Documenting Field Knowledge for Better Land Management Decisions

Experiences with WOCAT tools in local, national and global programs

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Abstract: Ten years ago, during the ISCO Conference in Sydney in 1992, a global network of Soil and Water Conservation specialists called the " World Overview of Conservation Approaches and Technologies" (WOCAT) was initiated. WOCAT has developed tools to document, monitor and evaluate SWC know-how and disseminate it around the globe in order to facilitate exchange of experience. The present paper reviews some of WOCAT's strengths and weaknesses and shows the way forward. The WOCAT network has a well-established decentralized structure, and depends heavily on institutional as well as individual commitments. The methods, tools and outputs set global standards and fill a gap in documentation and exchange of experiences in SWC. But data collection is demanding and data quality is still a problem. The great challenge ahead is to prove that information can be used and helps in implementing better land management. WOCAT will also contribute to the international years of mountains and freshwater.
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1 WOCAT: Tools for better decision-making based on local knowledge

Every day land users and soil and water conservation (SWC) specialists evaluate experience and generate know-how related to land management, improvement of soil fertility, and protection of soil resources. Most of this valuable knowledge, however, is not well documented or easily accessible, and comparison of different types of experience is difficult. This SWC knowledge therefore remains a local, individual resource, unavailable to others working in the same areas and seeking to accomplish similar tasks. This may be one of the reasons why soil and water degradation persists, despite many years of effort throughout the world and high investments in SWC.

Ten years ago, during the ISCO conference in Sydney in 1992, a global network of Soil and Water Conservation specialists called the " World Overview of Conservation Approaches and Technologies" (WOCAT) was initiated. The ISCO Conference in Beijing offers an opportunity to review the first ten years of experience, promote this global initiative, and enhance the use of the tools and outputs developed to promote the goal of improving rural livelihood and sustainable soil and water management. Thus the aim of this paper is to review some of the strengths and weaknesses and show the way forward.

WOCAT has reported on its progress in methodology and outputs in several publications (Giger and Liniger 1999, Liniger and Schwilch 2002, Liniger H.P. *et al*., 1998, Liniger, 1997). In addition, two papers in these proceedings highlight the efforts made in mapping (Van Lynden *et al*., 2002) and categorization of SWC technologies (Liniger *et al*., 2002). An extensive review of the WOCAT program was carried out in 1998 (Stocking and Pozzi, 1998).

2 A framework for the evaluation of SWC

WOCAT's mission is to provide tools that allow SWC specialists to share their valuable knowledge in soil and water management, that assist them in their search for appropriate SWC technologies and

approaches, and that support them in making decisions in the field and at the planning level. SWC technologies are defined as agronomic, vegetative, structural and management measures that control soil degradation and enhance productivity in the field. SWC approaches are defined as ways and means of support that help to introduce, implement, adapt and apply SWC technologies in the field. (WOCAT 2000)

WOCAT is organized as a consortium of national and international institutions and operates in a decentralised manner. This means that it is carried out through initiatives at regional and national levels, with backstopping from experienced members of the consortium.

Box 1 What does WOCAT offer

To SWC specialists, extension workers and technicians?

- a method for documenting, evaluating and monitoring their own experience in SWC
- information on SWC approaches and technologies world-wide in books, maps and digital format
- comprehensive information about the biophysical and socio-economic context of SWC
- SWC options, including their potentials and limitations
- contacts and information exchange around the globe

To national and regional SWC institutions , planners and decision-makers?

tools that can be used to learn from existing experiences and avoid mistakes and duplication through:

- an information management system containing a database to document, store, analyse and disseminate SWC activities
- an instrument for evaluating and monitoring on-going activities
- a decision support system for making appropriate plans
- a network enabling the sharing of experiences at national and international levels
- training support for SWC specialists and decision-makers
- educational tools (extension, training, instruction).

To donors?

tools and outputs that assist in:

- decision-making for investments
- monitoring the efficiency and effectiveness of investments in SWC (impacts and better returns)
- capacity building of national and regional SWC expertise
- evaluating the contribution of SWC towards overall goals, such as poverty alleviation and sustainable development.

A set of three comprehensive questionnaires has been developed to document all relevant aspects of SWC technologies and approaches, including area coverage. A computer based database system facilitates data entry, retrieval and evaluation. These tools have been tested in many workshops world-wide, and they have been systematically optimised over a period of ten years through application in a context of international, national and local expertise. All tools, results and outputs are accessible via the Internet, in the form of books and maps or on CD-ROM and are available in English, French and Spanish. Additional translations into Arabic, Russian and Chinese are underway (Liniger and Schwilch, 2002). The questionnaires on technologies and approaches together describe case studies from the field. They are always linked to a specific area where the technology is applied, and to SWC specialists who provide the information. The questionnaire on SWC 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 SWC 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 collection of information involves personal contacts and knowledge sharing between land users and SWC specialists. The immediate benefits of filling in the questionnaires include the compilation of fragmented information – often consisting of the undocumented experiences of land users and

specialists – and a sound evaluation of one's own SWC activities. The questionnaire on the SWC map addresses the issue of where degradation problems and their treatments occur.

3 The use of WOCAT

WOCAT should not be seen as a separate activity or project that runs parallel to existing efforts in SWC. WOCAT aims to have its tools and activities incorporated and integrated into existing programmes at international, national and sub-national level.

At the international level, WOCAT fits well with the UN-Convention to Combat Desertification (CCD) and the Convention on Biodiversity (CBD) for documentation and exchange of experiences and the search for options to combat desertification and enhance human created diversity. With respect to implementation of the Framework Convention on Climatic Change (FCCC), WOCAT can help document and assess the impact of improved land management on carbon sequestration. Use of WOCAT tools for the International Panel on Land and Soil (IPLS) has also been proposed. WOCAT has been cited as a useful method for assessing rehabilitation measures in the context of the recent international project Land Degradation Assessment in Dryland Areas (LADA).

At the national and project level, WOCAT has been successfully integrated into ongoing government, non-governmental and other development projects (e.g. Philippines, Ethiopia, Tanzania, South Africa) as part of their efforts to document and evaluate their experiences and tap knowledge for improved decision making gained with other experiences in their countries, in the region or even on other continents. Additionally, WOCAT tools and results have been increasingly used in training and education for universities and in extension programmes.

4 Experience so far

The strengths and weaknesses of WOCAT have been collected and are listed during several national and regional WOCAT workshops and the annual steering meetings. These are listed in Boxes 2 and 3.

Box 2 The WOCAT Network

Strengths:

- a decentralized structure
- personal and institutional commitment
- free / open access to tools, data and outputs
- sharing resources
- not competitive but complementary
- non-political
- annual workshops cum steering meetings

Weaknesses:

- individuals leave institutions, which requires re-establishing a personal link to the institution
- limited funding for global (core) activities
- national / regional programmes need additional funding
- low capacity to run WOCAT at national / regional level

The WOCAT **network** is based on the principle of open sharing of information, in which synergies are used and the "atmosphere" of partnership is appreciated by collaborators. Most important are the annual international workshops cum steering meetings where all collaborators are invited and where experiences are shared and plans for the future made (see Figure 1). As in any network heavily dependent on individual commitment there is a danger that institutional contacts cannot be guaranteed when individual collaborators leave these institutions. The funding of national and regional activities and the building up of the capacities to implement the programme requires quite some effort, time and commitment. Again this depends rather heavily on the personalities involved. WOCAT is aware of this

danger and suggests committing several persons for each national and regional institution (at least a coordinator and a person responsible for the database). The recently conducted training workshop for national facilitators not only helped in supporting the national initiatives and decentralizing the process but also to build up a bigger pool of fully trained and equipped collaborators.

Box 3 The WOCAT methods, tools and outputs

Strengths:

- works at field level, national level and global level
- considers both socio-economic and ecological aspects
- fills a gap (national and global) in documentation and exchange
- sets global standards: methods, tools, outputs
- brings practitioners, researchers and planners together
- provides tools and a platform

Weaknesses:

- demanding data collection (case studies & maps) for practitioners (use for self-evaluation, training)
- low quality of some data
- problems in using the tools (need for training)
- challenge still ahead: use in the field and at planning level

The strengths of the **method and the outputs** as highlighted by the collaborators are that WOCAT fills a gap and provides standard tools which enable documentation, exchange of knowledge and better decision making from the field to the national and international level. Weaknesses and threats are that WOCAT cannot be carried out rapidly. It is rather demanding and requires commitment for the collection of experience, and for the storage of the information and its use for improved decision making. To describe a SWC technology using the WOCAT method, a team of SWC specialists (including practitioners, researchers, land users) needs about two days. To fill in the corresponding SWC approach takes another two days. By comparison with the amount of time it would take to describe the experience without a standard format, the WOCAT method has been evaluated by the users as much more suitable and less time-consuming. The greatest additional benefit is that the information can be more easily shared and analysed than with other forms of documentation. As SWC specialists become acquainted with the standardized and structured WOCAT tools and describe more than one technology for a region, they take less time. One of the arguments for the structured questionnaires is that they take much less time than an open format, and allow the exchange of information since there is a standard procedure as well as standard definitions of the terms used.

Since the methodology has been tested and developed based on the needs and requests of the collaborating institutions (mostly the users of WOCAT) the current products are the result of a long-term participative and collaborative process. Participants in national and regional workshops evaluated the WOCAT tools, the database and the outputs. The process of testing and revising (involving major changes of) the methodology has taken place since 1994 when the first questionnaire was developed, but since 1998 more emphasis has been placed on collection and use of data. The national workshops held from 1999 onwards showed that the current form is suitable for its purpose. An explanation for why the WOCAT questionnaires need to be rather long and comprehensive has been given by the collaborators as follows: Each situation is unique and SWC needs to be adapted and optimised to the particularities of its environment – the human as well as the natural. As natural resources like water and land are getting scarcer, and given the increasing pressure on land and land users to increase production and move to less suitable (more marginal and more vulnerable) land, good understanding is needed for decisions to be made. This thorough understanding requires detailed evaluation and documentation; otherwise it would be almost useless. An analysis of how well questionnaires were filled in and especially which questions are not answered, inconsistently answered or incompletely answered (Table 1) showed that SWC specialists had problems in identifying the area coverage of the technologies and approaches and great

difficulties in providing information about the economics. Experience during the training workshops also showed that there is a lot of guesswork about the impacts of SWC, be it ecological, social and economic. This therefore reveals important gaps in essential information required for application of SWC.

Table 1 Questions that were not or incompletely answered out of 42 preselected datasets, indicating the most difficult questions for the description of SWC technologies and approaches.(Source: WOCAT database)

Question	% not or incompletely answered
Questionnaire on SWC Technology	
Define the area in which the SWC Technology has been applied: **total area**	36
Indicate in the **map** below the area where the SWC Technology is applied	38
Provide a **sketch** ("artist's impression") and a **photograph / slide** showing an overview of the technology	33
Provide a **technical drawing**	33
Establishment and recurrent **costs**	45
How many land users have implemented the technology **with incentive support / wholly voluntarily**	71
List the major **strengths / advantages of** the technology and how they can be sustained / enhanced, **in the land users' view**	24
List the major **weaknesses / disadvantages** of the technology and how they can be overcome, **in the land users' view**	43
Questionnaire on SWC Approach	
Define the area where the SWC Approach has been (or is still being) **implemented**	33
Provide a **photograph / slide** showing an impression of the approach	74
Provide if possible, an **organogram** that points out important actors within the approach	82
Indicate the total **budget** for the SWC component of the approach (over entire period)	54
List the major **strengths / advantages** of the approach and how they could be overcome, in the land users' view	24
List the major **weaknesses / disadvantages** of the approach and how they could be overcome, in the land users' view	42

Although WOCAT was not designed as a research programme it has shown that collaboration between applied research and implementation is crucial for the success of the documentation and exchange. The identified contributions of research towards better understanding of degradation and improved implementation of good land management practices are to: identify and use existing knowledge (compile and make it available):

Ttraditional/indigenous and new SWC technologies and approaches

- assess degradation and good land use (WOCAT map tool combined with remote sensing, surveys, ...)
- identify important gaps / needs: e.g. economics and impacts of land use (ecological, social, economic)
- search for solutions based on land users' experiences
- contribute to up and downscaling between local, regional and global level
- assess impacts of land use on natural resources and identify key indicators and threshold values
- document agro-biodiversity

5 Collaboration and funding

Due to the decentralized structure of WOCAT, activities are basically carried out at two different levels (Box 4). The major activities take place at the national and regional level where the WOCAT tools are being adapted and used, data is collected and shared and used for improved decision making. At the global level, the network is being supported, the tools are further developed, training is provided and data is shared globally.

Box 4 The funding of WOCAT activities takes place on two levels

Core (global) activities:

- further develop method, tools
- initiate regional / national initiatives
- provide initial training
- maintain a global database (exchange with national / regional initiatives)
- support regional / national outputs
- provide seed money for national / regional initiatives

National / regional activities: to be identified to:

- establish national / regional coordination
- collect data and assure quality
- manage data (data entry, update, exchange with global database)
- produce outputs: books, CD-ROMs, maps
- support additional training and backstopping

For both of these levels there are different partners and funding. Thanks to the medium to long- term commitment of some donors a basic support for core activities as the development of the methodology and the backstopping of the regional initiatives seems to be assured for the medium term future. However, depending on the demand by regional and national initiatives, more core funding would be needed. Collaborating regional and national institutions are expected to search for their own funding of the activities to coordinate WOCAT in the region and the countries, to build up a regional initiative using the WOCAT tools and methodology, and to collect knowledge on SWC and share it within the organization as well as with others in the region and worldwide.

6 The way forward

The achievements till 2002 are that the WOCAT network is well established, the methodology developed, tested and used in different countries worldwide (Box 5). The main WOCAT activities in the near future are to use WOCAT tools for sustainable resource management and integrate them into local, national and international activities. WOCAT is not a new and separate activity, it should be seen as a help in doing the daily work and thus should be incorporated into ongoing activities and development projects. However, WOCAT only works if existing experience is well documented and shared between land users and specialists. WOCAT's current emphasis is on enhancing data quality, further data collection and sharing, as well as on the production of useful conclusions and recommendations for the field and the national and regional level. The great challenge ahead is to prove that the information is used and helps in implementing better land management, which improves the livelihood of the people and uses the natural resources sustainably.

Box 5 Some achievements by 2002

- established network 7 Management Group members: CDE, FAO, ISRIC, RELMA, INSAH, BSWM, WASWC, and
- 27 collaborating national and international institutions world-wide
- tools for documentation and exchange of knowledge tested and developed
- comprehensive data collected in 10 countries with 49 Technologies and 33 Approaches
- additional preliminary data from 27 countries (178 Technologies and 106 Approaches)
- over 400 SWC specialists from 35 countries trained

WOCAT can be applied in all environments. Since soil degradation in sloping areas is much more of a problem and a threat than in lowlands, lots of activities actually take place in mountains and highlands (Box 6). Due to the role of mountains as water towers the sustainable management of the mountain areas with improved water and soil conservation plays an important role. Water and land cannot be separated and need to be seen as an entity (Box 6). The experience of WOCAT so far has shown that appropriate land use and management are the key to local and global issues such as combating desertification, mitigating water conflicts, providing food security, alleviation of poverty and even maintaining or improving biodiversity.

Box 6 WOCAT and the International Year of Mountains 2002 and the International Year of Freshwater 2003

The basic purpose of the **International Year of Mountains 2002**, as declared by the UN General Assembly, is "to promote the conservation and sustainable development of mountain regions, thereby ensuring the well-being of mountain and lowland communities." In order to achieve this purpose, natural resources in mountain regions need to be used in a sustainable way that avoids overuse and degradation. Mountains are particularly susceptible to soil erosion caused by surface runoff due to high rainfall, steep slopes with erodible soils, growing pressure to use marginal lands for agriculture in some areas, abandonment of agro-pastoral land in other areas, and the construction of infrastructure for economic activities.

More than 50 % of the global soil degradation is caused by water erosion, which means an improper water management with excess water causing damage. On the other hand there is a globally growing freshwater crisis with growing conflicts over decreasing quality and the diminishing availability of water. Both water quality and quantity heavily depend of the land use and land management. So far WOCAT's focus has been firstly on the soil and their degradation or improvement. In future WOCAT will put more emphasis on the impact of land management on the water. As 2003 has already been declared by the UN General Assembly as the **International Year of Freshwater**, WOCAT provides tools which help in showing efforts and achievements made towards improving freshwater availability and quality.

Because mountains also serve as water towers, providing water not only in mountain areas but for the surrounding lowlands as well, land degradation in mountains has serious impacts on the global supply of fresh water and on growing water-related conflicts. This indicates the strong connection between mountains and freshwater. The documentation and exchange of knowledge on sustainable use of the fragile mountain systems through WOCAT should be seen as a contribution to the overall purpose of both the International Year of Mountains and Freshwater .

WOCAT emphasizes on the need to document knowledge and to base land management decisions on existing knowledge, in order to optimise the implementation of appropriate SWC, to avoid duplication of efforts and to make most efficient use of development funds. Experiences made in many countries all over the world show that the developed tools are unique and can satisfy an important need raised by many institutions and individuals worldwide to use and make local knowledge available world-wide.

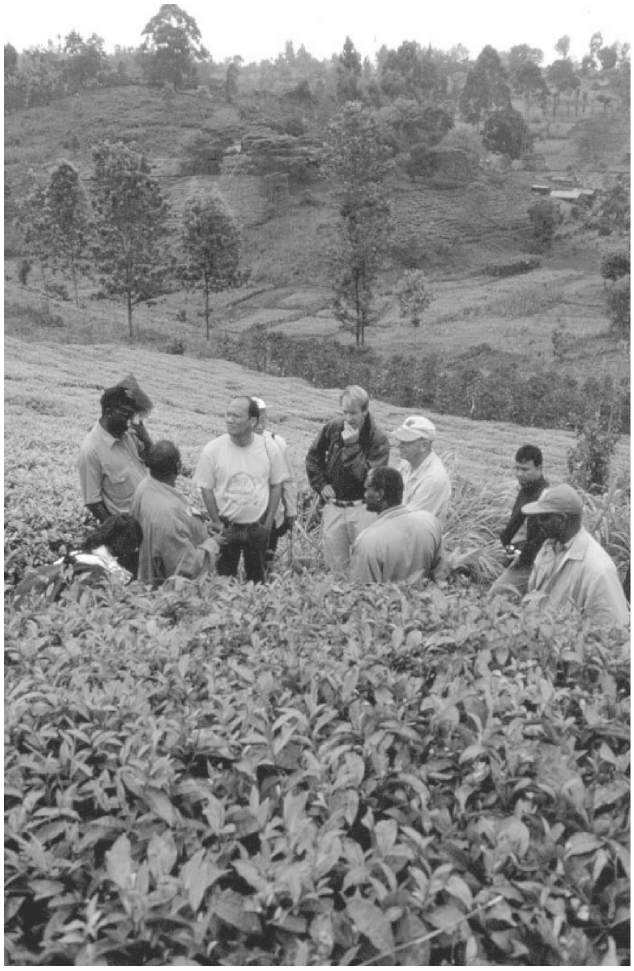

Fig.1 Inernational group of WOCAT SWC specialists and land users sharing experience during the field day of the annual international workshop 2001. Tea and coffee zone of Kenya . Photo: H.P. Liniger

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