



Assessment of benefits and costs of Sustainable Land Management (SLM)

Contributions from the WOCAT Knowledge Management System

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Prevention



Mitigation / „Cure“



„Rehab“

Documenting SLM knowledge



Questionnaire
technology



Documentation
and work

WOCAT Technologies **QT 16** Specification

2.4.3.2 Establishment

Initial establishment activity (in sequence)

- 1 ... Digging ...
- 2 ... Cutting ...
- 3 ... planting ...
- 4 ... Transplanting ...
- 5 ...

Entering



Ent

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

2.2.2. Characterisation and purpose of the technology

2.2.2.1 Indicate land use types

	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%		

2.2.2.2. Which measures does the technology use?

agronomic measures	3
vegetative measures	1
structural measures	2
*	

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

Reduction of land degradation	1
Prevention of land degradation	3
*	

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

Soil erosion by water	2
Wind erosion	1
Soil fertility problem	2
*	

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

Control of raindrop splash	2
Control of concentrated runoff (retain/trap)	3

Computer data entry form

Global knowledge base

- 310 SLM technologies 170 approaches from 50 countries
- degradation and SLM maps from 20 countries
- **Data search and query system ... for analysis, reporting**

All online, open source, in different languages

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World Overview of Conservation Approaches and Technologies
TECHNOLOGIES

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Data capturing and management
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Technology search

Section 1.1 & 1.2
Section 1.3
Section 2.1
Section 2.1.3
Section 2.2.1 & 2.2.2.1
Section 2.2.2.2 - 2.2.2.4
Section 2.2.2.5
Section 2.2.2.6
Section 2.3.1
Section 2.4
Section 2.5.1.1
Section 2.5.1.2
Section 2.5.1.2 cont.
Section 2.5.2.1
Section 2.5.2.2
Section 2.5.2.2 cont.
Section 2.5.3.1
Section 2.5.3.2
Section 2.5.3.2 cont.
Section 2.5.4.1
Section 2.5.4.2
Section 2.5.4.2 cont.
Section 2.6.1
Section 2.6.2
Section 2.7.1 - 2.7.3
Section 2.7.4 - 2.7.5
Section 2.7.6 - 2.7.7
Section 2.7.8 - 2.7.9
Section 2.7.10 - 2.7.14
Section 2.7.15 - 2.7.18
Section 2.8.1 - 2.8.4

Technology code: MOR295

PART 1: GENERAL INFORMATION

1.1 Contributing SLM specialist(s)

Main contributor: Chaker, Miloud

Data collection date: 2008-08-19

List the names of other contributing specialists who assisted in filling out this questionnaire:

Name:	Surname:	Institution:

Please confirm that institutions, projects, etc. referred to, have no objections to the use and dissemination of this information by WOCAT.

Date: 2011-04-09 *

1.2 Brief identification of SLM Technology

Country: Morocco

Technology code: MOR295

1.2.1 Common name of SLM Technology:
Régénération assistée de chêne-liège

1.2.2 Local or other name(s) (with language):

You are logged in as Godeit Van Lynden (Super user)

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MAP

Home
WOCAT home
Registration (new user)
Forgot password

Mapping data management
Add new
View/Edit/Delete data
Export data

Manage languages
login history

Downloads
QIM Basic v1.0
Mapping Unit Template

0/38 mapping unit id's found matching your search criteria.

View / Edit / Delete data

Country: Spain

Base map edition: guadalquivir_2009

Select a mapping unit

- Sub-division 1: Select a value
- Land use system: Select a value
- Mapping unit id: Select a type a value

Order by: Select a value

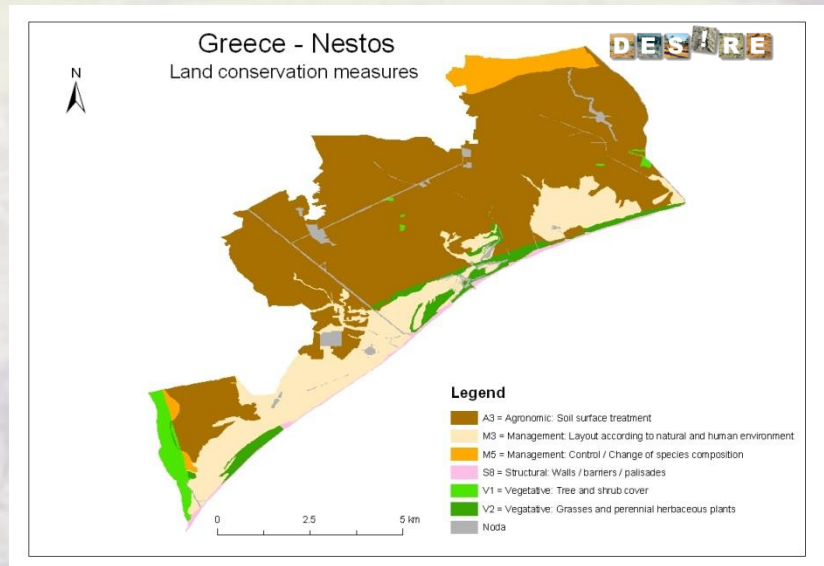
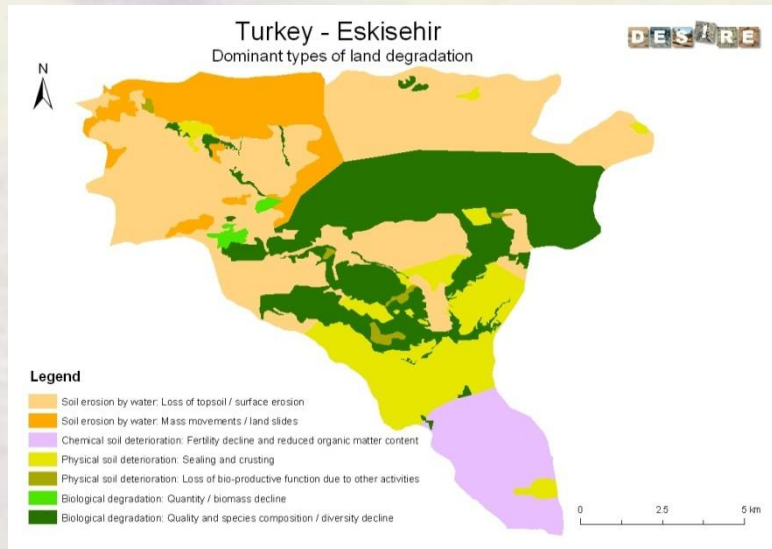
Sort order: Select a value

Search

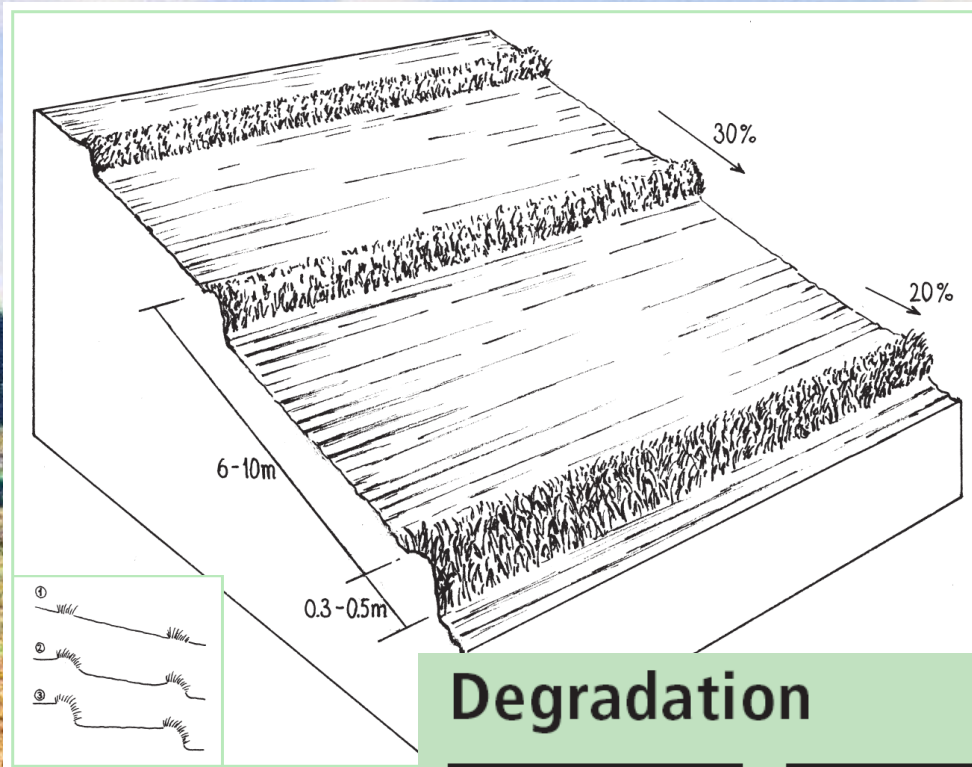
Sub-division 1	Sub-division 2	Sub-division 3	Land use system	Mapping unit id	Action
North exposed	flat slope		Almond-olive orchard (CI)	5	
North exposed	flat slope		Animal farms (Oa)	25	
North exposed	flat slope		Cereals (Ca)	1	
North exposed	flat slope		Grazing land (meadowland and sangeland)	21	

Global spread of SLM

- National and regional maps of degradation and conservation



Costs and Benefits of SLM Technologies ~~WOCAT~~



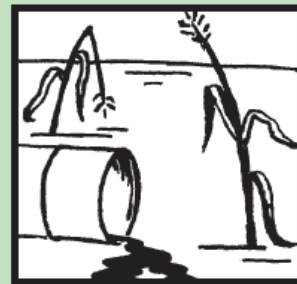
Natural vegeta
Philippines

Within individual cropland
contour and left unploughed
barriers of naturally establis

Degradation

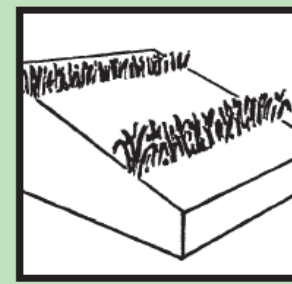


water erosion:
loss of topsoil,
gully

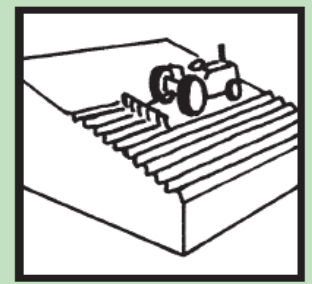


chemical:
fertility decline

SWC measures



vegetative:
narrow grass
barriers



agronomic:
contour plough,
mulching (supp.)

Establishment inputs and costs per ha

Inputs	Costs (US\$)	% met by land user
Labour (5 person days)	15	100%
Equipment		
- Animal traction (32 hours)	40	100%
- Tools (2): Plough and harrow	25	100%
- Stakes (pegs)	4	100%
TOTAL	84	100%

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

Impacts (on- / offsite)

Production and socio-economic benefits

- + + + fodder production/quality increase (or biomass as mulch)
- + + + very low inputs required
- + + farm income increase
- + crop yield increase

Socio-cultural benefits

- + + + improved knowledge SWC/erosion
- + + community institution strengthening
- + + national institution strengthening (government line agencies and educational institutions)

Ecological benefits

- + + + soil cover improvement
- + + + soil loss reduction
- + + + soil structure improvement
- + increase in soil moisture
- + increase in soil fertility
- + biodiversity enhancement

Off-site benefits

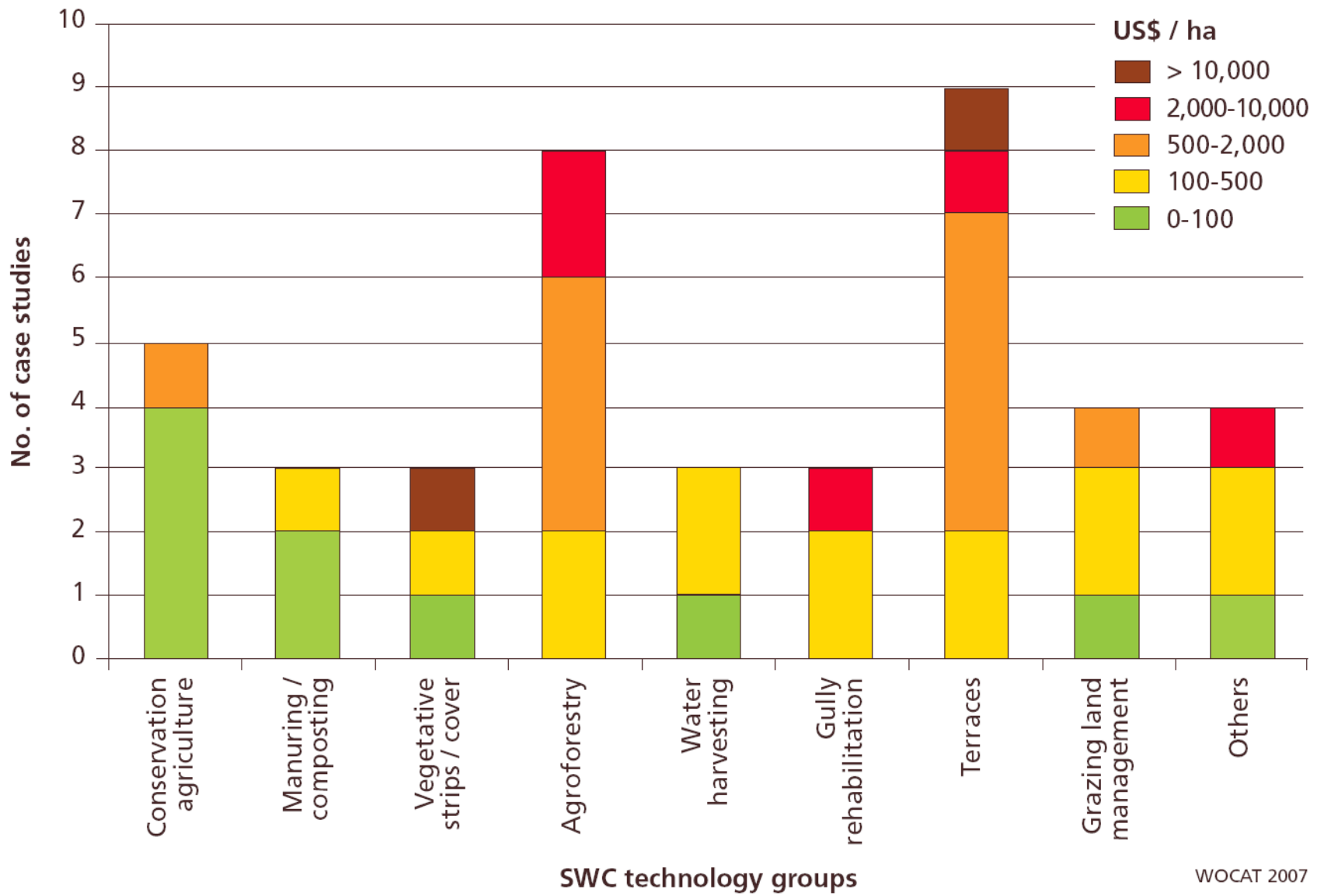
Table 3: A comparison of inputs involved in terrace establishment and maintenance

Technology	Country	Slope	Rainfed/ irrigated	Establishment			Maintenance		
				Person- days/ha	Total costs/ha US \$	% met by land users	Person- days/ ha/year	Total costs/ha/ year US \$	% met by land users
Orchard terraces with bahia grass cover	China	16–30%	Rainfed	350	1,840	70	60	376	100
Loess plateau terraces	China	16–30%	Rainfed	600	1,200	95	12	25	95
<i>Fanya juu</i> terraces	Kenya	5–8%	Rainfed	90	320	100	10	38	100
Rainfed paddy rice terraces	Philipp.	30–60%	Rainfed	800	2,700	100	10	40	100
Traditional stone wall terraces	Syria	16–30%	Rainfed	375	1,270	100	50	160	100
Small level bench terraces	Thailand	8–16%	Rainfed	125	275	100	20	45	100
Stone wall bench terraces	S. Africa	16–30%	Rainfed	420	1,460	100	5	20	100
Traditional irrigated rice terraces ¹	Nepal	30–60%	Irrigated	unknown	unknown	100	125	840	100
Rehabilitation of ancient terraces ²	Peru	30–60%	Irrigated	130	1,400	35	6	126	100

¹ no information on labour input in contraction of these ancient terraces

² refers to rehabilitation of ancient systems, not original establishment

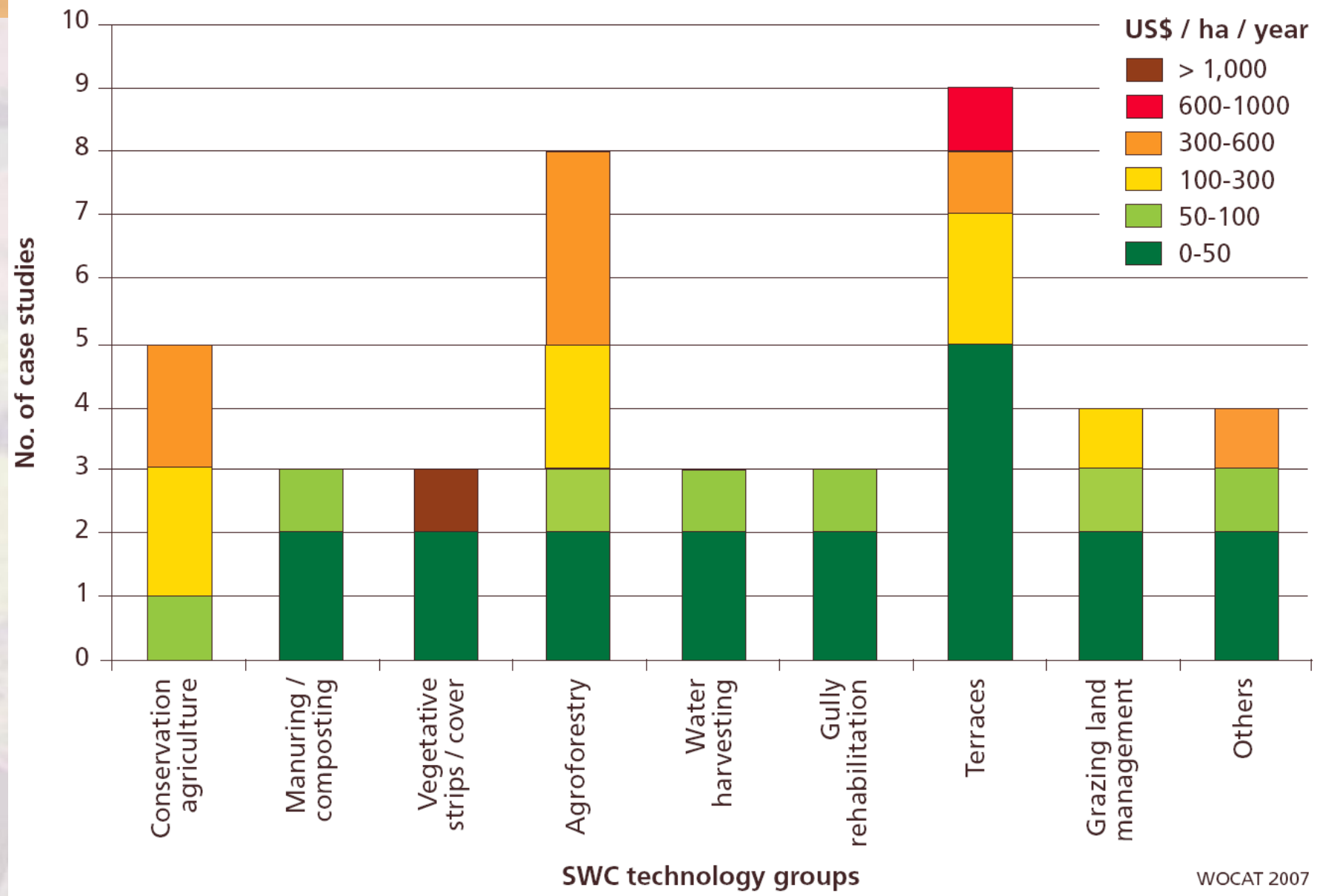
Total establishment costs



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Figure 10 (left part): Establishment costs in relation to the SWC technology groups

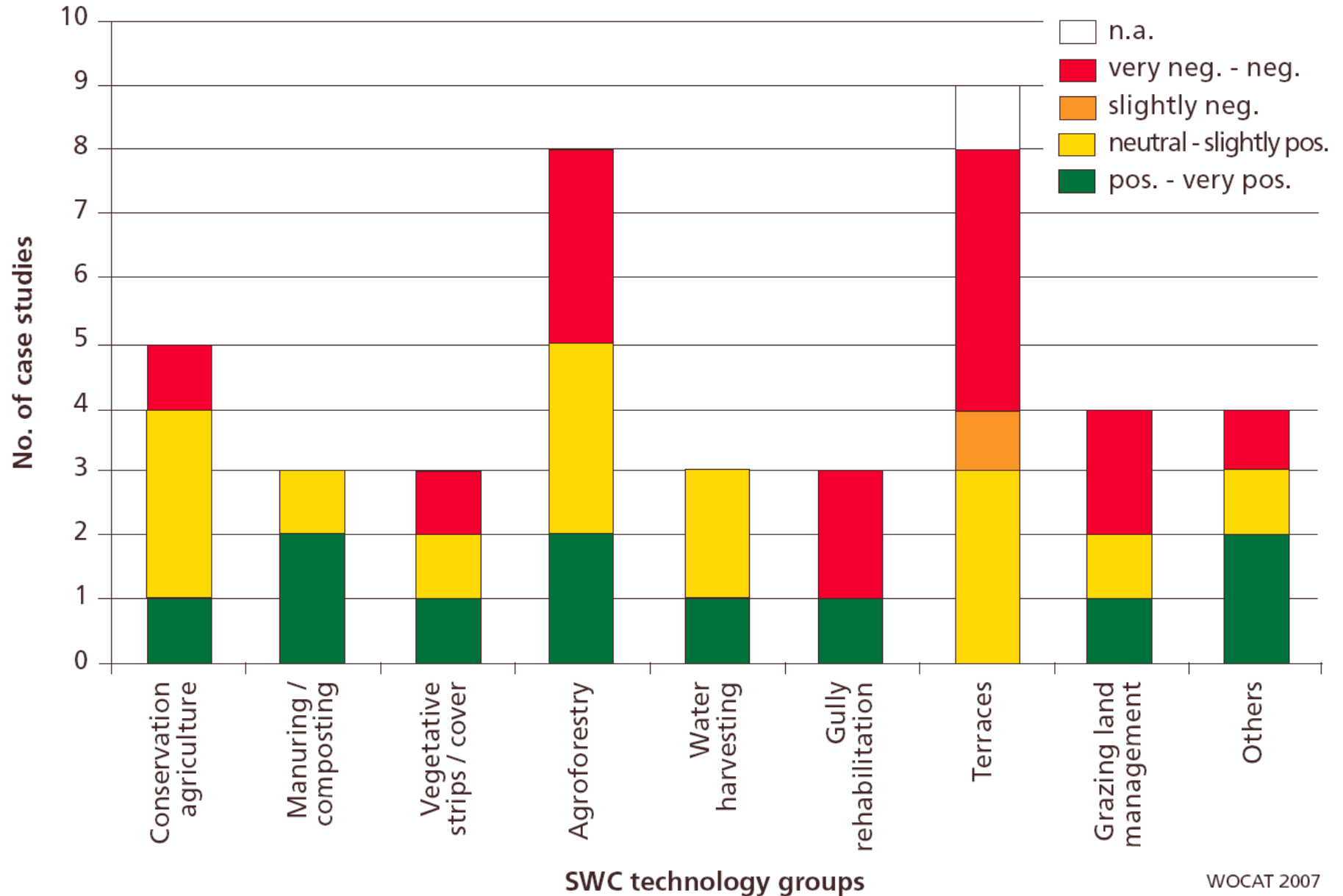
Total maintenance costs



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Figure 10 (right part): Maintenance costs in relation to the SWC technology groups

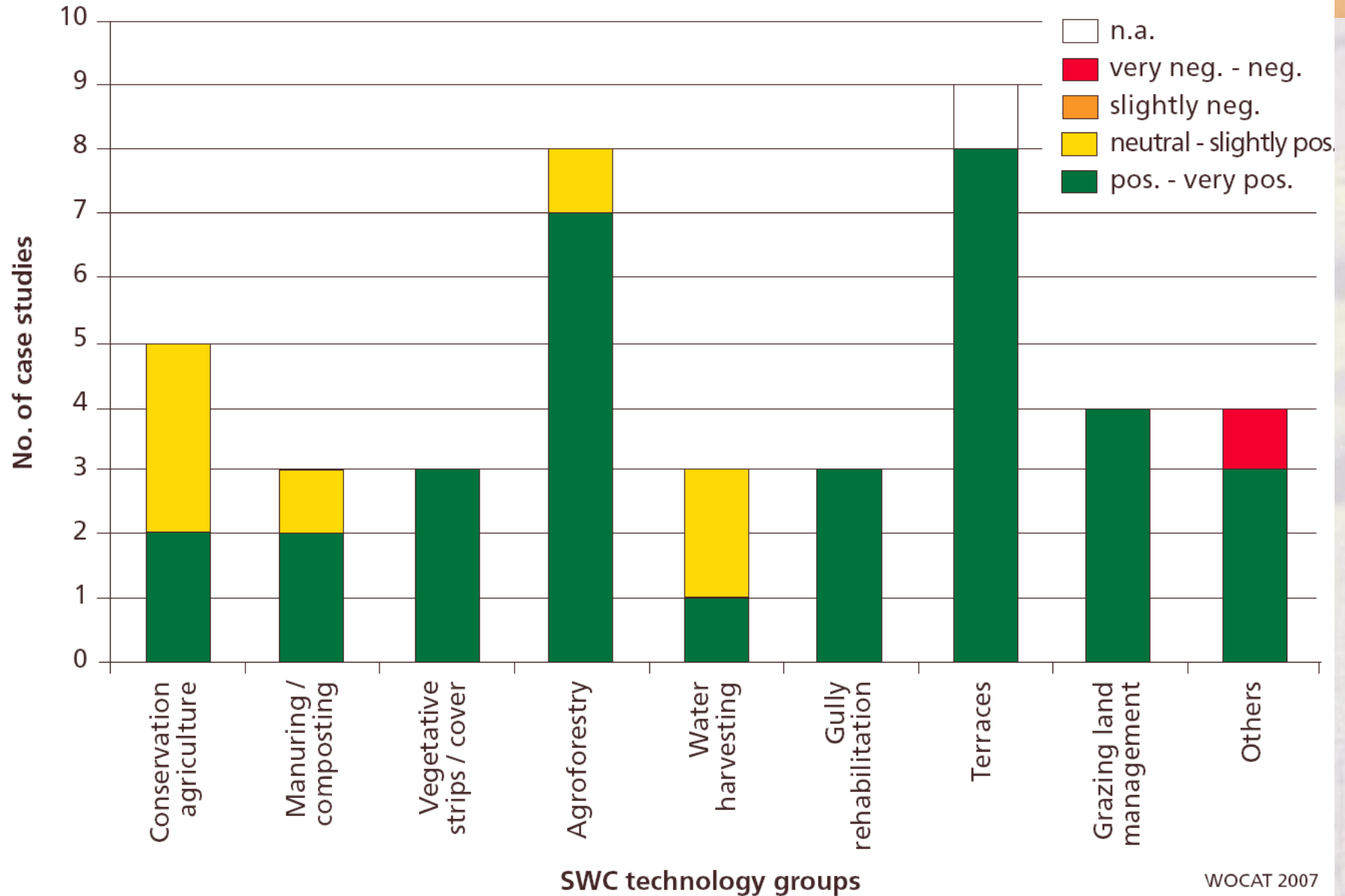
Short-term benefits in relation to establishment costs (a)



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Figure 11 (a) : Perceived benefits of SWC technologies: short-term benefits in relation to establishment costs

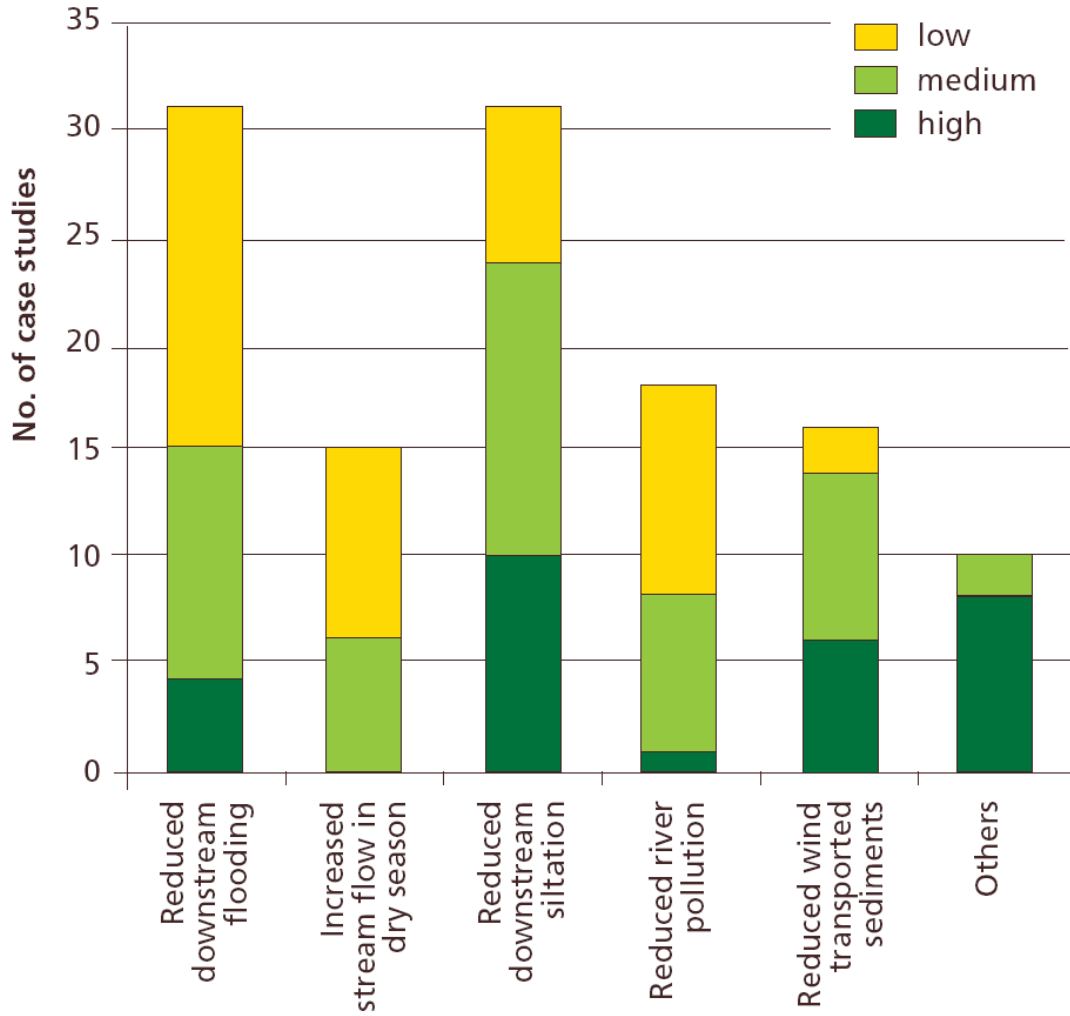
Long-term benefits in relation to establishment costs (c)



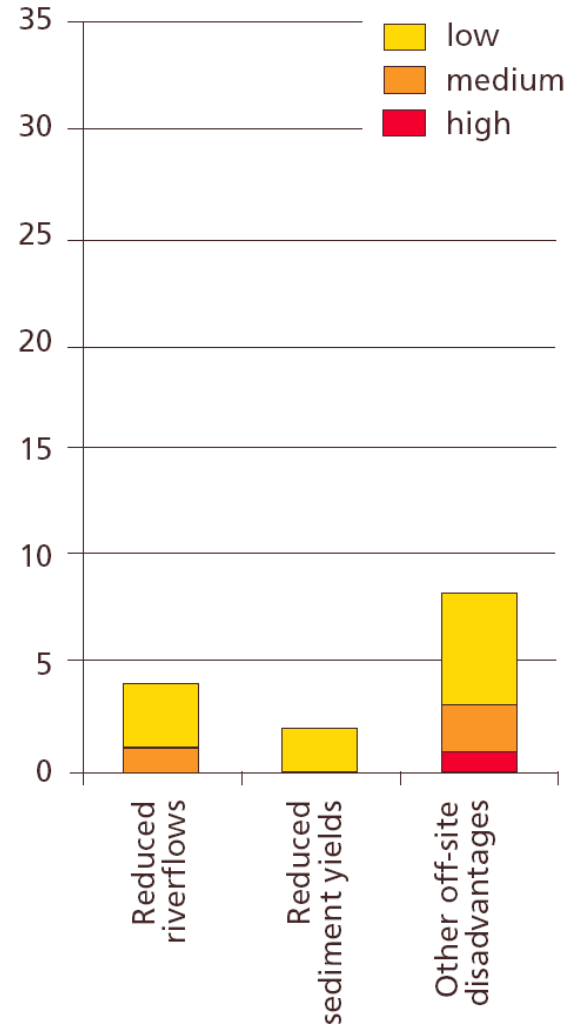
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Figure 11 (c): Perceived benefits of SWC technologies: long-term benefits in relation to establishment costs

Off-site benefits



Off-site disadvantages



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Figure 20: Perceived off-site (generally 'downstream') advantages/ benefits and disadvantages of the technologies described in the case studies.

Challenges



- Economic impacts of SLM measures are often context specific
- Benefits and costs of SLM are often not recognized and understood (land users, technicians, scientists...)
- Very often only qualitative assessments are done/available
- Monetarization of bio-physical and social impacts needs sophisticated methods

WOCAT's contribution:

- WOCAT provides methods for standardized, rigorous and holistic assessment
- WOCAT database can be used as a reference
- Description of SLM technologies with WOCAT methods can provide a solid basis for more sophisticated economic valuation methods
- Economic methods can be integrated in WOCAT's decision support tools