CHAPTER 15

Planning of Territorial Organizations as an Entry Point for Agricultural Research towards Rural Development and Innovation

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Introduction

This chapter argues that the planning processes undergone by local governments and community-based organizations are viable entry points for agricultural research into rural development and innovation processes. In this context, local, departmental, and national governments are partners, in addition to community-based organizations and institutions of the national agricultural research systems. The 2002 Annual Review of the International Center for Tropical Agriculture (CIAT, the Spanish acronym) focused on aspects of scaling up and out. In our case, scaling up refers to obtaining support from higher administrative levels to local initiatives through complementary activities or policy that could not be conducted at the local level. Scaling up can refer also to linking local planning efforts to the planning of higher administrative levels, although moving up in scale implies reducing the geographic scale of map representations when passing from local scale to national, continental, and global scales. Scaling out refers to the contribution of territorial-based organizations and governments in diffusing "technologies that work". Our arguments are supported partly by observations from our ongoing work within the agreement between CIAT, the Colombian Ministry of Agriculture, and the Colombian Corporation for Agricultural Research (CORPOICA, the Spanish acronym), and partly by observations from authors of other studies reported in the literature.

Planning means to anticipate the course of action needed to reach a desired situation. The process of planning is a systematized sequence of decisions and actions that includes the definition of the desired situation and the selection of means of reaching it (BID-EIAP-FGV, 1985). Planning

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is essentially an act of power and it bears an implicit idea of intent because we choose certain actions instead of leaving things to chance (PRONATTA-MADR, 1996) or letting others decide for us. Governments of all countries and administrative levels have to plan their activities and the spending of their resources, and in most countries this is done through an official and regulated process. The resulting plans express a series of programs, projects, and norms to be carried out during the mandate of the administration in question, and determine how the financial resources will be used, therefore constituting a highly important part of policy.

The discussions and needs identified during planning can greatly influence other forms of policy, such as legislation and specific decisions taken along the way. Planning is repeated after every change of leadership, but if done satisfactorily, it is a continuous management process including execution, monitoring, and evaluation. Governments can use planning to enable development processes led by other players, even when no funding is involved. This idealistic vision of planning is often shunted by clientelistic politics, corruption, and fraud, and "There is a growing skepticism and reappraisal of the ability of public administrators and politicians to manage and target public services" (Helmsing, 2002). This also discourages scientists from linking their work to governmental planning. Scientists are often reluctant to have their efforts used by politicians to increase the politicians' popularity or to promote certain projects that might be inequitable. Another reason for discouragement is that science is usually reductionist, whereas governmental planning is extremely vast, being multi sectoral, multi stakeholder, and multi level. The number of points to consider can be overwhelming, and it is sometimes difficult to break down problems and address them in parts. However, working independently of local and national policymakers limits the success of the processes that applied scientists are trying to encourage. Avoiding the political processes also limits all positive influence that could be had on democratic processes. If what is sought is to affect the way in which decisions are made, then involvement is in some way political. The political aspect should not be avoided, but the transparency of decision making should be increased (Vargas del Valle, 2002). Planning processes must also provide the necessary linkages for scientists to be able to participate in the whole, while concentrating on the part of the problem that corresponds to their area of competence.

Why Should Agricultural Research Scientists and Institutions be Interested in the Planning of Territorial Organizations?

For scientists and information providers, decision making by territorial or political institutions constitutes an opportunity to put results at the service of the development and management of natural resources. It provides an "entry point", a link in the chain between research and

development (R&D), onto which scientists can "hook". Hooking on to planning is much easier than contributing to solving problems as they arise, when the urgency seldom leaves sufficient time for decision makers to consider different options, look for relevant information, or to communicate questions to the scientific community. When considering the larger meaning of the word "planning", which includes diagnosis, action planning, execution, monitoring, and evaluation, it becomes synonymous with management. Encompassing planning is a good way to strengthen the management component in integrated natural resource management (INRM), a need that Lefroy (2002) identified.

Agricultural research is conducted to help beneficiary groups to reach desired conditions, such as food security or sustainable livelihoods. In the case of CIAT, the main beneficiaries are rural communities, and small- and medium-scale producers, as well as the urban poor who can benefit from increased food production in rural areas. However, we have all faced situations where "external" factors, such as markets, prices, policy, transportation, infrastructure, conflicts of interest, and political good will, hindered the success of a given local initiative, or the successful adoption of a technology. In many cases, the impeding factor is the absence or lack of functionality of some necessary activity, mechanism, or infrastructure. For higher administrative levels, some of these impeding factors or needed contributions are not external, but form part of what is under their control.

On the other hand, planning is an opportunity for scientists to orient their research towards their possible contributions to their beneficiaries' objectives. As we will see later, requests that come from a planning process can be different from ones obtained by consultations in which beneficiaries are asked what they need. Participating or responding to requests coming from a planning process can allow scientists to participate in endogenous innovation processes rather than impose technology. In addition, planning allows individuals and institutions to manage innovation processes because these encourage the consideration of a wider range of options than when solving urgent problems. Planning allows the analysis of problematic situations in a systematic way in order to understand the various causes and driving forces. This eventually leads to forming alliances with other players involved, thus changing the ways of organizing in order to reach the desired conditions. Planning also gives the opportunity to complement rather than duplicate the efforts of institutions with respect to R&D.

Planning can have a most important role in strengthening adaptive capacity. If done strategically, it allows players to calmly formulate questions, collect necessary information, explore different options with their consequences on the desired results and on the various stakeholders, and structure the relationships between the players for execution, monitoring, and evaluation. Because strategic planning

includes the anticipation of future problems and the consideration of past ones, it can generate an organization of players and data to be effectively used in the solution of problems "along the way". The monitoring and evaluation components of planning also provide an opportunity for collective learning, allowing players to learn from their successes and mistakes, and to adjust their actions according to the effects they cause.

Planning also offers an opportunity for leaders, influential groups, and the population to expand their mental image of their social and environmental systems. Through personal contact and discussions, they can become more aware of the needs and contributions of other players, and their mental picture of "us" can expand unconsciously. They are also obliged to think of the long-term implications of their actions, which may further expand their conception. These expansions may direct their decision making towards a more effective consideration of collective, diverse, and long-term needs. This phenomenon reduces power struggles because it enables the convergence of objectives. The resulting increase of trusts, combined with strengthened organization, contribute to increasing social capital. "Learning about each other and the issues at hand too, deliberating parties can create public value: From the value of mutual recognition to that of their empowered capacities to act, singly or together" (Forester, 1999).

Our interest in governmental planning is twofold. On the one hand it is an ongoing process routinely conducted in almost every country, and one that we scientists can piggyback to improve the relevance and impact of our work. On the other hand, it is a powerful mechanism for rural development and innovation, and thus a worthwhile subject of research in itself. Like many other mechanisms, planning is most often used well below its potential, and presents many opportunities for improvement that we will describe later. These constitute valuable research opportunities in a multidisciplinary field to which agricultural research can contribute.

Our experience

We initiated our work relative to governmental planning in Colombia in 1999, as the contribution of the Land Use Project to the agreement between CIAT, the Ministry of Agriculture, and CORPOICA. At that time, the country was experiencing a period of panic with regard to territorial planning. The national government required a new type of plan from municipalities, the Plan for Territorial Ordering (POT, the Spanish acronym) through law 388 of 1997 (http://www.dnp.gov.co/ArchivosWeb/Direccion_Desarrollo_Territorial/legislacion/ley_388_1997.pdf) and had fixed 1999 as a first deadline for their approval, later postponing this deadline to June 2000. Territorial planning has been, for municipalities, the first serious long-term planning effort. The POTs have a timespan of 9 years and cover three times the constitutional mandate of mayors. In this strategic planning effort, the municipal administrations have to set a

series of norms, actions, programs, and projects at short-, medium-, and long-term, spatializing them over their legal territory. Previously, municipalities already were acquainted with planning through the Municipal Development Plans (Ley Orgánica del Plan de Desarrollo, Law 152 of 1994; http://www.dnp.gov.co), but these only consider the period of mandate of the administration, although they also respond to long-term objectives. The other novelty of POTs in regard to development plans is that maps are used to represent the spatial distribution of natural threats and risks, areas with specific restrictions or potentials for land use, areas with cultural, historical or environmental patrimony, as well as the present and desired distribution of infrastructure. Thus, POTs create a need for increased technical capacity and geographical information.

Our first entry point to planning was an offer of geographic information systems (GIS) technical capacity, geographical information, and the development of decision-support tools. The CIAT Land Use Project had digitized a significant amount of information over the municipality of Puerto López that we knew could be put to good use when made available to the municipal government for developing its POT. We therefore initiated a partnership with the municipal administration to assist in the POT, with the objective of adapting and developing methods and tools, which could then be applied elsewhere.

We participated in the adaptation and Spanish translation of the MapMaker software, developed by Map Maker Inc. in Scotland, which led to the version MapMaker popular (Dudley, 1999), which is freely distributed. We also elaborated a Spanish language guide for self-training in the software (Beaulieu et al., 2000a). However, as we collaborated with the municipal administration's staff and contractors, and as we discussed with professionals involved in POTs of other municipalities, we noticed the diagnosis stage often caused general frustration, which we humorously called the diagnosis syndrome. This frustration tends to occur when large quantities of data are acquired over a site, and yet diagnostic conclusions cannot be drawn. It is sometimes exacerbated by the use of GIS because important investments are made in digitizing, correcting, and organizing data. Indicators can be calculated from the data, but these are difficult to use in a diagnosis when the development objectives are not clear. Geographical information is of indisputable usefulness, but to be effectively used it has to be organized to answer the questions that occur during planning. These questions have to be guided by clear development goals.

We formalized a method for vision-based planning (Beaulieu et al., 2000b; 2002), which we call "visions-actions-requests across administrative levels". This method aims at helping planners and stakeholders identify the questions that will guide the collection and analysis of information, while helping improve the participatory component of planning and the articulation of players within and between

administrative levels. In a series of meetings with focus groups, for each of the themes to be addressed, players define their vision of the desired future conditions, the actions that they can conduct to reach those conditions, and the actions or resources requested from other actors. Visions and the articulation of actions and requests from one level to the next are discussed in articulation workshops. The "vision" or desired future conditions help to define the questions relating to diagnosis or to monitoring and evaluation. The actions and requests identified in the exercises guide the formulation of action-planning questions. This method shares many elements with other vision-based planning methods (Green et al., 2000; Lightfoot and Okalebo, 2001), with the method used in Colombia's Agrovisión 2025 (Presidencia de la República de Colombia, 2001) and with other participatory methods that include visioning exercises, such as the soft systems methodology (Checkland and Scholes, 1990) and appreciative planning and action (APA) (Bhatia et al., 1993). Our method is distinguished by setting the desired future conditions before (and to guide) the diagnosis, and by strongly emphasizing the matching of actions and requests between players within and between administrative levels. It can be combined with other planning approaches, such as scenario planning (Schwartz, 1996) that involves the exploration of different possible futures, usually dependent on external factors.

The municipality, with our support, completed the Basic Plan for Territorial Ordering (PBOT, the Spanish acronym) of Puerto López in early 2000 (Alcaldía de Puerto López-CIAT, 2000). The GIS data (particularly soil maps) and satellite images were especially useful for determining areas with restrictions for land use (Rodríguez et al., 1999; Rubiano and Beaulieu, 1999; Vrieling, 2000; Vrieling et al., 2002) and areas vulnerable to natural disasters, such as floods. A variety of georeferenced information, photographs, and the documents of the plan were organized in a customized application of MapMaker Popular and widely distributed on CD-ROM. The plan received congratulations from Regional Autonomous Corporation for Orinoquia (CORPORINOQUIA, the Spanish acronym), the institution mandated to review and approve the environmental component of the POTs of its region. Following this success, there was much demand for training, and the Ministry of Agriculture encouraged us to transfer our know-how to other municipalities. In 2000 and 2001, we gave training and training materials to agriculture secretariats, so that they, in turn, could give training to municipalities. Eight 1-week courses were given, in different regions of Colombia, including concepts on the legal aspects of territorial planning, the visions-based planning methodology, and basic skills in MapMaker Popular; 185 professionals were trained. In 2002, four 1-week courses were given in Ecuador, funded by individual provinces, with the support of the Interamerican Institute of Cooperation for Agriculture (IICA, the Spanish acronym). Our capacity-building activities then expanded to include the Processing Georeferenced Information System (SPRING, the Portuguese acronym) image-processing software, developed by the

National Institute of Spatial Research (INPE, the Portuguese acronym) in Brazil.

In Colombia, following important decentralization processes, which have accelerated in the last 2 decades (Oliva et al., 1998), municipalities have increased resources and responsibilities regarding rural development. In 1998, the national government found that a fourth phase of the fund of Integrated Rural Development (DRI, the Spanish acronym) was unnecessary because municipalities receive sufficient funds from the government through obligatory transfers (Vargas del Valle, 2002). Now, municipalities are in charge of enabling rural technical assistance to small- and medium-scale producers through a public extension office, Municipal Unit of Agricultural Technical Assistance (UMATA, the Spanish acronym), or through contracting private agents. The funds allocated to rural infrastructure and activities bound to stimulate rural development are determined in the municipal development plan, which includes the Municipal Agriculture and Livestock Program (PAM, the Spanish acronym), itself including the plan for rural technical assistance. In the philosophy of Nueva Ruralidad (Echeverri Perrico and Pilar Ribero, 2002), municipalities are the interface between the rural population and the government.

In 2001 and 2002, we supported the municipality of Puerto López in developing its Plan de Desarrollo Municipal (Figure 1). In Colombia, each time a change in leadership occurs, every level is legally required to produce multi-sectoral development plans. Planning exercises are therefore repeated after each election, every 3 years in the case of municipalities and departments, and every 4 years in the case of the national presidency.

Figure 1. Participants in one of the participatory planning workshops conducted for the Plan de Desarrollo Municipal in the municipality of Puerto López, Colombia.

Because of their existence in various administrative levels, these offer the possibility to link actions between levels and to connect the various components of a given level. In Colombia, development plans are carried through at the municipal, departmental, and national levels. At present, territorial plans are only legally required for the municipal level, but the Organic Law of Territorial Ordering (http://www.dnp.gov.co), presently under discussion, will make them required at departmental level also. Independently of the legal obligation, various departments have elaborated their territorial plan.

In the follow-up of both plans, we tried to support specific projects or goals, especially those from small farmer communities. The report by Fajardo (2002) summarizes our work with communities, jointly conducted with the UMATA, which consists of helping five villages of the municipality with their planning, especially related to agricultural projects and commercialization. With the aim of using this experience to develop public goods that could be used elsewhere, we began developing other tools to be used by national government and municipal technical assistants. These tools (Box 1) complement others developed in CIAT and elsewhere, and include Crops and Fruits for Colombia (CUFRUCOL, the Spanish acronym) (Fajardo, 2001), CLIMCROP (León, 2000), GEOSOIL, and ARBOLES (Hoyos et al., 2001).

Box 1

Tools for use by national government and municipal technical assistants

Crops and Fruits for Colombia (CUFRUCOL, the Spanish acronym) is a database of crops and fruits of interest for Colombia that includes botanic and agronomic information, crop climate and soil requirements, and production costs. CLIMCROP is a geographic information systems (GIS) tool for mapping the degree of climatic limitation of a given crop, according to requirements given by CUFRUCOL or entered by the user. It also allows the elaboration of a more detailed report of limitations for a given location. It can be complemented by the use of FloraMap (Jones and Gladkov, 2002). GEOSOIL is a geo-referenced database for soil data, obtained from field measurements and observations, and from soil maps. It also produces basic estimations of soil quality, depending on the data available. ARBOLES is a database tool that allows applying rules of a decision tree to data entered by the user or from a soil map to make recommendations about the type of production system to be implemented. At present, the decision tree that has been programmed is for the Altillanura portion of the Colombian llanos, and contains rules relative to soil properties and slope. The rules can be edited to include other properties and can be adapted to other geographical areas. Areas recommended for a given production system can be mapped using GIS programs.

Parallel to tool development, we analyzed the costs of different strategies with farmers, and conducted a participatory evaluation of market options using methodology developed by the Agro-enterprise Project, all jointly with the UMATA. We also participated in initiating specific projects. For example, in the village of El Turpial, the main commercialized crop is cassava (*Manihot esculenta* Crantz), but sometimes farmers lose their crops because of a lack of market for fresh cassava. They also did not have the means of conserving this highly perishable crop. Technicians from the Latin American and Caribbean Consortium to Support Cassava Research and Development (CLAYUCA, the Spanish acronym) came to the village and showed farmers how to shred and dry their cassava using a machine lent by CIAT's Cassava Project, and put them in contact with an animal feed factory, which purchased the resulting dry cassava. The farmers then repeated this operation, with the support of the UMATA, who found an even more favorable buyer (see Figure 2). CIAT has been promoting this technology since the beginning of the 1980s (Gottret and Raymond, 2003), thus it is far from new, but responds to urgent farmer need. Although selling fresh rather than dried cassava is much more profitable, farmers can now sell off dried what remains unsold of their fresh produce. The community board has regained enthusiasm and increased its trust and will to work with the UMATA. Neighboring villages wanted to "do a project like in El Turpial".

Figure 2. The Director of the Municipal Unit of Agricultural Technical Assistance (UMATA, the Spanish acronym) of Puerto López, Nohemi Peñuela, provides payment to farmers of the village of El Turpial for their dried cassava, serving as an intermediary between them and an animal feed factory.

In participatory planning workshops with the two indigenous villages of the reserve of Humapo and La Victoria, residents wanted to recuperate the natural areas in their reserve, needed for hunting, fishing, and

gathering materials to construct their roofs and produce their crafts. They also wanted to be more independent with regard to food supply. Ways to achieve this include diversifying crops and cultivating cassava on the altillanura part of the reserve, relieving pressure on the gallery forest. Cassava is traditionally cultivated on the riverbanks in a rotational *conuco* system, but an increase in population meant a greater demand for food requiring constant use of land that impedes crop rotation, and new forest areas are cleared for cassava cultivation. The Colombian Family Welfare Institute (ICBF, the Spanish acronym) has funded cassava projects on the altillanura, but since these ended, residents are looking for ways to be more self-reliant. The main obstacle to these agricultural projects is the purchase of inputs. Considered solutions to overcome this include micro-funding mechanisms and organic agriculture practices to reduce the need for inputs. Strategies to recuperate natural areas include preventive burning and reforestation. The communities have begun constructing a greenhouse to reproduce native tree species and fruits, with financial support from the Mayor's Office, for materials. At the end of 2002, the communities conducted a preventive burning trial, whose chosen location was helped by observing satellite images.

Under a special program by the Ministry of Agriculture and Rural Development (MADR, the Spanish acronym), CORPOICA obtained funding for a project with the Ministry on maize (*Zea mays* L.) for small-scale producers to promote the crop in the altillanura of the Colombian llanos. The UMATA of Puerto López is a partner in this project, and because of the participatory workshops run for municipal planning, knew that Puerto Guadalupe farmers wanted to implement such crops. They were therefore included in this project and in the co-funding of production activities during the first years of the project. Our contribution will be mostly in exploring options for the groups to continue productive activities in a self-reliant way, even after co-financing by the Ministry terminates, and to provide information for decision support.

Examples of Scaling Out and Up from Our Experience

Our activities being relatively recent, the scaling up and out of our results is only just beginning. Even if the examples we present seem trivial and local, they point to mechanisms that will continue to produce development impact and that can be used by any other group promoting rural innovation.

In terms of scaling out, the secretariats of agriculture that we have trained in the use of the participatory method and the MapMaker software have trained municipalities and other agents. Some of these trainees and their second generation trainees presented their results at a seminar organized at CIAT in November 2002. Both the use of the MapMaker software and the visions-actions-requests methodology are spreading out

in an effective way. We have encountered people who use them, who have been trained by us or by others. Many trainees learned to use the vision-based planning method during a workshop in which they participated, and then they adapted the method to their taste. The planning secretariat of the department of Meta used it in 2003 to plan the territorial and development plans of its constituting municipalities. The agriculture secretariat of Valle del Cauca is using it to articulate the actions of various actors involved in food security. The department of San José del Guaviare has used it in the elaboration of its departmental territorial plan (Rodríguez Porras, 2002). Management committees also used elements for planning and capacity building in the La Macarena Special Management Area (AMEM, the Spanish acronym) (Vanegas Reyes, 2002).

Again in terms of scaling out, we can cite the municipality's role in repeating the cassava drying initiative of El Turpial in other villages, and the UMATA's distribution of germplasm for farmer trials. We need to mention that higher administrative levels are involved here in the scaling out, thus somehow involving a scaling up process.

Since we have been working mostly at the community and municipal levels, our examples of scaling up (in the sense of complementary actions at higher administrative levels) are mostly between these two levels. Because of the participatory planning workshops, the municipal administration and the UMATA have become increasingly aware of ways to support local initiatives. In addition to increasing investment in rural areas for services, such as electricity, water supply, and health, the municipality is supporting projects that village associations and boards propose. For example, following the success of the cassava drying operations in El Turpial, the municipality will be funding, in 2003, the purchase of two shredding machines and the construction of two drying floors with sliding roof, one for El Turpial and another for Puerto Alicia. The municipality is supporting the construction of greenhouses for reforestation in the indigenous reserve of Humapo and La Victoria, and shows strong interest in funding a cassava processing plant that could provide market opportunities for many small- and medium-scale producers. The UMATA has supported the formation of various farmer associations and the writing of various projects, submitted to the Ministry of Agriculture, for the co-financing of production projects. The UMATA also has run trials with farmer groups to try cassava varieties provided by CIAT.

Opportunities for Improving Planning

Planning rarely fulfills its potential, and is the object of justified criticism. However, problems related to planning do not imply that planning in itself is useless, but that we should improve the way it is being used. Instead of describing the problems related to planning, we will try to discuss the multiple opportunities to improve the process, and suggest ways to do so.

Clarify ends and define means

It seems almost typical that legislation, policy, or norms have effects that are totally opposite to what they were designed to do. All policy mechanisms are double-bladed knives, and if actors and stakeholders do not understand their objective well, the desired results will not be obtained. In the case of restrictive policy, players always seem to find ways around the restrictions, and in the case of incentives, abuses almost always occur. However, the behavior of those who fully understand the ends of a given policy is usually compliant, even when it is against their short-term and individual interests.

Unfortunately, the ends, desired outcomes, or desired future conditions are too often absent from planning or from the prescriptions coming from different forms of policy. "We have substantial technical knowledge about probing means and strategies to reach objectives, but we know much less about probing ends" (Forester, 1999). This probing of ends is what vision-based planning methodologies seek to attain (Green et al., 2000; Lightfoot et al., 2001). However, as Forester (1999) pointed out, the quest to learn about "what we should want" and about "value" can be manipulative. Planners and politicians can use these exercises as "dialogical boot camps" to help stakeholders really know what they want. Here again, learning and exploring common goals can be used aiming either at genuine deliberation or at manipulation. The end, sometimes hidden and sometimes openly exposed, is a determining factor. Because ends (or goals, or objectives) are often different among the actors and stakeholders, the result depends on who pulls strongest on the blanket through well-known power struggles. When goals are divergent, results are rarely fully satisfactory for any stakeholder. When actors and stakeholders can work out goals to which they can all identify, or more general ones where different objectives can co-exist, then these are reached with a disconcerting rapidity. It resembles a tug of war where both teams pull on the same side of the rope. And it is often much easier to find agreement on goals or desired future conditions than it is on the means of achieving them, because each actor can contribute differently to the objectives. Finding common goals does not mean homogenizing points of view. On the contrary, including different and contrasting viewpoints in the discussion of common goals ensures that the goals will be sufficiently general to avoid concentrating on only part of the problem, and considering only the contributions of certain actors. This helps avoid the trap of solving false problems (Mitroff, 1998). Indeed, when goals are general enough, different points of view often simply lead to different contributions to the goals.

Discussing a vision of a desired future also has a positive psychological effect on participants, compared with the discussion of problems (Bhatia et al., 1993; Kirway, 2001). Participants feel excited and motivated to do what they can to reach their dream, and the discovery that other influential actors share it makes them optimistic. On the other hand,

focusing on problems (or causes of a dissatisfactory situation) tends to discourage people. In vision-based planning, problems become implicitly formulated within the proposed actions or requests, but in a more prospective way, with a better identification of who can solve them and how. However, developing a common vision of desired future conditions is different to coming up with a "vision statement", a technique often used in business management. The set of desired future conditions can be long, and should include all of the participants' input and all viewpoints.

As already mentioned, we often tend to focus more on the means than on the ends. Planning is also a means that can help us attain various objectives. It is important for planners, politicians, and all those who participate in planning to understand why it is being done. Is it only to fulfill a legal or administrative requirement? Planning can provide much more, including better organization, articulation, understanding, and trust between players, more effective management and decision making, better organization of information, a wider range of options, the possibility of choosing between different paths, and avoiding crisis situations by anticipating problems. However, we have to be guided by our desired future conditions, whatever they are, or else very different results can be obtained with the same means.

We work with the idealistic hypothesis that if players can deliberate and agree on desired future conditions, and can combine their means to reach them, then they will find the way to do so successfully, and will do so much more effectively than through social struggle. Naturally, this is not what happens in practice most of the time, but it is an approach that can be chosen. It is certainly more likely to happen than that humanity becomes overtaken by a spirit of generosity and goodness. Still, it must be borne in mind that not everyone has made that particular choice, and that, even if it were so, the world would remain an imperfect place.

Use planning in an effective management and learning approach

If planning is done to satisfy a legal requirement, but is not being used as a management or a learning tool, the exercise will be of doubtful usefulness and participants are likely to be frustrated about the time invested. Following up on planning has to be made simple, otherwise it can make management heavy and inflexible, or it can discourage players from taking part.

Independent of the type of management used, administrators and the civil society councils should actively practice monitoring and evaluation. The follow-up of planning between the actual planning exercises is a most important mechanism to remind the players of their objectives and engagements. Monitoring and evaluation includes verifying the effect of actions, allowing players to learn from successes and failures, and adjusting activities and norms included in the plan. It affords an opportunity for the

organization that participated in the planning to continue to work with others in a regular fashion, and to develop operational linkages. It allows the collection of information that will be useful for the next plans.

Administrators and municipal councils should use the evaluation of previous plans as a basis for the diagnosis of any new plan. To simplify monitoring and evaluation and the continuity between plans, there should be clear objectives or desired future conditions determined in agreement during the participatory process. It is important not only to state what needs to be done (i.e., the mechanisms and actions), but also the effect we are trying to achieve on the environment and livelihoods of residents. As we have seen before, merely applying mechanisms as such does not ensure the success of the processes. Without clear objectives, administrators can be tempted to implement the mechanisms simply to comply with the plan, while missing the actual goals.

Planning and follow-up should work as much as possible with existing institutions, committees, councils, and other structures. When possible, for example in small municipalities, different councils grouping members of civil society can be integrated into one general council that have monthly meetings on various subjects, rather than having separate councils for emergencies, rural development, territorial planning, development planning, etc. meeting every 6 months or every year. The formation of new commissions or committees should always be related to existing ones to ensure more continuity and connection between the different activities.

Local learning groups, related but not necessarily dependent on governmental structures, can be created by community residents, and can be supported by local governments. These can include participatory research and experimenting groups, machinery rings, co-marketing groups, and community food cooperatives (Pretty, 1998). Lightfoot et al. (2001) give various reports of exploration of local learning processes in east Africa to help farmers and extension workers cope with the decentralization and privatization of agricultural extension services. Methodological suggestions, which include elements of vision-based planning, are also given. Participatory monitoring and evaluation is an important component of collective learning processes (Roothaert and Kaaria, this volume). Learning alliances can be created between groups and various institutions (Lundy, this volume), and stimulate complementary activities that could not be conducted only locally.

Improve participation and articulation of players through a systems approach

Mitroff (1998) states that the inefficiency of many institutions comes from the fact that they try to solve the wrong problems. This occurs when decision making only concentrates on part of the problem, considers only a limited range of options, and does not consider their consequences on all

the interest groups. His approach for smart thinking therefore includes recommendations on how to think with a systems approach, to consider the various interest groups involved, to expand the limits of the problem, and the range of possible options. He insists strongly on the need to integrate different points of view to avoid falling into the trap of solving a false problem. He mentions that it is always better to count on the interest groups themselves, but when these are not available, that a variety of viewpoints can be generated or imagined. He presents techniques allowing enterprise decision makers to work with the help of psychological principles, allowing them to imagine the points of view of non-influential interest groups that could be against their decisions. Governmental and community planning, on the other hand, provide fantastic opportunities to combine different points of view without having to generate or imagine them. Thanks to the participatory requirements of most planning laws, and of the constitutions of democratic countries, planning processes have the excuse and the obligation of integrating the viewpoints of real-life players, *in vivo*. Actors and decision makers, however, need to develop listening, learning, and thinking skills to be able to take advantage of these exchanges.

"A systems approach involves placing as much emphasis on identifying and describing the connections between objects and events as describing the objects and events themselves" (Clayton and Radcliffe, 1996). A systems approach allows simplifying the understanding and description of complex hierarchical arrangements, where an exhaustive description would be overwhelming because another series of hierarchical organizations is found upon looking at any component in detail. A system is a set that is composed of a series of smaller sets or components (or subsystems), and which itself forms part of a larger set (or supersystem). Clearly, governmental hierarchies, the organization of most institutions, as well as social and biophysical processes can be described as systems. The most important defining characteristics of systems include emergence, hierarchical control, and communication (Clayton and Radcliffe, 1996). Emergence refers to the fact that each set has properties that cannot be explained solely by referring to the properties of its components. Hierarchical control refers to the imposition of functional relationships by each level on the dynamics of the level below, either promoting or constraining its actions. Communication refers to the transfer of information for regulation, and functions principally through feedback loops, which in turn affect hierarchical control. Systems must find an adequate degree of control to avoid excessive control limiting their ability to adapt to new conditions, and to avoid insufficient control, reducing their ability to determine outcomes. Planning therefore not only involves setting the control mechanisms, actions, and constraints to achieve the desired state of the system, but also involves strengthening communication, identifying and facilitating the necessary feedback loops, and enabling the necessary interactions between players within and between levels. Of course, it also includes defining the desired and acceptable states of the system and its subsystems.

Even when governments try to please all stakeholders, by offering programs, funding opportunities, and incentives within the limits of their resources, they will have limited impact if they do not enable interactions between the various players of the territory. Within the framework of decentralization, governments have a greater role in enabling than in providing (Helmsing, 2002). Consulting stakeholders separately, and then deciding to whom they should attribute resources, will not have the same effect as a fully interactive participatory process where players can discuss points, establish common goals, and enable the matching of contributions of some with the needs of others. Thinking systematically can improve the enabling role of governments, if they consider themselves as catalyzers of the interactions between players rather than the center point of "you request, I provide" relationships.

Pretty (1995) elaborated a typology of participation including seven types with increasing potential for rural development. The first type is manipulative participation, where participation is simply pretence. The others are passive participation, participation by consultation, bought participation, functional participation, interactive participation, and self-mobilization and self-reliance. In this latter case, "people participate by taking initiatives independently of external institutions to change systems. They develop contacts with external institutions for resources and technical advice they need, but retain control over how resources are used". Although the exercises used for vision-based planning are mostly of interactive participation type, they should encourage capacity building for groups to continue to act even in the absence of facilitators. Also, self-reliance does not imply aiming at disconnection from external institutions and other players.

Improve linkage of information to development

Information is an important input to planning. With the word "information" we include data, documentation, maps, information systems, and decision support tools that can be generated by diverse individuals or institutions. However, we all have seen or experienced situations in which information is accumulated without being used efficiently for planning or decision support. Sometimes, much energy is spent in digitizing, organizing, correcting, and updating information, and then when precise information is needed for a particular decision, we find that it has not been included in the database under development. Sometimes, we are in a situation where the need for the information that we are collecting has not clearly been defined.

On the other hand, it would be incorrect to say that all decisions are taken on the basis of external information. In many cases, decisions are correctly taken based on intuition and local knowledge, which are rooted in the experience of people, and on the information accumulated and interpreted in their minds over time. In many cases, especially where no conflicts of opinion occur, local knowledge and intuition are sufficient.

However, opportunities arise when additional information is necessary, for example, where opinions diverge or when there is uncertainty about what should be done. In these cases, diagnoses that are based on the players' perceptions need to be supported by trustworthy information from secondary sources, surveys, or measurements. Information can become extremely useful to expand the range of options being considered, and to explore their consequences. But in power struggles, less influential players, such as poor rural people, should have the same opportunities to access information as the more influential players. Democracy in data access suffers the same obstacles as democracy in any other sector, and participatory planning offers many opportunities for progress in this area.

While recognizing the importance of information for planning, we suggest starting the planning process based on local knowledge and intuition, rather than on information collection, and then supporting the planning process with information from secondary sources, surveys, field measurements and observation, and the results of scientific research. However, one source of information must be considered by all planners and participants at the start, and comprises all previous plans and any records of their monitoring and evaluation.

To prevent the blind accumulation of information, we must carefully define the questions that we want to answer. For this, we suggest the use of the visions-actions-requests methodology defined in the previous section. Two types of questions result from this analysis, those for monitoring and evaluation, and those for action-planning. The desired future conditions are used as a reference to formulate the monitoring and evaluation questions, which lead to the formulation of indicators. These questions include "How far are we from the desired conditions?" "Why is the present situation the way it is?" "How would the situation be if the present tendencies were maintained?" "What is being done about it, and how is that helping?" The actions and the requests lead to the definition of the action-planning questions of the type: "Which are the most appropriate actions for a given place?" "Which would be the best location for a given option?" And "what would happen if we chose such and such a strategy?" Local players can use geographic information in a learning and empowerment process, rather than have these players simply participate in a planning process that is managed by technical professionals (D'Aquino et al., 2002).

It is also important for scientists and information providers to receive feedback from users about the local questions and knowledge related to rural development, which are the conflicts of opinion, to define where more research or information gathering is needed. Planning can be a mechanism for this feedback, where needs in information and research are formulated in the requests, from individual levels of the social systems towards the national and international levels.

Information is useful to answer questions related to development, but it can help also to strengthen the relationships between institutions and players, because it can be shared at a minimal cost. As discussed previously, planning can help institutions understand the complementarities of their roles and contributions to development. Some of these institutions have the role of providing information. However, we need policies that facilitate rather than restrain the accessibility to information.

Conclusions

Governmental planning is a powerful mechanism that scientists can hook onto in order to increase their impact, through the scaling up and out mechanisms that are mentioned in this chapter, but also to orient their research towards the needs of their beneficiaries. However, planning in itself is a multidisciplinary research theme to which agricultural research can contribute. We became interested in planning as an entry point to geographic information and decision-support tools. We found that many opportunities to improve planning are available, and that they are necessary for planning to produce the desired links between science and development. In our work in Colombia, we have been promoting a simple planning method that aims at facilitating the four types of improvements mentioned in the text. Indeed, being vision-based, it helps clarify the ends sought through planning and planned actions. Results of the various workshops can easily be transformed into a list of goals, actions, and partnerships, which can be used in management and in monitoring and evaluation. The hierarchical structure of the workshops helps integrate points of view and stimulate interactions between players and administrative levels, through the matching of actions and requests. It can help identify questions for monitoring and evaluation and for action planning, which will guide the data acquisition and analysis, as well as the communication of information. It can be complemented with elements of other planning approaches.

Through our work in the Colombian llanos, especially in the municipality of Puerto López, we have seen modest, but extremely encouraging, examples of how governmental planning can help scaling up and out the results of agricultural research and the results of local innovations. We also have seen significant changes in attitude. For example, the UMATA of Puerto López went from being a “political” instrument to being a development mechanism that the municipality fully recognizes. We are bound to encounter more and more encouraging examples as we begin to support planning at higher administrative levels. We have seen that departmental secretariats of agriculture all over the country are genuinely motivated to develop their territorial plans and to help municipalities with their planning. The recently formed network on development planning benefits from the active participation of various members from the Ministry of Agriculture, departmental governments, municipalities, universities, and nongovernmental organizations.

Finally, we hope we have been able to convince readers to link their work, in one way or another, to the development processes supported by the various governmental planning mechanisms. In addition to this, it is important for all of us to realize that "real planning *is* research" (Eric Dudley, personal communication, 2003) in which we can test our hypotheses that the actions we envisage will take us to the desired outcomes.

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