



Water solutions in drylands

Experiences from the DESIRE project

Desertification mitigation and remediation of land – A global approach for local solutions

Simone Verzendvoort, Erik van den Elsen Rudi Hessel, Coen Ritsema(Alterra)

Nichola Geeson (MEDES)

Gudrun Schwilch (CDE)

Luuk Fleskens (University of Leeds)

Victor Jetten (ITC-University of Twente)

Patrice Burger (CARI)

and the DESIRE consortium



Land degradation in drylands calls for solutions

- Loss of biological or economic productivity
- Loss of ecosystem services
- Loss of livelihood

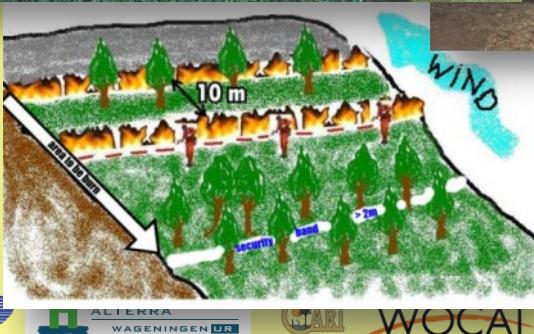


Concerns for society
and thus policy interest

Sustainable Land Management strategies provide solutions

Interventions at local-regional scale aiming at:

- Increasing productivity
- Improving livelihoods
- Improving ecosystems



cycle, pratiques et enjeux pour le développement
WWF6, Marseille, 12 March 2012



DESIRE



Why research/invest in SLM strategies ?

- Within reach of smallholder farmers
- Benefits beyond agriculture

water scarcity

Energy supply

Poverty alleviation

Food security

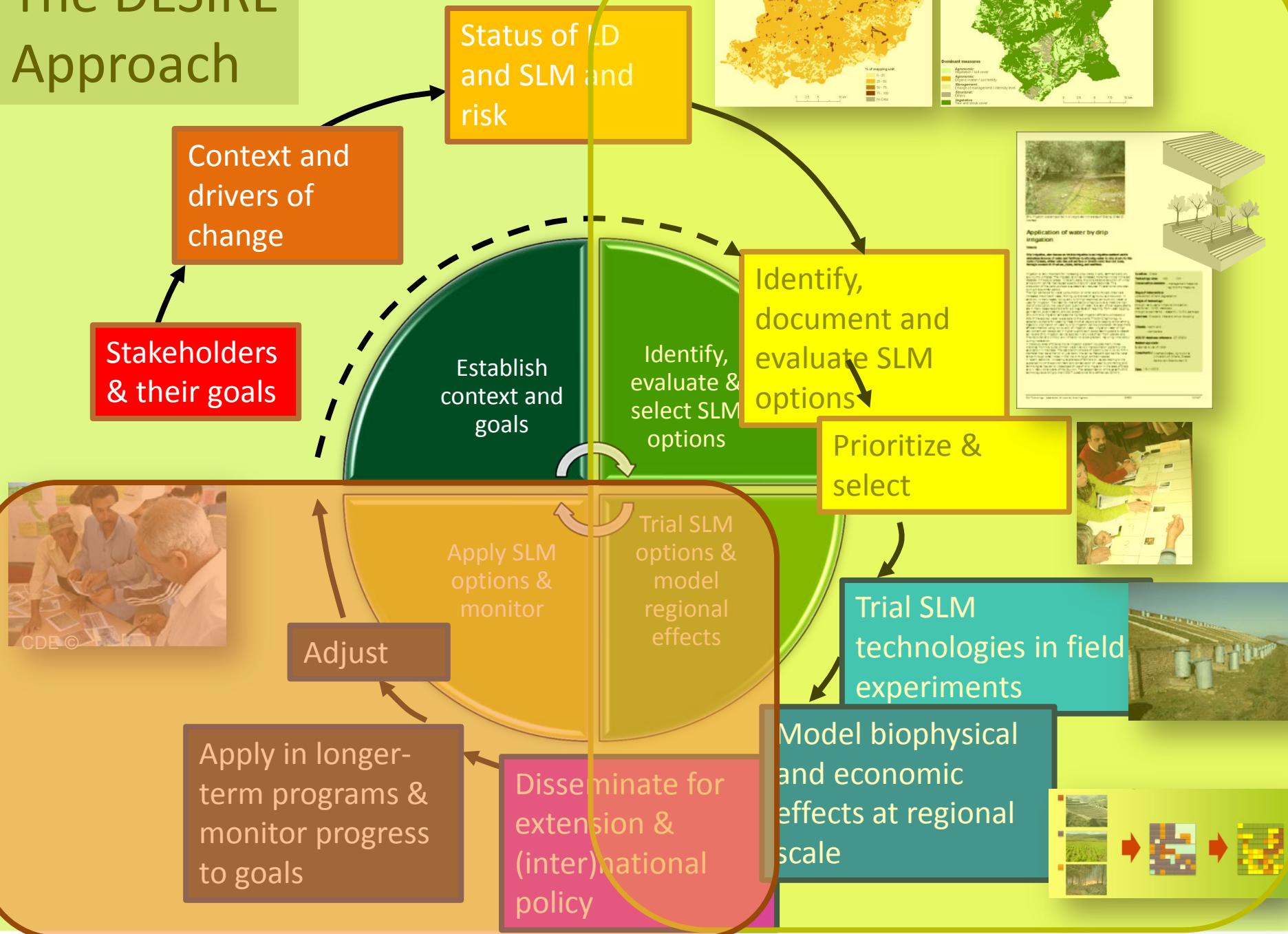
Climate change mitigation

Biodiversity conservation

Resource use efficiency



The DESIRE Approach



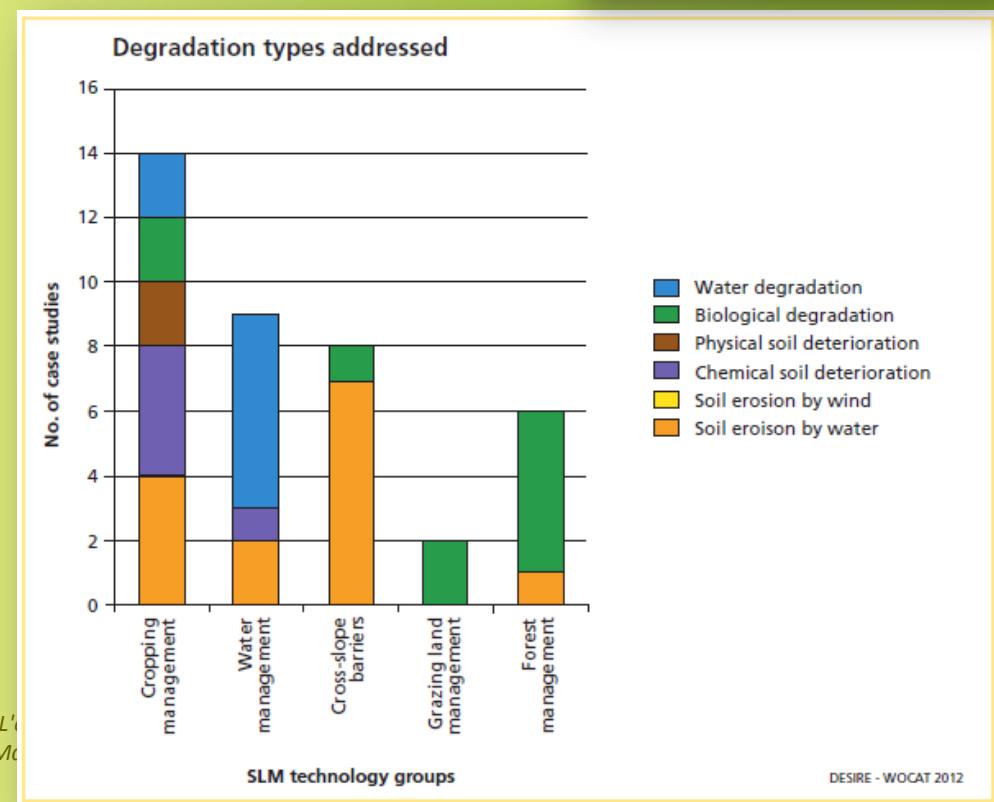
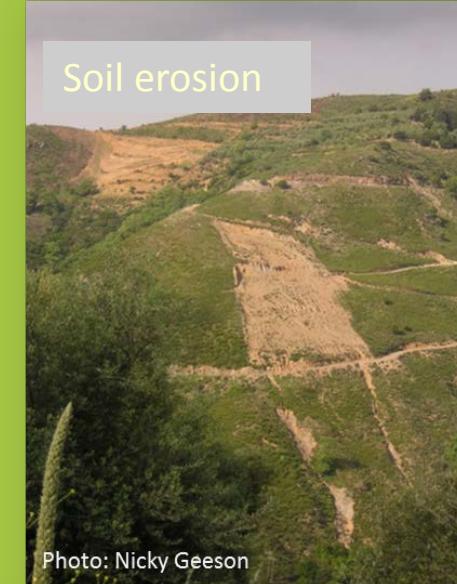




Aims of water-related SLM technologies

Addressing various forms of land & water degradation:

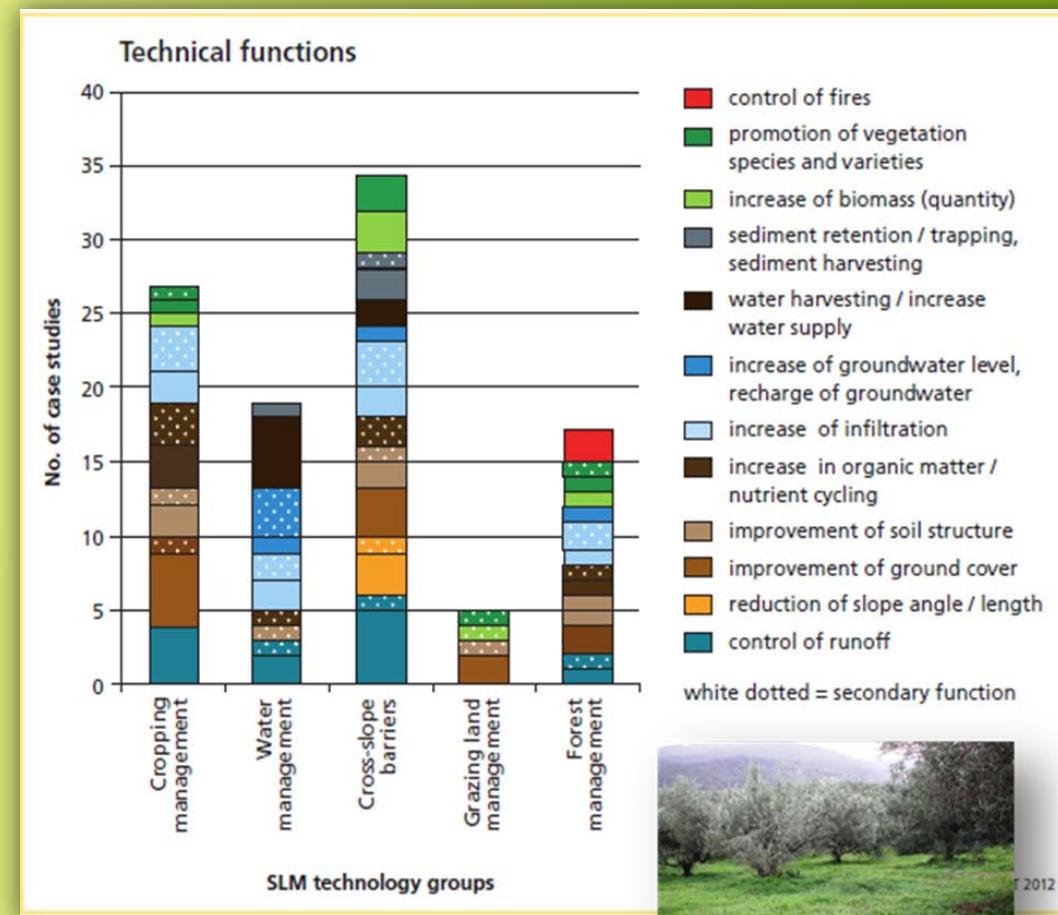
- Vegetation degradation
- Salinization
- Soil & water loss
- Fertility depletion





Technical functions of water-related SLM technologies

- Runoff control
- Increasing infiltration
- Groundwater recharge
- Water harvesting



2012



Assessment and selection of SLM technologies and approaches in DESIRE using WOCAT: a 3 step process

I. Identification



II. Evaluation



III. Selection



- Intensive collaboration with stakeholders in two workshops, separated by an evaluation phase
- Stakeholders: local communities, land users, local/regional authorities, farmer's unions, water boards, land owners, researchers





Water management technologies from DESIRE



Roof rainwater harvesting system

Botswana - Lekidi

Roof rainwater catchment system using galvanised iron roof material, feeding an underground water tank.

A roof of galvanised iron (corrugated iron) with the dimensions 7 x 6m is constructed on a support of gum poles (see photos). The roof catches the rain. The rain water flows over the roof into pipes at the rear end of the roof (sloping side) into an underground conical water tank. The tank is made of bricks and mortar. The underground tank serves two key roles: i) it stores water for use during the dry spells or times of no rain; and ii) the tank keeps the water cool in this hot environment. The technology is most preferred for so-called 'lands' areas, to provide household drinking water. On average, these 'lands' are distant from water sources (e.g. 2-15 km). Other benefits of storing rainwater include less pressure on natural water ponds, but this would be a secondary concern.

Water is critical for human consumption and needed around the home. The cool water is effective in quenching the thirst; it reduces labour time to collect water thus freeing time to concentrate on other farm activities. The water is mainly for household drinking and human health. It is also used as a source of water for milking and washing animals and for individual farmers and thus restricted to individual households. The owner of the farmer has exclusive rights to the use of the water. Some farmers indicated that, in times of no rain, or before the first rains, they collect water from the village in drums, and pour it into this underground water tank, thus using it as a reservoir. They especially like the persistent coolness of water stored in the underground tank.

The technology is for rainwater collection in four villages. Rainwater that flows over the roof is collected, for example, on galvanised iron roofs. The water then runs through



Above left: View of roof rainwater system at the lands in Mokoboxhane (Photo: L. Magole)
Above right: Taking dimensions for a rainwater system in Mopipi lands (Photo: M. Moemedi)



Location: Boteti area, in the Central District of Botswana
Region: Central District
Technology area: 0.01 km²
Conservation measure: structural
Stage of intervention: mitigation / reduction of land degradation
Origin: Externally - 10-50 years ago
Land use: Cropland, grazing land
Climate: semi-arid, subtropics
WOCAT database reference: QT BOT04

Documented in the WOCAT
online Database of Technologies
(www.wocat.net)

DESIRE water management technologies:



Jessour, Tunisia

An ancient runoff water harvesting technique widely practised in the arid highlands



Tabia, Tunisia

Earthen dyke for water harvesting used in the foothill and piedmont areas



Water harvesting from concentrated runoff, Spain

Water harvesting from intermittent streams to nearby fields and terraces during runoff events



Transport of freshwater from local streams, Greece

To replace the traditional form of irrigation (by pumping saline groundwater from wells)



Recharge well, Tunisia

A drilled hole used to allow the direct injection of floodwater into the aquifer.



Drip irrigation, Turkey

Minimum use of water and labour for the optimum irrigation of plants in arid and semi-arid regions



Drip Irrigation, Russia

Gradually applied water into the zone around the stem of the irrigated plant.



Roof rainwater harvesting system, Botswana

Galvanised iron roof material feeding water into an underground water tank.



Water-related SLM Approaches

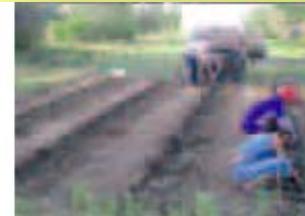


Tunisia

Dryland watershed management approach

Integrated land and water management approach, including vegetative, management, and agronomic measures.

P 225



Russia

Living together - thinking on common water

Testing and disseminating a water saving technology like drip irrigation.

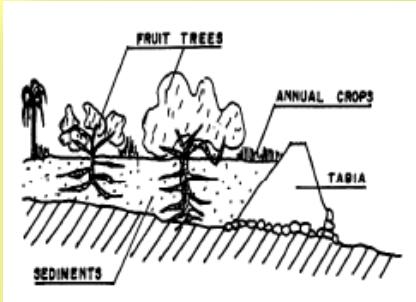
P 217

SLM Approach

- Involves actors at all levels
- Inputs and means (financial, material, legislation, policy)
- Know-how (technical, scientific, practical)

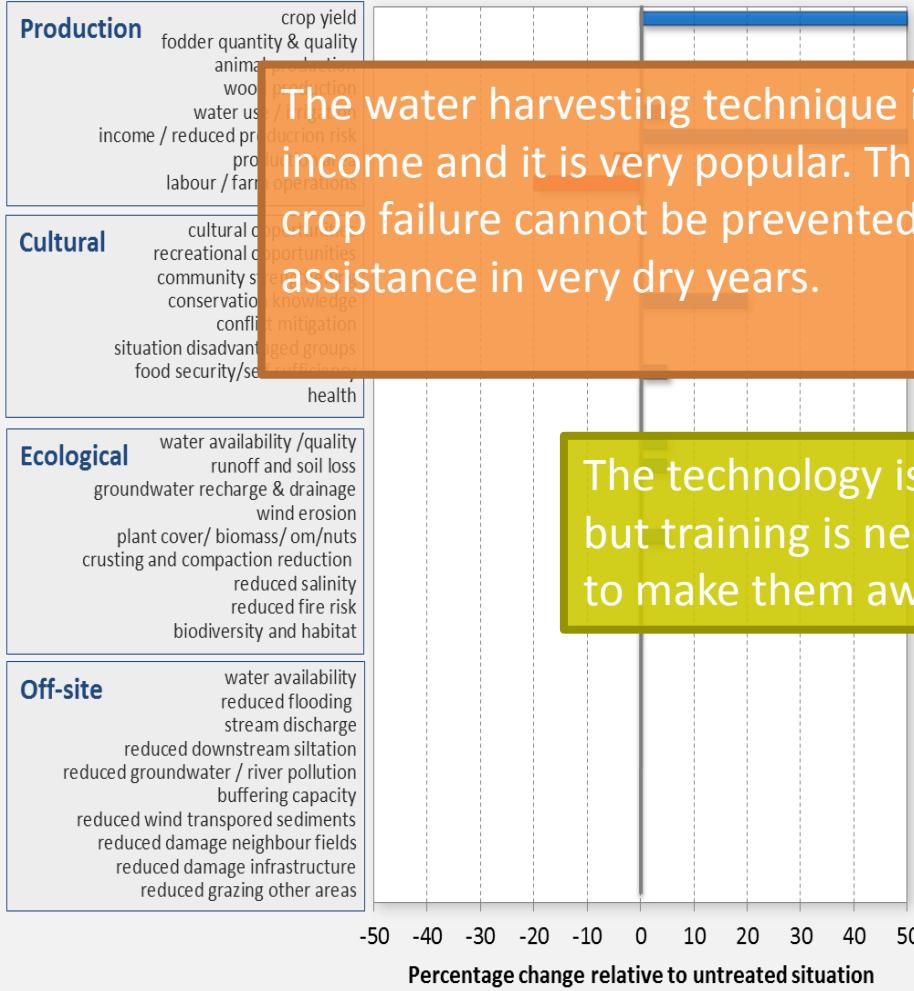
Example: SLM options for Zeuss Koutine watershed, Tunisia

- Overexploitation of aquifers for olive culture in combination with drought periods
- Traditional water harvesting techniques for improved soil water content: Jessour and Tabias
- Recharge structures: gabion check dams and recharge wells



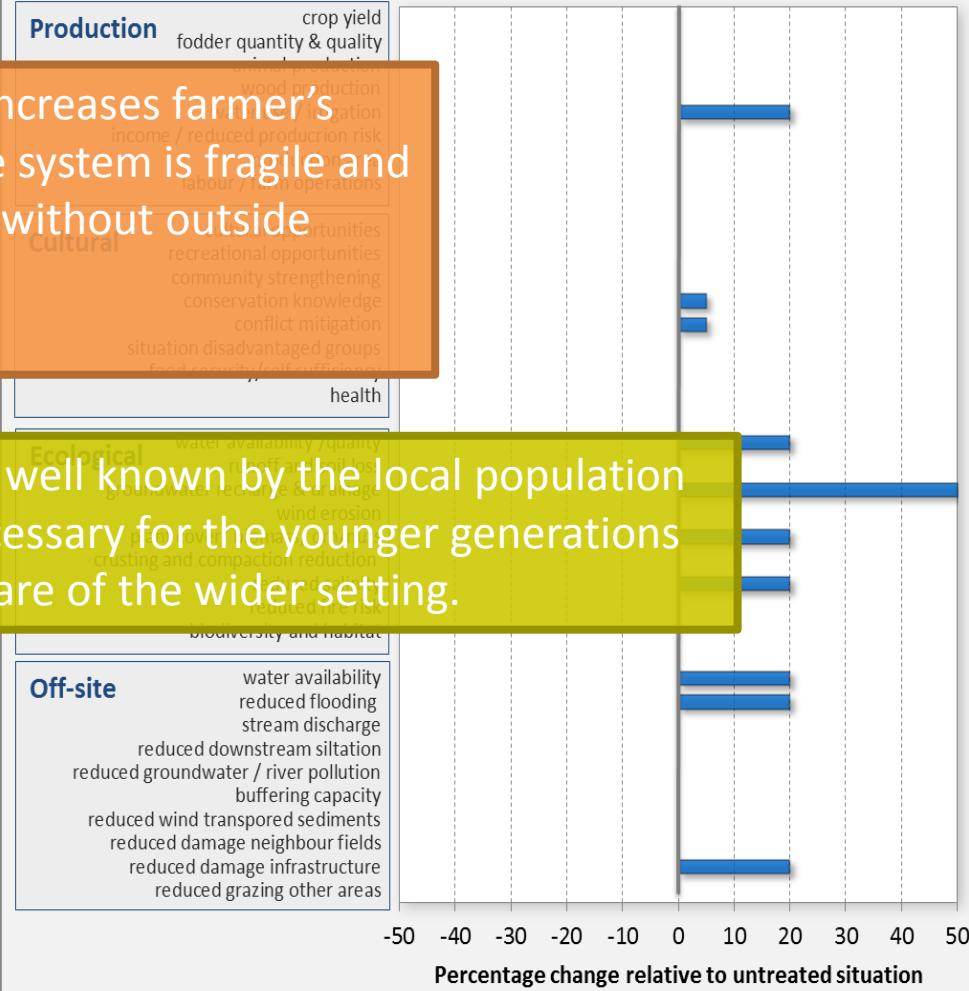
Results

Tunisia - Water harvesting: Jessour



The water harvesting technique increases farmer's income and it is very popular. The system is fragile and crop failure cannot be prevented without outside assistance in very dry years.

Tunisia - Recharge well



The technology is well known by the local population but training is necessary for the younger generations to make them aware of the wider setting.

Regional assessment of local water-related SLM solutions using a biophysical-economic model

1. Define applicability limits of SLM technologies (landform, slope, distance to stream,...)
2. Consider spatial variability in investment costs

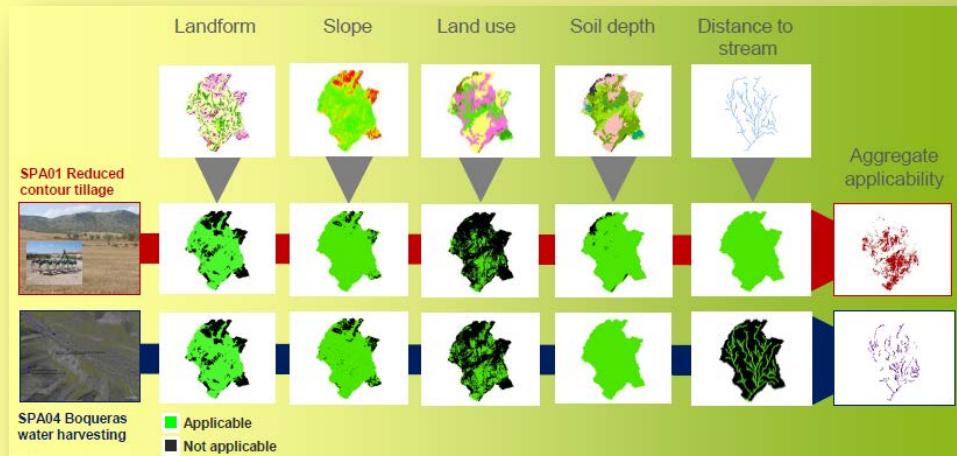
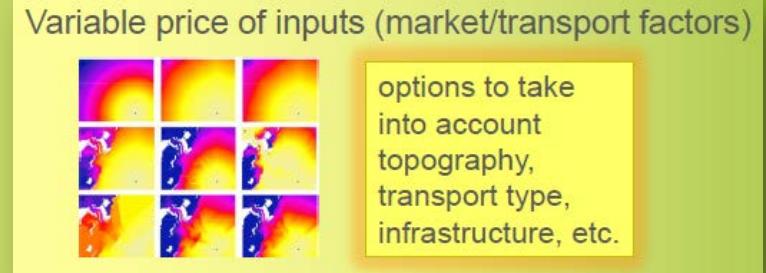
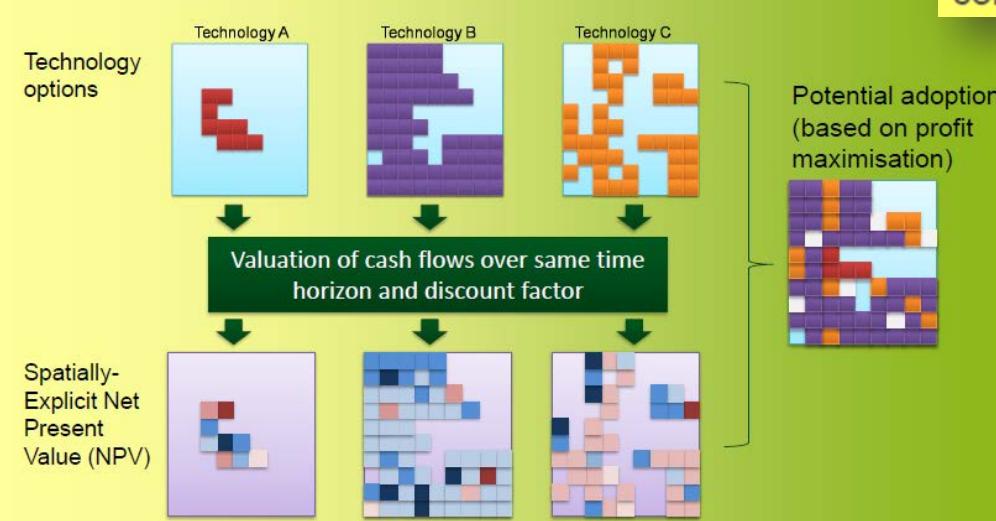


Table Ronde L'eau dans les régions arides - CARI
WWF6, Marseille, 12 March 2012



Regional assessment of local water-related SLM solutions using a biophysical-economic model

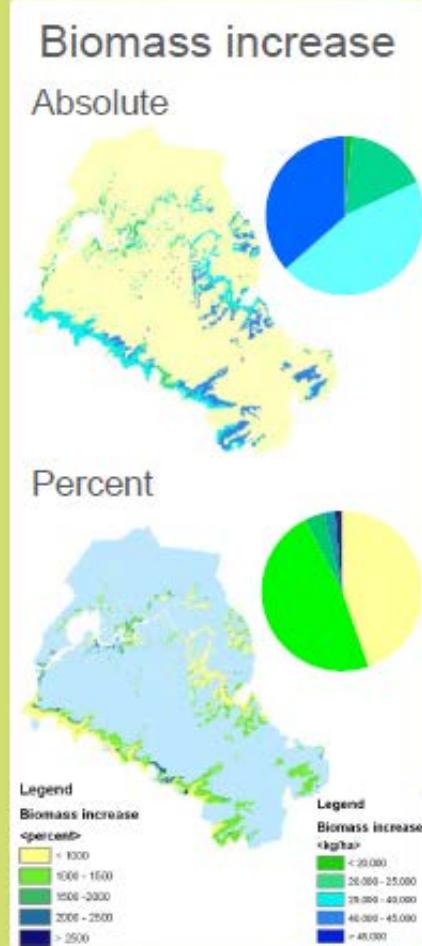
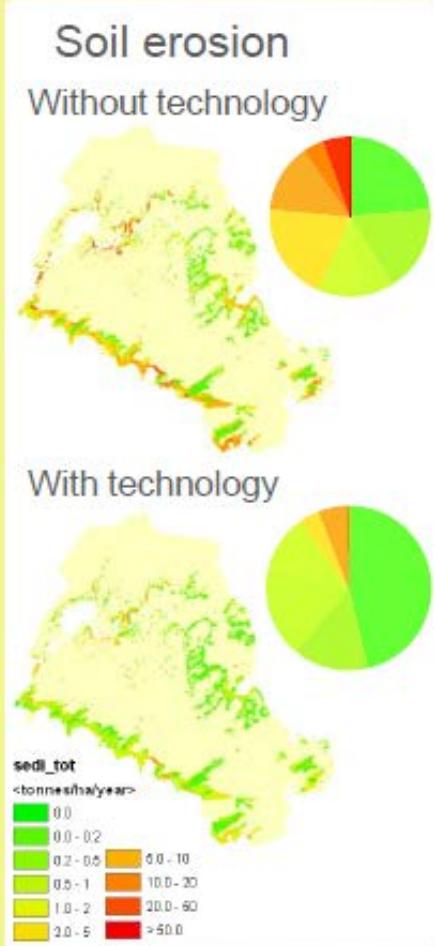
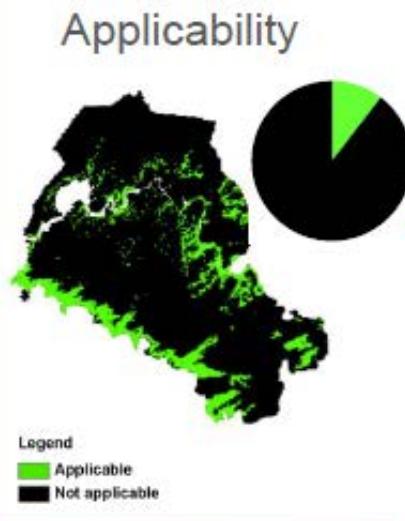
3. Construct cash flow series
4. Financial CBA for each SLM technology
5. Scenario development (technology, policy, adoption, global)



Without case				TUN11: Rangeland restin			
Y	INV	MAI	PRO	Y	INV	MAI	PRO
0	-	-	-	0	-52	-	-
1	-	-	20	1	-	-5	0
2	-	-	20	2	-	-5	0
3	-	-	20	3	-	-5	0
			20	4	-	-	200

The economic life
of technologies is
basis for the
comparison

Sehoul, Morocco – Technology scenario fencing and plantation of atriplex (MOR15)



Sehoul, Morocco – Policy, adoption and global scenarios

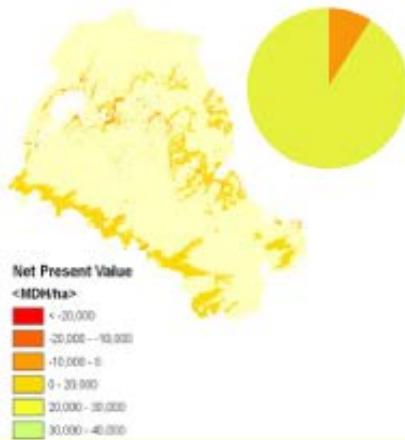
Policy MOR15

Subsidised investment

Investment cost

50%
↓

Net Present Value
After 10 years

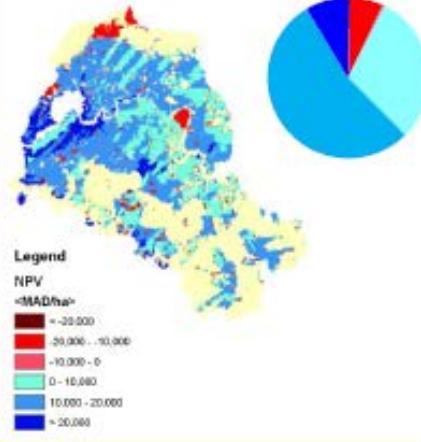


Policy MOR 16B

Prohibited stubble grazing



Net Present Value
After 10 years

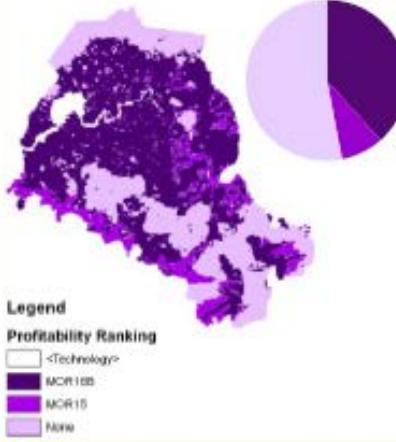


Adoption scenario

Without policies

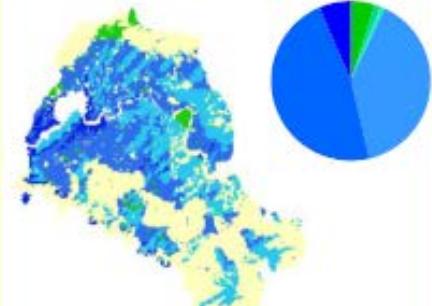


With policies

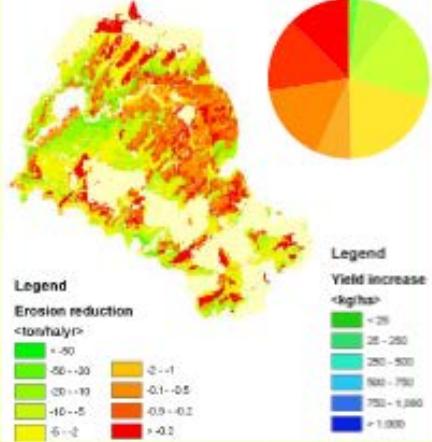


Global scenario

Scope for yield increase



Scope for reduced erosion



Getting informed on water solutions from DESIRE

- Online WOCAT databases on technologies & approaches
- HIS: www.desire-his.eu
- Book 'Desire for greener land'
- Brochures

Greener solutions from the DESIRE Project
Addressing the 6th World Water Forum
Marseille, France, 12-17 March 2012

DESIRE has identified and documented best practices in dryland management of drylands. Following the group of Sustainable Land Management.

Water solutions in drylands
Addressing the 6th World Water Forum
Marseille, France, 12-17 March 2012

Home (Login)

Technology

Technology search - Restricted

General

Name:

Description:

Geographic

Country:

Problems / Means

Measure:
or

Main means:

Main means: water harvesting / increase water supply

Soil degradation addressed: W: Soil erosion by water

Natural environment

Climatic regime: semi-arid

Enter criteria to search for water solutions



Table Ronde L'eau dans les régions arides- CARI
WWF6, Marseille, 12 March 2012





Language

Select English ▾

Global context

The bigger picture

Desertification

UNCCD

Desertification research

Global collaboration

Recent European research

DESIRE Project

Home

search...

DESIRE Project

Harmonised Information System:

providing local solutions to global sustainable land management problems

Welcome to the DESIRE Project Harmonised Desertification Information System. The HIS will comprehensively archive, document and give access to all the material developed in the DESIRE project. It will be under continuous development until the project is completed in 2012.

DESIRE HIS Editors: Jane Brandt, Nichola Geeson, Giovanni Quaranta, Rosanna Salvia, MEDES, IT



Creeping [desertification](#) around the world affects more than 250 million people.

The [DESIRE research project](#) is working to fight the phenomenon with new conservation strategies.



Funded under the EU's Sixth Framework Programme, the DESIRE project is international, bringing together 28 research institutes, non-governmental organisations and policy-makers from around the world. The aim of the project is to come up with alternative strategies for the [use and protection](#) of these vulnerable areas.



Tags Cloud

There are no tagged articles!

+ All tags

Translator login

Username

Password

Remember Me

Login

[Forgot your password?](#)

[Forgot your username?](#)

Acknowledgement



The DESIRE project is co-funded by the European Commission, Global Change and Ecosystem.

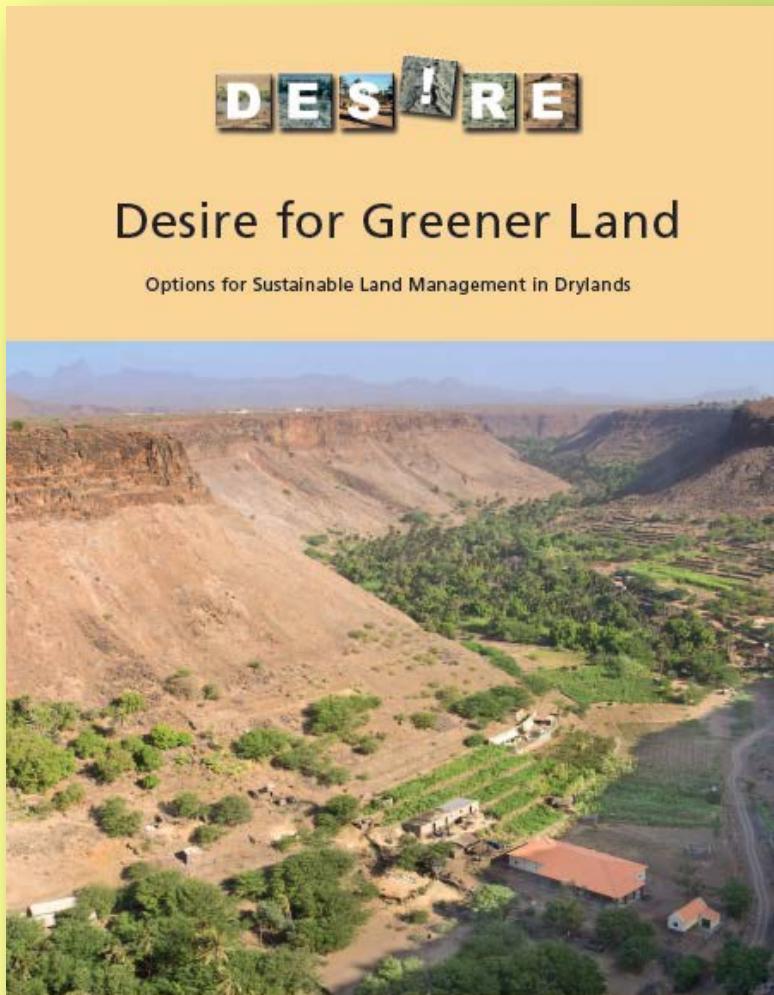
DESIRE brings together the expertise of 26 international research institutes



Table Ronde L'eau dans les régions arides - CARI
WWF6, Marseille, 12 March 2012



Book: Desire for greener land



DESIRE
Desire for Greener Land
Options for Sustainable Land Management in Drylands

Part II: Case studies

2.1 SLM case studies

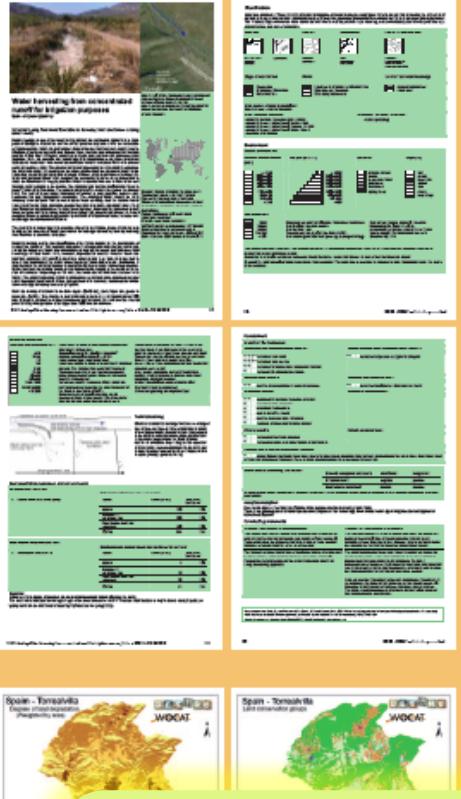
- Cropping management (8 case studies)
- Water management (8 case studies)
- Cross-slope barriers (7 case studies)
- Grazing land management (2 case studies)
- Forest management (5 case studies)
- SLM approaches (8 case studies)

2.2 Mapping case studies

- Spain – Portugal – Italy – Greece – Turkey – Morocco – Tunisia – Russia – China – Botswana – Mexico – Chile – Cape Verde

2.3 DESIRE methodology examples

- Eskisehir (Turkey)
- Yan River Basin (China)



More information on DESIRE → [www.wocat.net/desire](#)
More information on WOCAT → [www.wocat.net](#)

cycle, pratiques et enjeux pour le développement
WWF6, Marseille, 12 March 2012



Wide range of audiences:
from local agricultural
advisors to scientists and
policymakers

From stakeholder-science collaboration to policy: the vital role of NGOs

DESIRE A global initiative to combat desertification

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

Info-brief 13

January 2012

Recommendations from the DESIRE project

DESIRE: lessons learned on science-NGO collaboration in research projects

It is often said that scientists work in an ivory tower, not able to share their research with the rest of the (non-scientific) world. This is especially so with the natural sciences, whose research topics are technical, specific and difficult to understand. However, in order to convince those who determine land use and design agricultural policies the latest cutting-edge research on these topics is needed; if only to support the 35% of the world population living in drylands facing the problems of land degradation, hunger and poverty.

DESIRE
A global initiative to combat desertification
A publication from the DESIRE project - funded by the European Union's 6th Framework Program "Global Change and Ecosystems"

Policy Brief

Une expérience du site de Zeuss Koutine en Tunisie

Une stratégie doublement gagnante pour les éleveurs et pour le territoire : *La mise en repos des terres de parcours dans les zones arides de Tunisie*

Suite aux échecs passés pour restaurer et réhabiliter les parcours dégradés du sud tunisien, le dialogue avec les acteurs locaux et la mise en œuvre d'une pratique traditionnelle, la mise au repos des parcours, met en évidence après quatre années seulement une étonnante capacité des espèces pâturees à reconstituer le couvert végétal et à fixer les sols.

Le pâturage : une activité traditionnelle en évolution

Le pâturage a toujours été le type d'utilisation des terres le plus important dans les régions arides de Tunisie. Cependant, ces parcours ont été de plus en plus soumis à des processus de dégradation grave en raison des profonds changements socio-économiques (privatisation des terres collectives et extension des terres cultivées particulièrement l'oléiculture, accroissement du nombre de cheptels, abandon de la transhumance) ayant eu lieu depuis l'indépendance. Ils ont conduit à l'émergence de la société agro-pastorale au lieu de l'ancienne qui était essentiellement pastorale. Les systèmes de pâturage traditionnels (transhumance et nomadisme), qui avait historiquement permis des périodes de repos du pâturage et le

Parcours dégradés en raison principalement du surpâturage, A. Ouled Belgacem

Thank you for your attention!



Photo: www.wocat.net



Photo: Erik van den Elsen



For more information, visit:

www.desire-his.eu

www.desire-project.eu

