



ENJEUX SCIENCES

DESERTIFICATION AND CLIMATE CHANGE ARE THEY PART OF THE SAME FIGHT?

BERNARD BONNET, JEAN-LUC CHOTTE, PIERRE HIERNAUX,
ALEXANDRE ICKOWICZ, MAUD LOIREAU, EDS

éditions
Quæ



and its main parameters to determine the most appropriate options (technical or social) in each case;

- To disseminate, replicate or adapt to other territorial areas the actions to combat desertification that have already proved successful in certain territorial areas, their respective territorial contexts must be considered and any such actions tailored to the new context.

WHY DO WE NEED AN INTERDISCIPLINARY, MULTISTAKEHOLDER APPROACH?

Alexandre Ickowicz, Patrice Burger, Maud Loireau

Whether at local, regional or global level, understanding and taking action on desertification phenomena requires considering different scales (from microorganisms and the soil to the field, region, country, continent and even planet) and the compartments of social ecosystems (soil, water, atmosphere, flora, fauna, human societies) with their interactions and the timescale. A wide range of skills provided by various stakeholders are needed to understand the issues and implement measures to prevent or restore degraded land. Developers and researchers from different fields can combine their expertise by working together to rigorously analyse the phenomena to be managed or find innovative technical and social solutions. Additional territorial stakeholders at different levels must also be involved as they have a direct or indirect impact on the practices implemented: farmers and other rural stakeholders, local decision makers, industrial players and other private individuals, national policymakers and more. It is important for both of these groups of stakeholders to understand why they need to work together.

An enriching scientific outlook

For scientists, analysing these complex processes requires collaboration to leverage a full range of disciplinary skills. Climatologists, soil scientists, ecologists, biologists, hydrologists, geologists, physicists, chemists, agronomists and more must all work together to analyse the various biophysical processes and identify solutions

to reverse the dynamics of degradation. Similarly, sociologists, geographers, economists, anthropologists, environmental lawyers and others must combine their skills to analyse social processes and put forward solutions to regulate relations between people and between people and their environment. In addition to this type of interdisciplinary collaboration between major fields, it is crucial for the biophysical sciences and the social sciences to join forces. It is also important to draw on both academic and local knowledge from people, which has been proven by years of experience and often passed down through the generations, and to integrate the expectations and perceptions of local people into the innovation process. For example, how can we make a reliable assessment of the impact of a farming practice without knowing the detailed processes at work in the soil and what drives a farmer's actions?

While these collaborations may be vital, they can be quite challenging to put into place. Beyond the difficulty of bringing all these disciplines together around the same objective, collaboration itself between these experts from different disciplines can prove tricky. This is because each expert is often specialized in a particular research subject (root systems in soil, household income, landscapes, territorial identity, etc.) and a particular scale of work (e.g. the plant, plant population, landscape or family, village, nation, etc.). Experts also have their own disciplinary view of the subject being analysed and therefore of the evolutionary processes under way. As a result, all the scientists involved must be willing to listen to their colleagues and their assessments, and be able to carry out collective, interdisciplinary studies to produce joint assessments and proposals. They must all make an effort to speak a language that everyone can understand, admit that the same term can have different meanings from one discipline to another, and be prepared to develop or broaden the concepts and methods of their science.

When these collective processes are developed, they require lengthy discussions, analysing the problems and issues at stake, developing diagnostic methods, and ultimately reaching compromises between disciplines on the measures to be implemented and the objectives to be achieved in order to stay within a



reasonable intervention framework. Disciplines other than those mentioned above – including data science and scientific modelling, knowledge engineering and cognitive science – can help with these processes of exchange and interdisciplinary co-construction. These disciplines showcase knowledge so that it can be better shared, and integrate it and connect it to generate new knowledge: spatialization of the phenomena studied; prediction of their spatial and temporal evolution; social appropriation and acceptance; dissemination of proposed solutions; decision support systems, etc. However, even when scientists do engage in interdisciplinary collaborations, the knowledge produced or the developed solutions may not be acknowledged or used (or only to a limited extent) by the local populations or stakeholders, because they are only partially or not at all suited to the different territorial contexts.

Territorial stakeholders must overcome divisions

When it comes to territorial stakeholders, they vary greatly depending on their activity (farmers, artisans, community organizations, tourism and industrial players, government officials who manage the area, local political authorities, etc.) and the social and professional category to which they belong (women, men, young people; entrepreneurs and employees; etc.). Everyone has their own point of view and makes their own assessment of the situation, influenced by their own interests, aims and experience; everyone has their own methods of analysis, intervention and communication. But their shared challenge is to find compromises in order to take action in the same territory and to reach consensus on the desired objectives. They must also find common ground and ways to work together so they can fully address the issues at stake. Whether a compromise is found (in the best of cases) or a solution is imposed by one or a minority of stakeholders, they are generally able to implement the necessary levers of action to achieve the set objectives (change in practice, regulations, investment, natural resource management, etc.). However, stakeholders sometimes lack tangible, reliable information on which to base their decisions, especially since the actions

they will take following these negotiation processes may have negative impacts that were unanticipated or with an intensity they had not measured over the medium and long terms. Such actions may be carried out with full knowledge of the impacts, based on demands or short-term choices, for example, to the detriment of the sustainable management of land and natural resources.

The pragmatic virtues of dialogue between all parties

It is crucial for scientists and territorial stakeholders to work together, from identifying problems to resolving them and following up through monitoring and evaluation in the short, medium and long terms to adapt actions as necessary. Dedicated systems (e.g. so-called multistakeholder and science–society interface platforms, field schools, exchange programmes and training courses, etc.) can bring together scientists and territorial stakeholders to promote the exchange of viewpoints, knowledge, methods and capacities for action, and in so doing encourage collective intelligence. The process of arriving at a consensus on the assessment of the desertification situation, operational objectives for preventing or combating it, and realistic methods of action that often involve many stakeholders – all with an outcome that meets their multiple priorities – can be participatory, collective or collegial. The choice depends on whether the co-construction aspect applies partially (to certain issues or at certain key moments in the overall process) or fully. These mechanisms and approaches are complex and sometimes difficult to manage, especially over the long term, and more often than not require greater investment in time and human and financial resources. But they do have the advantage of not sidelining key stakeholders involved in critical issues, solutions and decisive means of action. These approaches can also save resources, such as when a solution existed but was unknown or had not yet been evaluated by most stakeholders. Regardless, leadership and mediation efforts are required to ensure that all viewpoints are taken into account, but also to spark a more collective dynamic, without which actions in this area have little chance of succeeding.