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Interaction for irrigation: how analysis guided a construction project in Peru

Natasha van Dijk

• Introduction

Participatory techniques and approaches, such as PRA, are often only used in the planning phase of a project. Yet the information generated during the early stages may only become meaningful later in the development process. This article describes the analysis that took place during different stages in the rehabilitation of a small-scale irrigation system in the Peruvian Andes. The users analysed not only the issues related to the physical construction of the infrastructure but also the subsequent 'social construction' of their technical ideas. Initially hesitant in their dealings with external organisations, they became keen initiators of joint debate and analysis.

As an external organisation, we gained insights around two critical questions:

- Who defines what are the important issues?
- What is the role of intervening organisations in creating 'moments' that allow local people to generate and analyse information, and to introduce new perspectives in this process of analysis?

Our experiences show that if participation is consistently emphasised in *all* phases of the project - and not only in the appraisal and planning phases - local people will increasingly become the owners¹ of the changes they propose. They will be able to

¹ Ownership refers to the feeling that the responsibility to manage and maintain the project lies with the users. This is important in that it makes people analyse and act more autonomously in problem solving and developing the system, a condition for sustainable development.

influence more strongly local development through their own decisions, taken on the basis of their own criteria, criteria which flow from a collective or individual process of analysis.

The process of participatory intervention

Early in 1997, the Institute of Water and Environmental Management (IMA), a governmental agency in the Peruvian Andes, received technical and financial assistance from the Dutch Development Organisation (SNV/Peru) to start a two year pilot project. It aimed to develop and apply participatory methodologies in which equal opportunities were created for men and women to improve their natural resource management capacities. The project arose because several internal and external evaluations concluded that more emphasis should be given to strengthening the social processes in villages and emphasising gender roles in intervention strategies. In short, it was felt that interventions should become less engineer-designed and imposed, and based more on the real needs of the local people involved.

Three villages are involved in the project, including the 47-family community of Huaranca, living on barren mountain slopes at 3200 metres, which is the focus of this study. The villages are located in one of the IMA's intervention areas and were selected according to a number of criteria, including local experience with technical assistance and the ecological zone. Permission to work in each village was requested only from the village council, as there is no higher level authority which co-ordinates development aid interventions.

Our work started with a participatory appraisal and planning phase that lasted 6 months. This

was followed by a process of interactive design, a construction phase, and the current stage of clarifying water management to enable effective use of the physical infrastructure. For each phase, I will explain when and what kind of analysis took place and describe who took what role.

• **Laying the groundwork**

At the outset, the objectives were discussed together with the participatory nature of the process proposed by IMA. Participatory techniques, such as mapping and visits to individual plots, were used to form a clear picture of the availability and use of natural resources. Venn diagrams and wealth ranking helped us understand how people were organised, how village institutions functioned, and how people viewed external support organisations.

The information was almost entirely generated in separate groups of women and men. The team² always tried to move beyond questions of 'Where?' and 'How many?', to more analytical questions, such as: 'What is your personal opinion?', 'Why do you like this or why not?', 'What could be an alternative?', 'What have you done to try and solve this problem?', 'What kind of leadership do you need, and why?'. This qualitative approach gave everyone better insights into how different factors influenced the local situation.

Periodically, the information generated was fed back at community council meetings. After villagers presented the results of their group work, discussions led to key conclusions and main bottlenecks.

The facilitators were crucial in guiding the process and asking questions so as to reach the desired results: an increased awareness among the villagers about the different type of intervention proposed by the IMA (with an emphasis on participation), and therefore a

more active and more responsible role. Another outcome has been a better understanding for both insiders and outsiders of the village dynamics and the factors that influence local level management of communal resources. Organisational levels, individual leadership capabilities, local rules and regulations and the role of outsiders were some issues raised by local people.

During this first stage, the agenda for all the meetings and the methodology was defined by the facilitators. This included defining the main themes as the availability and local level management of natural resources. The team decided not to look at other subjects, such as health, which fall outside the scope of the expertise offered by the IMA. The team was aware of its steering role in this phase, but felt it was mythical to expect people, especially in the Sierra of Peru (where they are used to playing a passive role, waiting for the outsiders to come and bring services, whether needed or not), to take a leading role from the outset.

Thus the facilitators took up the role of guiding the analysis of the main topics to be discussed (including gender relations), and defining the methodology (separate women and men's groups, alternated with general assemblies for feedback sessions). Within the topics defined by the facilitators, the users defined the bottlenecks and important issues and also decided when to have meetings and who would participate.

Promoting analysis and reflection

The external steering of the process resulted in women participating for the first time in analysing village level dynamics, the daily work they do and the role they play within decision making processes. It was also one of the first occasions during which male farmers were encouraged to take on a more open attitude about the abilities and knowledge of women. This was achieved by working in segregated groups, followed by plenary sessions for collective reflection.

During the assessment phase, extension events were organised, using puppet theatre and video performances, to discuss topics such as women's roles in the family and the

² The project team consisted of a co-ordinator, a civil engineer, an agronomist or forest engineer, and an extensionist specialised in organisation, social dynamics and gender. We do not make a distinction between facilitators and engineers, as every person of the team has technical as well as facilitating functions.

functioning of community organisations. After each performance, we stimulated discussion about the local situation.

Farmer exchange visits with other villages were crucial for raising awareness on the technological innovations available locally (such as improved potato seed storage and glasshouses for vegetable production). For the women, exchange visits, particularly with other women's groups, 'opened their eyes to the outside world', as they expressed it themselves. They saw that it is possible to tackle certain problems successfully, such as overcoming the fear of public speaking, and being able to express their ideas and points of view in assemblies.

Each and every exchange visit consisted of a preparatory phase with the farmers: 'What would you like to learn about a certain topic?' and 'What would you like to present to the others about your village or your experience?'. This last question helped emphasise what was already happening in the village, and that people have valuable local knowledge. Each exchange was followed by a participatory evaluation, and a feedback session back home, where the villagers could inform others and discuss what they learned. In this way we tried to optimise the learning and analysis impact.

• **Planning the intervention**

The planning phase started with a summary of the work completed during the first four months. Again, we worked in separate groups of men and women, and again the facilitators dominated. Nevertheless, the list of local problems needing solutions clearly came from negotiations between men and women about priorities. It did not, for example, include soil conservation measures, which are part of the traditional package of services offered by the IMA. The final outcome was a village action plan defined by those who attended the assembly (95% of the villagers), using local criteria for priority setting: irrigation, drinking water, improved village rules and regulations, and organisational strengthening.

The village action plan included only short term activities. People first wanted to prove that they were able, with the help of the IMA to tackle some key issues. They felt that only

by evaluating their capacity to lead and implement, would they be able to adjust and extend their plan according to further needs. This shows that people will reflect critically and analyse their possibilities and limits, *provided that they are given a chance to do so*. It also shows the rational nature of people's planning. In this case, their low level of self-confidence, their limited leadership skills, and the limited time available, encouraged them to start conservatively.

It was in the next phase that the importance of persistent participatory work and maintaining room for local level analysis was most clear.

• **Interactive design of the irrigation system**

Traditionally, the village of Huaranca was divided into four sections, each of which received water independently of each other. At the start of each growing season, the families in each section agreed on the sequence of who would irrigate when and on maintenance obligations. There was no formal organisation and no institutionalised rules or regulations.

The new project aimed to increase the availability of water, through the use of reservoirs and the piping of water to individual fields. But first it had to be designed. Normally, IMA engineers enter the village, collect data, and return to the office where the system is designed. In the best cases, the design will be presented to the users but this rarely happens.

Instead, in Huaranca, the project team conducted a two-day workshop as a first step in an interactive designing process that incorporated farmers' priorities. Technical aspects, such as location of canals and reservoirs, were discussed alongside social considerations, such as existing traditional organisations and water rights. The water sources and sections to be irrigated were also visited. This proved to be a valuable input to the participatory mapping, which followed the fieldwork.

The next step was to compare the alternative designs made by the engineer in charge and by a small group of men, who volunteered to take the lead in proposing an alternative lay-out.

They ended up with four layouts, which they compared, enabling increased analysis about the links between hydraulic properties of an irrigation system and the water use requirements. In other words, how does a certain design influence the operational requirements of the system?

After some debate, the users in Huaranca opted for a system with four reservoirs, mirroring the existing, informal organisation. They argued that any new system would need an overarching irrigation organisation for operational purposes, which would complicate the water management. Their conclusion was: 'Let's maintain the present social structure and adjust the physical infrastructure to it' (rather than the reverse which many engineers do). The fruitful interaction between the IMA field staff and the male farmers would not have come about without the prior phase of six month's introduction and analysis. Mapping alternative designs, and selecting the best amongst various options, showed IMA that farmers are capable of analysis.

After the workshop, the team asked the water-users to reflect on the outcome of the workshop and discuss it again, in their own space and time, with their families and other villagers. Although many women attended the two-day planning workshop, they did not participate actively, either in the technical sessions or subsequent discussions. Thus, the role of women was limited in the workshop. Large group and village sessions provided few opportunities for women to define their role in irrigation matters. Further, the perception of the technicians, as well the local people, was that irrigation is a male domain. Whereas, village men had clearly gained in confidence during the first months of the project, women were still reticent about taking a more active role when dealing with external organisations.

• **Implementing and consolidating the irrigation system**

Construction of the irrigation system also followed a participatory process. The farmers formed a management committee which was held responsible for organising the work - not only the provision of free labour but also managing the materials. This last aspect is new in IMA's process of construction. By giving

more responsibility to the farmers, IMA assumed that a greater sense of ownership would be created. This resulted not only in delegation of power to the committee, but also in a better understanding of the complexities of implementing a project: what kind of materials are needed, at what moment, which quantities, how to control outflow from the storage, who will be held responsible for losses etc..

Evaluation showed that the users had taken their responsibilities seriously and this led to an important institutional decision: transferring a large amount of money to the users' bank account. The users now had to manage the finance and administration of the next (drinking water) project, planned by the villagers. They had shown they could manage and solve problems, and were thus given more responsibilities in a next phase.

On finalising the construction, the users moved on to analyse the implications of the work. They asked themselves how, at field level, they could irrigate with this new technology. Sprinkler systems are a relatively new technology in these dry steep areas. Though quickly adopted by farmers, they do not yet know how to use them optimally. Therefore, the team has planned more extension events, to bring together water users with different levels of experience to exchange their knowledge. In this way, those to whom the technology was new can develop their knowledge and skills.

The water-users also began to discuss: 'How can we organise ourselves so this system can function well and everybody will follow the rules?' They recognised that the situation had become more complex with the new system: more users and more maintenance meant more collective responsibility. Therefore, the users proposed to hold an assembly to discuss the organisational structure and propose the formation of a water-users' committee. They requested the assistance of the project team to orient them in analysing this complex issue. The team was invited to the assembly, with the facilitators' responsible for suggesting an approach for analysing the organisational challenge.

In the long plenary session, the team had no active involvement. They agreed on a structure, and the men even decided to ask one

woman to join the committee, recognising the leadership abilities that some of the women had developed over the past 18 months. The outcome of the meeting had been the result of the people's process of analysis and debate. The villagers opted to create a body that could mediate relations with others outside the village, but which was not needed to manage irrigation water use.

• **Process approach in interventions and analysis**

If one defines an intervention as a process in which analysis should be carried out by local people, it is important to consider the following issues that emerged from our experiences in Huaranca.

Participatory analysis takes place not only in the planning phase of a project. *It is in the continuation of the process, in subsequent moments, that the information that has been generated and the analytical abilities strengthened take on meaning.* Sometimes, the concrete results of a participatory planning exercise are not immediately obvious. Much information is often gathered but how it is analysed, and with what effect, is not always clear, especially after the first stage of appraisal and planning. The value of *collective* analysis becomes visible in the initiatives and actions taken by the people in subsequent phases of a project.

It is not so much the data collection that is important but rather how it is collected and processed by the users themselves, and how the information is discussed and with what purpose. Our example shows that feedback sessions, at community level, are essential to come to meaningful conclusions that can be translated into decisions and action by the users themselves. The feedback sessions, PRA techniques, exchange visits, video and puppet sessions always provided room for *collective* analysis (crucial for collective action to develop communal management issues) and reflection. They provided crucial stimulus throughout our three-step learning sequence:

1. Improve understanding about the need to reflect upon certain issues ('Why do we explore this subject?').

2. Reflect about local situation ('How does my/our situation compare with the subject discussed?').
3. Act for improvement - from awareness about the need to change things in order to move ahead. Having the responsibility to act and to do creates a greater dynamic for analysis as to whether the correct decisions are being taken. Acting also raises levels of self-confidence, a precondition for further autonomous action.

Analysis is not only carried out in formal sessions that are initiated by external support organisations. More important are the moments without the facilitators, when villagers are able to discuss in their own private or public space the issues raised in previous sessions and reflect upon different or new options. From an intervention point of view, it is crucial to include such moments of 'non-intervention'. But the consequence is a more time-consuming process than most development organisations are willing to allow.

It is important to create a historical perspective, and retain earlier work to stimulate deeper analysis. For example, a Village Action Plan is a critical instrument for autonomous local level planning in the long term. It is important to reflect on the plan from time to time with the users: 'Where are we now?'; 'Where are we going?'. In the case of Huaranca, returning to the plan has helped the farmers to realise that constructing the irrigation system is only a first step in a long-term development process that is their own responsibility. Therefore the documentation of analysis is important.

• **Role of the intervening agency**

As an intervening, initiating agency, we have learnt much about how to adapt our role to one in which gender-equitable local analysis is encouraged, rather than imposing our terms and timing.

If we compare, on a sliding scale, the level of team involvement in the three phases, it is clear that the initial agenda was largely set by the team, who also steered some of the analysis by defining the broad topics. However, over time, the users increasingly

undertook the analysis by themselves. After two years, and at the end of the project, the people now set the agenda, propose ways of tackling problems, and take the initiative to invite the team for specific purposes. This shift was made possible largely through:

- an increased level of self-esteem, amongst men and the women;
- a relation of mutual trust and respect between the 'intervener' and the local people, in which the latter were encouraged at *every step* to think from their perspective and to take a decision on their own criteria; and,
- stressing the value of mistakes as opportunities to learn and develop local management capabilities further.

Gender, confidence and information

Better analysis of the information generated during participatory intervention requires ways to include all groups in society in the process. This helps to create, for example, technologies that include the perceptions of those who use it, and not only the point of view of the committee, who may not always take into account what is best for the majority. It also results in better local information management, which is important for developing opinions and participation in decision-making moments. This was especially important for the women, who now have a voice *and* vote. As power accompanies access to information, analysis with a broad range of people is important. A final point relates to our goal of consensus: if many people support a decision, the better the system will function.

We focused on finding ways to encourage women's views to influence the activities. This was not easy, especially in relation to issues like men-dominated irrigation. Only later, when women had gained confidence because of explicit activities defined and they realised themselves, did they become more visible and vocal. One thing is clear in this case - it would have been inappropriate to force women to take a more active analytical role in the design phase when they were not ready (or willing) to assume this role. However, one year on, they helped design a drinking water project, bringing forward, in public, their points of view. Thus another important factor that

affects whether women engage in analysis and decision-making is whether the topic relates to their day-to-day responsibilities.

Essential in the whole process is confidence-building. In a society where ideas persist such as 'farmers only have a short term vision with limited capacities', it is not difficult to imagine what self-image men and women have when dealing with the external service agencies who have always claimed to know 'what is good for the people'. Any intervention wanting to ensure shared analysis by local people, should acknowledge that confidence building is crucial. In the case of Huaranca, this was achieved not only by constantly motivating men and women to take an active role in the events, but also by teaching them practical skills such as management of inputs and financial resources, accounting, speaking in public, functioning as a committee member, etc. It is the combination of improving practical skills and motivating people to become the main actors in an autonomous process of analysis and decision making that is essential.

• **Natasha van Dijk**, SNV/Peru, Los Pinos 550, Lima 27, Peru. Email: natasha@chaski.unsaac.edu.pe

NOTE

The author's role was primarily that of co-manager of project implementation and particularly of process designer.