# Innovating with rural stakeholders in the developing world

## Action research in partnership

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# 9. Operational mechanisms, methods and tools

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This chapter looks at the operational decisions, ones that are tactical in nature – as opposed to the strategic. They help define each activity in detail, specify execution modalities, and determine indicators for evaluating results.

## No recipes, only an approach

The purpose of the action research in partnership project determines the nature of the mechanisms and the planning of the activities that will form part of the project. Some conventional participatory research approaches and methods advocate a standard way of designing these mechanisms and conducting these activities. This is not the case here.

The ARP is not a method, rather it is an approach, i.e., a set of principles to implement. These principles require the creation or adaptation of specific operational tools, methods, and mechanisms – which have to be specified and shaped each time with stakeholders at their core and for responding to the problems identified with them.

For example, if the goal is the design of new agricultural techniques, the operational mechanisms will typically include a combination of on-field experiments, demonstrations, farmer exchange meetings, training sessions, etc.

If the goal is market insertion, the operational mechanisms will instead feature studies on value addition, meetings between supply-chain actors, modeling of flows between them, etc.

And, finally, if the objective is rural land management, the mechanisms may include such activities as the co-creation of maps of resources and their use, simulations of possible scenarios with role-playing games, negotiations with local communities, etc.

## Some definitions

### What is a tool?

The term "tool" is used to designate a technical object that helps do some work. This object can be tangible, such as a blackboard or a scale, or intangible, such as a cross-tabulation table, a list of tasks, or participatory mapping. A tool can be very simple or very complicated. It can range from, for example, a calculation of ratios for a small number of variables (for example, a yield or gross margin per hectare or per day of work) to complex mathematical modeling for simulating decision making by some actors.

A tool in itself is of no particular value unless it is adapted to a particular situation. It acquires meaning only when it relates to a problem that has to be solved and to the use the stakeholders put it to. Thus, the same tool can be used in different ways depending on the objectives. For example, participatory mapping can be used in two contrasting ways to plan infrastructure spending: the first in conjunction with the populations concerned, the second imposed from above by technicians.

In an ARP, the basis for the tool's creation or its use should be discussed. For example, what is meant by gross profit for a farmer's plot? In this way, the tool can become a powerful adjunct to reflection and help stakeholders structure the way they perceive their situation (Moisdon, 1997).

### How to use a tool?

Specifying the method of using a tool or a set of tools is therefore necessary. To do this, all the tasks that need to be accomplished using the tool should be clearly defined as should the steps to follow for correct use of the tool in pursuit of objectives decided upon. In particular, who will use the tool(s) and how it/they will be used need to be explained.

The method needs to be adapted to each different situation, by involving the stakeholders in its creation or, at the very least, in its collective validation. When the method includes the use of several tools, we often use the concept of "toolbox" which allows users to choose tools most suitable for the task(s) at hand.

### Context of using a tool

Methods and tools acquire meaning by being part of operational set-ups, for example an agricultural or animal experimentation set-up, a set-up for monitoring natural resources, or a set-up for sharing

experiences between stakeholders. These operational set-ups require operational decisions to be made, which are debated and negotiated by the stakeholders: How to organize a trial? Who decides where to conduct it, what control treatments to use, how will it be managed, what measurements to take? How to arrange an exchange of experiences? Should it be through a field visit or study tour? How to structure a discussion of research findings so that progress is made in resolving the problem?

## Understanding tools, methods, and operational mechanisms in context

In this section, we use two contrasting examples of tool use by stakeholders to show how methods of using the tools were developed and how operational set-ups were established.

In the first example, the tools may appear simple. In the second, they are much more complex. But in both cases, similar questions arise on the skills necessary for the use of the tools by the stakeholders, researchers included.

### A farmer experiment in Guatemala

In this example, farmer-experimenters in Guatemala came together to design and implement a series of tests on their plots. They hoped to resolve an agricultural problem they had clearly identified at the start (Box 12).

This example seems, at first sight, disconcertingly simple. Is there something new? There are no sophisticated tools, no GIS, no isotopic markers, or anything of that sort.

In spite of its brevity, the contents of Box 12 does show that conventional tools were used in the project. They were those that the farmers, technicians, and researchers found in their immediate environment. To conduct their agronomic trials, all they needed were a 10-meter measuring tape, a scale, some inputs (seeds of various sorghum varieties, of peanuts, and of jack bean, some urea), some sheets of paper, technical documentation, indelible marker pens, a flipchart with its sheets of paper, and daily allowances for visits (food and travelling expenses).

The technician used basic tools to facilitate the meetings. The other tools were simple enough to be used by the farmers, in particular: a plot for conducting the test, a notebook to make observations in, data

**Box 12. The "Superación" farmer-experimenter local committee**

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In 1994, a core of farmer-experimenters (FE) decided to form, with the help of the local extension services, a "farmer researcher" committee which they called "Superación" ("doing better"). There were five members, of whom two were illiterate. The surface areas of their farms ranged from 1 to 2 ha. This committee hired a half-hectare flat plot in the center of their village to conduct trials even though they all lived and farmed their own lands in the nearby hills. This was their "farmer experimentation center" (FEC).

Their diagnosis on the functioning of their village community highlighted the importance of increasing the production of their primary food crop (sorghum) in pursuit of added food security for local families. On this basis, the committee decided on a certain number of trials they thought they would be able to conduct. Each member assumed responsibility for a particular issue:

– Stand density of two sorghum varieties;

– Determination of sorghum cutting height (by machete) at the end of the first rainy season to ensure good regrowth for the second season and a good overall yield;

– Comparison of urea doses applied to sorghum regrowth;

– Combining jack bean and sorghum during the first rainy season to ensure good sorghum regrowth during the second season (test over three years);

– Comparison of five peanut varieties, a cash crop, because it is necessary to also bring in a minimum of income.

In the FEC, each FE was thus responsible for conducting his own trial. Some tasks could be undertaken alone, others required the help of the other four members. In addition, each FE looked for three or four collaborators from near his farm in the hills to conduct the same type of experiment. Their plots functioned as replications.

The field advisor from the local extension services played a major role in assisting the group by stimulating the farmers' reflections. In addition, he involved his *compadre* (friend-colleague) from the research station to support the FEC. The farmers lent him a plot on which he conducted a trial with a more sophisticated protocol on the issue of fertilization.

The overall work undertaken by the local agricultural research committee involved a number of stages. In chronological order, they were: (1) planning, (2) defining trial protocols, (3) selecting site and plots, (4) planting the trials, (5) conducting the trials, (6) organizing exchange visits between committee members and between committees of other communities, (7) organizing visits of the support team consisting of researchers and field advisors (8) collecting data, (9) promoting and disseminating activities directed at the community, (10) harvesting test crops, (11) analyzing data, (12) interpreting results, (13) reporting back the findings to the committee and to the community, (14) planning of the next cycle.

sheets for analyzing individual results, and tables to compare results between farmers. We must note that the concept of "simple" is relative, especially for a farmer who has to feed his or her family off a small plot of land and who is just learning to read.

Let us take the example of the experimental plot of a given trial. Juan was in charge of this plot in the farmer experimentation center. He explained to Alberto, Antonio, and Gerardo, who had volunteered to conduct the same test on their farms in the hills, the size of the plot he will plant, its location, the crop-management techniques he will use, data he will collect, etc. In short, the protocol.

To reach this result, all four had to apply their minds as did their technician to understanding the why and how of what they wanted to do. And, in this way, they constructed the "trial" tool and decided how to use it. They invented, in other words, a type of operational set-up (farmers concerned, plots used, objects compared, modalities of managing the trials, etc.).

The farmers were responsible for the smooth running of the process, individually or collectively, not the researchers or field advisors. Their operational mechanism was the farmer experimentation center and the trial plots in the hills. The initial reaction of some agronomic researchers when they saw the field of the farmer experimentation center was blunt: "The location of your tests is not at all representative of the real conditions of your village." To this the farmers responded, "Our first goal is make our work known and to involve others. That is why we first chose a well-trafficked location, even if conditions there differ from those at our farms. We will then involve our neighbors in our farms." Communication and agronomy are the two pillars of their experimentation center.

In such an approach, researchers and technicians participate in farmers' activities, not the other way around. The approach promotes learning and development of new skills: observation, data analysis and comparison, analysis of biological processes, justification and explanation of results and decisions to others, planning of activities, and organizing collectively.

The farmers slowly change their perception of their environment. They grow more autonomous and self-sufficient and feel more capable, less dependent on external support. And, above all, they feel they are in a better position to express requirements and formulate proposals if they do require external assistance.

## Land management in Senegal

The example of the land-use plan in Senegal (Box 13) shows how stakeholders came together for improved management of land and natural resources and the tools they used to do so.

**Box 13. Assistance to local communities and the land-use plan in Senegal**
*P. d'Aquino*

The Senegal River valley is a strategic space for animal husbandry, agriculture, and fishing. Nevertheless, in the last three decades the valley has become gradually covered by irrigated-agriculture schemes. This has negatively impacted animal husbandry and has led to social tensions.

Policies of decentralization implemented in the 1990s have transferred some powers for managing land to local communities. The decentralization has, however, excluded the hydro-agricultural schemes from the process; they are still managed without any great coordination by the State. This situation has led to frequent complaints and several conflicts.

That is why, in 1997, a development-research team put in place a pilot project to test, in a real-world situation, a program to empower local communities to manage their own space. This program was destined to reconcile the development of different productive activities and the preservation of natural resources.

The issues were clearly defined: strengthen the effective powers of local communities, consisting of elected rural personnel, to cooperatively manage the space. This meant:

– Creating the necessary space for communities to act without institutional interventions;

– Creating and transferring suitable technical capabilities;

– Helping learn in action, without supervision, for a sustainable acquisition of new skills;

A three-stage supporting approach was retained:

– A stage for raising awareness of local institutions, lasting a minimum of six month, so that they agree to let local communities take decisions and undertake actions. This also meant the new roles of everyone involved (local administration, technical services, traditional and tribal leaders) were valorized and supported in the new arrangement;

– A stage, lasting about a year, for local communities to construct their own geographic information system. This stage was to culminate in the creation of a tool suitable for their needs and perceptions, and included phases for learning its use and discussions on its limitations;

– A discovery stage of about six months by the communities of the complexity of territorial management. As and when necessary, the development-research team would provide fresh assistance for collective analysis, such as role playing and territorial modeling, and also new information, such as on available intensification techniques.

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Thus in three years, the project led to independent actions by local communities, with the drawing up of a land-use plan, grassland planning, and the resolution of conflicts with a national park. In addition, it led to a method which the technical services decided to scale up by themselves to cover the entire valley (45,000 km$^2$), without any assistance from the initial team or any external project and without external funding.

This example shows that rural stakeholders, as part of local communities, can construct, use, and master complex tools such as a geographic information system. They do so by using their knowledge of the environment (resources, spaces, uses, etc.) and also scientific knowhow, for example, on soils and vegetation. Maps then become a basis for mediation processes on the management of space, for pinpointing difficulties, and for identifying possible actions – such as new rules or new arrangements.

The local communities need to acquire new technical skills to master the geographic information system and to use its results, the maps. They have to learn what can be expected from such a system and become capable of defining mappable areas and zones that will be meaningful to them, of interpreting a map, and of taking land-use decisions based on the map.

Training is thus an essential part of the project. As this process of learning is supposed to take place while undertaking actions ("learning while doing"), time will be required to let stakeholders participate in the design of the tools, master their use, and employ them in their activities.

The training itself used a set of tools. For example, role playing (see Box 14) involved rural stakeholders living out a simulated history of the management of their community's resources.

We observe that, just like in the first example of Guatemalan farmer experimentation, it is not the tools mobilized as such (geographic information system, maps, and role playing) that are central to the ARP. It is the approach on which everything depends; it has to be clearly explained and designed to achieve the goals fixed by the stakeholders.

**Box 14. Role playing for managing village lands**
Role playing recreates dialog between different types of stakeholders, each of whom is represented by a person. Dice, paper, and pencils form the core of what is required, complemented by a good dose of imagination.
Role playing simulates different land-use scenarios. It helps participants understand the situation of their village, analyze the various stakeholders' strategies, and grasp the impact of different choices in managing land and resources.
Stakeholders learn collectively by creating or changing their representations of their environment. They discover that they have room for maneuver and can shape their future.

## Lessons learnt from the tools used

### Diversity and complexity of tools

A wide range of diverse tools can be mobilized in an ARP, ranging from the simplest to the most complicated. Which ones to use depends directly on the objectives sought: conducting a diagnosis, sharing and communicating, evaluating and directing activities, managing conflicts, and building up skills. And, of course, their choice depends on the specific problems that need to be solved. We would not need a geographic information system to fine-tune sorghum-based cropping systems, for example.

The Senegalese example, above, shows that stakeholders can understand and work with complex tools. This illustrates one of the fundamental principles of, and challenges for, ARP: empowerment, i.e., helping stakeholders really master a tool so that they can use it independently without requiring help from the research community.

### Generic or specific tools?

Are the mobilized tools specific to the ARP? Experience clearly shows that, generally, no tool is really unique. After all, an agronomic trial conducted by a farmer, geographic information systems, or role playing were not invented in an ARP framework.

What changes is the way of using the tools, the method. Their use has to be put in perspective with respect to the goals aimed for. Defining modalities for tool use requires an agreement between all concerned ARP stakeholders and it often makes them the center of discussion in ARP group discussions and stimulates stakeholder interactions.

## Stakeholder participation in tool construction and use

In an ARP, all stakeholders participate to some extent in building and adapting tools. The Guatemalan example shows how the farmers planned their trials, what they wanted to compare (varieties, techniques), and what observations they deemed important.

In the Senegalese example, the rural inhabitants decided which environmental and geographical entities they wanted to represent on the maps. They proposed a format for their geographic information system so that its outputs, such as maps and diagrams, helped answer the questions that concerned them.

Building and using such tools therefore requires stakeholders to define collectively the questions that each tool should help answer. Data collection and/or formatting of existing information into a particular format may also be required. Finally, stakeholders need to collectively analyze and share results. However, this does not preclude some tasks from being delegated to specialists or service providers when, for example, specific skills are called for or some resources are scarce at the level of the stakeholder involved (time, money).

Thus, for example, in an approach for participatory plant breeding, the involvement of geneticists specialized in molecular marking is clearly justified: they are asked to verify, in the varieties created, the presence and the stability of genes that meet the farmers' criteria.

## The researcher's role

The team of researchers and technicians plays a role at various levels. It participates in the building of the stakeholder collective of researchers, technicians, and others. It is an interface between the scientific world and the non-scientific world, including those of the producers and the technicians, and provides scientific knowledge to them. And, this team participates in the construction of the tools used, whether simple or complex.

In the Guatemalan example, the involvement of the thematic researcher took second place to that of the technician. In reality, the former's contribution was upstream of the project itself, during the preliminary phase of consultation and discussions between farmers, communities, researchers, and technicians on the activities to be conducted.

In the Senegalese example, because of the type of tools used, the researchers' contribution was greater. They were deeply involved in the adaptation and fine-tuning of the geographic information system.

They also contributed to its ergonomic aspects, not only in the ease of use of the tool itself but also in its insertion into individual or organizational workflows.

The researcher can also take an interest in the stakeholders' use of the tool. Its appropriation, rejection, modification, use for purposes other than intended, changes in stakeholder relationships brought about by its use can reveal much about their strategies.

### Learning while doing

Every experience shows that ARP stakeholders learn to use and master a wide range of tools which, until then, they used little or never. The learning aspect – formal training is part of it – is a fundamental driving force in an ARP. It encompasses a diverse range of practical modalities but all have a common aspect: learning always takes place while doing and is based on the critical analysis of practices and each concerned stakeholder's specific circumstances.

### Multiple functions

In an ARP, tools have multiple functions. On the one hand, they have two traditional functions: first, producing new knowledge, by facilitating data management, comparison of results, and restructuring of knowledge. The second is to resolve problems by helping make a diagnosis, assisting the decision-making process, implementing and monitoring actions, and evaluating the obtained results.

In addition, tools have functions and dimensions specific to an ARP. They are thus intermediation objects which help organize exchanges between shareholders, compare viewpoints, and lead to the adoption of common positions. They also play a fundamental role in the learning processes, not only of individuals but also of collectives.

ARP initiative takers do invest part of their energy in all these aspects and employ their knowhow and expertise to build, adapt, and implement tools that are often more complex than may seem at first glance.

## Selecting, using, and adapting tools

Rules can be derived from the preceding discussions for selecting, using, and adapting tools for building stakeholder capacities to undertake relevant activities and produce knowledge. These rules are based on the following six criteria: suitability, adaptability to requirements, ability to help impart autonomy to stakeholders, ability to produce

quick results, ease of use by the stakeholders, and their ability to evolve.

A tool's suitability is its ability to respond to questions that confront stakeholders. Even though such an approach ensures they appropriate the corresponding discussions, the creation of tools that may be needed can require experienced persons with specialized skills.

Contrary to what too many experiences illustrate, it is the tools that have to adapt to the stakeholders' requirements, rather than vice-versa. Instead of adopting readymade and easily available tools, it is preferable to design specific new tools or adapt existing ones with the stakeholders' participation so that the tools are specific to their requirements.

For stakeholders to acquire autonomy, they have to have appropriate tools and the ability to reason. The participation of the stakeholders in building tools contributes towards greater autonomy. Adopting work routines or habits that require the use of certain tools to acquire skills (routine of recording and logging decisions and passing them on, or the routine of analyzing results obtained by the tool used, for example) can also lead to the appropriation of tools.

Stakeholders involved in an ARP are often eager to obtain as fast as possible the first concrete results, even partial solutions to the original problem that led to the creation of the ARP collective. If this impatience has to be satisfied, tools must be chosen that bring together, within short durations, phases of accumulating and analyzing information, and of implementing actions and reflecting on their implications for the stakeholders. Nevertheless, to avoid the search for quick results from negatively impacting the other aspects of the ARP, a balance has to be found between short- and medium-term tools.

Using tools that are within the reach of the different ARP stakeholders is one of the necessary conditions for an effective participation and appropriation. However, if the use of complex tools becomes unavoidable (see Chapter 9, "Lessons learnt from the tools used," page 121), it is imperative to explain the results obtained clearly, the way they were obtained, and their limitations to the stakeholders who may have little knowledge of them.

Two reasons justify the evolvability criterion of the tools chosen in an ARP project. Firstly, the skills of the partners grow rapidly, as is demonstrated by the ability of some farmers to quickly learn to use PowerPoint software or browse the Internet. Such an improvement in skills allows tools from a progressively wider range to be selected,

thus leading to the use of ever more effective tools. Secondly, the tools may need to change over time to take into account the results obtained in earlier stages or for taking changes in the ARP environment into consideration.