

Soil and Water Conservation Map of Thailand and Using Wocat Methodology

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Abstract: The World Overview of Conservation Approaches and Technologies (WOCAT) Program is a global network of institutions that compile and standardize information through collecting, describing and making available information on technologies, approaches and area coverage of successful examples of soil and water conservation (SWC). It produces information that is used for sustainable land management and SWC, and it assists with strategic policy formulation. WOCAT was launched in 1992 by the World Association of Soil and Water Conservation and is organized as a consortium of institutions, implemented at regional and national scales by local teams. The consortium is operated by a Management Group consisting of representatives of the international, regional and national institutions: FAO, ISRIC, RELMA, INSAH, BSWM, WASWC and CDE.

Much valuable practical soil conservation information is not well documented and thus unavailable to people in other locations because they do not have access to it. WOCAT is designed to help share this experience and make it available as a decision support system worldwide. Standardized questionnaires are used to collect information on SWC technologies and approaches at regional and national levels. Data are analyzed, presented, and disseminated on a global, regional and national basis. The information is available as books and maps, as well as in digital format. So far WOCAT operates in many African, Asian and Latin American countries. WOCAT operates on the basis of a shareholder principle: individual specialists contribute their specific knowledge to the database, while they receive the complete set of data of all other specialists who have contributed to the database in the past. It thus invites specialists and institutions to join the program and to share their knowledge about sustainable land management with the other WOCAT participants. Benefits for doing so are multiple and mutual, and the chances to reduce problems and pitfalls in achieving better land management systems through the improved WOCAT decision support are manifold.

WOCAT work in Thailand was initiated in 1996. Seventy SWC specialists collected data for a number of technologies and approaches being employed in the country. A small group of specialists worked for the Overview WOCAT map of Thailand, using topographic data of ASSOD as the base map. The purpose of this map, in digital format, is to show land use type, soil degradation, SWC, and productivity trend. The map may be used by technicians, SWC implementers, planners and policy makers, in order to get an instant ideas of what has happened to land resources in particular area or the whole country. This digital map has a feature that facilitates a rapid change in appearance when new data, such as particular technology or approach are inputted.

However, the resulting map turned to be less than satisfactory in both its creation and use. Using topography for establishing polygons has caused some of them to be extremely large. Certain polygon may be as large as 100,000 sq km, which is unrealistic when considering the states of land degradation and SWC. The solution has come up by using administrative boundary of Thailand's 76 provinces for establishing polygons; thus 76 polygons were created. Though being less realistic in terms of the attributes related to soil degradation and SWC measures employed, this kind of polygon greatly facilitates contribution from specialists

working in respective provinces who know the conditions well, leading to higher accuracy of data to construct the map.

The preliminary overview map of a number of provinces now shows conditions for each province, which may be useful for policy making and planning. The future plan is that a WOCAT map of district level will be executed by using district boundary as polygons. Since each province comprises 6—21 districts, an exercise for making WOCAT map will be useful for provincial and district officials responsible for land development and other agricultural sectors to gain knowledge in land degradation and SWC and may incorporate in their database for doing future work plan. As the ultimate goal, SWC implementers will acquire a good knowledge and may be able to plan by themselves in selecting technologies and approaches to use in their own areas, reflecting the idea of participatory planning and implementing, leading to better farmers' acceptance and agricultural sustainability.

Keywords: soil & water conservation, sustainable land management, WOCAT, technologies, approaches, map

1 Introduction

The World Overview of Conservation Approaches and Technologies (WOCAT) programme, launched in 1992 by the World Association of Soil and Water Conservation (WASWC), was established as a global network of SWC specialists. It facilitates more efficient use of existing know-how and, consequently, of development funds. It thus helps to optimize the implementation of appropriate SWC and to avoid duplication of efforts (WOCAT 2000a; WOCAT/FAO 2000).

The long-term goal of WOCAT is to contribute to sustainable use of soil and water worldwide and to increase productivity and food security by promoting the integration of successful soil and water conservation (SWC) measures into land use systems. The term “soil and water conservation” is interpreted in a broad sense and covers “activities at the local or farm level that maintain or enhance the productive capacity of the soil resource in erosion-prone areas. These activities also help to prevent or reduce soil erosion, conserve soil moisture, and maintain or improve soil fertility.” The WOCAT database includes a range of conservation-related items, such as biophysical parameters, land use aspects, degradation data, socioeconomic information, etc. (WOCAT 2000a; WOCAT/FAO 2000).

WOCAT contributes to the implementation of some United Nations Conventions such as Convention to Combat Desertification (CCD), the Framework Convention on Climate Change (FCCC) and the Convention on Biodiversity (CBD). The following discussions provide details about methodologies, implementation and progress about WOCAT up to now (WOCAT Brochure, 2000).

2 Making local experience available at the global level

There has been a heavy focus on assessing soil degradation in the past, but documenting of sustainable land management practices—which is much more complicated—has not yet been undertaken. In fact, a wealth of SWC knowledge and information exists, and there is a great demand for access to it. The challenge now is to optimize the exchange of know-how between land users and SWC specialists, such as technicians, extension workers, planners, coordinators and decision-makers.

WOCAT examines advantages and disadvantages of SWC systems and why technologies were accepted or rejected by local users. Data are collected through three comprehensive questionnaires: SWC Technologies, SWC Approaches, and SWC spatial extent (maps). SWC technologies are agronomic, vegetative, structural and management measures that control soil degradation and enhance productivity in the field. On the other hand, SWC approaches are ways and means of support that help to introduce, implement, adapt and apply SWC technologies in the field. The resulting information system and analytical tools provide a useful framework for decision-makers and project planners responsible for project design, implementation, monitoring and evaluation. At the same time the questionnaires themselves offer a valuable tool for evaluation of SWC activities (WOCAT 2000a,b,c,d,e; WOCAT/FAO 2000).

Outputs of WOCAT consist of books and reports on appropriate SWC technologies and approaches, thematic maps of SWC activities, a digital database and worldwide accessible information in paper or digital format and through the Internet (*www.wocat.net*). In 2000, a second and updated CD ROM was produced that illustrates the WOCAT methodology and contains an introduction to WOCAT, the databases of SWC technologies, approaches and map, questionnaires, addresses, guidelines, a slide presentation, various reports, a glossary and a short video (WOCAT 2000a; WOCAT/FAO 2000).

The WOCAT process ensures systematic recording and piecing together of local information together with specific details about the environmental and socioeconomic setting in which the information was obtained. This standardized method facilitates the transferability of knowledge to other areas of need (Figure 1).

3 Collecting and documenting SWC knowledge

WOCAT is a tool for documenting and evaluating SWC activities. Collection of information involves personal contact and sharing of knowledge between land users and SWC specialists.

Each type of documented experience derived directly from the field increases the knowledge base with actual, rather than theoretical, experience. This valuable knowledge needs to be safeguarded for the future to promote better decision-making.

A set of three comprehensive questionnaires and a database system have been developed to document all relevant aspects of SWC technologies and approaches, including area coverage. These tools have been tested in many workshops worldwide, and they have been systematically optimized for five years through application in a context of international expertise.

WOCAT's standard tools and procedures, including training workshops, help to maintain the consistency and quality of data.

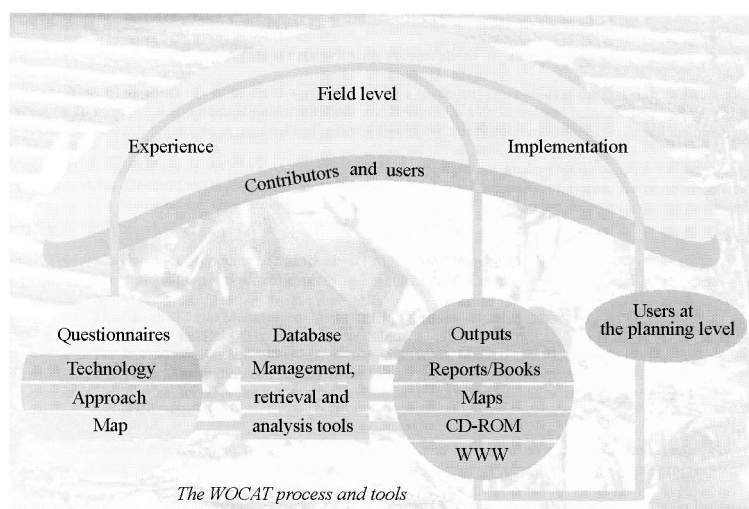


Fig.1 The WOCAT process and tools

At the field level, SWC specialists work under very different biophysical, socioeconomic and institutional conditions. They search for technologies and approaches that are adaptable to their specific situation and meet their specific demands.

The WOCAT query system provides access to information at various points. The search criteria include agro-ecology, climate, soils and slope conditions, degradation processes to be tackled, farming systems, the desired level of costs and inputs, etc. Thus, a choice can be made among relevant SWC options.

WOCAT has developed guidelines for using the database to either evaluate the strengths and weaknesses of a given technology or approach, or to assess the applicability for a specific set of biophysical and socioeconomic conditions of a technology or approach from somewhere else.

Those who do not have access to a PC or the Internet can use WOCAT books and maps. Names and addresses are included for personal contact with the respective providers of the information, and for discussion of questions that still remain open after consulting the WOCAT outputs. This allows SWC specialists and land users to make a final joint decision about which technology or approach to choose, and how to adapt and implement it. This choice is supported by the experience of other and based on the local situation in the field.

4 Using WOCAT outputs at the planning level

At the national and regional levels, the WOCAT database, overviews and maps help planners, coordinators and decision-makers to document, monitor and evaluate what has been achieved in SWC. These tools help to make appropriate plans, set priorities for future investments, and maintain contact with other institutions that have similar responsibilities. Eventually, SWC activities must be evaluated to determine whether they met their goals and to assess both their strong points and their weaknesses.

WOCAT provides training support to build regional and national capacities in SWC. As a tool for more efficient use of existing human resources and know-how, WOCAT addresses the challenges that donors face in managing funds more efficiently. This is possible through coordinated and collaborative networking. WOCAT can be used as an instrument for monitoring the efficiency of investments in SWC. It can help to assess whether SWC activities lead towards or away from sustainable land management, and eventually whether they contribute towards overall development of goals in line with AGENDA 21, produced by the Earth Summit in Rio de Janeiro in 1992.

5 A global network with decentralized organization

WOCAT is a network of soil and water conservation specialists from all over the world, is organized as a consortium of national and international institutions and operates in a decentralized manner. This means that it is carried out through initiatives at regional and national levels, with backstopping from experienced members of the consortium.

At the global level, WOCAT is coordinated by a management group (MG), assisted by the global secretariat at the Centre for Development and Environment of the University of Berne, Berne, Switzerland (Figure 2). The Management Group consists of representatives of the following international, regional and national institutions:

- The Food and Agriculture Organization (FAO) of the United Nations, Rome, Italy
- The International Soil Reference and Information Centre (ISRIC), Wageningen, The Netherlands
- The Regional Land Management Unit (RELMA), Nairobi, Kenya
- Institut du Sahel (INSAH), Bamako, Mali
- The Bureau of Soils and Water Management (BSWM), Manila, The Philippines
- The World Association of Soil and Water Conservation (WASWC), Bangkok, Thailand
- The Centre for Development and Environment (CDE), University of Berne, Switzerland
- (Program coordinator)

Task forces are set up to further develop initiatives and tools, and to support national and regional institutions. Annual international workshops and steering meetings provide a basis for exchange on progress with different initiatives and for directing future activities.

Meanwhile, there is considerable experience available on how to start, organize and maintain national and regional initiatives. This experience is made available in the form of guidelines and through personal support of members of the WOCAT consortium (WOCAT 2000f,g).

6 Initial launching of WOCAT in africa

Twenty-two mountain and highland countries in Africa have done WOCAT exercises when methodologies were being tested and the experiences in SWC of that continent gathered (Giger *et al.*, 1999). Altogether there were 38 approaches and 50 technologies.

7 Example of national initiatives in Southeast Asia

A Case of PHILCAT Following technologies and approaches have been described in the database: **Technologies:** *Natural vegetative strip (NVS), Small water impounding projects (SWIP), Small farm reservoir (SFR), Conservation tillage technology, Resoiling, Multi-storey cropping, Residue incorporation and Vetiver grass technology.* **Approach:** *Landcare and Vegetative approach in the stabilization of sand dunes* (Labios *et al.*, 2001-02; Rondal and Labios, 1999).

A case of CHINACAT The operating area of WOCAT in China (CHINACAT) is in Fujian Province. In November 1997, a workshop was organized in Fuzhou, the capital of Fujian Province, to collect a number of technologies and approaches. Twelve technologies and five approaches were collected. At present seven each are being updated, i.e. (a) *Horizontal beefwood windbreak*, (b) *Vetiver barrier*, (c) *Level terrace for longan*, (d) *Level terrace for tea*, (e) *Hillside ditch for longan*, (f) *Non-structural soil conservation measures*, and (g) *Contour bund*. Additionally, the WOCAT map of Fujian Province is also being implemented.

A case of THAICAT With improvement of methodologies, and hence the questionnaires, from the WOCAT core group, the WOCAT Thailand team has updated three technologies and three approaches concerning (a) *vegetative erosion control cropping system*, (b) *cut-off drain*, and (c) *small bench terrace*, in 2000. It is expected that in 2002 technologies and approaches for the following items would be readily updated: (a) *Hillside ditch*, (b) *Contour grass strip*, (c) *Rice terrace*, (d) *Farm pond*, (e) *Trash line*, (f) *Small bench for rubber*, (g) *Contour bund*, (h) *Vetiver grass system*, and (i) *Agroforestry*.

At the same time THAICAT team has initiated a WOCAT Thailand overview map in 2001, where data on land use type, soil degradation, soil and water conservation and land productivity will be collected for all provinces of the country and digitized into the map.

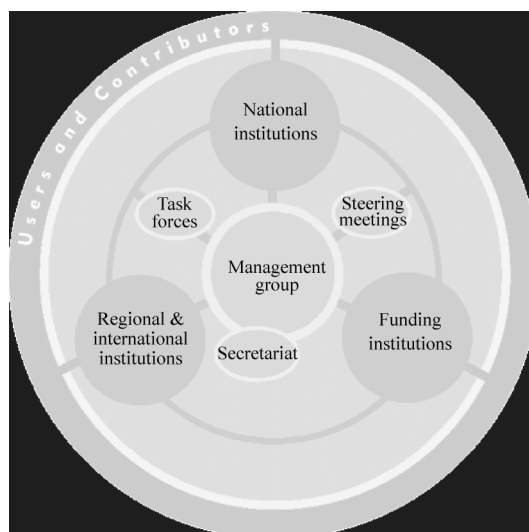


Fig.2 The organizational set-up

8 WOCAT map for thailand

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