

A publication from the **DESIRE** project - funded by the European Union's 6th Framework Program 'Global Change and Ecosystems'

Researchers collaborate with local people to combat land degradation

USING LAND FOR THE BENEFIT OF ALL

The WOCAT methodology for the selection of possible solutions to land degradation was developed in the DESIRE research project, which is funded by the EU. The DESIRE project allowed us to test the newly developed methodology at 17 sites in 13 countries around the world. In each study area the local research teams were trained in the use of the WOCAT methodology, and then they tried out the solutions they had chosen. Their feedback to the methodology was very positive overall.

The methodology is being shared through various networks and we hope to contribute to new and successful collaboration between more researchers, advisors and land users, to increase sustainable land use.

DESIRE: Desertification mitigation and remediation of land – a global approach for local solutions



The DESIRE Project worked in dryland study sites with a wide range of land degradation problems

Land degradation and soil erosion

Land degradation and soil loss may be very obvious where we see deep gullies forming. If small channels and rills on slopes disappear after ploughing, land degradation is still happening, and soil is still being lost across the whole slope, but the damage is hidden.



A large gully in Sehoul, Morocco. Soil is also being gradually washed down over the surface (see circle on the right of the gully)

G. Schwilch, 2009

As time goes by, the rills can no longer be ploughed away. Ditches and gullies start to form and steadily deepen and widen. Fertile soil is lost and yields from the crops gradually decrease.



G. Schwilch, 2009

Years later, the formerly fertile land has lost most of its productive capacity and farmers can hardly make a living from the small harvest. The same process and its negative effects can be observed on grazing land.

It is difficult to grow strong healthy crops when the best soil has been washed away

.....but land degradation is not just soil erosion

Besides erosion by water there are numerous other types of soil degradation such as: salinization, wind erosion, degradation of vegetation cover, forest fires, soil compaction, etc.



Soil loss and other degradation mostly affect the land users (including farmers and herders). However, there are many other indirect effects too. Washed away soil fills up drainage channels and dams, blocks roads, and contaminates drinking water. Rural people start migrating to towns because they can no longer live from the fruits of their land. Abandoned land is prone to further degradation. Tensions among land users arise and conflicts become more frequent.....

In drylands this problem can be severe and is called desertification. In many regions of the world the situation is aggravated by climate change as drought increases, rainfall becomes less reliable but more intensive, and the cultivation period becomes more variable. Agriculture becomes more difficult and more risky for poor, small-scale farmers.

Researchers, technical advisors and land users can find the best solutions by working together



How to grow bigger crops, - the scientific way

Researchers look for possible solutions for current problems from the perspective of experimental evidence.

Technical advisors bring the solutions to the farmers. Then the farmers try to use the advice. Sometimes this advice works well, and other times farmers reject the new ideas.

Sometimes farmers do not understand the science behind the advice or do not find it practical. It could be difficult for a farmer to accept a new practice that appears to involve more manual work, but not provide a significantly greater economic benefit. New ideas that do not conform to traditional ways and cultures may not be trusted, however sustainable they might be.

It is very important that researchers and advisors realise that theoretical advice based on scientific experiments may not always work well in practice. But if the science is combined with the traditional knowledge of the local people, there is a much greater chance of success. Local people know from experience about soil properties and which crops grow best. They often already use some measures to prevent or reduce soil degradation.

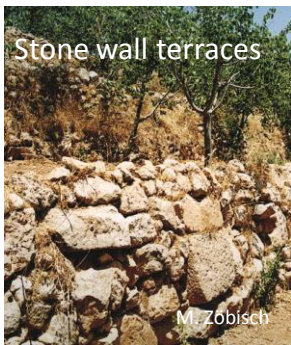


Farmers may not realise that ploughing out former terraces (that retain soil) is likely to cause rapid soil erosion down the slope



Local adaptation of no-tillage ideas

Sustainable land management



A wide range of sustainable solutions is available. There are measures that seek to prevent land degradation, and others that mitigate the effects of degradation. A third category of measures is applied on totally degraded areas with the aim of restoring at least part of the productive capacity of the soil and making the land usable again.

What is Sustainable Land Use?

Sustainable land use is:

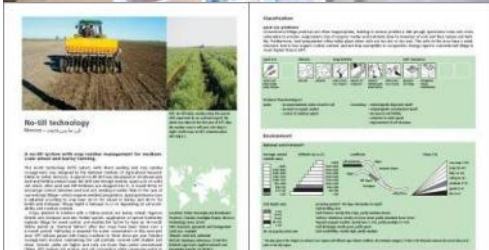
- **economically** viable
- **socially** acceptable
- **ecologically** compatible

and where

- everyone involved agrees on sustainable actions
- land use has a long term productive plan
- productive, physical and cultural functions are considered together

How is it possible to find the most appropriate sustainable form of land use? WOCAT has developed a method for this purpose.

The goal of the research was twofold: to make all the well-known, existing solutions accessible, and to develop a methodology to guide a process that brings together research knowledge and local knowledge to select and implement the most appropriate solutions.



- **Part I – Identification:**
Identification of existing and potential solutions with the help of a participatory learning-based approach (first workshop)
- **Part II – Assessment:**
Evaluation, documentation and sharing of solutions with the help of standardized WOCAT questionnaires
- **Part III – Selection:**
Selection of the most promising solutions with the help of a decision support tool (second workshop)

WOCAT Methodology Part I: Sharing and negotiating knowledge



Everyone has different experience and ideas

In this process researchers act as knowledge-brokers, to bring everyone's experience together. Small-scale and large-scale farmers, representatives of local authorities, different ministries and NGOs, etc., - everyone is included. Quite often this is the first time that all these different groups have the opportunity to get together and discuss the problems of land use and possible solutions!

The participatory learning approach in the 1st workshop uses lots of different methods to help people talk about their experience and knowledge, and to learn together and from each other. The problem of land degradation is not the focus, which is more on possible solutions for sustainable land management.



The water cycle is a good basis for discussing what is happening locally in drylands, how much land degradation there is, and what good practices are already in use



At the end of the 1st workshop people select a number of promising solutions out of all identified solutions. These will be looked at in much more detail in the next step of the methodology

WOCAT methodology Parts II and III

Part II: Assessment of possible solutions

These rational and locally feasible solutions are documented and evaluated with the help of standardised questionnaires. The data are entered into a public database in order to allow access and exchange around the world.



Part III: Selection of solutions for implementation

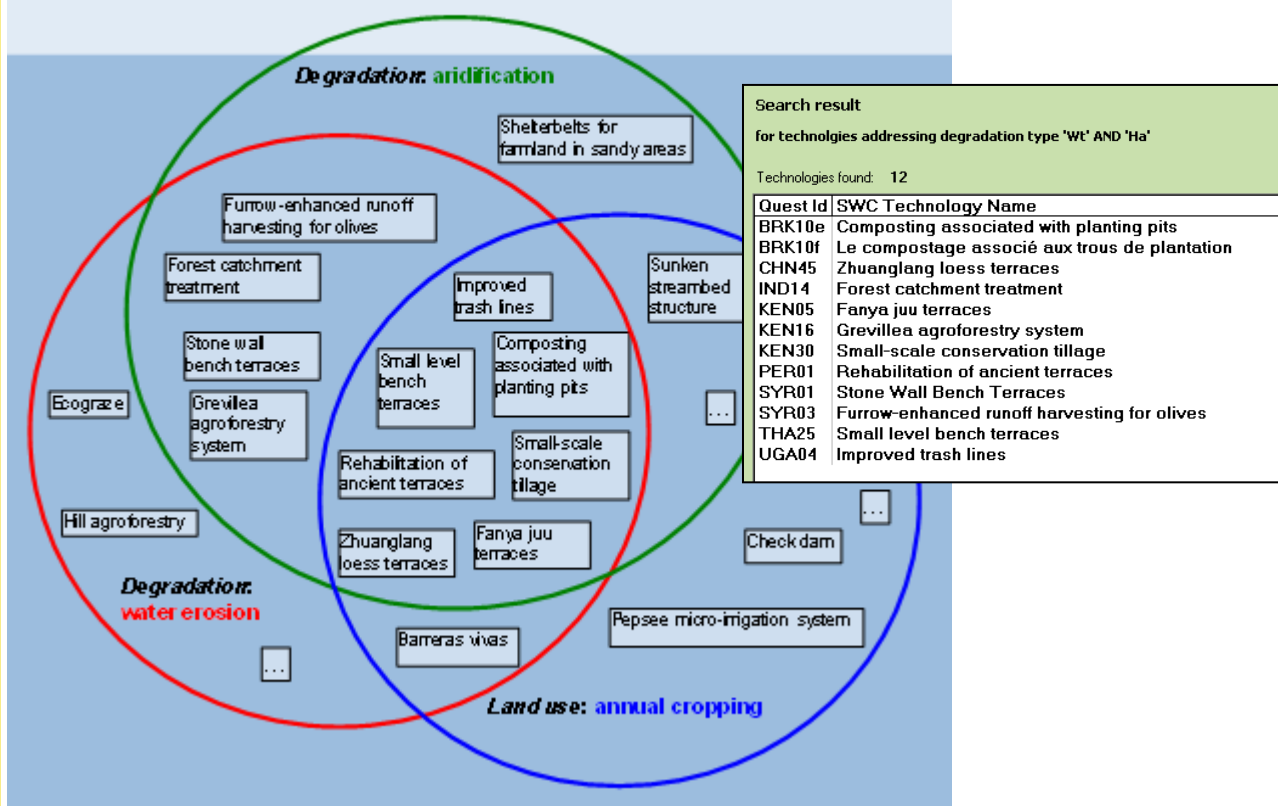
The aim of the 2nd workshop is to select one or two good solutions. First people define the criteria that 'good' solutions have to fulfill, according to their understanding. The aim is to identify criteria for all three dimensions, (or capitals), of sustainability, i.e. Ecological, Economic and Social/cultural criteria.



What new solutions might there be?

The WOCAT database describes measures from around the world, that can be used to add ideas to the workshop. The database lists types of land use, degradation types, climatic zones etc. so that a selection of potential solutions can be retrieved.

Searching for external solutions



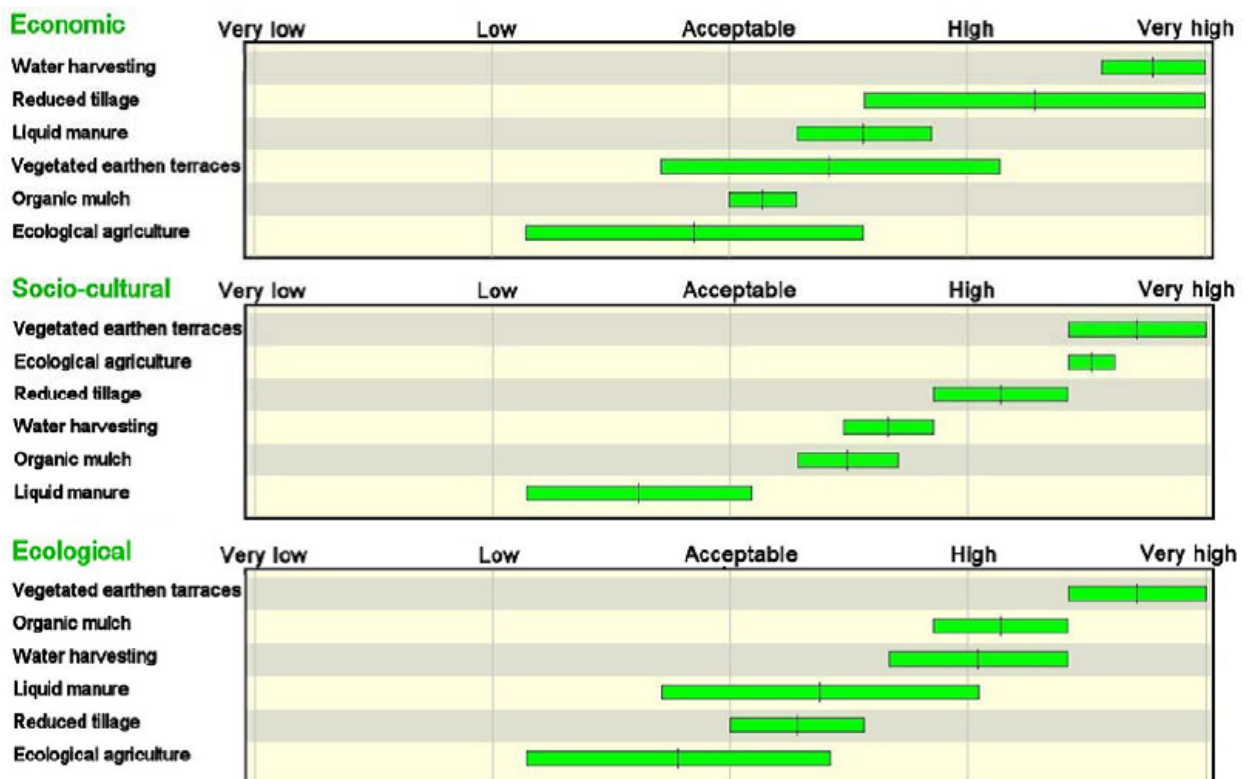
The intersection of the circles displays external solutions which could possibly work in a certain situation. However, the measures always require adaptation to the local solution context, e.g. adaptation to slope, to crop type, to locally available material, etc.

Some 6 to 10 local and external options are systematically assessed according to the predefined criteria. A simple 'evaluation ladder' allows people to move the different options along a scale according to how well they fulfill the criteria. For each of the predefined criteria, e.g. yields, costs, labour input etc., all options are scored individually.



The Facilitator programme for Decision Support

The Facilitator computer software can be used during the second workshop to help reach decisions on which measures may be best to tackle degradation problems.

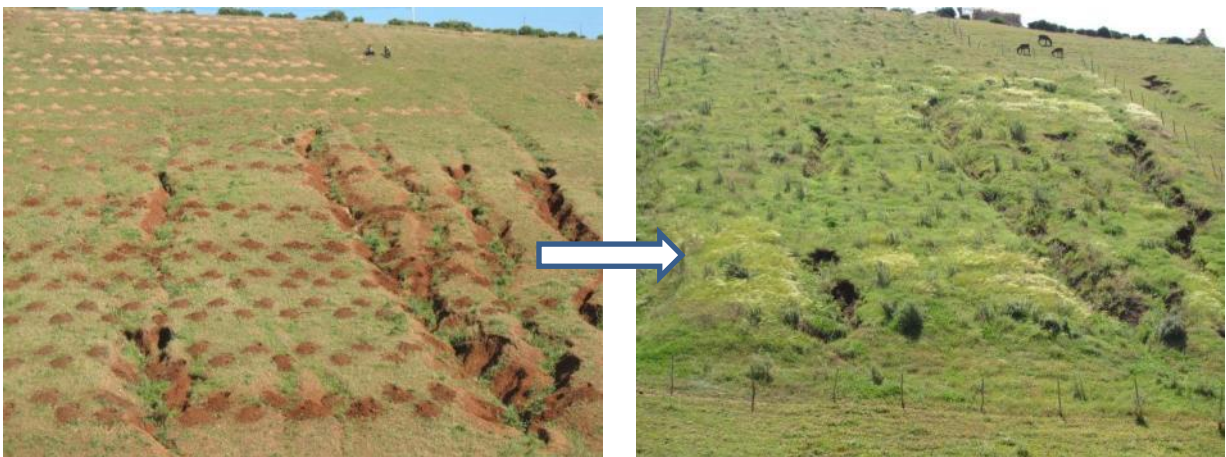


Facilitator is simple to use and allows us to visualize the results of the scoring process by producing graphs. The graphs show how each of the solutions performs in the three sustainability realms or capitals (Economic, Socio-cultural and Ecological). It often happens that there is no single solution that is the best in all three realms. Further discussion and negotiation is usually needed to come to a decision on what measures to try out.

In the example above, water harvesting gets a very high Economic score, and vegetated earthen terraces get the highest Socio-cultural and Ecological scores. Land users might be encouraged to consider trying combinations of all the measures reaching higher scores on the right hand side of the graph.

Successful outcomes from WOCAT workshop II

At the end of the workshop the participants decide who will try out and test some of the measures and solutions. Some farmers agree to accept the experimental measures on their land, while advisors and experts support the implementation with practical advice. Researchers supervise the implementation process by regularly measuring rainfall, soil properties and other relevant data that can measure the success or failure of the test. A big advantage of the WOCAT workshop process is that the selected solutions are tested directly on a farmer's fields and not just in a research station where the economic outcome is not so important. Therefore, the results that indicate the success of the trials are much more relevant for farmers.



See how slopes in Sehoul, Morocco, have been successfully planted with Atriplex sp. to stabilise the soil with a more extensive layer of vegetation, and prevent further gullies and erosion



Sustainable land use relates directly to the three United Nations environmental conventions. It helps to prevent Desertification, to increase Biodiversity and to make people less vulnerable to the effects of Climate change. In addition, it plays an important role in mitigating climate change through improving soil organic matter and increasing vegetation cover.

Sharing the knowledge

The DESIRE Project has used WOCAT methodology to choose sustainable land use practices suitable for use in all dryland sites affected by degradation and erosion

This Methodology can be used by any group of land users. All the details can be found on the WOCAT website:

<http://www.wocat.net/en/knowledge-base.html>

Full details of the selection process for new measures to combat desertification in the DESIRE study sites can be found at: <http://www.desire-his.eu/en/potential-strategies>

See the accompanying PowerPoint presentation: Land use to the benefit of all

Further information:

- Report and synthesis of DESIRE stakeholder workshop I: <http://preview.tinyurl.com/bvxn timer>
- Database of evaluated strategies from the DESIRE project: <http://preview.tinyurl.com/dyglgzb>
- Decision support tool for strategy selection: <http://preview.tinyurl.com/dyrs8yz>
- DESIRE Stakeholder workshop II, synthesis report: <http://preview.tinyurl.com/bru6fzl>

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For more information and contact details see:

- The DESIRE Harmonised Information System: www.desire-his.eu and DESIRE website: www.desire-project.eu



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