



WOCAT - World Overview of Conservation Approaches and Technologies

Questionnaire on Sustainable Land Management (SLM) Technologies

Version: Core (2016)

A tool to help document, assess, and disseminate SLM practices

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Introduction to the questionnaire

Definitions

Sustainable Land Management (SLM) in the context of WOCAT is defined as the use of land resources – including soils, water, vegetation, and animals – to produce goods and provide services to meet changing human needs, while simultaneously ensuring the long-term productive potential of these resources and the maintenance of their environmental functions.

An **SLM Technology** is a physical practice on the land that controls land degradation, enhances productivity, and/ or other ecosystem services. A Technology consists of one or several measures, such as agronomic, vegetative, structural, and management measures.

An **SLM Approach** defines the ways and means used to implement one or several SLM Technologies. It includes technical and material support, involvement and roles of different stakeholders, etc. An Approach can refer to a project/ programme or to activities initiated by land users themselves.

A modular framework for the documentation and assessment of SLM practices

The ultimate goal of documenting and assessing land management practices is to share and spread valuable knowledge in land management, support evidence-based decision-making, and scale up identified good/ best practices. To achieve this, it is important to analyse field experiences and gain a better understanding of the reasons behind successful SLM practices, regardless of whether they were introduced by projects or whether they are found in traditional systems.

WOCAT focuses on efforts to prevent and reduce land degradation and restore degraded land through improved **land management technologies and approaches to implement these**. All practices may be considered, whether they are traditional or indigenous, newly introduced through projects or programmes, adopted and/ or adapted by land users, or recent innovations.

The **Core Questionnaire on SLM Technologies (QT)** helps to describe and understand the land management practice by addressing the following questions: **what** are the specifications of the Technology, what are the inputs and costs, **where** is it used (natural and human environment), and what **impact** does it have?

The **Core Questionnaire on SLM Approaches (QA)** addresses the questions of **how** implementation was achieved (including capacity building, decision-making, technical and material support, change of legal framework and policies) and **who** achieved it (including all stakeholders involved and their roles). **In the case of projects, WOCAT asks you to document only those components or activities of the project that are relevant to SLM.**

The Core questionnaires on SLM Technologies (QT Core) and on SLM Approaches (QA Core) contain the key questions on sustainable land management. They are the foundation of the WOCAT knowledge base. They are shorter and less time-consuming to fill in than the formerly used “basic” questionnaires.

The WOCAT framework is flexible and open. It enables users to include specific topics, depending on their interests and needs, to expand the standardized WOCAT Core questionnaires. Development of the following **modules** has been completed or initiated: **Climate change adaptation (QC)**, **Climate Change Mitigation/ Carbon Benefits**, **Economics of SLM**, and **Biodiversity**. The realization of additional modules depends on the initiative of interested partners and the mobilization of resources. WOCAT is open for collaboration, joint projects, and further development of the knowledge base. All modules will be docked onto the core version of QT and QA.

A further tool, the **questionnaire on SLM Mapping (QM)**, has been developed to analyse and depict the spatial distribution of SLM and land degradation processes, causes, and impacts.

The questionnaires mentioned above complement each other. All information documented through WOCAT questionnaires is made available in an open-access **online database** and can be used to disseminate SLM knowledge and improve decision-making for further implementation and spreading of SLM practices.

Please read the following notes before filling in the questionnaire:

- It is recommended that the questionnaire be filled in by a **team of SLM specialists – including land users** – with different backgrounds and experience, who are familiar with the details of the SLM Technology (technical, financial, socio-economic).
- **Answer all questions.** If hard or precise data are not available, we ask you to provide a best estimate based on your professional judgement. If certain questions are not applicable or not relevant, indicate “n/a”. Remember that the quality of the results depends entirely on the quality of your answers.
- Questions with the icon  must be answered in consultation with land users. Depending on the Technology, it may be advantageous to answer all questions in consultation with land users.
- Questions with the icon  require measurements or observations in the field.

- *Instructions, explanations, definitions, and examples are indicated in italics. Use the definitions given in this document, even if they deviate from your own/ national definitions (e.g. land use, slope classes, etc.).*
- **Square boxes must be ticked!** If “Several answers possible” is not indicated, tick only one box!
- **Make use of existing documents and seek advice from other SLM specialists and land users as much as possible in order to improve the quality of the data.**
- *If you do not have enough space for answers, use the empty pages at the end of the questionnaire for additional information. Please always make proper reference to particular questions and page numbers!*
- **Attach good technical drawings, photographs (including descriptions), references, etc.**
- *Please fill in a separate questionnaire for each Approach and each Technology (i.e. one questionnaire per Approach; one questionnaire per Technology). An Approach should be linked with one or several Technologies. Together, the two questionnaires (on SLM Technologies and on SLM Approaches) describe a case study within a selected area.*
- *The questionnaire was designed to document SLM Technologies. However, it can also be used for any land use management practice which is considered **non-sustainable**. If the objective is to compare situation 1 (before or without SLM measures) with situation 2 (after or with SLM measures), or to assess two different technologies and compare their impacts within the same land use system, fill in two separate questionnaires. Questionnaire 1 has to be filled in completely. In Questionnaire 2, it is sufficient to fill in the answers that differ from those given in Questionnaire 1. Indicate reference/ link between questionnaires in question 1.6.*
- *Fill in the questionnaire **carefully and legibly**.*
- **Please enter the information in the WOCAT online database, see gcat.wocat.net.**

1. General information

1.1 Name of the SLM Technology (hereafter referred to as the Technology)

Name:

Locally used name:

Country:

1.2 Contact details of resource persons and institutions involved in the assessment and documentation of the Technology

Compiler

The person who conducted the interviews, compiled the information, and filled in the questionnaire.

Last name: First name(s): female
 male

Name of institution:

Address of institution:

Postal Code: City:

State or District: Country:

Phone no. 1: Phone no. 2 (mobile)

E-mail 1: E-mail 2:

Optional: Add a photo of the compiler and indicate filename here:

Key resource person(s)

Person(s) who provided most of the information documented in this questionnaire. These can be land users, SLM specialists (e.g. technical advisers, researchers), or any other persons.

Specify the key resource person: land user¹ SLM specialist/ technical adviser other (specify):

.....

Last name: First name(s): female
 male

Name of institution:

Address of institution:

Postal Code: City:

State or District: Country:

Phone no. 1: Phone no. 2 (mobile)

E-mail 1: E-mail 2:

Optional: Provide a photo of the key resource person(s) and indicate filename here:

¹ **Land user:** *the person/ entity who implements/ maintains the Technology. The term land user may refer to individual small- or large-scale farmers, groups (gender, age, status, interest), cooperatives, industrial companies (e.g. mining), government institutions (e.g. state forest), etc.*

Name of the institution(s) which facilitated the documentation/ evaluation of the Technology (if relevant):

Name of project which facilitated the documentation/ evaluation of the Technology (if relevant):

Note: You may upload the logo(s) of your institution/ project to the WOCAT database.

Indicate further resource persons who have provided information on the Technology (if relevant):

Resource person 2: land user SLM specialist/ technical adviser other (specify):

Last name: First name(s): female
male

Name of institution:

Address:

..... Country:

Phone no. 1: Phone no. 2 (mobile)

E-mail 1: E-mail 2:

Resource person 3: land user SLM specialist/ technical adviser other (specify):

Last name: First name(s): female
male

Name of institution:

Address:

..... Country:

Phone no. 1: Phone no. 2 (mobile)

E-mail 1: E-mail 2:

Resource person 4: land user SLM specialist/ technical adviser other (specify):

Last name: First name(s): female
male

Name of institution:

Address:

..... Country:

Phone no. 1: Phone no. 2 (mobile)

E-mail 1: E-mail 2:

1.3 Conditions regarding the use of data documented through WOCAT

When were the data compiled (in the field)?:

The compiler and key resource person(s) accept the conditions regarding the use of data documented through WOCAT:

yes no

Note: If you do not accept the conditions regarding the use of data documented through WOCAT, you will not be able to enter and edit data in the WOCAT database.

Conditions regarding the use of data documented through WOCAT

- *Data captured through WOCAT questionnaires will be entered, edited, and stored in the WOCAT online database by the compiler or a data entry person assigned by the compiler. Overall responsibility for compilation and data quality lies with the compiler. The compiler, resource persons, and data entry person will be recorded and given credit for the data in the database as well as in any compilation or publication of the documented Technology.*
- *Data stored in the WOCAT database are open access.*
- *Data are made available for users under the [Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License](http://creativecommons.org/licenses/by-nc-sa/3.0/legalcode).*

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1.4 Declaration on sustainability of the described Technology

Note that WOCAT questionnaires focus on the documentation and assessment of SLM practices. However, this questionnaire can also be used to describe a non-sustainable land management practice if you wish to compare this practice with specific SLM Technologies. In this case, indicate reference to those SLM Technologies in question 1.6.

Is the Technology described here problematic with regard to land degradation, so that it cannot be declared a *sustainable* land management technology?

yes no

Comments:
.....

1.5 Reference to Questionnaire(s) on SLM Approaches

To understand properly the implementation of the Technology, the associated SLM Approach must be described. Name the corresponding Approach and its compiler below, and make sure that a link is created in the database.

Name of SLM Approach: Compiler:

1.6 Reference to/ comparison with other Technologies

If the Technology described in this questionnaire is part of a comparative assessment of different Technologies/ situations, please indicate details.

Name of other SLM Technology/Technologies: Compiler:

2.4 Videos of the Technology

If video files presenting the Technology are available, upload them to a public platform (e.g. vimeo.com, youtube.com) and indicate a link and a short description for each file in the table below.

Link	Comments, short description	Date and location	Name of videographer

2.5 Country/ region/ locations where the Technology has been applied and which are covered by this assessment

The described Technology might be applied in various sites. However, restrict information given in this questionnaire to only those sites that have been assessed/ analysed in the documentation process (through field visits, interviews with respective land users, reports, etc.). Do not include other sites where the same Technology is applied but no data have been collected.

Country: Region/ State/ Province:

Further specification of location (e.g. municipality, town, etc.), if relevant::

Number of sites considered/ analysed in the documentation of this Technology:

single site 2-10 sites 10-100 sites 100-1,000 sites > 1,000 sites

Site: A site can be a single plot or a larger area managed by individuals or a community, or a place where specific infrastructure has been implemented (e.g. dam).

Geo-referenced information (coordinates) of the sites where the Technology was documented (reference sites):

Name of location, name of land user, etc.	Longitude	Latitude

Comments:

2.6 Date of implementation

Indicate year of implementation:

If precise year is not known, indicate approximate date:

less than 10 years ago (recently) 10-50 years ago more than 50 years ago (traditional)

2.7 Introduction of the Technology

Specify how the Technology was introduced:

- | | |
|---|--|
| <input type="checkbox"/> through land users' innovation | Comments (type of project, etc.) |
| <input type="checkbox"/> as part of a traditional system (> 50 years) | ..... |
| <input type="checkbox"/> during experiments/ research | ..... |
| <input type="checkbox"/> through projects/ external interventions | ..... |
| <input type="checkbox"/> other (specify): | |

The terms **traditional** and **innovation** refer to the land users' own technologies. They cover technologies that have been in use for generations, as well as those developed more recently by innovative land users in response to changing circumstances. Use "other" when the Technology does not fit any of the given categories and specify why it does not fit.

3. Classification of the SLM Technology

3.1 Main purpose(s) of the Technology



Several answers possible.

- improve production (crop, fodder, wood/ fibre, water, energy)
- reduce, prevent, restore land degradation (soil, water, vegetation)
- conserve ecosystem
- protect a watershed/ downstream areas – in combination with other Technologies
- preserve/ improve biodiversity
- reduce risk of disasters (e.g. droughts, floods, landslides)
- adapt to climate change/ extremes and its impacts (e.g. resilience to droughts, storms)
- mitigate climate change and its impacts (e.g. through carbon sequestration)
- create beneficial economic impact (e.g. increase income/ employment opportunities)
- create beneficial social impact (e.g. reduce conflicts on natural resources, support marginalized groups)
- other purpose (specify):



3.2 Current land use type(s) where the Technology is applied

See definitions of land use, land use types, and subcategories below.

<i>Select land use type</i> <small>Usually one, max. two ticks</small>	<i>Select one or more subcategories</i> <small>Several answers possible</small>	<i>Specify major products/ services/ remarks</i>
<input type="checkbox"/> cropland	<input type="checkbox"/> Annual cropping <input type="checkbox"/> Perennial cropping <input type="checkbox"/> Tree and shrub cropping <input type="checkbox"/> Other (specify):	Main crops (cash and food crops):
<input type="checkbox"/> grazing land	<p>Extensive grazing</p> <input type="checkbox"/> Nomadism <input type="checkbox"/> Semi-nomadism/ pastoralism <input type="checkbox"/> Ranching	Main animal species and products:
	<p>Intensive grazing</p> <input type="checkbox"/> Cut-and-carry/ zero grazing <input type="checkbox"/> Improved pasture <input type="checkbox"/> Other (specify): .....	..... ..... .....
<input type="checkbox"/> forest/ woodlands	<p>(Semi-)natural forests/ woodlands</p> <input type="checkbox"/> Selective felling <input type="checkbox"/> Clear felling <input type="checkbox"/> Shifting cultivation <input type="checkbox"/> Dead wood/ prunings removal <input type="checkbox"/> Non-wood forest use	Products and services: <input type="checkbox"/> Timber <input type="checkbox"/> Fuelwood <input type="checkbox"/> Fruits and nuts <input type="checkbox"/> Other forest products (honey, medicinal plants, etc.)
	<p>Tree plantation, afforestation</p> <input type="checkbox"/> Monoculture local variety <input type="checkbox"/> Monoculture exotic variety <input type="checkbox"/> Mixed varieties <input type="checkbox"/> Other (specify):	<input type="checkbox"/> Grazing/ browsing <input type="checkbox"/> Nature conservation/protection <input type="checkbox"/> Recreation/ tourism <input type="checkbox"/> Protection against natural hazards <input type="checkbox"/> Other (specify):

<input type="checkbox"/> mixed (crops/ grazing/ trees), incl. agroforestry	<input type="checkbox"/> Agroforestry <input type="checkbox"/> Agro-pastoralism <input type="checkbox"/> Agro-silvopastoralism <input type="checkbox"/> Silvo-pastoralism <input type="checkbox"/> Other (specify):	Main products/ services:
<input type="checkbox"/> settlements, infrastructure	<input type="checkbox"/> Settlements, buildings <input type="checkbox"/> Traffic: roads, railways <input type="checkbox"/> Energy: pipelines, power lines <input type="checkbox"/> Other (specify):	Remarks:
<input type="checkbox"/> waterways, waterbodies, wetlands	<input type="checkbox"/> Drainage lines, waterways <input type="checkbox"/> Ponds, dams <input type="checkbox"/> Swamps, wetlands..... <input type="checkbox"/> Other (specify):	Main products/ services:
<input type="checkbox"/> mines, extractive industries	Specify:	Main products:
<input type="checkbox"/> unproductive land	Specify:	Remarks:
<input type="checkbox"/> other (specify):	Specify:	Remarks:

Comments:

.....

If land use has changed due to the implementation of the Technology, indicate land use before implementation of the Technology:

Choose from the land use types and subcategories listed below.
Land use: human activities which are directly related to land, making use of its resources or having an impact on it.
Land cover: vegetation (natural or planted) or man-made structures (buildings, etc.) that cover the earth's surface.

Land use types

Main categories	Subcategories
Cropland: land used for cultivation of crops (field crops, orchards)	<ul style="list-style-type: none"> • Ca: Annual cropping: land under temporary/ annual crops usually harvested within one, maximally two years (e.g. maize, paddy rice, wheat, vegetables, fodder crops) • Cp: Perennial (non-woody) cropping: land under permanent (not woody) crops that may be harvested after 2 or more years, or where only part of the plants are harvested (e.g. sugar cane, banana, sisal, pineapple) • Ct: Tree and shrub cropping: permanent woody plants with crops harvested more than once after planting and usually lasting for more than 5 years (e.g. orchard/ fruit trees, coffee, tea, grapevines, oil palm, cacao, coconut, fodder trees)
Grazing land: land used for animal production	<ul style="list-style-type: none"> • Ge: Extensive grazing land: grazing on natural or semi-natural grasslands, grasslands with trees/ shrubs (savannah vegetation) or open woodlands for livestock and wildlife. Includes the following subcategories: <ul style="list-style-type: none"> • Nomadism: people move with animals • Semi-nomadism/ pastoralism: animal owners have a permanent place of residence where supplementary cultivation is practiced. Herds are moved to distant grazing grounds. • Ranching: grazing within well-defined boundaries, movements cover smaller distances and management inputs are higher compared to semi-nomadism. • Gi: Intensive grazing/ fodder production: improved or planted pastures for grazing/ production of fodder (for cutting and carrying: hay, leguminous species, silage etc.) not including fodder crops such as maize, cereals. These are classified as annual crops (see above). Intensive grazing can be subclassified into: <ul style="list-style-type: none"> • Cut-and-carry/ zero grazing: carrying fodder to animals confined to a stall/ shed or another restricted area; in zero-grazing systems the livestock are not permitted to graze at any time • Improved pastures: pasture that is sown with a mixture of introduced grasses and legumes (can be fertilized and/ or inoculated with rhizobia to fix nitrogen).

<i>Forests/ woodlands: land used mainly for wood production, other forest products, recreation, protection.</i>	<ul style="list-style-type: none"> • Fn: Natural or semi-natural: forests mainly composed of indigenous trees, not planted by man <ul style="list-style-type: none"> • Selective felling • Clear felling: felling the whole forest at one time • Shifting cultivation: felling (harvesting) only certain valuable trees within a forest • Dead wood/ prunings removal (no cutting of trees) • Non-wood forest use (e.g. fruit, nuts, mushrooms, honey, medicinal plants, etc.) • Fp: Plantations, afforestations: forest stands established by planting or/ and seeding in the process of afforestation or reforestation <ul style="list-style-type: none"> • Monoculture local variety • Monoculture exotic variety • Mixed varieties • Fo: Other: e.g. selective cutting of natural forests and incorporating planted species
<i>Mixed: mixture of land use types within the same land unit (includes agroforestry)</i>	<ul style="list-style-type: none"> • Mf: Agroforestry: cropland and trees • Mp: Agro-pastoralism: cropland and grazing land (including seasonal change between crops and livestock) • Ma: Agro-silvopastoralism: cropland, grazing land and trees (including seasonal change between crops and livestock) • Ms: Silvo-pastoralism: forest and grazing land • Mo: Other: other mixed land
<i>Settlements, infrastructure</i>	<ul style="list-style-type: none"> • Ss: Settlements, buildings • St: Traffic lines: roads, railways • Se: Energy lines: pipe lines, power lines • So: Other infrastructure
<i>Waterways, waterbodies, wetlands</i>	<ul style="list-style-type: none"> • Wd: Drainage lines waterways • Wp: Ponds, dams • Ws: Swamps, wetlands • Wo: Other waterways
<i>Mines, extractive industries</i>	<ul style="list-style-type: none"> • I: Mines, extractive industries
<i>Unproductive land</i>	<ul style="list-style-type: none"> • U: Wastelands, deserts, glaciers, etc.



3.3 Further information about land use

Water supply for the land on which the Technology is applied:

rainfed mixed rainfed–irrigated full irrigation other (e.g. post-flooding):

Comment:

Rainfed: crop(s) establishment and development is completely determined by rainfall.

Mixed rainfed–irrigated: the application of a limited amount of water to the crop when rainfall fails to provide sufficient water for plant growth, to increase and stabilize yield; the additional water alone is inadequate for crop production.

Full irrigation: any of several means of an artificial regular supply of water, in addition to rain, to the crop(s).

Post-flooding: after rainwater has naturally flooded the field (e.g. in Wadis, riverbanks), the water infiltrated into the soil is used intentionally as a water reserve for crop cultivation. The crop(s) use(s) this water reserve for establishment.

Number of growing seasons per year: 1 2 3 Specify:

Livestock density (if relevant):

3.4 SLM group to which the Technology belongs

Assign the described Technology to one of the following SLM groups. If this is not possible, select several (max. 3) groups to represent the Technology:

- natural and semi-natural forest management
- forest plantation management
- agroforestry
- windbreak/ shelterbelt
- area closure (stop use, support restoration)
- rotational system (crop rotation, fallows, shifting cultivation)
- pastoralism and grazing land management
- integrated crop–livestock management
- improved ground/ vegetation cover

- minimal soil disturbance
- integrated soil fertility management
- cross-slope measure
- integrated pest and disease management (incl. organic agriculture)
- improved plant varieties/ animal breeds
- water harvesting
- irrigation management (incl. water supply, drainage)
- water diversion and drainage
- surface water management (spring, river, lakes, sea)
- groundwater management
- wetland protection/ management
- waste management/ waste water management
- energy efficiency
- beekeeping, aquaculture, poultry, rabbit farming, silkworm farming, etc.
- home gardens
- ecosystem-based disaster risk reduction
- post-harvest measures
- other (specify):

Natural and semi-natural forest management: encompasses administrative, legal, technical, economic, social, and environmental aspects of the conservation and use of forests.

Forest plantation management: plantation forests comprise even-aged monocultures and are established primarily for wood and fibre production. They are usually intensively managed and have relatively high growth rates and productivity.

Agroforestry: integrates the use of woody perennials with agricultural crops and/ or animals for a variety of benefits and services including better use of soil and water resources; multiple fuel, fodder, and food products; and habitat for associated species.

Windbreak: or shelterbelt is a plantation usually made up of one or more rows of trees or shrubs planted in such a manner as to provide shelter from the wind and to protect soil from erosion. They are commonly planted around the edges of fields on farms.

Area closure (stop use, support restoration): enclosing and protecting an area of degraded land from human use and animal interference, to permit natural rehabilitation, enhanced by additional vegetative and structural conservation measures.

Rotational systems (crop rotation, fallows, shifting cultivation): is the practice of growing a series of dissimilar/ different types of crops/ plants in the same area in sequenced season, letting it fallow for a period of time, shifting cultivation is an agricultural system in which plots of land are cultivated temporarily, then abandoned and allowed to revert to their natural vegetation while the cultivator moves on to another plot.

Pastoralism and grazing land management: is the grazing of animals on natural or semi-natural grassland, grassland with trees, and/ or open woodlands. Animal owners may have a permanent residence while livestock is moved to distant grazing areas, according to the availability of resources

Integrated crop–livestock management: optimizes the uses of crop and livestock resources through interaction and the creation of synergies.

Improved ground/ vegetation cover: any measures that aim to improve the ground cover be it by dead material/ mulch or vegetation

Minimal soil disturbance refers to no-tillage or low soil disturbance only in small strips and/ or shallow depth and direct seeding.

Integrated soil fertility management (ISFM) aims at managing

Improved plant varieties/ animal breeds: refers to the development of new plant varieties or animal breeds that offer benefits such as improved production, resistance to pests and diseases, or drought tolerance, in response to changing environmental conditions and land users' needs.

Water harvesting: is the collection and management of floodwater or rainwater runoff to increase water availability for domestic and agricultural use as well as ecosystem sustenance.

Irrigation management (incl. water supply, drainage) aims to achieve higher water use efficiency through more efficient water collection and abstraction, water storage, distribution, and water application.

Water diversion and drainage: is the natural or artificial diversion or removal of surface and sub-surface water from an area

Surface water management (spring, river, lakes, sea): involves the protection of springs, rivers, and lakes from pollution, high water flows(floods), or over-abstraction of water, as well as protection measures against damage from waterbodies (e.g. river bank erosion, floods, tidal erosion)

Groundwater management: involves securing the recharge of groundwater reserves and their protection from pollution, overexploitation/ overuse, and rising groundwater levels leading to salinization.

Wetland protection/ management: managing wetland typically involves manipulating water levels and vegetation in the wetland, and providing an upland buffer.

Waste management/ waste water management: is a set of activities that include collection, transport, treatment and disposal of waste, prevention of waste production, and modification and reuse/ recycling of waste.

Energy efficiency technologies: reduce the amount of energy required to provide products and services, e.g. for cooking and heating, reducing the demand for fuel (fossil, wood).

Beekeeping, aquaculture, poultry, rabbit farming, silkworm farming, etc.: allow food production and agricultural products requiring small surfaces of the land.

Home gardens (also called backyard or kitchen gardens): are a traditional multifunctional farming system applied on a small area of land around the family home. They have the potential

soil by combining different methods of soil fertility amendment together with soil and water conservation. ISFM is based on three principles: maximizing the use of organic sources of fertilizer (e.g. manure and compost application, nitrogen-fixing green manure and cover crops); minimizing the loss of nutrients; and judiciously using inorganic fertilizer according to needs and economic availability.

Cross-slope measures: are constructed on sloping lands in the form of earth or soil bunds, stone lines, or vegetative strips, etc. for reducing runoff velocity and soil erosion.

Integrated pest and disease management (incl. organic agriculture): Integrated pest and disease management is a process to solve pest and disease problems while minimizing risks to people and the environment.

to supply most of the non-staple foods (including vegetables, fruits, herbs, animals and fish). They also provide a space for recreation, leisure, and relaxation.

Ecosystem-based Disaster Risk Reduction: is the sustainable management, conservation, and restoration of ecosystems with the aim of enabling these ecosystems to provide services that mitigate hazards, reduce vulnerability, and increase livelihood resilience.

Post-harvest measures: encompasses activities to deliver a crop from harvest to consumption with minimum loss, maximum efficiency, and maximum return for all involved – such as drying, storage, cooling, cleaning, sorting, and packing.

3.5 Spread of the Technology

Specify the spread of the Technology:

- evenly spread over an area (e.g. mulching, series of terraces, afforestation, micro-catchments)
- applied at specific points/ concentrated on a small area (e.g. water points, dams, compost production pits, smallstock stables, hydropower stations)

If the Technology is evenly spread over an area, indicate approximate area covered:

- < 0.1 km² (10 ha)
- 0.1-1 km²
- 1-10 km²
- 10-100 km²
- 100-1,000 km²
- 1,000-10,000 km²
- > 10,000 km²

Comments:

.....

3.6 SLM measures comprising the Technology

Use the SLM measures and subcategories listed below. Several answers possible.

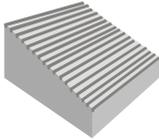
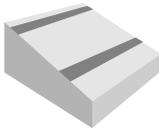
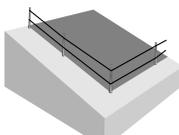
- | Select SLM measure | Select one or more subcategories/ codes (see definitions below) |
|--|---|
| <input type="checkbox"/> agronomic measures | |
| <input type="checkbox"/> vegetative measures | |
| <input type="checkbox"/> structural measures | |
| <input type="checkbox"/> management measures | |
| <input type="checkbox"/> other measures | |

Comments/ remarks:

.....

SLM measures – the constituents of a Technology

SLM measures fall into five categories: agronomic, vegetative, structural, management, and other. Measures are components of Technologies. Each Technology is made up of one or – very commonly – a combination of measures: For instance, terraces – a typical structural measure – are often combined with other measures, such as grass on the risers for stabilization and fodder (vegetative measure), or contour ploughing (agronomic measure).

Type of measure	Subcategories	Examples
<p>Agronomic measures</p>  <ul style="list-style-type: none"> are usually associated with annual crops are repeated routinely each season or in a rotational sequence are of short duration and not permanent do not lead to changes in slope profile are normally independent of slope 	<p>A1: Vegetation/ soil cover</p> <p>A2: Organic matter/ soil fertility</p> <p>A3: Soil surface treatment</p> <p>A4: Subsurface treatment</p> <p>A5: Seed management, improved varieties</p> <p>A6: Others</p>	<p><i>Mixed cropping, intercropping, relay cropping, cover cropping</i></p> <p><i>Conservation agriculture, production and application of compost/ manure, mulching, trash lines, green manure, crop rotations</i></p> <p><i>Zero tillage (no-till), minimum tillage, contour tillage</i></p> <p><i>Breaking compacted subsoil (hard pans), deep ripping, double digging</i></p> <p><i>Production of seeds and seedlings, seed selection, seed banks, development/ production of improved varieties</i></p>
<p>Vegetative measures</p>  <ul style="list-style-type: none"> involve the use of perennial grasses, shrubs, or trees are of long duration often lead to a change in slope profile are often aligned along the contour or against the prevailing wind direction are often spaced according to slope 	<p>V1: Tree and shrub cover</p> <p>V2: Grasses and perennial herbaceous plants</p> <p>V3: Clearing of vegetation</p> <p>V4: Replacement or removal of alien/ invasive species</p> <p>V5: Others</p>	<p><i>Agroforestry, windbreaks, afforestation, hedges, live fences</i></p> <p><i>Grass strips along the contour, vegetation strips along riverbanks</i></p> <p><i>Fire breaks, reduced fuel for forest fires</i></p> <p><i>Cutting of undesired trees and bushes</i></p> <p><i>Tree nurseries</i></p>
<p>Structural measures</p>  <ul style="list-style-type: none"> are of long duration or permanent often require substantial inputs of labour or money when first installed involve major earth movements and/ or construction with wood, stone, concrete, etc. are often carried out to control runoff, erosion, and wind velocity, and to harvest rainwater often lead to a change in slope profile are often aligned along the contour/ against prevailing wind direction are often spaced according to slope <p><i>If structures are stabilized by means of vegetation, also select relevant vegetative measures!</i></p>	<p>S1: Terraces</p> <p>S2: Bunds, banks</p> <p>S3: Graded ditches, channels, waterways</p> <p>S4: Level ditches, pits</p> <p>S5: Dams, pans, ponds</p> <p>S6: Walls, barriers, palisades, fences</p> <p>S7: Water harvesting/ supply/ irrigation equipment</p> <p>S8: Sanitation/ waste water structures</p> <p>S9: Shelters for plants and animals</p> <p>S10: Energy saving measures</p> <p>S11: Others</p>	<p><i>Bench terraces (slope of terrace bed <6%); Forward-sloping terraces (slope of terrace bed >6%)</i></p> <p><i>Earth bunds, stone bunds (along the contour or graded), semi-circular bunds ("demi-lunes")</i></p> <p><i>Diversion/ drainage ditch, waterways to drain and convey water</i></p> <p><i>Retention / infiltration ditches, planting holes, micro-catchments</i></p> <p><i>Dams for flood control, dams for irrigation, sand dams</i></p> <p><i>Sand dune stabilization, rotational grazing (using fences), area closure, gully plugs (check dams)</i></p> <p><i>Rooftop water harvesting, water intakes, pipes, tanks, etc.</i></p> <p><i>Compost toilet, septic tanks, constructed treatment wetlands</i></p> <p><i>Greenhouses, stables, shelters for plant nurseries</i></p> <p><i>Wood-saving stoves, insulation of buildings, renewable energy sources (solar, biogas, wind, hydropower)</i></p> <p><i>Compost production pits; reshaping of surface (slope reduction)</i></p>
<p>Management measures</p>  <ul style="list-style-type: none"> involve a fundamental change in land use usually involve no agronomic and structural measures often result in improved vegetative 	<p>M1: Change of land use type</p> <p>M2: Change of management/ intensity level</p> <p>M3: Layout according to natural and human environment</p>	<p><i>Area closure/ resting, protection, change from cropland to grazing land, from forest to agroforestry, afforestation</i></p> <p><i>Change from grazing to cutting (for stall feeding), farm enterprise selection (degree of mechanization, inputs, commercialization), vegetable production in greenhouses, irrigation; from mono-cropping to rotational cropping; from continuous cropping to managed fallow; from open access to controlled access (grazing land, forests); from herding to fencing, adjusting stocking rates, rotational grazing</i></p> <p><i>Exclusion of natural waterways and hazardous areas, separation of grazing types, distribution of water</i></p>

<ul style="list-style-type: none"> cover often reduce the intensity of use 	<p>M4: Major change in timing of activities</p> <p>M5: Control/ change of species composition (if annually or in a rotational sequence as done e.g. on cropland → A1)</p> <p>M6: Waste management (recycling, re-use or reduce)</p> <p>M7: Others</p>	<p>points, salt licks, livestock pens, dips (grazing land); increase of landscape diversity, forest aisle</p> <p>Land preparation, planting, cutting of vegetation</p> <p>Reduction of invasive species, selective clearing, encouragement of desired/ introduction of new species, controlled burning (e.g. prescribed fires in forests/ on grazing land)/ residue burning</p> <p>Includes both artificial and natural methods for waste management</p>
<p>Other measures</p> <ul style="list-style-type: none"> comprises any measures which do not fit into the above categories 		<p>Beekeeping, smallstock farming (e.g. poultry, rabbits), fish ponds; food storage and processing (including post-harvest loss reduction)</p>
<p>Combinations</p> <ul style="list-style-type: none"> occur where different measures complement each other and thus enhance each other's effectiveness may comprise any two or more of the above measures 		<p>Terrace (S1) + Grass strips and trees along riser (V2, V1) + Contour tillage (A3)</p> <p>Zero grazing/ stall feeding (M2) + Construction of stables and fence (S10) + Compost/ manure production pits (S12) + Application of manure and compost on cropland (A2)</p>



3.7 Main types of land degradation addressed by the Technology

Land degradation: Degradation of land resources, including soils, water, vegetation, and animals.

Use the degradation types and subcategories listed below. Several answers possible. Detailed information on the causes of land degradation may be documented using the WOCAT Mapping Tool.

Select degradation type	Select one or more subcategories/ codes (see definitions below)
<input type="checkbox"/> soil erosion by water
<input type="checkbox"/> soil erosion by wind
<input type="checkbox"/> chemical soil deterioration
<input type="checkbox"/> physical soil deterioration
<input type="checkbox"/> biological degradation
<input type="checkbox"/> water degradation
<input type="checkbox"/> other

Comments/ remarks (e.g. human-induced and natural causes of degradation):

.....

Degradation types

W: Soil erosion by water

- Wt Loss of topsoil/ surface erosion: even removal of top soil, sheet and interrill erosion
- Wg Gully erosion/ gullying
- Wm Mass movements/ landslides
- Wr Riverbank erosion
- Wc Coastal erosion
- Wo Offsite degradation effects: deposition of sediments, downstream flooding, siltation of reservoirs and waterways, and pollution of water bodies with eroded sediments

E: Soil erosion by wind

- Et Loss of topsoil: uniform displacement
- Ed Deflation and deposition: uneven removal of soil material
- Eo Offsite degradation effects: covering of the terrain with windborne sand particles from distant sources ("overblowing")

C: Chemical soil deterioration

- Cn Fertility decline and reduced soil organic matter content (not caused by erosion): e.g. leaching, soil fertility mining, nutrient oxidation and volatilization (N)
- Ca Acidification: lowering of the soil pH
- Cp Soil pollution: contamination of the soil with toxic materials
- Cs Salinization/ alkalization: a net increase of the salt content of the (top) soil leading to a productivity decline

P: Physical soil deterioration

- Pc Compaction: deterioration of soil structure by trampling or the weight and/ or frequent use of machinery

<i>Pk</i>	<i>Slaking and crusting: clogging of pores with fine soil material and development of a thin impervious layer at the soil surface obstructing the infiltration of rainwater</i>
<i>Pi</i>	<i>Soil sealing: covering of the ground by an impermeable material (e.g. construction, mining, roads, etc.)</i>
<i>Pw</i>	<i>Waterlogging: effects of human-induced water saturation of soils (excluding paddy fields)</i>
<i>Ps</i>	<i>Subsidence of organic soils, settling of soil</i>
<i>Pu</i>	<i>Loss of bio-productive function due to other activities</i>

B: Biological degradation

<i>Bc</i>	<i>Reduction of vegetation cover: increase of bare/ unprotected soil</i>
<i>Bh</i>	<i>Loss of habitats: decreasing vegetation diversity (fallow land, mixed systems, field borders), increased fragmentation of habitats</i>
<i>Bq</i>	<i>Quantity/ biomass decline: reduced vegetative production for different land use</i>
<i>Bf</i>	<i>Detrimental effects of fires (includes low/ high severity of fires): on forest (e.g. slash and burn), bushland, grazing land, and cropland (burning of residues)</i>
<i>Bs</i>	<i>Quality and species composition/ diversity decline: loss of natural species, land races, palatable perennial grasses; spreading of invasive, salt-tolerant, unpalatable, species/ weeds</i>
<i>Bl</i>	<i>Loss of soil life: decline of soil macro-organisms and micro-organisms in quantity and quality</i>
<i>Bp</i>	<i>Increase of pests/ diseases, loss of predators: reduction of biological control</i>

H: Water degradation

<i>Ha</i>	<i>Aridification: decrease of average soil moisture content</i>
<i>Hs</i>	<i>Change in quantity of surface water: change of the flow regime (flood, peak flow, low flow, drying up of rivers and lakes)</i>
<i>Hg</i>	<i>Change in groundwater/ aquifer level: lowering of groundwater table due to over-exploitation or reduced recharge of groundwater; or increase of groundwater table resulting in waterlogging and/ or salinization</i>
<i>Hp</i>	<i>Decline of surface water quality: increased sediments and pollutants in fresh water bodies due to point pollution and land-based pollution</i>
<i>Hq</i>	<i>Decline of groundwater quality: due to pollutants infiltrating into the aquifers</i>
<i>Hw</i>	<i>Reduction of the buffering capacity of wetland areas to cope with flooding and pollution</i>

3.8 Prevention, reduction, or restoration of land degradation

Tick max. two answers.

Specify the goal of the Technology with regard to land degradation:

- prevent land degradation
- reduce land degradation
- restore/ rehabilitate severely degraded land
- adapt to land degradation
- not applicable

Comments/ remarks:

.....

Prevention: good land management practices that are already in place on land that may be prone to land degradation. They maintain natural resources and their environmental and productive functions.

Reduction: interventions intended to reduce ongoing degradation and/ or halt further degradation. They start improving natural resources and their functions. Impacts tend to be noticeable in the short to medium term.

Rehabilitation/ restoration: required when the land is already degraded to such an extent that the original use is no longer possible, and land has become practically unproductive. Here, longer-term and more costly investments are needed to show any impact.

Adaptation: applied when rehabilitation/ restoration of the original state of the land is no longer possible or requires resources beyond the means of land users. This means the state of land degradation is “accepted”, but land management is adapted to suit land degradation (e.g. adapting to soil salinity by introducing salt-tolerant plants).

4. Technical specifications, implementation activities, inputs, and costs



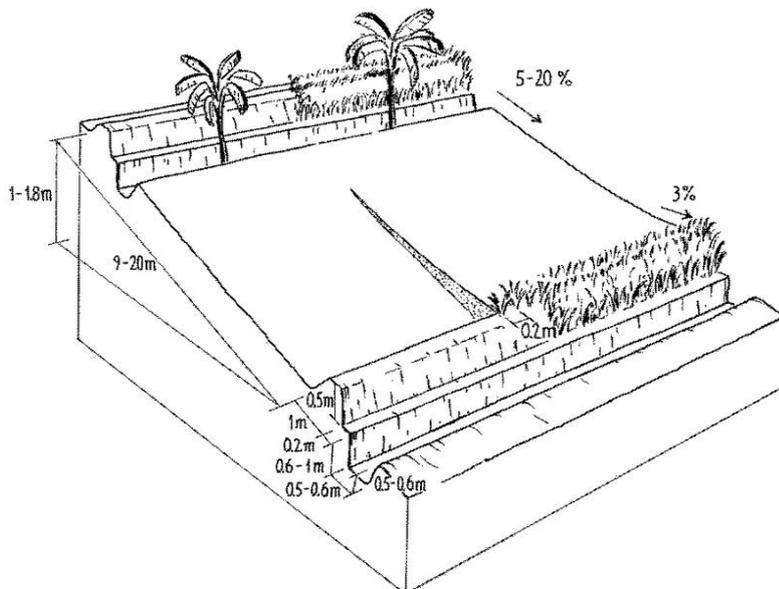
4.1 Technical drawing of the Technology

Please provide a comprehensive and detailed drawing (including dimensions) of the Technology and indicate technical specifications, measurements, spacing, gradient, etc. You can also provide several drawings showing (a) a temporal sequence of operations or (b) different elements or details of the Technology. Alternatively you can also provide one or several photographs with technical specifications drawn and/or written onto the photograph(s). Include as much technical information as possible on the drawings (or photographs).

Keep the drawing simple and schematic. The technical drawing is crucial for understanding the Technology! Scan the drawing and upload the scan.



Author: Date:



Example: Technical drawing indicating technical specifications, dimensions, spacing



4.4 Establishment activities

List establishment activities for the Technology (in sequence) and indicate timing

Activity	Type of measure ¹ (A/V/S/M/O)	Timing ²
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Comments:

¹ **Type of measure:** A = Agronomic; V = Vegetative; S = Structural; M = Management; O = Other measures; refer to 3.6

² **Timing:** time during which activity is carried out, e.g. month or season, or “after harvest of crops”, “before onset of rains”, etc.



4.5 Costs of inputs needed for establishment

Note: Costs and inputs specified below should refer to the Technology area/ Technology unit defined in 4.3 and to the activities listed in 4.4. Use the currency indicated in 4.3.

If possible, break down the costs of establishment according to the following table, specifying inputs and costs per input. If you are unable to break down the costs, give an estimation of the total costs of establishing the Technology:

Input	Specify input ³	Unit ⁴	Quantity	Costs per unit	Total costs per input	% of costs borne by land users
Labour						
Equipment						
Plant material						
Fertilizers and biocides						
Construction material						
Others						
Total costs of establishment of the Technology						

³ **Specify inputs:**

- **Labour** includes total person-days, be they paid or unpaid (e.g. contributed by family members). Under “Costs per unit”, indicate daily wage for hired labour. If relevant, differentiate between skilled and unskilled labour.
- **Equipment** includes tools, machine hours, animal traction, etc. Cost calculation for machine hours and animal traction should be based on hiring costs – even if the machinery/ animals are owned by the land user.
- **Plant material** includes seeds, seedling, cuttings, etc.
- **Fertilizers and biocides:** compost/ manure, inorganic fertilizer, herbicides, pesticides, etc.
- **Construction material** includes timber, stones, earth, cement, pipes, tanks, etc.

⁴ **Units:** person-days, kg, litres, pieces, etc.

If land user bore less than 100% of costs, indicate who covered the remaining costs:

Remarks/ comments:

.....



4.6 Maintenance/ recurrent activities

List maintenance/ recurrent activities for the Technology (in sequence) and indicate timing

Activity	Type of measure ¹ (A/V/S/M/O)	Timing ² / frequency ³
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Comments:

¹ **Type of measure:** A = Agronomic; V = Vegetative; S = Structural; M = Management; O = Other measures; refer to 3.6

² **Timing:** time during which activity is carried out, e.g. month or season, or “after harvest of crops”, “before onset of rains”, etc.

³ **Frequency:** e.g. annually, each cropping season, etc.



4.7 Costs of inputs and recurrent activities needed for maintenance (per year)

Note: Costs and inputs specified below should refer to the Technology area/ Technology unit defined in 4.3 and to the activities listed in 4.6. Use the currency indicated in 4.3.

If possible, break down the costs of maintenance according to the following table, specifying inputs and costs per input.

If you are unable to break down the costs, give an estimation of the total costs of maintaining the Technology:

.....

Input	Specify input ⁴	Unit ⁵	Quantity	Costs per Unit	Total costs per input	% of costs borne by land users
Labour						
Equipment						
Plant material						

Fertilizers and biocides						
Construction material						
Others						

Total costs of maintenance of the Technology

⁴ **Specify inputs:**

- **Labour** includes total person-days, be they paid or unpaid (e.g. contributed by family members). Under “Costs per unit”, indicate daily wage for hired labour. If relevant, differentiate between skilled and unskilled labour.
- **Equipment** includes tools, machine hours, animal traction, etc. Cost calculation for machine hours and animal traction should be based on hiring costs – even if the machinery/ animals are owned by the land user.
- **Plant material** includes seeds, seedling, cuttings, etc.
- **Fertilizers and biocides:** compost/ manure, inorganic fertilizer, herbicides, pesticides, etc.
- **Construction material** includes timber, stones, earth, cement, pipes, tanks, etc.

⁵ **Units:** person-days, kg, litres, pieces, etc.

If land user bore less than 100% of costs, indicate who covered the remaining costs:

Remarks/ comments:



4.8 Most important factors affecting costs

.....

5. Natural and human environment

Give details of the natural (biophysical) conditions where the Technology is applied. Make specific reference to the sites where the documented Technology has been assessed and analysed. Tick one box per question only, except for slope and soil parameters (see indications below). Use comment sections to specify your answers and provide additional information.

Note: Some of the environmental conditions (e.g. slope angle, soil characteristics, water quality/ availability, etc.) may change as a result of the Technology! However, you are requested to **describe the conditions as they were without any impact of sustainable land management!** In exceptional cases, certain questions might not be relevant for the Technology. In such cases, skip the question but use the comment sections to explain why you are skipping it.

5.1 Climate

Annual rainfall (max. 2 ticks)

- < 250 mm
- 251-500 mm
- 501-750 mm
- 751-1,000 mm
- 1,001-1,500 mm
- 1,501-2,000 mm
- 2,001-3,000 mm
- 3,001-4,000 mm
- > 4,000 mm

Specify average annual rainfall (if known): mm

Other specifications/ comments on rainfall distribution, seasonality (e.g. monsoon, winter/ summer rains), number/ length/ months of rainy seasons, occurrence of heavy rains, length of dry periods:

Indicate the name of the reference meteorological station considered:

Agro-climatic zone

- humid
- sub-humid
- semi-arid
- arid

Specifications/ comments on climate:

Agro-climatic zone

- Humid: length of growing period (LGP) > 270 days
- Sub-humid: LGP 180-269 days
- Semi-arid: LGP 75-179 days
- Arid: LGP < 74 days

Length of growing period (LGP) is defined as the period during which precipitation is more than half of the potential evapotranspiration (PET) and the temperature is higher than 6.5° C.



5.2 Topography

Slopes on average (max. 2 ticks)

- flat (0-2%)
- gentle (3-5%)
- moderate (6-10%)
- rolling (11-15%)
- hilly (16-30%)
- steep (31-60%)
- very steep (> 60%)

Landforms (max. 2 ticks)

- plateau/ plains
- ridges
- mountain slopes
- hill slopes
- footslopes
- valley floors

Altitudinal zone (max. 2 ticks)

- < 100 m a.s.l.
- 101-500 m a.s.l.
- 501-1,000 m a.s.l.
- 1,001-1,500 m a.s.l.
- 1,501-2,000 m a.s.l.
- 2,001-2,500 m a.s.l.
- 2,501-3,000 m a.s.l.
- 3,001-4,000 m a.s.l.
- > 4,000 m a.s.l.

Slope gradient conversion table:

Slope in degrees	→	Slope in percent
1°	→	2%
3°	→	5%
5°	→	8%
9°	→	16%
17°	→	30%
31°	→	60%

Landforms (modified from ISRIC 1993):

- **Plateau/ plains:** extended level land (slopes less than 8%).
- **Ridges:** narrow elongated area rising above the surrounding area, often hilltops or mountaintops.
- **Mountain slopes** (including major escarpments): extended area with altitude differences of more than 600 m per 2 km and slopes greater than 15%
- **Hill slopes** (including valley and minor escarpment slopes): altitude difference of less than 600 m per 2 km and slopes greater than 8%

45° → 100%

- **Footslopes:** zone bordering steeper mountain/ hill slopes on one side and valley floors/ plains/ plateaus on the other side
- **Valley floors:** elongated strips of level land (less than 8% slope), flanked by sloping or steep land on both sides

Indicate if the Technology is specifically applied in convex situations:
 concave situations
 not relevant

convex: ridge (diversion of water flow)

concave: depression (conversion of water flow)

Comments and further specifications on topography (e.g. exact altitude and slope angles of the evaluated sites):

.....
.....



5.3 Soils

Max. 2 ticks per question.

Soil depth on average

- very shallow (0-20 cm)
- shallow (21-50 cm)
- moderately deep (51-80 cm)
- deep (81-120 cm)
- very deep (> 120 cm)

Soil texture (topsoil)

- coarse/ light (sandy)
- medium (loamy, silty)
- fine/ heavy (clay)

Soil texture (> 20 cm below surface)

- coarse/ light (sandy)
- medium (loamy, silty)
- fine/ heavy (clay)

Topsoil organic matter

- high (> 3%)
- medium (1-3%)
- low (< 1%)

If available, attach full soil description or specify the available information, e.g. soil type, soil PH/ acidity, Cation Exchange Capacity, nitrogen, salinity etc.):

.....
.....



5.4 Water availability and quality

One tick per question.

Groundwater table

- on surface
- < 5 m
- 5-50 m
- > 50 m

Availability of surface water

- excess (e.g. frequent waterlogging, high runoff)
- good (e.g. available year-round)
- medium (e.g. not available year-round)
- poor/ none

Water quality (untreated)

- good drinking water
- poor drinking water (treatment required)
- for agricultural use only (irrigation)
- unusable

Is water salinity a problem? no yes Specify:

Is flooding of the area occurring? no yes If yes: frequently episodically

Comments and further specifications on water quality and quantity (e.g. seasonal fluctuations, source of pollution)

.....

5.5 Biodiversity

Indicate the state of biodiversity in the analysed sites relative to your region/ country standards. Tick one option per question.

Species diversity

- high
 medium
 low

Habitat diversity

- high
 medium
 low

Comments and further specifications on biodiversity:

Species diversity: a measure of diversity within an ecological community that incorporates both species richness (the number of species in a community) and the evenness of species' abundance; species include all fauna and flora above ground and in the soil (modified from eearth.org)

Habitat diversity: refers to the variety or range of habitats in a given region, landscape, or ecosystem (modified from oecd.org)

5.6 Characteristics of land users applying the Technology

Specify the characteristics of the average/ typical land users who apply the Technology. Tick max. two answers per question. Indicate characteristics relative to your region/ country standards.

Sedentary or nomadic

- Sedentary
 Semi-nomadic
 Nomadic
 Other (specify):

Market orientation of production system

- subsistence (self-supply)
 mixed (subsistence/ commercial)
 commercial/ market

Off-farm income¹

- < 10% of all income
 10-50% of all income
 > 50% of all income

Relative level of wealth²

- very poor
 poor
 average
 rich
 very rich

Individuals or groups

- individual/ household
 groups/ community
 cooperative
 employee (company, government)

Level of mechanization

- manual work
 animal traction
 mechanized/ motorized

Gender³

- women
 men

Age of land users (several answers possible)

- children
 youth
 middle-aged
 elderly

¹ *Off-farm income: income other than from the use of cropland, grazing land, forest, and mixed land (e.g. from business, trade, manufacturing, industry, pension, remittances)*

² *Relative level of wealth: use local instead of international standards*

³ *Indicate gender of persons using the land*

Indicate other relevant characteristics of the land users:



5.7 Average area of land owned or leased by land users applying the Technology

Indicate the total area owned or leased by land users, including the land where no Technology is applied. Tick max. two answers.

- < 0.5 ha
- 0.5-1 ha
- 1-2 ha
- 2-5 ha
- 5-15 ha
- 15-50 ha
- 50-100 ha
- 100-500 ha
- 500-1,000 ha
- 1,000-10,000 ha
- > 10,000 ha

Is this considered small-, medium- or large-scale (referring to local context)?

- small-scale medium-scale large-scale

Comments:

.....

.....



5.8 Land ownership, land use rights, and water use rights

Tick max two options per question

Land ownership

- state
- company
- communal/ village
- group
- individual, not titled
- individual, titled
- other (specify):

Land use rights

- open access (unorganized)
- communal (organized)
- leased
- individual
- other (specify):

Water use rights (if relevant)

- open access (unorganized)
- communal (organized)
- leased
- individual
- other (specify):

Comments:

.....

Land ownership refers to the type of entity possessing the land, whereas *land use rights* refer to the type of entity having a right to access the land

Land use rights/ water use rights:

- *Open access: means free for all*
- *Communal (organized): means subject to community-agreed management rules*
- *Leased: right to use land for a limited period of time against payment (contract)*
- *Individual: right of use pertains to single user*

5.9 Access to services and infrastructure

	poor	moderate	good
health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
technical assistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
employment (e.g. off-farm)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
markets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
energy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
roads and transport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
drinking water and sanitation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
financial services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other (specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. Impacts and concluding statements

Assess relevant impacts in the table below. If data based on measurements are not available, give your best estimate. Negligible means “no significant benefit nor disadvantage”. Make use of the “Quantify before SLM/ after SLM” and “Comments/ specify” columns to show evidence and justify your selection as far as possible. Choose adequate indicators to quantify impacts (e.g. t/ha for crop production, coliform measurement for water quality, etc.). Even if a 10% increase (e.g. in yield) might be judged as a great improvement, please nonetheless tick the category “Slightly positive (+5-20%)”, and use “Comments” to explain. Only indicate “Quantify (before/ after)” if impacts were measured in the field or determined by means of a survey. Impacts that are not ticked are considered “not relevant” or “not applicable”.

On-site: concerns the area where the Technology is applied.

Off-site: concerns adjacent areas or areas further away from the area where the Technology is applied.

6.1 On-site impacts the Technology has shown

First, tick relevant impacts (tick boxes on the left, several answers possible). Then, for each selected impact, tick the extent and specify/ quantify if possible.

		Extent of impact							If possible, quantify before/ after SLM		Comments/ specify	
		Very negative (-50-100%)	Negative (-20-50%)	Slightly negative (-5-20%)	Negligible impact	Slightly positive (+5-20%)	Positive (+20-50%)	Very positive (+50-100%)	before SLM	after SLM		
Socio-economic impacts												
Production												
<input type="checkbox"/> crop production	decrease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	increased	.....	.....
<input type="checkbox"/> crop quality	decrease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	increased	.....	.....
<input type="checkbox"/> fodder production	decrease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	increased	.....	.....
<input type="checkbox"/> fodder quality	decrease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	increased	.....	.....
<input type="checkbox"/> animal production	decrease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	increased	.....	.....
<input type="checkbox"/> wood production	decrease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	increased	.....	.....
<input type="checkbox"/> forest/ woodland quality	decrease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	increased	.....	.....
<input type="checkbox"/> non-wood forest production	decrease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	increased	.....	.....
<input type="checkbox"/> risk of production failure	increase	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	decreased	.....	.....
<input type="checkbox"/> product diversity	decrease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	increased	.....	.....
<input type="checkbox"/> production area (new land under cultivation/ use)	decrease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	increased	.....	.....
<input type="checkbox"/> land management:	hinder	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	simplified	.....	.....
<input type="checkbox"/> energy generation (e.g. hydro, bio)	decrease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	increased	.....	.....
Water availability and quality												
<input type="checkbox"/> drinking water availability	decrease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	increased	.....	.....
<input type="checkbox"/> drinking water quality	decrease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	increased	.....	.....
<input type="checkbox"/> water availability for livestock	decrease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	increased	.....	.....
<input type="checkbox"/> water quality for livestock	decrease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	increased	.....	.....
<input type="checkbox"/> irrigation water availability	decrease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	increased	.....	.....
<input type="checkbox"/> irrigation water quality	decrease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	increased	.....	.....
<input type="checkbox"/> demand for irrigation water	increase	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	decreased	.....	.....
Income and costs												
<input type="checkbox"/> expenses on agricultural inputs	inc	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	reduced	.....	.....
<input type="checkbox"/> farm income	decrease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	increased	.....	.....
<input type="checkbox"/> diversity of income sources	decrease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	increased	.....	.....

- economic disparities increase decreased
- workload increase decreased

Other socio-economic impacts

- (specify):
- (specify):
- (specify):

 **Sociocultural impacts**

- food security/ self-sufficiency reduce improved
- health situation worsen improved
- land use/ water rights worsen improved
- cultural opportunities (spiritual, religious, aesthetic etc.) reduce improved
- recreational opportunities reduce increased
- community institutions weaken strengthened
- national institutions weaken strengthened
- SLM/ land degradation knowledge reduce improved
- conflict mitigation worsen improved
- situation of socially and economically disadvantaged groups (gender, age, status, ethnicity etc.) worsen improved

Other sociocultural impacts

- (specify):
- (specify):
- (specify):

 **Ecological impacts**

Water cycle/ runoff

- water quantity decrease increased
- water quality decrease increased
- harvesting/ collection of water (runoff, dew, snow, etc.) reduce improved
- surface runoff increase decreased
- excess water drainage reduce improved
- groundwater table/ aquifer lower recharge
- evaporation increase decreased

Soil

- soil moisture decrease increased
- Soil cover reduce improved
- soil loss increase decreased
- soil accumulation decrease increased
- soil crusting/ sealing increase reduced
- soil compaction increase reduced
- nutrient cycling/ recharge decrease increased
- salinity increase reduced
- soil organic matter/ below ground C decrease increased

acidity increase reduced

Biodiversity: vegetation, animals

vegetation cover decrease increased

biomass/ above ground C decrease increased

plant diversity decrease increased

invasive alien species increase reduced

animal diversity decrease increased

beneficial species (predators, earthworms, pollinators) decrease increased

harmful species (e.g. mosquitoes) decrease increased

habitat diversity decrease increased

pests/ diseases decrease increased

Climate and disaster risk reduction

flood impacts increase decreased

landslides/ debris flows increase decreased

drought impacts increase decreased

impacts of cyclones, rain storms increase decreased

emission of carbon and greenhouse gases increase reduced

fire risk increase reduced

wind velocity increase decreased

micro-climate worsen improved

Other ecological impacts

(specify):

(specify):

(specify):



6.2 Off-site impacts the Technology has shown

water availability (groundwater, springs) decrease increased

reliable and stable stream flows in dry season (incl. low flows) reduce increased

downstream flooding¹

downstream siltation¹

groundwater/ river pollution increase reduced

buffering/ filtering capacity (by soil, vegetation, wetlands) reduce improved

wind transported sediments increase reduced

damage on neighbours' fields increase reduced

damage on public/ private infrastructure increase reduced

impact of greenhouse gases increase reduced

Other off-site impacts

(specify):

(specify):

(specify):

¹ Downstream flooding and downstream siltation can be desired or undesired. Please specify in comments column and indicate whether an increase is positive or negative.

Comments regarding impact assessment:



6.3 Exposure and sensitivity of the Technology to gradual climate change and climate-related extremes/ disasters (as perceived by land users)

Indicate gradual changes in climate and climate-related extremes as observed by land users in the last 10 years (trend). Note: for a more detailed assessment, fill in questionnaire module on climate change adaptation.

Several answers possible.

Tick all gradual changes in climate and climate-related extremes/ disasters to which the Technology is exposed

How does the Technology cope with these changes and disasters in view of achieving its main purposes (as defined in 3.1)?

Type of climatic change/ extreme			very poorly	poorly	moderately	well	very well	not known
	Increase	Decrease						
Gradual climate change								
<input type="checkbox"/> annual temperature	<input type="checkbox"/>							
<input type="checkbox"/> seasonal temperature								
<i>indicate season*</i> :	<input type="checkbox"/>							
.....	<input type="checkbox"/>							
.....	<input type="checkbox"/>							
.....	<input type="checkbox"/>							
<input type="checkbox"/> annual rainfall	<input type="checkbox"/>							
<input type="checkbox"/> seasonal rainfall								
<i>indicate season*</i> :	<input type="checkbox"/>							
.....	<input type="checkbox"/>							
.....	<input type="checkbox"/>							
.....	<input type="checkbox"/>							
<input type="checkbox"/> other gradual climate change (specify):			<input type="checkbox"/>					
.....								
Climate-related extremes (disasters)¹								
Meteorological disasters:								
<input type="checkbox"/> tropical storm (cyclone, typhoon, hurricane)			<input type="checkbox"/>					
<input type="checkbox"/> extra-tropical cyclone (winter storm)			<input type="checkbox"/>					
<input type="checkbox"/> local rainstorm			<input type="checkbox"/>					
<input type="checkbox"/> local thunderstorm			<input type="checkbox"/>					
<input type="checkbox"/> local hailstorm			<input type="checkbox"/>					
<input type="checkbox"/> local snowstorm			<input type="checkbox"/>					
<input type="checkbox"/> local sandstorm/ duststorm			<input type="checkbox"/>					
<input type="checkbox"/> local windstorm			<input type="checkbox"/>					
<input type="checkbox"/> local tornado			<input type="checkbox"/>					

¹ Source: Disaster Category Classification and Peril Terminology for Operational Purposes. CRED and Munich RE. 2009. Working Paper. 'Rainstorm' was added to replace 'generic (severe) storm', hailstorm was added, and the disaster subtypes 'rockfall', 'subsidence' and 'animal stampede' were left out.

Climatological disasters: <input type="checkbox"/> heatwave <input type="checkbox"/> cold wave (any time of the year, e.g. frost) <input type="checkbox"/> extreme winter conditions <input type="checkbox"/> drought <input type="checkbox"/> forest fire <input type="checkbox"/> land fire (grass, shrub, bush)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Hydrological disasters: <input type="checkbox"/> general (river) flood <input type="checkbox"/> flash flood <input type="checkbox"/> storm surge/ coastal flood <input type="checkbox"/> landslide / debris flow <input type="checkbox"/> avalanche	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Biological disasters: <input type="checkbox"/> epidemic diseases (viral, bacterial, fungal, parasitic) <input type="checkbox"/> insect/ worm infestation (grasshoppers/ locusts/ worms, etc.)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Other climate related extremes/ disasters: <input type="checkbox"/> (specify):.....	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Other climate-related consequences <input type="checkbox"/> extended growing period <input type="checkbox"/> reduced growing period <input type="checkbox"/> sea level rise (gradual change) <input type="checkbox"/> other (specify):.....	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

* For temperate, boreal, and polar/ arctic climate choose: winter, spring, summer, autumn;
 For tropics and subtropics choose: wet/ rainy season, dry season .

Comments:



6.4 Cost-benefit analysis

Refer to questions 4.5 and 4.7 (where costs for establishment and maintenance have been specified).

How do the benefits compare with the establishment costs (from land users' perspective)?

	very negative	negative	slightly negative	neutral/ balanced	slightly positive	positive	very positive
short-term returns:	<input type="checkbox"/>						
long-term returns:	<input type="checkbox"/>						

How do the benefits compare with the maintenance/ recurrent costs (from land users' perspective)?

	very negative	negative	slightly negative	neutral/ balanced	slightly positive	positive	very positive
short-term returns:	<input type="checkbox"/>						
long-term returns:	<input type="checkbox"/>						

Short term: 1-3 years; long term: 10 years

Specify/ comments:



6.5 Adoption of the Technology

Note: For information on adoption barriers and adoption drivers (motivation of land users to implement the Technology), refer to the WOCAT Questionnaire on SLM Approaches.

How many land users in the area have adopted/ implemented the Technology?

Area: Refer to the country/ region/ locations defined in 2.5 and to the land use types described in 3.2.

- single cases/ experimental 1-10% 10-50% more than 50%

If available, quantify (no. of households and/ or area covered):

Of all those who have adopted the Technology, how many have did so spontaneously, i.e. without receiving any material incentives/ payments? 0-10% 10-50% 50-90% 90-100%

Comments:
.....



6.6 Adaptation

Adaptation: modifications made by land users to suit local context and changing conditions (Source: WOCAT)

Has the Technology been modified recently to adapt to changing conditions?

- no
- yes

If yes, indicate to which changing conditions it was adapted:

- climatic change/ extremes
- changing markets
- labour availability (e.g. due to migration)
- other (specify):

Specify adaptation of the Technology (design, material/ species, etc.)

.....

6.7 Strengths/ advantages/ opportunities of the Technology

Give a concluding statement about the Technology.



In land users' view¹:

- 1).....
.....
- 2).....
.....
- 3).....
.....
- 4).....
.....

In the compiler's or other key resource persons' view:

- 1).....
.....

- 2).....
-
- 3).....
-
- 4).....
-

¹ **Land user:** the person/ entity who implements/ maintains the Technology, including individual small- or large-scale farmers, groups (gender, age, status, interest), cooperatives, industrial companies (e.g. mining), government institutions (e.g. state forest), etc.

6.8 Weaknesses/ disadvantages/ risks of the Technology and ways of overcoming them

<i>Weaknesses/ disadvantages/ risks</i>	<i>How can they be overcome?</i>
 In land users' view:	
1).....
.....
.....
2).....
.....
.....
3).....
.....
.....
4).....
.....
.....
In the compiler's or other key resource persons' view:	
1).....
.....
.....
2).....
.....
.....
3).....
.....
.....
4).....
.....
.....

7. References and links

Indicate sources of information used for the compilation of information in this questionnaire.

7.1 Methods/ sources of information

Which of the following methods/ sources of information were used?

Specify (e.g. number of informants)

- field visits, field surveys
- interviews with land users
- interviews with SLM specialists/ experts
- compilation from reports and other existing documentation
- other (specify):

7.2 References to available publications

List relevant publications relating to the Technology (reports, manuals, training materials, case studies, etc.). Upload those publications that are available as soft copies to the database.

Title, author, year, ISBN	Available from where? Costs?
.....
.....
.....
.....
.....
.....
.....
.....
.....

7.3 Links to relevant information which is available online

Title/ description	URL
.....
.....
.....
.....
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