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WOCAT - World Overview of Conservation Approaches and Technologies

WOCAT orientation in Nepal –

16 December, 2008, ICIMOD

FOR MOUNTAINS AND PEOPLE

Outline

- Background
- WOCAT methods and process
- WOCAT outputs
- Network activities
- Latest developments
- WOCAT strategy 2008-2012

Background



WOCAT vision

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Local knowledge on **sustainable land management** is **shared** and **used** globally to **improve livelihoods** and the **environment**.

WOCAT mission

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**Provide a
standardized methodology
for documentation, evaluation and monitoring
as well as an international network
for sharing knowledge
of
bright spots / good practices
in Sustainable Land Management**

Why WOCAT

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- a wealth of **experience** exists world-wide, but this is not documented in a manner that allows easy access and comparison;
- there has always been a heavy focus on documenting **degradation** but too little on **Sustainable Land Management** practices;
- **experiences and lessons learned** at global, regional and national level should help to achieve better SWC;
- SWC specialists and decision-makers need **better information management**.

What does WOCAT offer?

- Provides a **standardized methodology** for documentation, evaluation and monitoring of SLM practices
- Creates an **international network** and platform for sharing SLM knowledge
- Assists people in their **search for appropriate SLM** technologies and approaches
- Supports people in **making decisions in the field** and at the planning level.

Why SLM

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Prevention

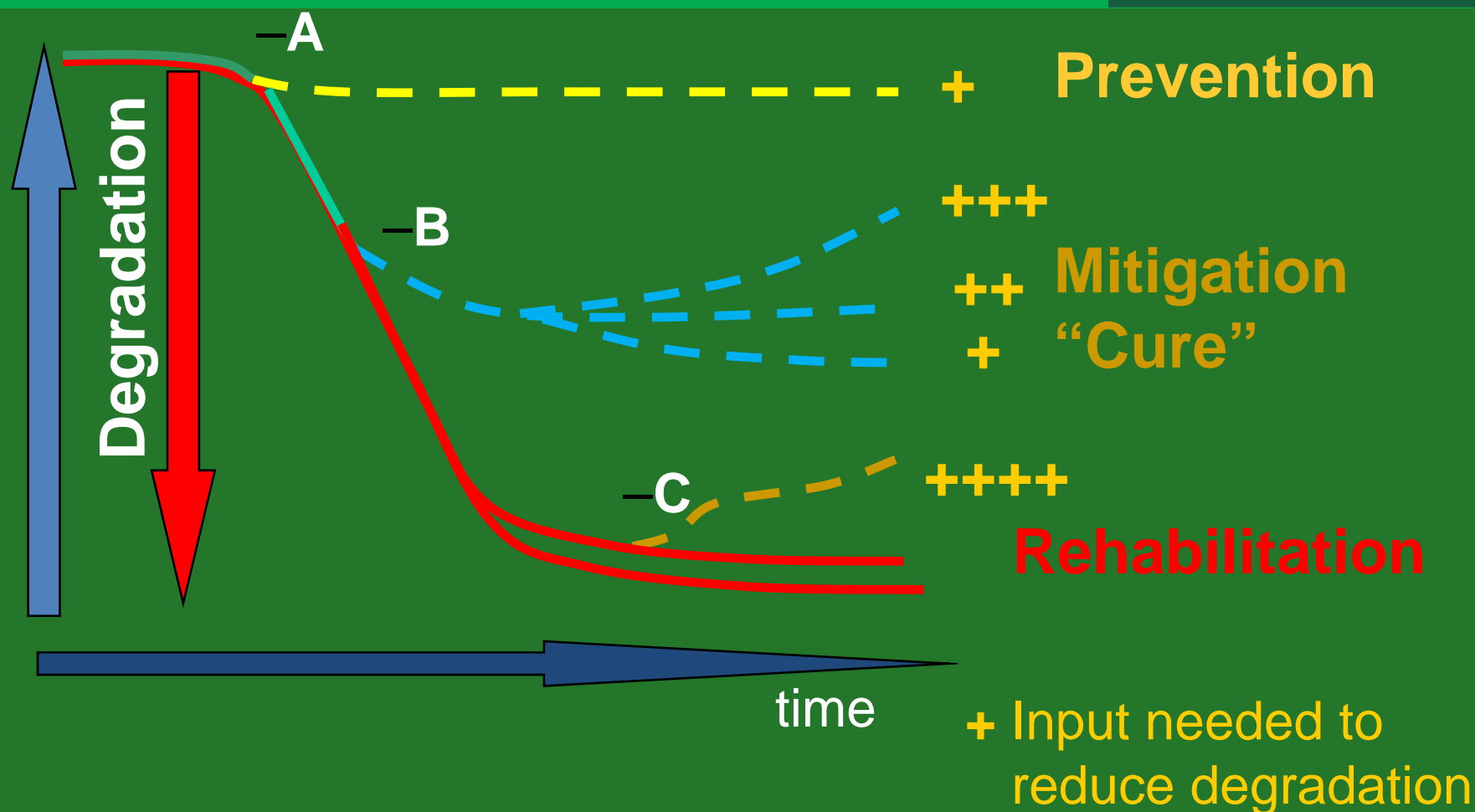


Mitigation / „Cure“



„Rehabilitation“

Stages of SLM interventions



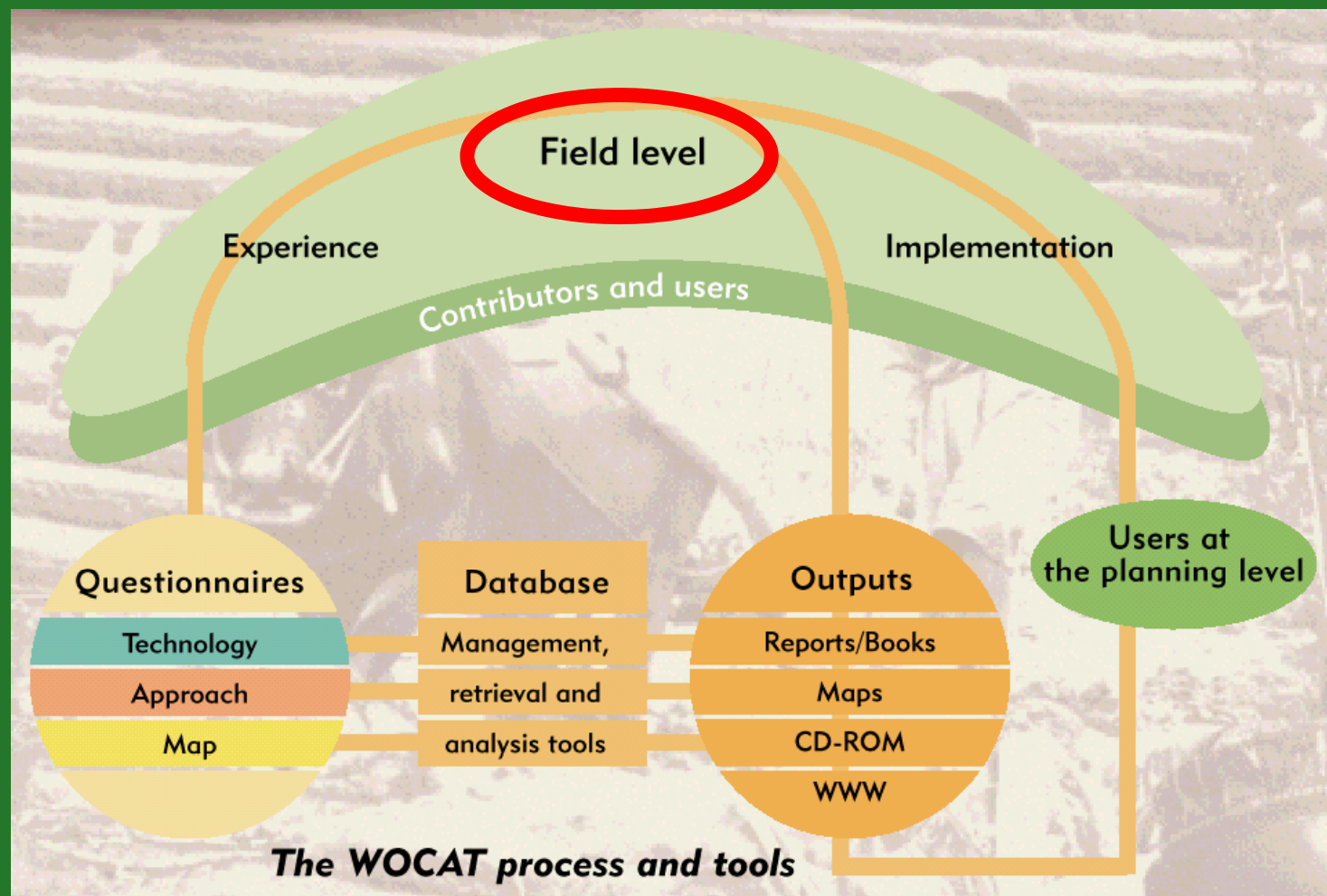
Methods and process



Knowledge *from* the field *to* the field

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Questionnaires

English, French, Spanish

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Framework for:
**documentation, evaluation and
exchange** of SLM practices

SLM Technologies
&
SLM Approaches

Local / field level
(Case studies)


SLM Map

Local, national, global;
scale independent
(overview)

Documentation

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WOCAT Technologies

2.4.3.2 Establishment and initial establishment activity (in sequence)

- 1 Digging holes
- 2 Cutting/digging planting material
- 3 Transporting
- 4 Transplanting
- 5

WOCAT Technologies Questionnaire (Specification - Purpose)

Questionnaire Id: CHN1

Institution Name: Fujian Ningde Perfecture Soil & Water Conservation Office

SWC Technology Name: Horsetail Beefwood Windbreak along seaside

◀
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▶

2.2.2. Characterisation and purpose of the technology

2.2.2.1 Indicate land use types

2.2.2.2 Which measures does the technology use?

2.2.2.3 In which of the following categories does the technology fit?

2.2.2.4 Which categories of soil degradation are mainly addressed by the technology?

2.2.2.5 What are the main means by which the technology achieves its observed impact?

	as % of total area utilized by land users (who applied the SWC Technology)	only where SWC Techn. is applied
Intensive grazing	10	<input type="checkbox"/>
Forest/woodlands	5	<input type="checkbox"/>
▶ Perennial crops	5	<input type="checkbox"/>
Annual crops	50	<input checked="" type="checkbox"/>
Total: 100%		
▶ agronomic measures	3	
vegetative measures	1	
structural measures	2	
*		
▶ Reduction of land degradation	1	
Prevention of land degradation	3	
*		
▶ Soil erosion by water	2	
Wind erosion	1	
Soil fertility problem	2	
*		
▶ Control of raindrop splash	2	
Control of concentrated runoff (retain/trap)	3	

Entering

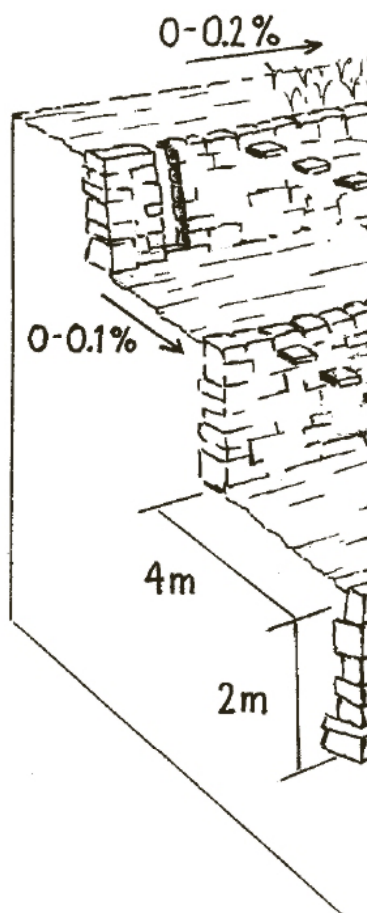
Computer data entry form

- Technology

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Technical drawing



Implementation activities, inputs and costs

Establishment activities

1. Separation of materials of collapsed wall: subsoil, topsoil, stone, weeds.
2. Cleaning and re-establishment of the foundation according to original structure.
3. Cutting stones from rocks (blasting and splitting); transporting.
4. Reconstruction of the stone wall, building on the basis of remaining intact structures of ancient terraces; simultaneous reconstruction of irrigation channels and complementary structures.
5. Backfilling with subsoil, moistening soil and consolidation with motor or manual compressor.
6. Covering with fertile topsoil.
7. Levelling of terrace bed and completion of riser edge (lip).
8. Planting of trees below terrace walls (optional).
9. Improved fallow, early tillage, ridging, and intercropping (supportive measures).

All activities carried out in dry period.

Used tools: A-frame, tape measure, motor drill, wheelbarrow, shovel, pick, steel bar, sledgehammer, hoe, hand compressor.

Duration of establishment: not specified.

Establishment inputs and costs per ha

Inputs	Costs (US\$)	% met by land user
Labour (130 person days)	560	40%
Equipment		
- Machines (compressor etc: 20 hours)	180	40%
- Tools (various: see description)	300	40%
Materials		
- Stone (450 m³)	200	40%
Agricultural		
- Seedlings (trees)	100	0%
Others		
- Construction supervisor (7 days)	60	0%
- Transport of inputs	0	100%
TOTAL	1400	35%

Maintenance/recurrent activities

1. Irrigation system cleaning
2. Clearing weeds from stone wall (dry season)
3. Inspection of the stone walls' stability (before sowing)
4. Repair structures (rainy season)
5. Tree pruning and root pruning

Maintenance/recurrent inputs and costs per ha per year

Inputs	Costs (US\$)	% met by land user
Labour (6 person days)	25	100%
Equipment		
- Tools	100	100%
TOTAL	125	100%

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and they create a favourable microclimate for crops, reducing loss of stored h



- Approach

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Systematic watershed approach

Peru – Participación comunitaria para la

Concluding statements

Strengths and → how to sustain/improve

An effective systematic watershed management approach applied at catchment level → Other projects/institutions should apply this approach. Soil conservation activities integrated in the plans of 'concerted development' → Strengthening of the Local Development Councils (CODDIS).

Human capacity building: 60 specialists trained in rehabilitation technology → Create opportunities to ensure continuation of their work. 80% of land users have changed attitudes towards SWC, and are convinced of the benefits of terrace rehabilitation → Promote SWC training and extension activities.

Strengthened customs and traditions: rituals of offerings to the earth, to crops and animals; customs of mutual help in labour (ayni, minka) and of exchanging food products (treque) → Create spaces and mechanisms for daily practice of important cultural rituals/customs.

Institutional capacity building: strengthening of organisations; increased participation → Continue the training of leaders.

Complementary conservation practices have been integrated into the terraces system: agroforestry, improved fallow, etc → Training of land users in the advantages and disadvantages of these practices.

Weaknesses and → how to overcome

Changes in leadership interrupt planned processes (of activities) → Permanent training to encourage leadership qualities.

Small holdings and land fragmentation are constraints for cost-effective agriculture → Accelerate the process of land consolidation and entitlement.

The economic incentives provided by the project affected the existing reciprocal relationships (eg labour exchange) → Cash for work incentives are sometimes useful to overcome labour constraints due to depopulation.

The generation of income encourages the purchase of industrialised products → More training regarding consumption of local products.

The approach requires the participation of all social and political stakeholders – which is practically impossible → Strengthen the Local Development Councils (CODDIS).

Labour overload in the family → Better planning of work at the household level.

Lack of a crop and irrigation plan for better water management → Elaboration and application of a plan.

Promoting the rehabilitation of ancient terrace systems and community action within catchment units

The Center for Studies and Promotion of Development started the Terrace Rehabilitation Project in 1993 to re-establish and irrigation practices that had largely been lost. The project is an integrated development programme. Its overall purpose is to increase productive capacity of terraced cropland, and to generate better productive infrastructure through soil conservation and management of existing water resources; (2) to increase levels of participation of local people in soil conservation and land management; (3) to promote relevant local institutions.

For implementation, a systematic watershed management

Technical

Local specialists in terrace rehabilitation and for construction supervision were lacking.

Training and competitions were organised to develop skills and select the best.

Participation and decision making

Target groups



Land users



SWC specialists/
extensionists



Teachers/
students



Politicians/
decision makers

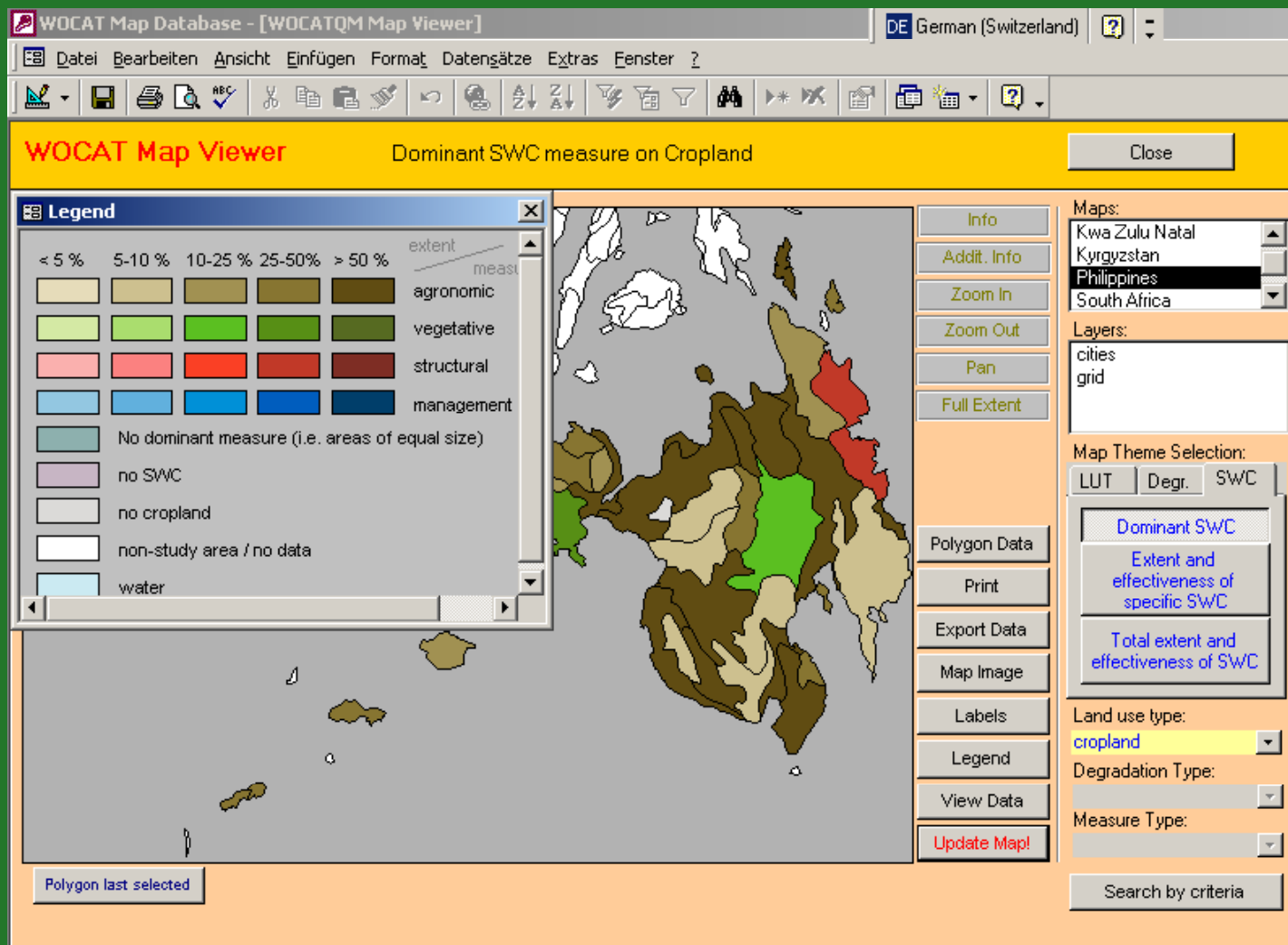
Approach costs met by:

International NGO	60%
National government	20%
Community/local	20%
	100%

Mapping tools

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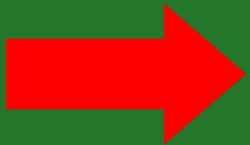


WOCAT Outputs



WOCAT outputs

- Books / fact sheets
- Publications / reports
- Posters
- Maps

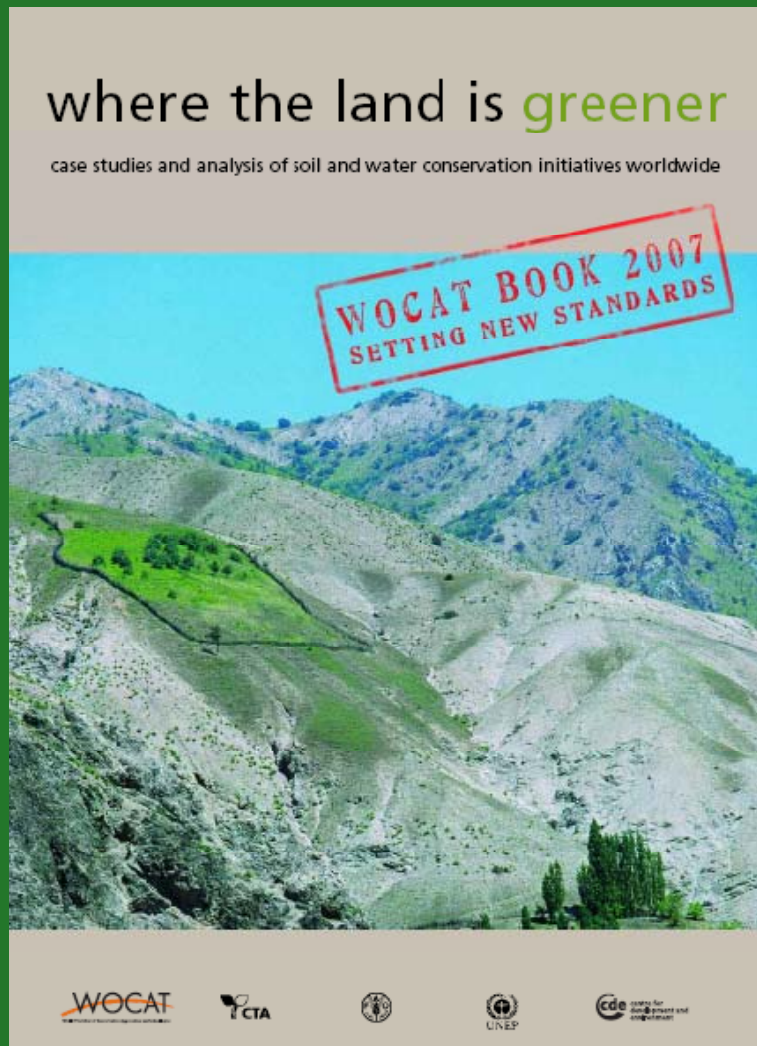


**Used as decision support tool
at planning level**

Global overview book

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First standardized presentation of

- 42 technologies and 28 approaches from 20 countries
- Analysis and policy implications

Order the book: 45 USD

visit www.wocat.net



Vermiculture

Nicaragua – Lombricultura

Continuous breeding of earthworm quality organic compost.

Vermiculture is a simple and cheap way to produce high quality organic compost of high quality. Earthworms called 'the red wigglers' are ideal for a range of environmental conditions. Under shade, in long wooden boxes filled with material (eg straw). The box is covered with plastic, or banana leaves to protect the worms, and also to maintain a few manure is a perfect food for the worms. Chopped crop residues (eg cowpeas, etc) added.

The compost produced by the earthworms is loose and spongy structure. It is a high rich in nutrients, and in a form that makes it easy to use. The content of a full box can be harvested mainly coffee and vegetables, but also increasing soil fertility and thus crop infiltration and water storage capacity.

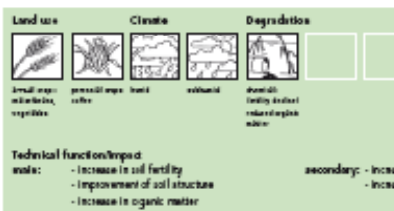
The compost can either be applied directly to the soil or mixed with soil. The amount of earthworms applied 1 kg to 1 for preparation of liquid fertilizer 50 kg and left to soak for 3 days. The compost water at a ratio of 1 to 10 and applied earthworms reach their reproductive stage. In perfect conditions an earthworm produces 10 to 15 eggs per day. Thanks to their rapid reproduction, an earthworm stock can be sold according to earthworm compost is kept back to initiate the whole process, or to start a new one. The area is characterized by humid conditions. Farmers are mainly smallholders with does not depend closely on the external market. favourable conditions inside the wetting. That's why it is usually recommended to place the boxes on poles in the home-garden. Ants, the main pest, standing the boxes on poles in the home-garden.

SWC Technology: Vermiculture, Nicaragua ■ V

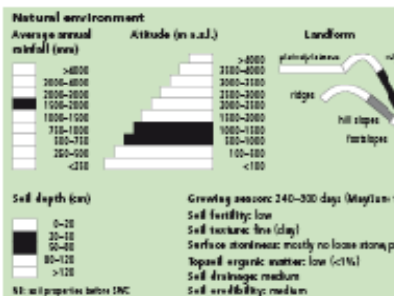
Classification

Land use problems

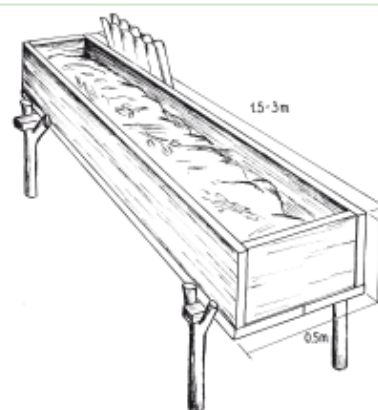
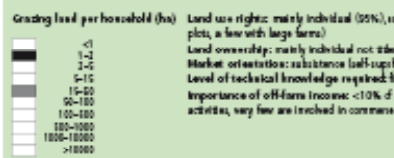
- low crop yields due to soil fertility decline
- water and wind erosion
- small landholdings



Environment



Human environment



Technical drawing

1.5-3 m long, 0.5 m broad and 0.5-0.7 m deep wooden box for earthworm compost production. The wooden boards are about 2 cm thick (whatever is available). The corrugated box serves as cover.

Assessment

Acceptance/adoption

By the year 2000, 60 land users had implemented the system supported by incentives; the trend is towards further adoption. The programme provides an initial stock of earthworms as an incentive to the participating farmers. Maintenance is usually good. An ADGAC (the Association for Agricultural Community Development and Diversification) has a permanent and long-term presence in the approach area, most interested farmers are directly involved in the programme activities; this explains the fact that only 5% of the technology users left people took up earthworm culture without incentives (see approach).

Benefits/costs according to land user

Benefits compared with costs	short-term	long-term
establishment	positive	very positive
maintenance/recurrent	very positive	very positive

Impacts of the technology

Production and socio-economic benefits	Production and socio-economic disadvantages
<ul style="list-style-type: none"> ++ crop yield increase ++ higher production/quality increase ++ farm income increase 	<ul style="list-style-type: none"> none
Socio-cultural benefits	Socio-cultural disadvantages
<ul style="list-style-type: none"> ++ improved knowledge SWC/conservation 	<ul style="list-style-type: none"> none
Ecological benefits	Ecological disadvantages
<ul style="list-style-type: none"> ++ increase in soil fertility ++ stimulation of soil fauna ++ increase in soil moisture (through improvement of soil water storage capacity) ++ improvement of soil structure 	<ul style="list-style-type: none"> ++ pests: the compost attracts pests like ants, chickens, moles
On-site benefits	Off-site disadvantages
<ul style="list-style-type: none"> ++ reduced tree pollution (lower inputs of chemical fertilisers) 	<ul style="list-style-type: none"> none

Concluding statements

Strengths and → how to sustain/improve	Weaknesses and → how to overcome
<ul style="list-style-type: none"> Continuous and increasing production of organic and very effective compost with high nutrient content (replacing chemical fertilisers) → expand the use of worm culture. Appropriate for different crops (50 kg in different forms) → direct application or spreading. Simple and cheap technology, low labour input → keep boxes close to the house. Increased crop yields → expand the use of worm culture. Continuous production to secondary or integrated part of the production system, especially for land users who have cows. Additional economic income through commercialisation of earthworm stocks → continuous maintenance of technology. Health: clean products without chemical treatments. 	<ul style="list-style-type: none"> Requires permanent access to water → A close fitting and secure box cover, as well as placement of the box in the shade reduce loss of humidity. Roof-top rainwater collection helps to get over dry periods. Requires continuous availability of manure to feed worms. Attracts natural enemies like ants, chickens, moles, flies, needs protection → improve the construction of the boxes (close holes and cover the box tightly).

Implementation activities, inputs and costs

Establishment activities

- Construct 3 wooden boxes (for design see technical drawing); another possibility is to dig pits in the soil, same measurements, with cut-off drain above pit to protect from flooding.
 - Fill with earth and cattle manure (2 kg each per box, not too wet, not too dry).
 - Put in stock of earthworms (1-2 kg per box).
 - Protect from natural enemies (ants, birds, certain snails): roof, set the poles in cans filled with water.
- No specific timing (implementation possible at any time).
- Tools: hammer, nails, buckets/wheelbarrow, shovel, possibly water hose.
- Duration of establishment: 2 days

Establishment inputs

Labour (15 persons)
Materials (10 m)
Wood (15-10 m)
Earth (16 kg)
Sheet metal, pit
Agricultural
Cattle manure
Railroad
Others
Earthworms (13)
TOTAL

Maintenance/recurrent activities

- Feeding every 3-5 days add another layer of cattle manure (1 kg earthworm eat 1 kg manure per day).
 - Maintain humidity at 80%; water frequently in dry season, maintain temperature between 15-30°C; do not exceed 42°C.
 - Gather compost every 3-4 months: discontinue feeding and irrigation for 5 days, then put a sieve with fresh manure on top of the compost. The worms migrate into the fresh manure. After 2-3 days take out the sieve and gather the newly worm free compost.
 - Apply compost to the crops (1 kg coffee plant, see description).
 - Continue the process.
 - Possible improvement: add lime to raise pH to a optimum level of 7.0.
- Tools: buckets/wheelbarrow, shovel, possibly water hose.

Maintenance/recurrent inputs

Labour (150 persons)
Agricultural
Fresh cattle manure
Railroad
TOTAL

Remarks: 80% of the land users have their own cattle, others get manure free of no commercial price in the region – there is no market for it. The inputs and cost 4,000 kg of worm compost, which is enough for one hectare of coffee per year suggest higher input-output ratios: in other words less output for the same area.

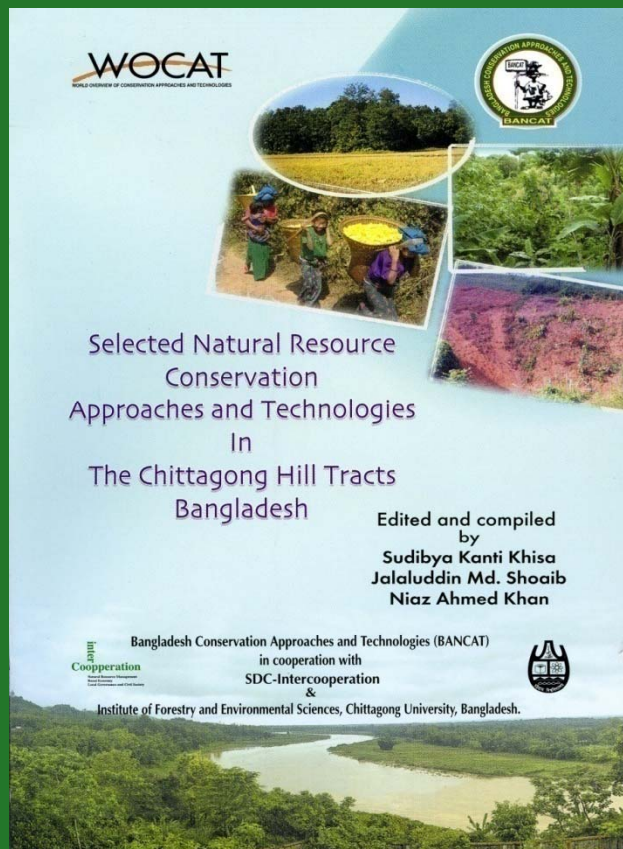
SWC Technology: Vermiculture, Nicaragua ■ WOCAT 2007

Key references: PASQUAC (2000) Guía Técnica de Conservación de Suelos y Agua. PASQUAC, Managua. ■ Penucci C (1982) Manual de Lombricultura. Ediciones Mundiprensa, Madrid, Spain. ■ Castillo H (1994) La lombricultura. In: Alternativas de Mejoramiento de Suelos. Proceso de Capacitación para el Mejoramiento de Suelos. Módulo 11. Alternativa, Ciudad de Guatemala. Contact person: Julio César Gómez Martínez, De INTET, 20 al Norte y 75 hacia al Sur, Calle Santa Ana, Apartado Postal 161, Managua, Nicaragua. Address: Calle Santa Ana, Apartado Postal 161, Managua, Nicaragua. Phone: (505) 0752-7100; fax: (505) 0752-5245

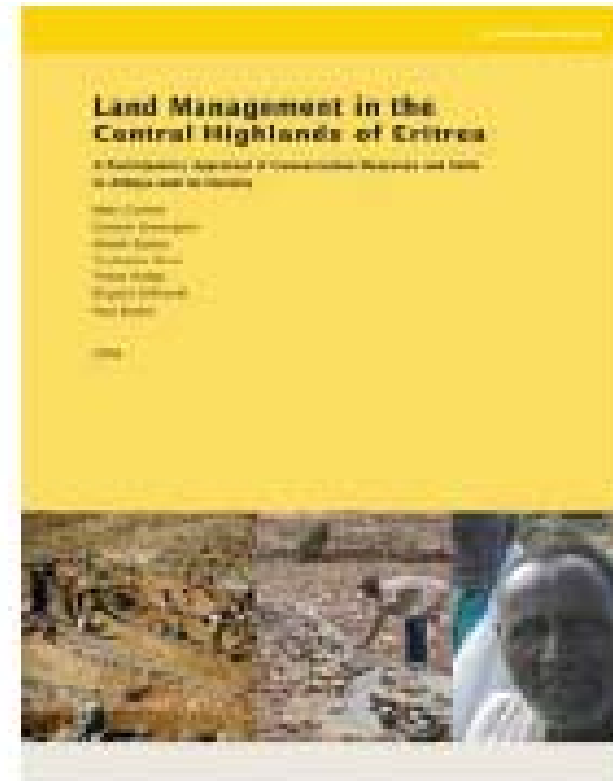
National overviews

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Bangladesh

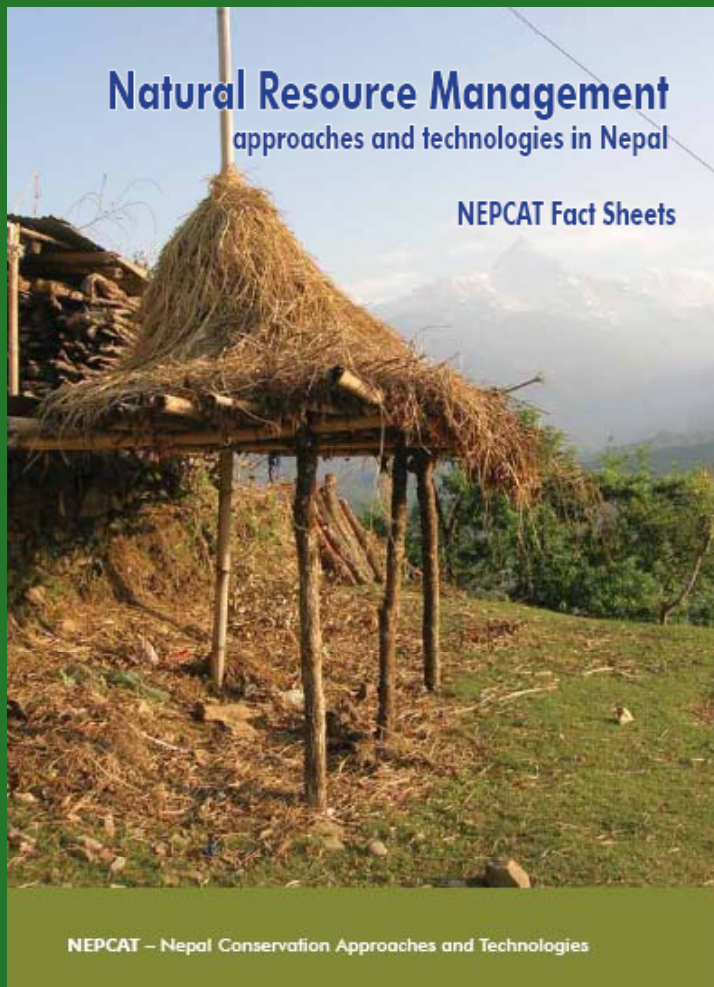


Eritrea

NEPCAT fact sheets

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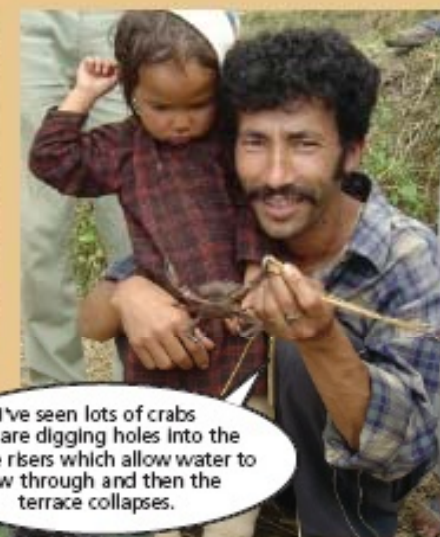


- 30 Technologies and approaches
- 4-page summary fact sheets

Posters – e.g. Nepal

WOCAT questionnaires: Solution-oriented learning

Soil and water conservation experts in Nepal document a conservation technology named «traditional terraces». They are using WOCAT questionnaires and consult the land users about certain questions.



Confronted with the detailed questions asked in the WOCAT questionnaire, experts and land users are forced to think about every aspect of the technology. They have to discuss and learn from each other. The questions make them think about things they had not considered before.

WOCAT
World Overview of Conservation Approaches and Technologies
www.wocat.net

Other outputs

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- CDs



- DVDs - movies



- Website
 - global / reg. / nat.
- Newsletter
 - global / reg.

Network activities



A global network

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WOCAT is a **network** of **Soil and Water Conservation (SWC)** experts, technicians, extension workers, planners, and decision makers from all over the world



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A decentralised network

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• **Global Management members:**
CDE (Berne), FAO (Rome), ISRIC (Wageningen),

- 64 major institutions world-wide (National, Regional, International);
- over 500 SLM specialists from 40 countries trained.

Global events

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Annual International Workshop and Steering Meeting
– e.g. Switzerland 2008

Symposium – 15 years of WOCAT

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Promoting SLM for its Local and Global Impacts
- Monday 20 October 2008, Bern

Latest / new developments

- Modules on **Watershed Management, Impact monitoring**
- **Templates** (4 and 2 page)
- Questions on **ecosystem services, human well-being and climate change**
- **On-line data entry**
- **Decision support system**
 - WOCAT-DESIRE project
- **Web-site** – a new look and more user friendly
- WOCAT on Google earth

Selecting SLM - DSS

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http://www.wocat.net/desire/DESIRE_ICRD08LR.pdf - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://www.wocat.net/desire/DESIRE_ICRD08LR.pdf

Appraising and
A methodology based on

Gudrun Schwilch, Felicitas Bachmann, Ernst Gabath
Centre for Development and Environment, University

Imagine: Y

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We have devel

Part I - Identifi
Identify existing

The complete methodology is being tested by DESIRE in 16 study sites around the world and will be used in various WOCAT initiatives.

Further testing and application is welcome!

DESIRE
Desertification mitigation and remediation of land – a global approach for local solutions (EU FP6; www.desire-project.eu)

WOCAT
World Overview of Conservation Approaches and Technologies (www.wocat.net)

Part II – Assessment
Evaluate, document and share strategies with standardised questionnaires

Interaction between land users and experts using WOCAT questionnaires which help to understand the reasons behind successful local experiences

Standardisation allows adding to and sharing of experiences worldwide through the WOCAT database

Part III – Selection
Select the most promising strategies with a decision support tool (Stakeholder Workshop 2)

The WOCAT Technologies Database

Selection of options is based on a search of the WOCAT database, leading through a series of low questions

Setting criteria, scoring, and the decision making process are supported by software for multi-criteria decision

Both tools are embedded into a stakeholder workshop, continuing the 'learning for sustainability' research

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Climate change

Technology response

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Parameter	Tolerant	Sensitive	Not known
Temperature increase			
Seasonal rainfall increase			
Seasonal rainfall decrease			
Heavy rainfall events (intensities and amounts)			
Windstorm / dust storm			
Floods			
Drought / dry spells			
Decreasing length of growing period			
Others			

WOCAT has lot to offer to --

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- SWC specialists, extension workers and technicians
 - methods to document, evaluate and document;
 - information on SWC approaches and technologies world-wide in books, maps and digital format
 - contacts
- to national and regional SWC institutions, planners and decision-makers
 - an information management system containing a database to document, store, analyse and disseminate SWC activities

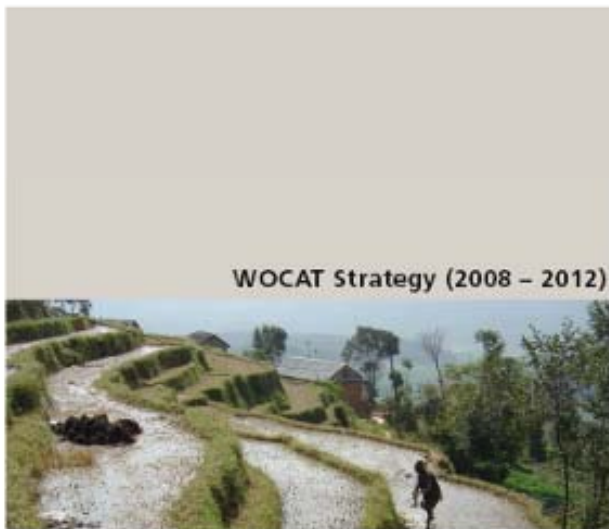
WOCAT has lot to offer to --

- donors, global programmes
 - tools and outputs that assist in decision-making for investment;
 - Capacity building of national / regional SWC expertise
 - evaluating the contribution of SWC towards overall goals, such as poverty alleviation and sustainable development.
- to research
 - assess degradation and good land use;
 - identify important gaps / needs;
 - search for solutions;
 - Identify indicators and threshold values.

WOCAT strategy 2008 -2012

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About this strategy

This statement of WOCAT strategy for the period 2008-2012 is the product of negotiation gathered in the World Overview of Conservation Approaches and Technologies (WOCAT) programme since its inauguration in 1992. It is a result of internal consultation and consultation on the future of the programme, in which all partners were involved.

This document determines the direction of the WOCAT programme for the next five years, including:

- the vision and mission of the programme
- WOCAT's contribution to Sustainable Land Management (SLM)
- organisation, management and funding
- roles and responsibilities at two levels: global programme and national/regional initiatives
- fields of activity with, in the annex document, specific objectives, target groups, supported results, dissemination strategy and outcome

This strategy statement on the one hand defines WOCAT's objectives at the global level, and as the other hand is intended to provide guidelines for coordinating the common efforts of national and regional WOCAT participants as well as potential donors and research partners.

As WOCAT operates at two levels, this strategy only allows for determining and steering its direction and monitoring outcomes at the global level. Because WOCAT is not centrally organized, it can only give suggestions and ideas to affect implementation at the national and regional level.

WOCAT
World Overview of Conservation Approaches and Technologies

Core activities: funding provided for near future to...

Global:

- further develop methods and tools;
- support initial training (facilitation);
- maintain a global database (exchange with national / regional initiatives);
- support national / regional outputs; *and*
- provide seed money for national / regional initiatives.

National / regional activities

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funding to be identified to...

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

Further information

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Please visit
www.wocat.org
or send an E-mail to:
wocat@giub.unibe.ch

Thank you