In search of new sources of protein

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The use of natural resources near the city of Iquitos, in the Peruvian tropical Amazon basin, is far from sustainable. Due to the high demand from the city for products from the forest, as well as increases in population, life in the rural areas has become very difficult for the local people. The products which they used to extract for their own consumption, such as fish and bush meat, are scarce nowadays. This results in malnutrition, mainly due to the lack of protein in the daily menu. Aiming to improve the livelihoods of the inhabitants, the NGO *Asociación por la Amazonía* (APA) started an EU-funded project in the river Momón in 2004, promoting sustainable natural resource management.

Alternative sources of protein

After the first rural appraisal it became clear that the problem of malnutrition was enormous; an alternative source of protein had to be found. In the first year of intervention, the NGO opted to promote poultry production. Every family could receive a number of chickens, which were meant to serve as the main source of protein. The first results were promising, but a wide range of diseases soon killed the majority of the newly introduced birds. A second attempt at improving the daily diet was to start producing beans. Villagers in different communities responded positively to the idea of growing beans, but mentioned that it would be difficult because of insects such as leaf-cutting ants *(Atta cephalotes)* and grasshoppers (*Gryllus* spp.), which could seriously affect yields. To find a solution, villagers in the whole area where the NGO was working were invited to take part in experiments to find ways of controlling the large number of insect pests. In total, 10 families from three communities said they were interested to participate in a small Participatory Technology Development (PTD) type research.

All farmers were convinced of the urgency of improving their diet, and after their first experience with poultry production, they were open to look for new opportunities. Growing beans seemed the most logical option. As migrants from other zones in Peru, they said that they had grown beans before, but at that time, nobody was doing it - they all stated that it was impossible because of the insects. During a first meeting, villagers were asked to propose pest control techniques which they would like to try. The list of potential measures to try to control pests was enormous, ranging from manual methods (picking up all larvae) to the use of cooking oil and chemical pesticides (see Box). This showed that the farmers had done their own experiments with other crops.

After a long discussion, the group decided to try using a repellent made with spearmint (*Mentha spicata*, fam. Lamiaceae*)*, and also to try using an extract of the *barbasco* plant (*Lonchocarpus nicou*, fam. Fabaceae*)*, which is used locally to fish in the rivers.

Photo: Author

The experiments produced good yields, but not all farmers began growing beans.

Asociación por la Amazonía established contact with the local university, where several studies had been done on the use of repellents and plant species used for pest control. Their entomologist was willing to participate and provided the necessary technical details for the preparation of the spearmint and *barbasco* solutions. But it was not so easy to convince other staff of a full participatory approach: they all had a very traditional view on how to do research, and were only familiar with trials on experimental fields, where all conditions are perfectly controlled. Doing research under field conditions was a completely new approach for them, and the fact that the participating farmers would apply their own repellents in their own experimental plots was a step too far. Their reasoning was not new: the analysis has to be statistically sound and they have to be able to publish the results, for which all trials and applications have to be similar. Coming to an agreement, the team decided to include two students in the trials. They could spray all fields and help with the preparation of the solutions, thus guaranteeing some continuity and similarity throughout the whole experiment. This was to serve as an assignment for their thesis, which would count towards the students obtaining their B.Sc. degree in agronomy.

Trying things out

Each of the ten participating families made a small plot of 20 by 20 meters available, where two different varieties of beans

Some of the possibilities for controlling pests mentioned by the Momón farmers

Manual methods: Pick up the larvae of the ants by hand. Capture the leaders of a row of ants.
Repellents: An extract of the yuguilla fish, smoked eel, strong fermented cassava beer, cooking oil, a mixture of salt and pepper, old motor oil, old batteries, human discharge, fishbone of the carachama fish, yeast, kerosene, an extract of the barbasco plant, an extract of spearmint, blood of a woman.
Chemicals: Lorsban (chlorpyriphos), Sevín (carbaryl), Aldrín (aldrin), Tamarón (metamidophos)
Others: Greet the ants every morning and ask them to leave the crops, make a fence around the crops, fill up the nests with petrol and blow them up.

were sown. The plot was divided into three different parts: one part was treated with *barbasco,* the other was treated with a spearmint solution, and the last was left as a control and not treated. The NGO provided a knapsack sprayer and the farmers gathered the necessary plants, which were then prepared according to the indications given by the university people. After several months the plots started producing and the results were generally good. But recording of various measurements did not go well: the students left before the harvest, as they could not stand the conditions in the village, and returned to the city. Some of the participating families harvested the beans and ate them before measuring the total production. Not surprisingly, the university did not find any significant difference between the treatments and the control in their statistical analysis.

In spite of these difficulties, results were clear to all participants. In an evaluation workshop, the participants indicated that the impact of *barbasco* was evident, while the repellent effect of spearmint was limited. It also became clear that the location of the plot is important: beans in plots where the primary forests were cut for the first time had less damage by the leaf-cutting ants than those grown in secondary forests. And one of the bean varieties gave much better results than the other. At the end of the process, all participants were convinced that growing beans is a possibility in their area, and that doing so could improve their daily meal.

Overall results

Two years later, however, only some of the participants of this experiment are still growing beans. All of them have quite good yields, without using *barbasco* or any other product for controlling insects. However, no other farmers, either in these or other villages, are currently growing beans, so local bean consumption is limited. The result of the process may seem diappointing, but in fact the bean trials led to many positive results:

- Convinced of the usefulness of a participatory approach, the same NGO continued with its project and started promoting the construction and use of local fish ponds, with the same objective of improving protein consumption. Ponds were built using local materials, and then filled with young fish of local species. Special emphasis was put on local knowledge and on the participation of all villagers. Results have been positive, as fish caught in the rivers grow well in the ponds, they are not prone to diseases, and taste much better than beans.
- Those who participated in the experiment and grew beans became very active in the promotion of the fish ponds, recognising the need to add protein to their daily diets and the possibilities of doing so using their own resources and abilities. Awareness of these possibilities came alongside increased self-confidence and recognition of the benefits of working together.
- Despite her students, the university entomologist became convinced of the possibilities of working together with farmers and the rural population, realising how her profession could contribute to poverty alleviation and rural development. She developed a special interest in the exchange of information with farmers, surprised at the fact that the exchange of information and the development of new knowledge could easily take place during the same exercise. Her continuous participation showed that academic professionals can be convinced of a participatory approach if they see that the knowledge which results from such an approach is directly applied by farmers (in contrast to what commonly happens with their work).

This experience showed that it is possible to develop and try out new technologies by doing participative research. If local knowledge is seriously taken into account, and if research is oriented at a problem that the people themselves define, then this population will most probably be very willing to participate in the experiments. The outcome, however, may differ entirely from what is expected at the beginning.

PTD experiments are a "real-life" attempt at trying something out, and not just an appraisal or an identification of problems. As such, constraints commonly found in the field, such as time limitations, lack of resources, or difficulties with the local agricultural calendar, will have a large impact on the way the whole exercise works out. At the same time, a participatory process implies including different actors with different expectations and interests, all of which need to be considered. In this case, for example, we had students who wanted to obtain a B.Sc. degree, an NGO interested in completing its project, farmers who wanted to maintain a good relationship with the NGO, and researchers who wanted to publish their results. The effect that all these different expectations will have on the process is hard to predict.

Furthermore, the work of APA showed that a "real-life" experience is necessary to find out and analyse the technical and also the cultural considerations related to the improvement of a production system. All participating farmers were convinced of the difficulties posed by insects. But just as important were the local eating habits, and the fact that farmers and villagers in general were not used to eating beans. This cultural aspect became clear after the trials and the introduction of the fish ponds, but not before. The work of *Asociación por la Amazonía* also showed that when something does not go as expected, this provides a great opportunity for trying out new activities, and for learning things we could not have predicted or imagined. The introduction of fish culture corresponds much better with the local eating habits, and, because of their positive experience with the bean trials, most of the bean growers became very active in the promotion of the ponds. The overall result is an improved diet. ■

Photo: Author

Participating farmers visit each other's experimental field and discuss the results of their trials.

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