

TOWARDS A GLOBAL MAP OF SOIL AND WATER CONSERVATION ACHIEVEMENTS: A WOCAT INITIATIVE

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Abstract

Over the past twelve years, the World Overview of Conservation Approaches and Technologies (WOCAT) programme has seen significant progress in documenting case studies of soil and water conservation (SWC) technologies and approaches. In addition to more detailed mapping activities at the (sub-)national level, WOCAT has recently launched an initiative to develop a world map. National SWC specialists have been asked to provide geographical information on the 2 to 8 most important SWC technologies in their country. Each of the main SWC types will be illustrated by symbols indicating land use, degradation and conservation, as well as by photos and a brief text. The map will be made available on the Internet and updated regularly to show the progress of data collection and SWC achievements.

This new initiative was spurred by various requests revealing the need for a geographical overview of SWC achievements worldwide. The map is intended for a very broad public, with the aim to raise awareness of the importance of soil and water conservation. It will be published jointly by the collaborating institutions of the WOCAT network. This paper presents the methodology used, as well as the progress made so far, and offers initial examples. It also calls for feedback and support from SWC specialists and the public.

Additional Keywords: soil, conservation, global map, geo-reference, technologies

Introduction

The World Overview of Conservation Approaches and Technologies (WOCAT) initiative started in 1992, partly in reaction to the Global Assessment of Soil Degradation (GLASOD) by ISRIC. The original idea of WOCAT was to develop a world map similar the GLASOD one, however showing the positive side, i.e. describing what achievements had been made to combat soil degradation. During subsequent workshops (1993–1995) the idea evolved to create a more comprehensive overview of SWC practices all over the world. This overview was to consist of a growing number of individual case studies documented with the aid of comprehensive questionnaires. A distinction was made between “technologies” (what is implemented in the field) and “approaches” (the methods and means required to successfully implement these technologies, such as training and extension, credit facilities, farmers’ skills, etc.) This project is now well underway, with more than 300 technologies and 200 approaches documented in almost 40 countries (see also Liniger et al. 2002, Liniger et al. 2004). A third component of WOCAT is a methodology for national and sub-national mapping of SWC practices. WOCAT has developed an interactive, scale-independent tool to map area coverage, degree, impact, effectiveness, and other parameters of land degradation and conservation for predefined spatial units (Van Lynden et al. 2002).

The original idea to create a SWC world map was somewhat forgotten, until a request by the National Geographic Magazine in 2002 revived this initiative. The WOCAT team realised that in addition to more detailed activities at the regional and national levels there is still a need for global information. The September 2002 issue of the National Geographic Magazine included a map called “A World Transformed,” which showed some symbols for soil and water conservation (among many others) that were based on information provided by and acknowledged to WOCAT. The WOCAT team decided that present good land management achievements should be done more justice than is possible in this very general SWC mapping. From there, the initiative evolved as described below.

WOCAT and its initiative for a world map on soil and water conservation

WOCAT is a network of soil and water conservation specialists from all over the world. Its mission is to provide tools that enable SWC specialists to share their valuable knowledge of soil and water management; to assist them in their search for appropriate SWC technologies and approaches; and to support them in decision-making processes both in the field and at the planning level. WOCAT has developed a set of tools to document, monitor, and evaluate SWC know-how, to disseminate it around the globe, and to facilitate the exchange of experience. This set of tools consists of three comprehensive questionnaires and a database system designed to document all relevant aspects of

SWC technologies and approaches, including area coverage (Liniger and Schwilch, 2002). In the context of WOCAT, soil and water conservation is defined as activities at the local level that maintain or enhance the productive capacity of the land in areas affected by, or prone to, degradation. SWC includes prevention and reduction of soil erosion, compaction and salinity; conservation or drainage of soil water; as well as maintenance or improvement of soil fertility and other aspects.

WOCAT has launched this new initiative for a global SWC map in order to show in which areas water, soil and vegetation are used sustainably. Existing maps show degradation at various scales for various land use and degradation types, but there are hardly any maps focusing on the positive aspect of the countless conservation efforts undertaken all over the world. Along with the demand for such maps at a regional, national, or sub-national level, there is also a need for a global-scale overview of achievements in preventing and combating land degradation.



Fig. 1: Land degradation and conservation in Machakos district, Kenya. (Photo by Hanspeter Liniger)

Aim and target groups

While the case studies on technologies and approaches and the (sub-) national mapping tool of WOCAT mainly focus on documentation, evaluation and exchange of local knowledge on soil and water conservation for specialists, the planned world map is intended for a very broad public. It will serve to raise awareness of the importance of soil and water conservation on a global scale. Its purpose is not only to show the positive aspect of the efforts and achievements made so far, but also to encourage politicians and international organizations to invest more effectively in SWC. The map could help to guide investments to those areas where they are most needed and most effective; other WOCAT tools, such as the case studies on technologies and approaches and the (sub-)national mapping tool, could then support the planning process on a national level. The WOCAT network can also be used as an instrument for monitoring the efficiency of investments in SWC. WOCAT tools can help assess whether a given SWC activity leads towards sustainable land management or away from it, and, eventually, whether the activity contributes to achieving the overall development goals that were set out in the AGENDA 21 at the 1992 Earth Summit in Rio de Janeiro.

The global overview map may be used by national governments, universities, and international bodies (such as UN organisations). However, it is also intended as an instrument to raise awareness of the achievements and problems of soil and water conservation at any level among the general public. This could help generate wide support for the creation of a global soil and water conservation agenda, similar to other global agendas, such as the desertification convention.

The map is planned to be published jointly by the different institutions collaborating in the WOCAT network and will be available both in print and on the Internet. It will be updated regularly to show the progress of data collection and long-term SWC achievements.

Compilation of information and design of the world map

To complete the task of creating a global SWC map, WOCAT is asking national soil and water conservation experts to provide geographical information on the 2 to 8 (depending on the size of the country) most important SWC technologies in their country. The selection of the most important technologies is left to the national SWC experts. However, it should be based on the criteria of territorial extent, effectiveness, and/or wide adoption by land users. The selection should include both traditional and promising new technologies, even though the actual territorial extent of the latter may yet be moderate.

After compiling the information, a small-scale world map (1:60,000,000) will be created, showing current achievements in SWC. Different-sized symbols will indicate the area coverage, with colours and shapes of the symbols referring to land use type, degradation type, and type of conservation measure.

WOCAT defines five main land use types, with which the described technologies can occur:

- cropland
- grazing land
- forest/woodland
- mixed land (e.g. agroforestry)
- other land (e.g. settlements, roads)

The types of degradation combated by the technologies are divided into four categories:

- water erosion
- wind erosion
- chemical deterioration (e.g. decline in fertility, salinisation)
- physical deterioration (e.g. compaction)

Conservation measures are categorised as follows:

- agronomic (e.g. minimum tillage)
- vegetative (e.g. grass strips)
- structural (e.g. terraces)
- management (e.g. enclosure)

Combinations of several degradation types and of several conservation measures are possible.

On the map, each type of SWC measure will be illustrated by photos and a brief text located in the free space in the ocean, with arrows pointing to the geographical location where it occurs. Existing case studies in the WOCAT database on technologies and approaches will also be pinpointed, enabling users to access this more detailed information by clicking on the symbols for these case studies.

First results

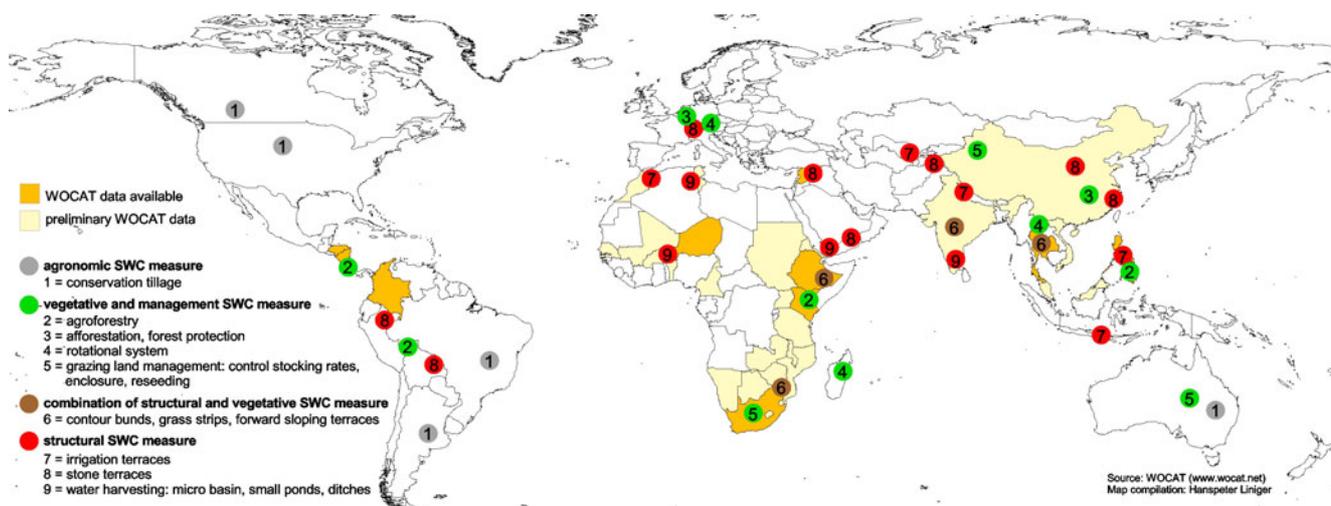


Fig. 2: First draft of world map on soil and water conservation achievements

The map above is a first rough draft of how SWC achievements could be presented (Hurni et al. 2002). It shows examples of SWC technologies in the main SWC categories as defined by WOCAT. The map also illustrates which countries have already documented SWC technologies in the WOCAT database (orange countries) and where

preliminary data is available (yellow countries). While this preliminary map only shows a few selected technologies, the final map will present SWC technologies in a much more detailed manner, illustrating the fact that most countries have several widespread technologies. This preliminary map also lacks photographs and short descriptions of the technologies. Data collection in the different countries is underway. So far, 13 countries from Africa, Asia, Europe, and South America have provided information on their most important technologies, covering a total of 47 technologies. These first results should soon become available on the Internet (<http://www.wocat.net/worldmap.asp>).

Call for feedback and support

As stated above, there is a demand for a global map on soil and water conservation achievements. However, requests often come in on short notice, not leaving enough time to compile the information comprehensively. The creation of a global map that reflects the perception of more than just a few international experts requires time and effort from many experts all over the world. To achieve the goal of a detailed global map, WOCAT therefore depends on feedback and support from many SWC specialists. WOCAT provides the platform for the compilation and the global exchange of knowledge, but the information needs to come from the countries.

All SWC specialists with a national focus and know-how are asked to fill in the requested form and provide WOCAT with the required details on the most important SWC technologies in their country. The form is available on the internet (<http://www.wocat.net/ftp/worldtecform.rtf>) and should be returned to WOCAT (wocat@giub.unibe.ch) together with illustrative photographs of the technologies.

A rough guideline for the number of technologies to be described per country:

- Up to **2** SWC technologies for **small countries** such as Lesotho, Nicaragua, Rwanda, or Switzerland
- Up to **4** SWC technologies for **medium-sized countries** such as Ethiopia, Niger, Peru, South Africa, Tanzania, or Thailand
- Up to **8** SWC technologies for **large countries** such as Australia, Brazil, Canada, China, India, Russia, or the USA

Conclusions

While there are many global maps of negative human impacts on the natural environment, almost none show any positive efforts and achievements made against those impacts. WOCAT tries to counterbalance this shortcoming and give a global overview of the achievements made so far in combating or preventing land degradation. This new WOCAT initiative will complement the ongoing WOCAT activities in documenting, evaluating and sharing knowledge about SWC technologies and approaches and their spatial coverage. It will combine the knowledge compiled on the local, national and regional levels to a comprehensive global-scale overview.

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