A methodology for appraising and selecting strategies to mitigate desertification based on stakeholder participation and global best practices

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1. Abstract

The main aim of the methodology presented in this paper is to provide a framework for a participatory process for the appraisal and selection of options to mitigate desertification and land degradation. This methodology is being developed within the EU project DESIRE (www.desire-project.eu/) in collaboration with WOCAT (www.wocat.org). It is used to select promising conservation strategies for test-implementation in each of the 16 degradation and desertification hotspot sites in the Mediterranean and around the world. The methodology consists of three main parts:

In a first step, prevention and mitigation strategies already applied at the respective DESIRE study site are identified and listed during a workshop with representatives of different stakeholders groups (land users, policy makers, researchers). The participatory and process-oriented approach initiates a mutual learning process among the different stakeholders by sharing knowledge and jointly reflecting on current problems and solutions related to land degradation and desertification.

In the second step these identified, locally applied solutions (technologies and approaches) are assessed with the help of the WOCAT methodology. Comprehensive questionnaires and a database system have been developed to document and evaluate all relevant aspects of technical measures as well as implementation approaches by teams of researchers and specialists, together with land users. This research process ensures systematic assessing and piecing together of local information, together with specific details about the environmental and socio-economic setting.

The third part consists of another stakeholder workshop where promising strategies for sustainable land management in the given context are selected, based on the best practices database of WOCAT, including the evaluated locally applied strategies at the DESIRE sites. These promising strategies will be assessed with the help of a selection and decision support tool and adapted for test-implementation at the study site.

2. Introduction to the methodology

Despite global concern about desertification and other forms of land degradation, and many years of effort and investment made for prevention, cure or rehabilitation, the processes of land degradation persist. There are a variety of existing and potential prevention and mitigation strategies for the various desertification and land degradation processes, such as physical measures and adaptation strategies, integrating changing social, economic, institutional and policy factors. The mitigation of water-related land degradation is crucial in arid and semi-arid areas which are very prone to desertification, and successful measures invariably depend on an improvement of water storage in the soil. There are a variety of measures available related to water harvesting and water conservation, either on-site (small-scale water harvesting structures, improved cover, etc.) or at the catchment scale (dams, etc.). A suitable conservation measure should always improve water infiltration and storage during the rainy season and prevent runoff and evaporation throughout the year. It is generally underestimated how much water is lost through evaporation on bare or scarcely vegetated ground (Njeru 2005).

Although land users and specialists have developed a wealth of know-how related to land management, improvement of productivity and protection of soil, water and vegetation resources, implementation of this know-how still lags far behind. One reason for this is that much of this valuable knowledge is poorly documented and thus simply not accessible to analysis, evaluation and dissemination (WOCAT 2007). When documentation is done, local stakeholders are often not properly involved in assessment and selection, even though a number of suitable methodologies for stakeholder participation have existed for a long time. It is still too often the case that technical experts recommend measures to land users which are neither based on local or other evaluated experience nor on stakeholder involvement. Whether such measures are accepted and implemented or not depends on factors such as cost-effectiveness, severity of degradation, knowledge, enabling framework conditions (e.g. policies and subsidies), and other socio-cultural and economic issues.

With the proposed participatory approach it can be hypothesized that selected measures are environmentally effective, socially acceptable and financially viable. Successful prevention and mitigation strategies consist of technical measures combined with the framework of their implementation (the implementation approach). The key to success lies in a concerted effort by all concerned stakeholders, where special attention needs to be paid to the process of selecting potential strategies. Otherwise land users will

neither accept nor properly implement the measure, and project success is in danger. Stakeholder involvement is crucial at all stages.

The new methodology presented here offers tools to projects, researchers or technical advisors for identifying and selecting strategies to mitigate desertification based on participatory appraisal of existing local and external experience. The tools are embedded in an overall methodology (see Figure 1), which guides users through a process, from initial co-learning on desertification problems and respective solutions (Part I), to the evaluation and description of identified local solutions (Part II), and finally to the selection of potential solutions for implementation from local and global experiences with the help of a decision support tool (Part III).
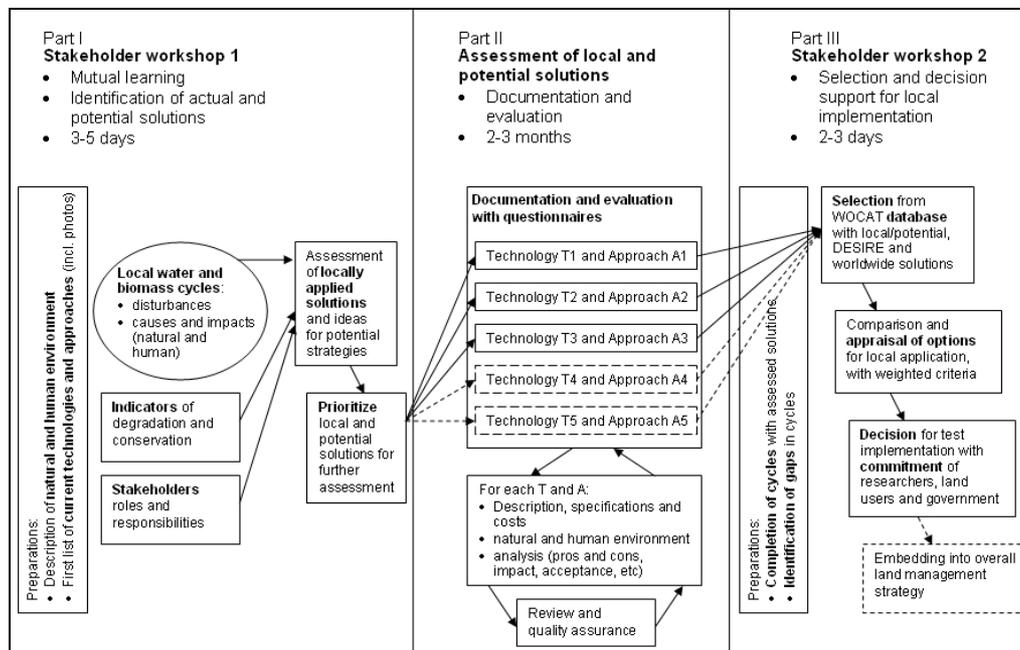

Figure 1 Overview of the methodology

3. Identification of desertification mitigation strategies in a stakeholder workshop

The first step in this methodology consists of an initial stakeholder workshop which aims to identify existing prevention and mitigation strategies already applied. The methodology brings together scientific and local knowledge while simultaneously supporting a co-learning process oriented towards sustainable development. The objectives of this 3-5 day workshop are: (1) To initiate a mutual learning process by sharing experience and jointly reflecting on current and potential problems and solutions related to land degradation and desertification. (2) To create a common understanding of problems, potentials and opportunities by integrating external and internal perceptions. (3) To strengthen trust and collaboration among concerned stakeholders. (4) To identify existing and new strategies to prevent or mitigate land degradation and desertification. (5) To select a set of these identified strategies for further evaluation and documentation in the next step.

The workshop is built on a series of 9 exercises, each with its own objectives, methods, procedure and expected results. The first two exercises focus on the identification of land degradation and desertification processes and their causes and impacts as well as on local sustainable land management practices. This is done with the help of photographs of local degradation and conservation, taking account of the water and biomass cycles, and with a transect walk. Exercise 3 develops a list of indicators used by local land users to recognize land degradation processes and land conservation respectively. Exercise 4 focuses on the identification of relevant stakeholders and their influence and motivation concerning sustainable land management. Exercises 5 and 6 serve as wrap-up and introduction for the external participants (see below). In Exercise 7 currently applied and potential solutions to confirmed land degradation problems are identified and quickly assessed. All these exercises constitute contributions to the development of a coherent strategy for sustainable land management in the given local context, which is the topic of Exercise 8. The workshop is closed with an evaluation (Exercise 9).

The exercises as well as the whole set-up of the workshop are described in detail in the workshop guidelines, which also contain supplementary material such as thematic sheets, model cycles, and a report format. The DESIRE project trained selected moderators and sustainable land management (SLM) specialists from each study site to conduct such stakeholder workshops.

The stakeholder workshop addresses the following target groups: a) local stakeholders (land users, representatives of local authorities, local NGOs, etc.) who live in the specific rural environment (local participants), and b) external stakeholders, i.e. researchers and development professionals (from NGOs, GOs

etc.) with different degrees of professional expertise on environmental and development issues (external participants). The duration of the stakeholder workshop is at least 3 days. During the 1st and 2nd day the focus is on local perspectives and the local context; mainly local stakeholders attend the meetings. On the 3rd day, external stakeholders join the group, and bring in their perspectives and experience, especially emphasizing the broader context, i.e. with a focus on the regional level and regional and national framework conditions.

Reflections and insights from the workshops, combined with the will and commitment of participants to actively change things, constitute the basis for identifying and elaborating options for action (Bachmann 2003). An important outcome of these learning–action processes is that local people become aware of the rich and vast knowledge they can tap and the fact that they already have many solutions in sustainable land management. Linking scientific and local knowledge makes it possible to derive a range of alternative options, including current practices and new or non-local measures, both of which require further assessment.

4. Assessment of desertification mitigation strategies using WOCAT questionnaires

The second part of the methodology entails the evaluation and documentation of the identified existing and potential prevention and mitigation strategies in the 2-3 months following the workshop. Comprehensive questionnaires and a database system have been developed within the WOCAT programmme (www.wocat.org; Liniger and Schwilch 2002; WOCAT 2007) to document and evaluate all relevant aspects of technical measures, as well as implementation approaches, by teams of researchers and specialists together with land users. This process allows better understanding of the reasons behind successful local experience – whether introduced by projects, or found in traditional systems – and how to share it among various sites. The work with these questionnaires also helps to critically review often fragmented knowledge, to identify the gaps and contradictions in what one already knows, and to question and evaluate one's own current perceptions and field experiences. This process ensures systematic recording and piecing together of local information, together with specific details about the environmental and socio-economic setting in which the information was obtained.

Strategies to be documented will contain technical measures as well as implementation approaches. Technologies are understood as agronomic, vegetative, structural and management measures that control land degradation and enhance productivity in the field. Approaches are ways and means of support that help to introduce, implement, adapt and apply SWC technologies on the ground. The questionnaire on technologies addresses the specifications of the technology (purpose, classification, design and costs) and the natural and human environment where it is used. It also includes an analysis of the benefits, advantages and disadvantages, economic impacts, acceptance and adoption of the technology. The questionnaire on approaches focuses on implementation, with questions on objectives, operation, participation by land users, financing, and direct and indirect subsidies. Analysis of the described approach involves monitoring and evaluation methods as well as an impact analysis.

The objectives are: (1) To document and evaluate each identified locally applied technology and approach in a structured and standardized way. (2) To guarantee a certain level of data quality through a review and quality assurance process. (3) To enter this information into the WOCAT database in order to share it with the other DESIRE study sites as well as globally. The steps to be followed are: (1) Become familiar with the questionnaires on technologies and approaches, and plan the documentation and evaluation process. (2) Refine the technologies and approaches to be assessed. (3) Identify resource persons and relevant documents. (4) Fill in the questionnaires: consult documents and resource persons. (5) Enter the data into the database. (6) Review: Identify possible reviewers and share data with them. (7) Quality assurance: Revise data by incorporating reviewers' comments and improvements. (8) Provide an English-language version to DESIRE/WOCAT.

Many local, national and regional initiatives have worked with the WOCAT questionnaires, have helped to improve them, and have confirmed their effectiveness. WOCAT tools provide a unique, widely accepted and standardised method of application, which are now embedded in an overall methodology. This allows exchange of valuable knowledge among all stakeholders and among the study sites as well as worldwide, and it is the foundation for the selection and negotiation process in the third part.

5. Participatory decision making for testing implementation of desertification mitigation strategies

Decision support tools were developed for various occasions but none seems suitable for finding, assessing and negotiating mitigation options in a simple manner together with stakeholders. This third part comprises a second stakeholder workshop where promising strategies for sustainable land management are selected based on the locally applied strategies evaluated for the DESIRE sites included in the global best practices database of WOCAT. A newly developed comparative selection and decision support tool is applied during the stakeholder workshop. It allows better assessment and negotiation of remediation strategies and support of the negotiation process concerning the best option(s) for a given human and natural environment. The workshop participants conduct a multi-criteria evaluation to rank existing and potential remediation strategies for field trials. This involves stakeholders identifying and weighing relevant criteria (for example, technical

requirements, costs and benefits of implementation, social acceptability, etc.), taking into account the technical, bio-physical, socio-cultural, economic and institutional dimensions.

The objectives are: (1) To select possible implementation options from a vast basket of options; (2) To compare, score and rank these options; (3) To negotiate the best option for implementation; (4) To decide upon 1-2 strategies for test implementation. The stakeholders are the same as in stakeholder workshop 1 and the moderators and SLM specialists again have practical guidelines at hand to plan and conduct the process. They need to prepare the first selection step ahead, as this is too complex to be done during the workshop. It entails going through a series of key questions and using a predefined 'search-by-criteria' form to find the most suitable technologies and approaches from the WOCAT databases. The key questions allow for narrowing down the selection regarding climate, land use and other crucial issues. After coming up with a manageable number of solutions (i.e. about 5-10), the specialists have to prepare posters and cards illustrating these solutions, based on a predefined format and an automatic retrieval of the data, but possibly with a necessary translation and adaptations to the local context (i.e. what would this measure cost in their situation).

The 2-day workshop follows up on what has been discussed in Workshop 1, including recently acquired knowledge from the documentation and evaluation process (Part II). This results in confirming or reformulating the main objectives of an SLM strategy. The moderators will then present the pre-selected possible strategy options to the participants with the help of the posters, and a plenary discussion will allow confirmation of their selection or a search for more options in the database. In a brainstorming session, the stakeholders identify criteria which reflect the most important qualities of the strategy options (e.g. costs, social acceptability, ecological effectiveness, etc.). During a game-like exercise, using the previously prepared cards, the stakeholders are asked to score all options against all criteria. They look at one criterion at a time and score all options against this criterion. The criteria are then organized into three groups, 'environmental', 'economic' and 'social', and ranked within these groups according to their importance. This assigns relative weight to the criteria. Analysis of this scoring and weighting process results in graphs that illustrate the relative merits of the various options. The process is iterative, i.e. criteria, options, scores and rankings may be revised several times until participants are happy with the outcome. Finally, the options have to be negotiated. Options which score high socially, economically and environmentally are most probably the best options. The workshop moderators lead the discussion in such a way that a final agreement can be reached on which solution(s) should be selected for implementation. An open-source software called 'facilitator' (Heilman et. al. 2002) is used and adapted to support the process, but many steps are done on paper and without a computer. Depending on the (computer) literacy level of the participants, more or fewer steps can be done by computer

6. Conclusion and outlook

The development of this methodology mainly consisted of bringing together a number of existing tools and methods and integrating them into a coherent and comprehensive process. This process can be applied in many local contexts, all aiming at sustainable land management, be it affected by desertification or any other form of land degradation. The process starts with initial co-learning among stakeholders about degradation and conservation, and ends with the agreed selection of a solution for field trial. The methodology, with its three parts, is being applied at all 16 DESIRE study sites. It will also be used by various WOCAT initiatives in different countries and their experiences will show its suitability and usefulness. Further testing and application in any desertification-prone area around the world would surely be welcome.

7. References

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