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Chapter 12

The ComMod and Gerdal approaches to accompany multi-actor collectives in facilitating innovation in agroecosystems

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Summary. The ComMod (Companion Modelling) and Gerdal (Group for Experimentation and Research: Development and Local Action) approaches facilitate the emergence of solutions and action plans negotiated within peer groups or arenas of heterogenous actors by stimulating interactions between their participants. Their theoretical, ethical and methodological foundations are described, and two case studies illustrate their use. In order to help practitioners reflect on their mode of intervention to collectives, the comparative analysis of these approaches highlights the key points of their accompaniment, such as the initial situation, creation of relevant collectives, management of processes, sharing of knowledge and points of view, monitoring and evaluation of effects, and strengthening of the capacity of collective innovation.

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While new approaches to innovation regard it as a reflective process involving heterogenous actors, the way of accompanying these processes is still the subject of an open debate: with which tools, based on which theoretical reference frameworks and which ethical principles? This chapter examines this problem on the basis of two approaches that have been implemented for many years, in different geographical contexts in the countries of the Global North as well as those of the Global South. The first is companion modelling (ComMod) and the second is the Group for Experimentation and Research: Development and Local Action (Gerdal). The analysis of these methods provides information on the theoretical, ethical and practical foundations mobilized to facilitate the emergence of acceptable solutions or negotiated action plans within peer groups or arenas of heterogenous actors. Both approaches are based on the facilitation of interactions amongst actors confronted by a problem, whether internal to the collective, or in the form of an external injunction imposed on a given social group.

Following a brief presentation of the approaches, two case studies are used to demonstrate their implementation. A comparative analysis of such accompaniment processes then focuses on a few key points to help practitioners reflect on their mode of intervention to collectives.

49. Key features of the ComMod and Gerdal approaches

49.1. Companion modelling (ComMod)

In 1996, several researchers working on the collective management of renewable resources started to build an intervention approach for complex territorial systems,

which they named companion modelling (ComMod)[32]. This type of modelling is characterized by a transdisciplinary analysis of the object under study, focusing on the interactions between actors and the co-viability of ecological and social dynamics. The researchers relied on collaborative modelling to catalyse interactions between researchers from different disciplines, as well as interactions between them and local actors. The initial implementations offered models that incorporated knowledge from different disciplines, and were quickly followed by dozens of case studies in many countries, covering a variety of themes. They favoured interactions between different holders of knowledge, researchers and local actors, through the use of different tools such as surveys, interviews, group exchanges, conceptual modelling workshops, role-playing games, multi-agent computer simulation models, etc. It then became necessary to clarify the initial postures of the researchers involved in the accompaniment and support of individual or collective actors, each with his particular representations of the situation, with different objectives and influence in the negotiation of solutions. Even though participating as a facilitator, the practitioner-researcher is one of the participants interacting in the ComMod process. In addition to favouring the production and sharing of knowledge, when the participants deem it necessary, the process aims to change the initial unsatisfactory situation by transforming the modalities of interactions between the actors and the common resource to be managed, and/or the forms of existing socio-economic relationships (Collectif ComMod, 2005).

49.1.1. ComMod theoretical references

This approach is inspired by:

- the sciences of complexity (interactions and unpredictability of trajectories of socio-ecological systems);
- constructivism (taking into account different points of view of actors);
- post-normal science (importance of the quality of the process of co-construction of collective decisions);
- the theory of resilience of socio-ecological systems and their adaptive management involving production and knowledge sharing;
- self-organization and social learning (co-design of a shared representation and implementation of a joint action plan);
- the patrimonial approach and mediation which suggest the use of the model, as a third-party mediator translating the parties' perceptions to facilitate exchange.

The ComMod model is used to construct a common representation of the system to be managed and to explain its dynamics. Once it is validated with the concerned actors, it can be used to analyse scenarios that explore possible future situations (Collectif ComMod, 2009).

[32] The ComMod collective (http://www.commod.org/), which was formalized into an association in 2009, originally began as a scientific network of researchers, especially in the social sciences, (agro)ecology and computer modelling, who designed, tested and evaluated this approach during the previous decade. This group offers training and methodological support to researchers and development agents interested in implementing this approach in territorial development processes.

49.1.2. Collaborative and integrative companion modelling

The use of protocols of interaction between actors and multi-agent simulation models as key accompaniment tools is an original feature of ComMod processes (Bousquet *et al.*, 2002). They are used to conceptualize a common representation of the situation by sharing points of view. Their implementation, as computer simulations and/or role-playing games, not only favours individual and collective learning, but also the group's creativity to identify desirable scenarios and the paths to follow to achieve them. The ComMod process is located upstream of the collective decision-making or of the technical action plan aimed at achieving the desired state of the system, and promotes the adaptive management of common resources.

49.1.3. Sequential, iterative and evolutionary accompaniment processes

The ComMod processes are often preceded by a stage of raising the awareness of the parties concerned of the issue at stake regarding this approach, and by the *ex ante* evaluation of the relevance of such a process and of its feasibility in the actual intervention circumstances. This is followed by a chain of iterative sequences that are evolutive; the first focuses on key issues arising from the initial analysis of the problem, and succeeding ones on new issues that emerge during the modelling and participatory simulation activities carried out previously. Each sequence consists of several phases (Box 12.1) aimed at the analysis of the problem, the co-construction of its representation into a conceptual model, and its implementation and use in the form of participatory simulations (Etienne, 2014).

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Box 12.1. Phases of a sequence of a companion modelling process

1. Definition of the key issue to be examined with the process's proponents.
2. Inventory of available relevant information (scientific data, expertise, local knowledge, etc.) and complementary diagnostic surveys.
3. Obtention and clarification, through surveys and interviews, of knowledge relevant to the conceptual modelling.
4. Co-design of the conceptual model with the concerned stakeholders.
5. Choice of the multi-agent tool (computerized or not) to implement this conceptual model.
6. Verification, validation and calibration of the model with the stakeholders.
7. Identification and definition of possible scenarios with the participants.
8. Exploratory participatory simulations with actors.
9. Dissemination of the results of the process to the concerned local actors who did not participate in the workshops.
10. Continuous monitoring and evaluation of the effects and of the evolution of the situation.
11. Identification of new key issues (return to point 1) or/and negotiation of a collective action plan.
12. Training of facilitators in the use of the co-constructed collaborative modelling tools.

Although they are often applicable on multiple scales, these processes have primarily concerned spatial entities ranging in size and scope from villages to small watersheds. Depending on their dynamics, the evolution of the context and the facilitation postures adopted, their duration varies from a few months to several years. On-going monitoring and evaluation mechanisms during the process and external *ex post* evaluations of their impact have revealed a variety of effects: awareness of a problem, improvement in self-confidence, widening of exchange networks, change in the mode of decision-making, adoption of new practices or rules of collective management, and organizational innovations ensuring their local regulation.

49.2. Gerdal's help in formulating and resolving problems

The approach proposed by the Group for Experimentation and Research: Development and Local Action (Gerdal)[33] was formulated in 1983, in a context in which the agricultural research community and agricultural organizations were underscoring the need for diversification of development models in agriculture in response to impasses created by agricultural modernization and by the organization of advisory services for farmers. Starting from a critical analysis of the model of social division of labour in the organization of agricultural development (distinction between those who think and those who execute) and the observation that farmers were facing a kind of domination by agricultural advisers, who were acting as votaries of technical-scientific knowledge (Darré, 1996), the Gerdal sociologists tried out, in several countries, an alternative approach to this diffusionist paradigm with the aim of helping farmers formulate and deal with the problems they encounter, and to increase their capacity for taking initiatives.

The Gerdal approach seeks to strengthen the activity of knowledge production and transformation through dialogue and collective reflection among peers in order to identify ways towards finding appropriate solutions and to be able to discuss them with other actors (Darré, 2006; Ruault, 1996).

49.2.1. Rethinking relationships between actors from the point of view of plurality of forms of knowledge

Emphasizing the plurality of forms of knowledge entails, first of all, differentiating scientific and technical knowledge from actionable knowledge. It also means accepting the multiplicity of ways of knowing and perceiving reality. From an action perspective, this leads to a rethinking of relationships between technicians, researchers and farmers, as well as those between farmers and other actors, in terms of comparison and the use of different ways of analysing and evaluating situations and, consequently, of formulating problems. Paying attention to each actor's voice, to the way of saying things, is thus central to the proposed intervention tools.

[33] Gerdal (http://www.sad.inra.fr/Ressources/Developpement-et-action-locale-Le-Gerdal) is an association founded by sociology researchers. Its mission is to provide an interface between research, development and training, with a view to developing methodological support for the production of knowledge by agricultural and rural actors involved in local development processes.

49.2.2. Linking social dynamics and dynamics of norms and practices in peer groups

On the basis of case studies, the Gerdal approach has shown that change in agriculture is a collective process of producing and transforming norms (rules of action), undertaken by the practitioners themselves in response to problems concerning action. This process is, in particular, carried out on an everyday basis in dialogues where, on the basis of the diversity of ways of perceiving and acting, there are revealed differing points of view regarding a given problem, change of context or injunction in order to arrive at suitable solutions. The nature of the debates, and what they produce in terms of knowledge, is correlated with the structure of the networks of relationships and the position occupied therein by individuals (giving them more or less a voice and power of initiative). In this way, the Gerdal approach aims to strengthen cooperation between farmers who do different things and do not occupy the same positions in professional networks.

49.2.3. Creating conditions conducive to productive cooperation between actors

These conditions refer, on the one hand, to the design of working mechanisms (with which social unit to work, with which bodies, at what scales, and to do what?), and, on the other, to carrying out activities to formulate the problems and find solutions (i.e., facilitating meetings, the most common form these activities assume).

To begin with, it is a matter of constituting relevant collectives, ensuring that their social configuration is appropriate to the nature of the problems to be addressed (Ruault and Lémery, 2008). These collectives are defined on a case-by-case basis relying, to the extent possible, on the practitioners' existing dialogue networks, and distinguishing between instances of practical discussion from those concerning policies and strategies. This step relies on analytical means (Table 12.1) to understand situations. Based on the sociological survey, the proposed tools aim to characterize the systems of actors and their socio-professional dynamics (kind of networks, multi-affiliations, levels of inter-knowledge, gaps in social positions, etc.), as well as the places and topics of the debates.

Table 12.1. Notions and tools for analysis and intervention used in the Gerdal approach.

Useful concepts to understand and analyse situations	Concepts and tools used to guide action
Individuals and social norms Social configurations: local professional group; dialogue networks; multi-affiliations Link between morphologies of dialogue networks and the dynamics of norms Technical, scientific and action-oriented points of view and forms of knowledge Practices and conceptions; system of norms; differentiating things, situations and relationships to things, to situations Social positions and right to be heard, power of initiative Interactions between project intervention and local socio-technical dynamics; distinguishing between project rationale and action rationale	Notion of relevant collective; conditions for mobilizing actors and to limit their selection Notion of addressable problem: transition from concerns or wishes to concrete questions allowing action ('How to ...?') The Say, Connect, Propose functions; methodological aid: – for oral expression (formulating action problems); – for production and organization of ideas; – for thinking about what we usually express The dynamics of speech; the dual value of arguments: social value (weightage given to the arguments depending on the social position of the speaker) and intrinsic value (weightage given depending on the relevance to the problem being addressed) The co-active search for solutions: – acknowledging the contribution of the diversity of ideas and practices;

	– aiding dialogue; – articulating support for reflection in peer groups and mobilizing scientific and technical knowledge

The management of collectives is then facilitated by the use of methodological tools to support reflection (also called 'tools of co-active search for solutions') (Darré, 2006; Ruault and Lémery, 2009; Table 12.1), in order to enhance the effectiveness of collective reflection. These tools focus on speech (vector of thought), by promoting dialogue and the expression of different ways of perceiving, and thus of expressing things, and by managing the gaps in social positions (able to speak and opportunity to be heard) in order to make the most of this diversity. The first step is to analyse the situation and define the problems to be addressed, and then help change the way the problem is posed in order to widen the range of possible solutions. During the research, resources outside the group, especially scientific and technical knowledge, are mobilized as required. Their usefulness, however, depends on the conditions of linkage of the external contributions of knowledge to the questions which participants ask themselves in the context of the practical exercise of their activities, and on the feasibility of specific actions to be carried out.

50. Case studies of the accompaniment of multi-actor collectives

50.1. Use of ComMod to support a fodder revolution in Thailand

The recent rapid transformations of the northern highlands of Thailand have created many land-use conflicts between government forest agents and herders practising extensive cattle rearing. The former are attempting to rebuild the forest ecosystem while the latter, encouraged by the strong demand for beef, want to continue with their livestock raising activity. During one such conflict between these parties in Nan Province, a companion modelling process was carried out over a two-year period, in order to share knowledge of the effects of extensive grazing on the growth of young trees and to identify new livestock rearing practices that could help both parties attain their respective goals (Dumrongrojwatthana and Trébuil, 2011).

50.1.1. The situation of intervention

Additional surveys were carried out by the team managing the process, consisting of researchers and their students, who were being trained in this approach, in the Hmong village of Doi Tiew, at different scales:

- at the scale of the grazed and/or replanted plot, to understand the dynamics of biomass with and without grazing;
- at the scale of the family farm, to understand the diversity of production systems and livestock rearing practices;
- at the landscape scale, to link recent changes in land use with the strategies of the institutions and actors intervening in this village territory (foresters, the new national park, the network of livestock traders, etc.).

The results helped researchers form their own opinion of this land-use conflict, and to build the first participatory modelling tool, based on a series of pictograms to represent local vegetation states that evolve over time and due to human actions.

50.1.2. Initiation to conceptual modelling

These pictograms were used in awareness-raising workshops on collaborative modelling held separately with foresters, on the one hand, and with Hmong livestock herders, most of whom had little formal education, on the other. Reconstructing the chronology of the state of vegetation, with human intervention and without, this set of cards was enriched by the addition of the states of vegetation used by these two actor groups as key indicators of the environment's productive potential. A conceptual model of changes in vegetation was thus gradually co-constructed in the form of a state transition diagram. Implemented as a multi-agent computer model, it was then used in a role-playing game to update, at each round of play, the vegetation types for every pixel of its visual interface. This game was the main intermediary object used to stimulate exchanges.

50.1.3. First role-playing workshop facilitated by a computer simulation tool

This first role-playing game had, as a visual interface, a simplified representation of the gradient of vegetation states (ranging from dense forest to orchards through annual crops and different types of fallow lands) of the most diverse part of the village's lands. The game was first enriched, and then validated, during an initial participatory simulation workshop with the herders in the village. Another session was held the following day with the majority of the herders and several forest agents (including the manager of the local reforestation unit) on neutral ground, in the district administrative offices. Simulations of forest replanting and cattle grazing practices showed the gradual colonization of extensive pastures by the forest. They led to the identification of a scenario for the future, acceptable to both parties, based on the introduction of artificial pastures of *Bracharia ruziziensis*, a technique that had long been available locally, but had yet to be adopted in the highlands.

50.1.4. Second, expanded workshop, with a modified game and simulation tool

The multi-agent computer model used for the role-playing game was modified to include the '*Bracharia* pasture' option, and the game components were also adapted. On the request of herders, who had limited trust in the foresters, the arena of actors was expanded to include the district livestock technician, agents of the national park and those of the neighbouring Sob Khun Royal Project, who expressed interest in the approach and in observing its implementation as it pertained to a topic close to their concerns. This second workshop took place in the village school and brought livestock herders, foresters and park agents together for the first time. The results of the participatory simulations of the selected *Bracharia* scenario, with individual and collective herd management, allowed participants to come up with a concrete collective action plan. It integrated the knowledge of the technician, who was an expert in the envisaged fodder innovation. He also acted as a witness to the agreement between the parties. The plan of action was based on the provision by the foresters of a 10 ha fenced experimental plot, sown with *Bracharia* using inputs supplied by the livestock department, and grazed by a herd lent by some large herders, and managed collectively.

50.1.5. An autonomous multi-agent model for training herders on this innovation

A full-scale experiment of the new livestock system, involving collective management of grazing was thus jointly created. The final version of the role-playing

game was implemented in the form of a self-contained computer simulation tool playing the game. It was used by the local researcher and the herders who co-designed it to train other herders who had not participated in the process at the meetings of the villagers, and then to train a few small groups of herders who had not participated in the earlier stages of the process. The new system's co-builders were thus able to explain and discuss the fodder revolution proposed to intensify cattle rearing, while allowing forest replanting of the upper watersheds.

50.1.6. Monitoring and evaluation of participation and knowledge sharing

The logbook, maintained in the form of a spreadsheet by researchers, was used for monitoring and evaluation. It allowed to quantitatively show the intensity of the interactions between the actors, who had not been on speaking terms earlier, as well as the diversity of information exchanged during the process. Figure 12.1, in which the line thickness is proportional to the intensity of the actors' interactions, shows that more than 40% of the time was devoted to sharing the herders' empirical knowledge, previously largely ignored.

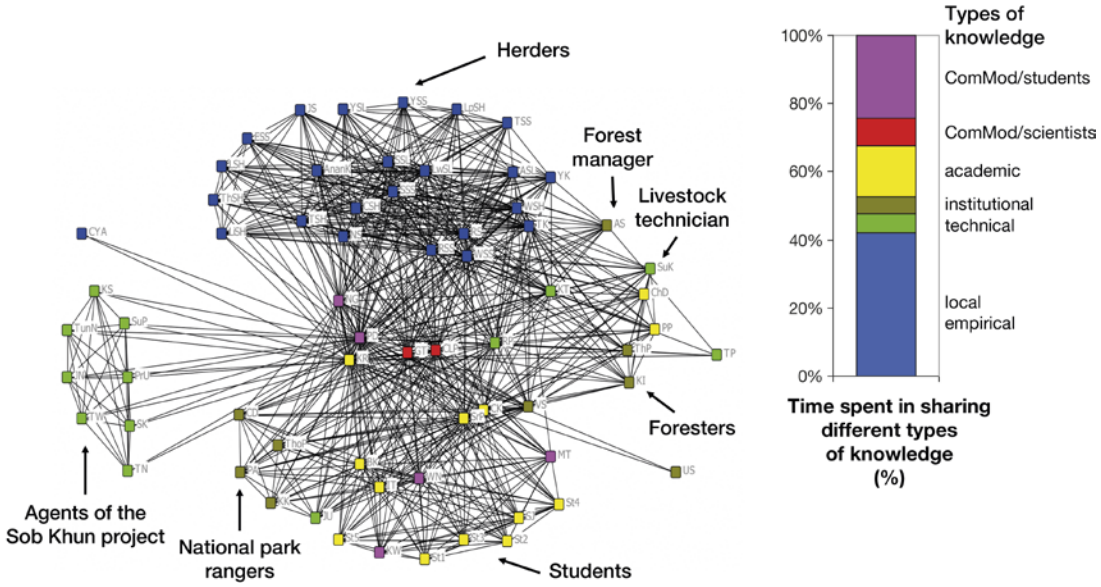

Figure 12.1. Interactions between different types of participants and diversity of knowledge exchanged during the ComMod process in Thailand.

50.2. Use of the Gerdal approach for hillside maintenance in the Isère valley

A deliberation was initiated between 2005 and 2008 by the elected members of an association of municipalities in the Isère valley in south-eastern France on the future of agriculture, in connection in particular with the revision and extension of the master plan of the Grenoble agglomeration. Based on a diagnostic study of the territory, conducted by the chamber of agriculture, a baseline appraisal of agriculture (number of farmers, farm characteristics, succession perspectives, etc.) and land use was undertaken, which resulted in the formulation of development objectives (maintaining a balance between agricultural activity and urbanization, maintaining open landscapes, etc.). The local elected officials, in an attempt to understand how to translate these objectives into action, deputed the development agents to work with the farmers and develop concrete proposals. It is around this aim, of engaging farmers to implement a public policy objective, that the Gerdal approach provided methodological support to the coordinating advisers of the South Grésivaudan

Territorial Committee, the body in charge of the process.

In an effort to ensure that the proposals would have the full backing of the farmers, development workers raised several issues:

- at what scale should farmers be organized, since that of the Territorial Committee seemed too broad to them and did not correspond to their usual scales of action and social relations;
- who to invite, in order to engage people other than just professional managers;
- how can farmers' concerns be emphasized, since issues raised by elected representatives (such as that of the landscape) were not necessarily priorities for them;
- how to organize a dialogue with other actors of the territory (elected officials, in particular)?

50.2.1. Constitution of a peer group

Based on an identification of dialogue networks, it was decided to invite all farmers, at the level of one to three municipalities – which led to four parallel meetings – to define the working method on the problem to be addressed (formulated from a sharing of concerns and desires about the sustainability of their activities and agriculture in the territory) and then constitute issue-based groups and envisage possible solutions.

Following the first meetings, which saw the participation of between 25% to 50% of the farmers in each municipality, one of the issues formulated, selected for the Cras and Morette municipalities, was as follows: 'How to make hillside maintenance profitable without it being too expensive or labour intensive?' This issue engaged a working group for three years. Based on a detailed analysis of the constraints and the evolution of agricultural activities (overwork, low profitability of the hillsides, accessibility, access to water, etc.), this question helped translate a territorial challenge, formulated by elected officials in terms of maintaining open landscapes, into an issue that could be addressed by the farmers.

Several possible solutions were then studied, mobilizing different tasks: inventory of hillsides and their land uses, compilation of a list of farmers interested in maintaining cultivated plots in these areas, and a study of different maintenance options (shared employees, insertion-employment company, etc.). The project based on collective maintenance equipment was finally selected, followed by the search for suitable machinery from companies, cost studies, etc.

50.2.2. From the local peer group to an extended collective and multi-actor meetings

Since it was necessary to increase the number of farmers involved to make the project viable, the group's members made contact with farmers from neighbouring municipalities and with a cantonal Cuma (cooperative for the use of agricultural equipment). In addition, exchanges were organized with local elected officials to ascertain their position on the planned solutions and to study the possibility of including the municipalities in the collective equipment effort. The elected officials supported the project and formed the link to the association of municipalities.

This example shows that the configuration of working groups evolves as the problem is addressed and that discussion within multi-actor bodies is more productive the more it is based on previously elaborated points of view amongst peers, especially between farmers (Ruault and Lémery, 2008). It also shows that the 'appropriation', by the territory's actors, of a development goal formulated by others is contingent on a reflection that relies on the knowledge and analysis of circumstances in the field, based on their own relationship to the concerned situations.

This collective reflection is not a given and requires the facilitator to play an active role to help undertake this analysis, formulate addressable problems and build relationships necessary to solve them, produce new knowledge and, ultimately, help participants retain control over the progress of their research, while helping them negotiate solutions.

51. Comparative analysis of the ComMod and Gerdal approaches

The importance accorded to dialogues within actors' groups is a common feature between the ComMod (companion modelling) and the Gerdal (Group for Experimentation and Research: Development and Local Action) approaches. These diverse and evolving collectives represent, based on the subjects addressed, either groups of peers or multi-actor arenas. The challenge is to facilitate the exchange of knowledge, arguments, points of view and proposals to arrive at negotiated and acceptable solutions. Several key periods of these approaches require particular attention.

51.1. Initial situation and enabling context for such approaches

Changes in practices are processes of collective transformation of norms and rules in use. However, since the change towards an objective is always driven by one or more particular actors, it is necessary to characterize the request for change accurately (Who formulates it? What is the objective or the problem? Who is it addressed to?).

The ComMod and Gerdal approaches take into account the different points of view present, which represent different ways of understanding, describing and analysing situations. The involvement of the actors thus requires an initial stage to formulate the issue to be addressed. In the case of multi-actor processes to examine an issue, a productive discussion requires taking into account the manner in which each of the parties present formulates one or more specific problems in terms of their own room for manoeuvre and possibilities of action.

ComMod assumes that the initial points of view on the issue to be addressed are based on an incomplete knowledge of the agroecosystem, due to the actors' focus on their respective activities. Thus, for the forester, extensive grazing had a negative effect on the growth of young plantations (trampling, increased risk of fire), but it was perceived positively by the farmers (reduction of fire risk by limiting biomass, organic fertilization), which the researchers' diagnostic survey confirmed. This example illustrates the importance of a shared and galvanizing definition of the problem to be tackled so that the actors engage in work that can be translated into action.

51.2. Setting up collectives that are relevant to the issue to be addressed

Arriving at a consensus on what to work on is, of course, necessary, but it does not say much about who should be involved in the exchanges to create the knowledge

and solutions that are acceptable to all. The composition of work collectives can be based on certain criteria of relevance of participants, such as their knowledge of the situation, their relationship with the issue, their representativeness, their legitimacy, or their social status, and, in particular, by taking the asymmetries between actors into account, i.e. how much of a voice, information, power, etc. do they have. However, these collectives are not fixed over time and can evolve depending on new questions raised and which have to be addressed.

For the Gerdal approach, support for arriving at a common point of view of a group of actors, especially those who are socially disadvantaged, is a necessary condition for cooperation. This implies a plurality of arenas of dialogue, with working sessions between peers alternating with multi-actor meetings. Special attention is also paid to the practical arrangements that encourage the actors' involvement, such as the choice of invited individuals, the way to contact them, the purpose of the invitation, the location and size of the meeting, etc.

The unpredictability inherent to such processes entails managing absences and refusals to participate, and adopting positions that facilitate cooperation. In the case of the ComMod approach applied in Thailand, given the impossibility of carrying out a first round of activities with all the actors, who were no longer on speaking terms, it was decided to first help the marginalized Hmong herders build their representation of the territory and test it in the form of role-playing sessions. At the end of this stage, the majority of them were able to defend their point of view in front of the foresters. Indeed, it was these herders who then wanted to expand the arena to include the livestock technician, for his knowledge and as a neutral observer to serve as a witness to the commitment made by the foresters for implementing the negotiated action plan.

51.3. Key role of facilitators in accompanying such collectives

The two cases described above illustrate the crucial role of the mechanisms' facilitation, alternating between periods of high and low interactivity, and evolving towards an enlargement of the collectives involved. While the definitions of facilitation are distinct – methodological assistance to aid deliberations, in the Gerdal approach, *versus* facilitator, non-neutral, participant just like others, in ComMod –, in both cases, the facilitation covers a variety of functions and refers to specific postures and skills, such as sociological analysis, support for group dynamics, and the organization of dialogue forums.

In the case of the Gerdal approach, the tools for methodological assistance to aid deliberation build up the capacity of the actors to express themselves verbally. While these tools help balance the amount of time each protagonist holds centre stage, they also orient discourse so that it is useful to action. To this end, the actors are encouraged to transcend preconceived ideas, clichés and dominant discourses in order to be more in sync with the experience and practical knowledge of people. Facilitation also aims to turn concerns into issues of action, to favour the expression of a wide range of ideas to open up new possibilities of solutions, and to organize what is being said in order to show the way forward for research. Particular attention is paid to topics that may crop up along the way that require research for information or specialized expertise. The facilitator helps evaluate this information, shows how it can contribute (or not) to solving the problem, modify its definition or the range of possible solutions.

For its part, the ComMod process consists of a series of sequences centred on the analysis of a key question to be examined. This involves a sharing of knowledge, a representation of the system concerned and its implementation using relatively sophisticated tools (role-playing games, multi-agent computer simulation tools, etc.), used to simulate possible evolutions of the situation and to evaluate these scenarios using indicators chosen by the participants. Interactive modelling and participatory simulation workshops, held over a few days, alternate with longer periods of surveys and the (re)construction of tools. A reflexive and critical posture on the part of the facilitators uses the monitoring and evaluation periods to build alliances between peer groups instead of insisting on the simultaneous presence of all actors, for example. A significant flexibility in the calendar of activities is required to deal with changes in context or unforeseen events and in order to adjust to delays or roadblocks, as also to favourable accelerations.

51.4. Sharing of know-how, knowledge and points of view

The central role of dialogue in these two approaches helps express points of view, a precondition to cooperation between participants. It is not a matter of making compromises or creating consensus, but of identifying differences and lack of understanding, so that the debate of ideas is structured and leads to the exploration of a variety of possible solutions, and subsequently to the choice of the most acceptable scenario to implement.

These two approaches use different methods of formalizing knowledge. In the case of ComMod, various collaborative modelling tools are used as intermediary objects. In the case of the Gerdal approach, this formalization essentially involves modelling dialogue networks (prior to creating the collectives) and phases of organizing ideas generated by the groups during or after meetings. The reports of the meetings help to move on from one meeting to the next, or between the different groups of actors involved.

51.5. Monitoring and evaluation

This task ensures that the ethical and methodological principles of the approaches are adhered to.

The Gerdal approach, with its action-research orientation, reinforces its support to field teams with monitoring and evaluation tools which are useful to development agents. They help understand what is happening, the difficulties encountered as well as the progress made, in order to be able to adjust the course of action and, ultimately, to learn from it. These tools are useful for analysing not only an entire process (growth in participation, circulation of information between groups, emergence of tensions or cooperation, change in the positions of the actors, etc.), but also a particular moment, for example a meeting. It is a matter of linking the results obtained and the difficulties encountered with the configuration of the collectives and their functioning. The goal is to identify the potential for improvement that will be useful to actors in dealing with complex situations.

In the case of the ComMod approach, a dashboard to keep track of activities was used to record step by step their type, contents, participants, durations, results, etc. Because this dashboard is linked to a network-visualization computer application, this database helped monitor and quantitatively analyse the effects of these activities on the frequency of communications between participants, on their degree of

engagement in the successive sequences, on the different types of knowledge in interaction, etc. (Figure 12.1). The evolution of these networks over time can help predict necessary inflections, or support emerging trends. The debriefings at the end of the simulation sessions are undertaken systematically in order to promote learning. And individual interviews are carried out to compare the characteristics of the situation on the ground that needs to be improved and its representation in the simulation tool used, to draw lessons from the results of the workshops held and to prepare follow-up phases of the participatory process.

52. Conclusion: similar objectives, but different ways to reach them

The ComMod (companion modelling) and Gerdal (Group for Experimentation and Research: Development and Local Action) approaches have proven their ability, across numerous types of territories and themes, to build up the actors' capacity to deliberate on their situation and identify collective solutions. The facilitation of dialogue, the sharing of points of view and knowledge, the creation of forums of relevant actors, and the importance of managing and facilitating such processes are features common to both approaches. They differ in the manner in which they address situations and problems, as well as in the types of tools used. While the Gerdal approach can deal with a wide range of topics, ComMod is mainly designed to facilitate the management of renewable resources and belongs to the family of participatory simulation methods. The facilitators responsible for implementing either of these approaches need to work on the accompaniment posture and the skills required to place the actors in the field at the heart of innovation processes. ComMod's simulation tools require access to expertise that is sometimes difficult to mobilize at the right moment in order to build and modify these tools iteratively in response to actor requests. However, training programmes now exist to overcome this limiting factor. In the Gerdal approach, the mastery of sociological analysis and tools for methodological assistance requires prior training, but it can also be acquired through practical experience.

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