the first had withdrawn) to establish a complementary protocol. They talked with the farmers who had led the agroecological trials of *Katche* and *Toura*. The group observed the pests and discussed possible biological control with plant extracts.





◆ On August 25, 2014, the Outdoor Laboratories workshop brought together around 30 people: the members of ORAD, in particular those involved in the trials, the researchers and students, a representative of the farmers union 'Synergie paysanne', and representatives from territorial communities, from national institutions and from civil society.

First fruits of this Outdoor Laboratory

➤ WITH REGARDS TO KNOWLEDGE:

◆ Six local varieties were identified: *Katche Sowoho* (brown, with upright growth), *Katche Sowoho* (brown, creeping), *Katche Peha* (white, with grey hile), *Katche Peha* (white, with black hile), *Toura Peha* (white, with grey hile), *Toura Peha* (white, with black hile). One variety of *Katche* from the center of Benin (Bohicon), *Kpodjiguegue*, was introduced to test its adaptability.

◆ Members of ORAD carried out a first collection of traditional knowledge on cultivation, conservation, and pest protection. Natural treatments were gathered: neem leave extracts; a preparation of *Hyptis suaveolens*, hot peppers, and local soap; Ethiopian lemongrass; manioc leaf extract, etc. Their efficiency is yet to be tested. The time of sowing was seen to have a certain influence on pest damage. Yet to be confirmed is the existence of old (and endangered) varieties of *Toura* that produce well without requiring any phytosanitary treatments. Modifying cultural practices (such as an alternative crop every other year) was also evoked as a way of limiting pest impacts.

◆ The student, with help from farmers, collected a number of *Katche* pests; their identification was to be carried out by a qualified entomologist (a Malian colleague of Dr. Zoundjiekpon).

➔ New questions and hypotheses:

◆ How to select and conserve locally adapted varieties?

◆ Why is pest pressure less at the end of the rainy season as compared to its beginning? Is it related to the life cycle of the pests?

◆ What impact does cotton production have on cowpeas? Does it have an effect on the pests' predators?

◆ How can practices be adapted according to social changes? For example, before the seeds were stored throughout the year in the kitchen above the fireplace. Smoke crossed seeds, preventing the development of insects and then was evacuated through the thatch. However this type of interior kitchen tends to disappear as the thatched roofs are replaced with tin roofs that prevent smoke from escaping. The kitchen is so done outside.

◆ In a general fashion, there was a question of how not to fall into a vicious cycle of peasant farmers depending on companies that make organic phytosanitary products? The farmers also wish results that

allow them to make natural effective products themselves. This brings into question research funding in Africa: the countries should finance the research for the benefit of farmers.

➤ **WITH REGARDS TO COLLABORATIVE PROCESS:**

➔ **What limitations or critiques were brought forward over the course of these meetings and workshops?**

- ◆ The participants welcomed the opportunity for exchange that the workshop made possible, but stressed that it is not always easy to coordinate the schedules of all the actors: farmers, researchers and students, as well as the market seasonality.
- ◆ Several other issues were noted, particularly that of the absence of research protocol validated by all actors, and where the role of each is clearly defined. This is partly explained by the fact that the University is far from the site of the trials, and the researchers do not have the means to travel regularly enough to ensure the best follow-up.
- ◆ It was pointed out that farmers need solutions quickly, or they will be obliged to return to pesticide use, not being able to risk losing their yields again.
- ◆ Organizing a workshop around methodology for teacher researchers would be of use, in order to come up with new methods of research and collaboration with farmers.
- ◆ The short timespan of the project was not sufficient to answer all questions

Perspectives for the future

- ◆ ORAD farmers wish to continue working together and are preparing the next sowings. They hope the student's trials and observations as well as his Master's thesis are pursued in collaboration with them.
- ◆ For the future, it is important to add a specialized entomologist to the team of researchers.
- ◆ The farmers were well implicated in the observations, but may need additional training.
- ◆ A documentary film is being produced on the farmer-researcher conference that preceded the August 2014 workshop in Djougou.



To know more about Outdoor Laboratories for Agrobiodiversity: bede@bede-asso.org

and on BEDE website : <http://www.bede-asso.org/?p=140>