

LAND DEGRADATION ASSESSMENT IN DRYLANDS

LADA
PROJECT

**MANUAL FOR LOCAL LEVEL ASSESSMENT OF LAND
DEGRADATION AND SUSTAINABLE LAND MANAGEMENT**

PART 2

Field methodology and tools



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PART 2

Field methodology and tools

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CONTENTS

Foreword	vi
Acronyms and abbreviations	x
1 Characterization of the study area	1
Introduction	1
Tool 1.1 Community Focus Group Discussion	2
Tool 1.2 Wealth ranking	5
Tool 1.3 Rapid land tenure analysis and institutional mapping	6
Tool 1.4 Study area mapping	7
Field form – Community focus group discussion	11
2 Reconnaissance visit and transect walk	19
Introduction	19
Tool 2.1 Transect walk and diagram	20
Steps of the Transect Walk	22
3 Vegetation assessment	39
Introduction	39
Vegetation types and indicators	41
Vegetation indicators	43
Tool 3.1 Vegetation Assessment in Forest / Woodland	44
Sampling	44
Field form – Vegetation assessment (degradation/SLM) in forest / woodland (Table 9)	47
Tool 3.2 Vegetation assessment in pasture / rangeland	48
Visual indicators and methods	48
Sampling	48
Scoring	52
Management practices in range and pasture lands	53
Grazing quality and carrying capacity	54
Trees in the grazing landscape	55
Tool 3.3 Vegetation assessment in croplands	57
Assessing crop biodiversity	58
Tool 3.4 Degradation effects on cropland productivity	59
Assessing yield and productivity	59
Plant growth characteristics	61
Plant nutrient deficiencies and toxicities	63
Field form – Review of management practices in cropland (Table 15)	65
Field form – Assessment of natural vegetation and crop condition and productivity in croplands (Table 16)	66

4 Soil assessment	67
Introduction	67
Soil erosion assessment	69
Tool 4.1. Visual assessment of soil quality	69
1. Soil depth	69
2. Soil texture	70
3. Soil structure	70
3a. Tillage and other soil pans	70
3b. Aggregate size distribution	73
4. Soil crusts	74
5. Soil colour	75
6. Earthworms (and other soil biota)	79
7. Quantifying roots	82
Tool 4.2 Soil measurements	83
1. Slaking and dispersion (Tool 4.3.1)	83
2. Soil pH (Tool 4.3.2)	86
3. Water infiltration (Tool 4.3.3)	86
4. Soil organic carbon – labile fraction (Tool 4.3.4)	88
5. Soil and water salinity measurements (Electrical conductivity) (Tool 4.3.5)	93
Limitations to field assessment of salinity	94
Methods	95
Field score card Part A: Soil Visual Descriptors	100
Field score card Part B: Field Soil Measurements	101
Tool 4.3 Soil erosion assessment	102
Tool 4.3.1 Field observations of erosion – type, state, extent and severity	104
Tool 4.3.2 Field scoring method for soil erosion features	109
Tool 4.3.3 Direct measurement of erosion	112
1. Measurement of rill erosion	112
2. Measurement of gully and ravine erosion	113
Tool 4.3.4 Direct measurement of erosion	114
3. Plant / tree root exposure	114
4. Fence post (and similar structures') base exposure	117
5. Tree mound	117
6. Pedestals	118
7. Solution notches and rock colouration	119
8. Armour layer	120
9. Soil / sand build-up against a barrier	121
10. Enrichment ratio	123
Field form – Enrichment ratio (Table 29)	125
5 Key informant and land user interview	127
Introduction	127
Tool 5.1 Land user and key informant interview on LD / SLM	128

Tool 5.2 Land user and key informant interview on vegetation resources	128
Field form – Sustainable land management practices (Table 30)	129
Field form – Plant indicator species (Table 31)	130
Tool 5.3 Interview with land-user on crop productivity and yield	131
Economics of soil erosion and conservation	133
Field form – Yield trend analysis (Table 32)	133
6 Water resources assessment	139
Introduction	139
Water indicators and assessment methods	140
Tool 6.1 Key informant interview on water resources in the study area	140
Tool 6.2 Detailed biophysical assessment (state / trend) of specific water resources	144
Additional measurements of water quantity and quality	146
Tool 6.3 Assessing degradation of river / stream banks and lake shores	147
Tool 6.4 Assessing livestock watering points	148
Tool 6.5 Assessing degradation and management of wetlands	149
Tool 6.6 Assessing land degradation and management practices in irrigated lands	152
7 Livelihoods	153
Introduction	153
Tool 7.1 Household livelihoods interview	154
Field form – Household livelihoods interview	158
Annexes	
1 Types and forms of erosion by water and by wind	171
2 Some general and specific crop nutrient deficiencies	175
References	181

Foreword

This document is the second part of a two part manual on local level assessment of land degradation and sustainable land management:

- **Part 1 – Planning and Methodological Approach, Analysis and Reporting**
- **Part 2 – Field Methodology and Tools**

The two parts should be used together as Part 1 provides the background information for the conduct of the methods and tools that are provided in Part 2.

The manual incorporates inputs and feedback from many individuals involved in piloting the local level land degradation assessment tools and methods in the six countries that participated in the **Land Degradation Assessment in Drylands project (LADA)** supported by the Global Environment Facility (GEF) and executed by FAO during the period 2006-2010. It draws on tools developed with the **World Overview of Conservation Approaches and Technologies (WOCAT)** for the assessment of sustainable land management (SLM). It also incorporates feedback from a series of national and inter-country workshops conducted during the period 2007-2010.

The development process was guided by the LADA team in the Land and Water Division of the Food and Agriculture Organisation of the United Nations, Rome, Italy, with substantial contributions from the School of International Development, University of East Anglia, Norwich, UK, under the overall technical supervision of Freddy Nachtergaele, LADA Coordinator and Riccardo Biancalani, LADA Technical Advisor.

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The participatory testing and adaptation of the tools and methods was an iterative process, with the LADA country teams building on a series of inter-country training and review workshops, namely:

- Initial workshop hosted by the University of East Anglia (Norwich, June 2007);
- Pilot Training of Trainers session hosted by Tunisia (Béja, November 2007);
- Mid-term review workshop hosted by Argentina (Mendoza, January 2009);
- Final review workshops hosted by the Universities of Amsterdam and Wageningen respectively (the Netherlands, August 2010).

The final peer review and editing was conducted by Anne Woodfine, independent expert in natural resources management (FAO consultant).

The support of the host and partner institutions in the six LADA pilot countries, which provided policy, technical and co-financing support for the local assessment piloting and workshop venues, is gratefully acknowledged. Insights, experiences and suggestions were provided by LADA country teams in developing this local assessment methodology, notably by:

- **Argentina:** Elena Abraham (Mendoza Region), Stella Navone (Puna Region), Donaldo Bran and Hugo Bottaro (Bariloche) and Esquel (Patagonia), who coordinated the local assessment teams with the institutes of IADIZA, FAUBA and INTA in the regions; supported at national level by Vanina Pietragalla, Maria Laura Corso and Andres Ravelo, Secretaría de Ambiente y Desarrollo Sustentable;
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A number of technical specialists and other staff in their institutions made significant contributions to the development of this manual. In particular, the valuable contributions of three key individuals Malcolm Douglas, Yuelai Lu and Michael Stocking are acknowledged and also two key partner institutions, namely:

- **Centre for Development and Environment**, University of Berne, host of WOCAT (World Overview of Conservation Approaches and Technologies) Secretariat;
- **United Nations University (UNU)** which supported inputs by UEA and use of an early rapid version of the local assessment manual through its SLM project in the Pamir Alai Mountains in Tajikistan and Kyrgyzstan.

Finally, this work was accomplished thanks to the following institutional support:

- **Technical and policy support of the Food and Agriculture Organization of the United Nations (FAO)** which executed the LADA project, in particular by Parviz Koohafkan, Director, Land and Water Division, and the interdisciplinary Project Task Force; and
- **Funding and implementation support of the Global Environment Facility (GEF) and United Nations Environment Programme (UNEP)** respectively to the LADA project.

The manual draws, in particular, on the following references:

- FAO-WOCAT (2011) A Questionnaire for Mapping Land Degradation and Sustainable Land Management (QM) v2. Food and Agriculture Organization of the United Nations, Rome, Italy.
- Department of Agriculture, Government of South Africa (2009). The core indicators for pasture / range condition scoring in LADA-Local were adapted from the pasture (veld)/ rangeland quality and vegetation assessment used in South Africa. (A list of visual indicators for assessing veld condition trend on farms and extensive grazing areas used with farmers, extension staff and researchers and repeated yearly. Ref. Roberts, 1970; Roberts, *et al.* 1975; Fourie & Roberts, 1977, as described by Jordaan, 1991).
- Douglas, M., (2008; unpublished). Assignment Report from China LADA Local Assessment Training Workshop, 10 -15 October 2008 including Guidelines criteria for the prioritisation of watersheds for improved management;
- FAO. (2009a) Towards defining forest degradation: comparative analysis of existing definitions, Forest Resources Assessment Working paper, 154, Food and Agriculture Organisation, Rome, Italy.
- FAO (2009b) Measuring and Monitoring Forest Degradation through National Forest Monitoring Assessment (NFMA). Eds. Tavani, R.; Saket, M.; Piazza, M.; Branthomme, A.; Altrell, D., Forest Resources Assessment Programme Working Paper 172, Food and Agriculture Organisation, Rome, Italy.
- FAO / TerrAfrica (2011) Sustainable land management in practice: Guidelines and best practices for sub-Saharan Africa (authors Liniger, H., Mekdaschi Schuder, R., Hauert, C. and Gurtner, M.), Food and Agriculture Organisation, Rome, Italy.
- McGarry, D. (2006). A Methodology of a Visual Soil - Field Assessment Tool “VS-Fast” to support, enhance and contribute to the LADA program;
- Stocking, M. and Murnaghan, N. (2001). Handbook for the field assessment of land degradation. Earthscan Publications Ltd, London, UK.

The participatory tools for Sustainable Rural Livelihoods' approaches/analysis draw from several publications, including:

Ellis, F. (1998). Survey article: Household strategies and rural livelihood diversification. *The Journal of Development Studies*. Vol.35, No.1, pp.1–38;

FAO Livelihoods Support Programme manuals and guidelines <http://www.fao.org/es/esw/lsp/manuals.html>; and

Scoones, I. (1998). Sustainable rural livelihoods: A framework for analysis. IDS Working Paper. No.72. Institute of Development Studies, Brighton, UK.

The soil and vegetation assessment methodology used in the local assessments in Argentina and South Africa also drew on the Landscape Functional Analysis (LFA) methodology, developed in Australia and adapted in Argentina as the MARAS system. While LFA has not been incorporated in the manual since it was used and validated for LADA Local in only 2 of the 6 LADA countries it presents, however, an acceptable alternative to the proposed LADA-Local VSA Fast soil and vegetation assessments and is posted on the LADA website.

Tongway, D. and Hindley, N. (2004) *Landscape Function Analysis: Methods for monitoring and assessing landscapes, with special reference to mine sites and rangelands*. CSIRO Sustainable Ecosystems, Canberra, Australia.

Oliva, G., *et al*, 2008 *Manual para la instalación y lecturas de Monitores MARAS (Monitoreo Ambiental para Regiones Áridas y Semiáridas)*, INTA, Proyecto PNUD GEF07/G35.

Also posted on the LADA website is the following wetlands assessment tool that was developed in South Africa and used by LADA-South Africa to complement the LADA Local water resources tools. This would need to be validated in other countries for wider application.

Government of South Africa. (2007). *Manual for the assessment of a Wetland Index of Habitat Integrity for South African floodplain and channelled valley bottom wetland types*, Department of Water Affairs and Forestry, Pretoria, South Africa.

Acronyms and abbreviations

BOD	biological oxygen demand
DPSIR	Drivers-Pressure-State-Impact-Response (D-P-S-I-R)
EC	electrical conductivity
ES	ecosystem services
FAO	Food and Agriculture Organization of the United Nations
FGD	focus group discussion
GEF	Global Environment Facility
GIS	geographical information system
GPS	Global Positioning System
km	kilometre
l	litre
LADA	Land Degradation Assessment in Drylands
LADA-L	LADA Local
LD	land degradation
LSU	livestock units
LUS	land use system
LUT	land use type
m	metre
MDG	Millennium Development Goal
m	minute
ml	millilitre
mm	millimetre
NGO	non-government organisation
N-LUS	national-land use system
SDC	Swiss Agency for Development and Cooperation
sec	second
SLM	sustainable land management
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WOCAT	World Overview of Conservation Approaches and Technologies



1

SECTION

Characterization of the study area

Introduction

The characterisation of the study area is organised and conducted using a participatory process with the selected local community/communities and resource people from local/ national technical sectors and local authorities. There are two main objectives:

1. Firstly, to provide an overview of the study area as the context within which land degradation and sustainable land management (LD / SLM) are occurring. The characterisation should enable the team to confirm that the study area is representative of the larger local assessment area and / or one of the national level land use systems (LUS) within it (see Chapters 3 and 5 in Part 1 of the Manual (FAO, 2011a)).
2. Secondly, the characterisation will provide the team with a rational basis for selecting the location, the required number of representative communities, transects and detailed assessment sites. The definition of the community depends on the settlement pattern; it may be a village or a dispersed population that is organised for administrative and / or productive purposes. It should be representative of the local population and include the full range of land users.

Five tools are provided for the characterisation, which need to be backed-up by the following activities by the assessment team:

- Organise a general meeting with the local authorities to inform them of the assessment objectives and activities and request their support;
- Collect and review available secondary information sources where available. A list of recommended secondary information is provided in Section 5.2 in Part 1 (FAO, 2011a);
- Identify key stakeholders and relevant projects and NGOs located in the area;
- Conduct an initial field visit, ideally before the focus group discussion (FGD) with the selected community/ies (Tool 1.1). A tour by road with a few key informants will help the team to familiarise themselves with the study area, land uses, also the extent and severity of degradation and types and extent of conservation and improved land management measures. If this takes place before the FGD, it can reveal interesting land resources features and observations for discussion with the community.

The following four tools are described in this section:

- ⊗ focus group discussion;
- ⊗ wealth ranking;
- ⊗ institutional analysis;
- ⊗ study area mapping.

Although these tools (1.1 - 1.4) are presented separately, it is logical to combine them as much as possible during the assessment. Following the community focus group discussion, the participants could be immediately divided into two groups, one to conduct the wealth ranking exercise to identify distinct land user groups and the second to draw a community map of the community territory and study area.

Both groups should involve representatives of different social groups (i.e. both men and women of all ethnic- and age-groups). In some cultural contexts this may require separate sub-groups, but ideally they should be combined and the facilitator can help ensure that their various and often diverse, issues and views are raised and taken into account.

The extent of the community territory requires careful discussion, as it may vary according to the use of resources. For example, land area belonging to the community (i.e. settled and farmed) may be much smaller than the land exploited for various resources (i.e. usufruct right, for example for fuel wood, grazing, water).

Tool 1.1 Community Focus Group Discussion

The objective of the community focus group discussion (FGD) is to obtain information about the range of land-users, their individual and communal management regimes and the history of the area. This will help the team to gain a better understanding of how the socio-economic and institutional factors influence land users' perceptions and management of land resources at the community and landscape levels, also within the different land use systems present in the study area. The community focus group discussion can be used to stimulate debate about the types of land degradation, their degree, extent and trends in the study area, as well as the effectiveness of, or the need for, interventions to prevent or mitigate degradation and restore or improve land resources (Chapters 4 and 6 in Part 1 (FAO, 2011a)). It will also help with interpreting the results from the detailed assessments of land degradation and effects of current land management practices under different land use types and systems.

The FGD can be conducted with a small number (6-10) of community elders (male and female together or separately depending on local customs), selected on the basis of their knowledge of the village territory, history and land uses. At least two members of the assessment team should facilitate and record the discussion.

After the discussion, the other team members need to be fully briefed on the findings before proceeding with the assessment. Local resource persons may be consulted to provide clarification on specific issues raised.

The following outline questionnaire should be reviewed by the team prior to the focus group discussion, in order to adapt the questions to the local context and terminology. Questions can be modified, added and / or omitted. The length of the questionnaire can also be adjusted to suit the time available and the level of knowledge of community members and local informants.

Questionnaire - Checklist

1. What is the population of the whole community (number of people and of households)?
2. What is the history and pattern of settlement in the area?
3. What are the main/important a) land use types differentiated by the community and b) water resources available and used by the community in the study area?
4. What are the main livelihood / production activities during the i) rainy and ii) dry seasons (include the main things people do for subsistence and to generate income)?
5. What are the main natural resources that the community uses for production / livelihoods? (e.g. cropland, grazing land, fuelwood, timber, medicinal plants, dry season water sources etc.).
6. What are the important types of land degradation¹ in the territory? For each distinct type: What do you consider are the main causes? What are the main impacts? What are the changes in the last 10 years or so, in terms of type, extent and severity? (See Chapters 4 and 6 in Part 1 (FAO, 2011a))

To facilitate the discussion, the team may need to prompt for more details on the causes and impacts of soil, water and vegetation degradation and resource use, for example:

- a. **Soil:** Is soil erosion occurring or are there other types of soil degradation? What are the main causes? What indicators do the locals use to describe soil erosion / degradation (e.g. loss of fertility, salinity, soil loss, gully formation (active / under control), build-up of sand or shifting sand dunes, sediment load or pollutants in water resources etc.)?
- b. **Vegetation:** Is deforestation occurring in the study area? Is this exploitation for local use, for transport to cities or both? Has it increased? What is the main local source of fuel for cooking (and heating)? Have the cover and / or species composition and quality of vegetation been increasing or diminishing? Have the abundance (number of plants) and richness (number of species) in a given area of i) palatable species for livestock or ii) invasive species increased

¹ In most cases land degradation will be interpreted as soil degradation, so deliberate efforts should be made to include vegetation and water resource degradation as well in the discussion.

or decreased in the area? Since when have the changes taken place? What are the causes? What conservation / management practices are used in crop, pasture and forest land? Depending on the responses further questions can be asked for example: Are fires a serious problem? Has the frequency and severity increased – or decreased? Is burning used for pasture management and / or pest control? What are its effects? Are grazing rotations or rangeland enclosures practiced? Since when and why? Are there other related problems relating to livestock numbers, land tenure etc?

- c. **Water:** What changes (over the last 10-20 years?) have there been in the amount and quality of water resources in the study area? (e.g. trends in rainfall amounts and seasonal distribution; drying up of water points, changes in levels of water in wells and boreholes; changes in river / stream flow, changes in water quality (salinity, pollution)). Is water used for irrigation and where is it sourced (e.g. rainwater harvesting, streams / rivers or wells / boreholes)? What crops are irrigated, when (all the growing season or only during specific critical period) and by whom (few/most farmers; large/smallholders, public/private sector? Do community members pay for water and under what circumstances?
7. Has the study area experienced i) drought, ii) flooding or any other extreme weather event (e.g. intense storms) in the last 10 years? Is the frequency and severity normal or exceptional?
8. What are the strategies and coping mechanisms adopted i) during drought or unusual dry years or ii) to reduce risk of flooding or iii) to reduce damage from wind/storms?
9. What are the livestock management strategies and related problems in terms of degradation or related benefits in terms of sustainable land management? Strategies could include, for example, range enclosures, rotational grazing, ranching, stall fed animals, seasonal livestock movements (agropastoralism), permanent livestock movements (nomadic pastoralism), cattle grazing corridors, as well as relevant by-laws (e.g. relating to the control of livestock numbers or burning etc.)
10. Are there any conflicts in relation to land and water uses in the area?
11. What are the main livelihood problems / difficulties (i.e. serious / long term);(less serious / short term) faced by rural households (food insecurity, poverty, access to resources, access to markets)?
12. Are there successful areas where land degradation control (i.e. conservation, restoration and or improvement of land resources) has been achieved? What were the main sustainable land management (SLM) practices or measures (policies, legislation, bye-laws etc.) to prevent land degradation that were implemented in specific land use systems / types? Were they aimed: i) to improve or restore the productive capacity of the land (e.g. soil fertility, use of water); or ii) for conservation / protection of resources (soil, water, vegetation, wildlife, biodiversity). Indicate for each whether they are the result of an external intervention or a local / traditional practice. (Refer to Section 4.2, Chapter 6 and Annexes 2-5 in Part 1 (FAO, 2011a)). What approaches were used (e.g. participatory, watershed management, farmer field schools etc.).

13. If possible, identify any interventions that have gone beyond a focus on soil and water conservation and productivity in situ to address wider ecosystem services (e.g. water catchment / supply, carbon sequestration, reduced greenhouse gas emissions, pest and disease regulation, protection of biodiversity and aesthetic landscape values etc.). What practices were used and what was achieved?

Venn Diagram: (to complete with the Tool 1.3, institutional mapping)

14. What are the various organizations that determine the way land (including water and vegetation resources) is managed in the community (e.g. informal groups or cooperatives of land or water users, NGOs operating locally, private sector investors, local leaders or authorities, government departments or research agencies, etc.)? (Prompt to solicit positive and negative effects).
15. What are the main informal and formal systems of tenure and rights to access land resources (crop land, pasture land, forest and water) in the community? How do they influence land degradation, conservation or improvement?
16. How do laws, rules and regulations concerning land resources affect the extent of land degradation and / or conservation? (Prompt for positive and negative effects).

Wealth ranking: (to complete with Tool 1.2, wealth ranking)

17. What other major social divisions (apart from poverty / wealth) exist in the community (e.g. religious or caste groupings, pastoralists or settled farmers, farmers practicing irrigation or rainfed

cropping) that affect the differential access people have to resources and / or the ways in which they manage their land?

A field form for the community focus group discussion is provided at the end of this section to help in recording the results, but it will need to be amended in line with any amendments in the questionnaire. This should be a semi-structured process i.e. efforts should be made to record information in the order that issues are raised by the community, as this reflects the issues that are most important to them. Some prompting may be required to fill gaps and solicit adequate responses, but to avoid following the form from start to finish or posing rigid questions.

Tool 1.2 Wealth ranking

The wealth-ranking exercise can be completed immediately after the community focus group discussion or later with 3-4 community members.

The relative “wealth² status” or “level of well being” of individuals in the community is often an important factor in determining their views and behaviour in relation to the land resources they use directly and the natural resources in the study area. Both the extent to which people are responsible for LD / SLM and how they are affected by the impacts of LD / SLM are strongly linked to their wealth or assets status and wellbeing.

The first step to categorize the household / livelihoods in the community using a simple wealth ranking exercise is to identify with the community members a set of key indicators for the three main (relative) wealth groups: better-

² Wealth in a relative and broad sense, not just the financial assets of the household.

off, medium, poor. These should be reliable local indicators that distinguish households in the community (e.g. farm size, number of livestock, size of household, type of house, off farm employment, financial assets/ indebtedness, education level, social assets, etc.). The indicators representing the three wealth groups should be agreed upon and recorded. For example, in a rangeland area, number of livestock could be 0 to 9 cattle for poor households, 10 to 100 for medium and more than 100 for the better-off and so forth. The second step is to order these indicators in terms of importance relative to the study area.

These simple wealth ranking indicators should be used subsequently to rank those households selected for the livelihoods interviews and ensure that each group is adequately sampled (in terms of land use in the field and household interviews). These indicators of wealth will be used as a reference to weight the capital assets in the household livelihoods assessment and identify different household profiles.

Tool 1.3 Rapid land tenure analysis and institutional mapping

Land tenure affects the way people have access to and manage the farmland, rangeland and forested land, also the associated natural resources and ecosystem services. In some contexts, land tenure is a major driver of land degradation.

In relation to land use and management, it is consequently important to consider, by group of land users, the implications of:

- ⊗ tenure and access rights on land resources;
- ⊗ formal and informal land rules;
- ⊗ governance and land policies.

Issues that should be discussed include whether land is owned, with or without titles, under tenancy or leasehold agreements, whether share cropping or other arrangements are in place (harvest; labour), issues of rights of access to resources including by female headed and landless households or other marginalised groups, conflicts arising over land and water and energy resources and so forth.

There are a number of tools that use ranking or institutional mapping (Venn diagrams) for probing the effectiveness of organizations and institutions that are relevant in regard to land degradation and sustainable land management. Figure 1 illustrates a Venn diagram from a hypothetical institutional mapping exercise.

This type of diagram is useful to enable communities to represent visually the importance, in terms of profile / activity, and the effectiveness of organizations / institutions that influence to a lesser or greater extent land and ecosystems management.

A relatively simple diagram like this can be generated during a focus group discussion. It can be very informative and a good way to represent

BOX 1 Drawing a Venn diagram

Circles represent organisations and their degree of influence – in this case in regard to LD and SLM

Size of the sphere: the larger, the higher the profile and level of activity of that organisation

Position: the closer to the centre, the more positive the influence of that institution on land management (outside the main circle representing the community) = a negative influence).

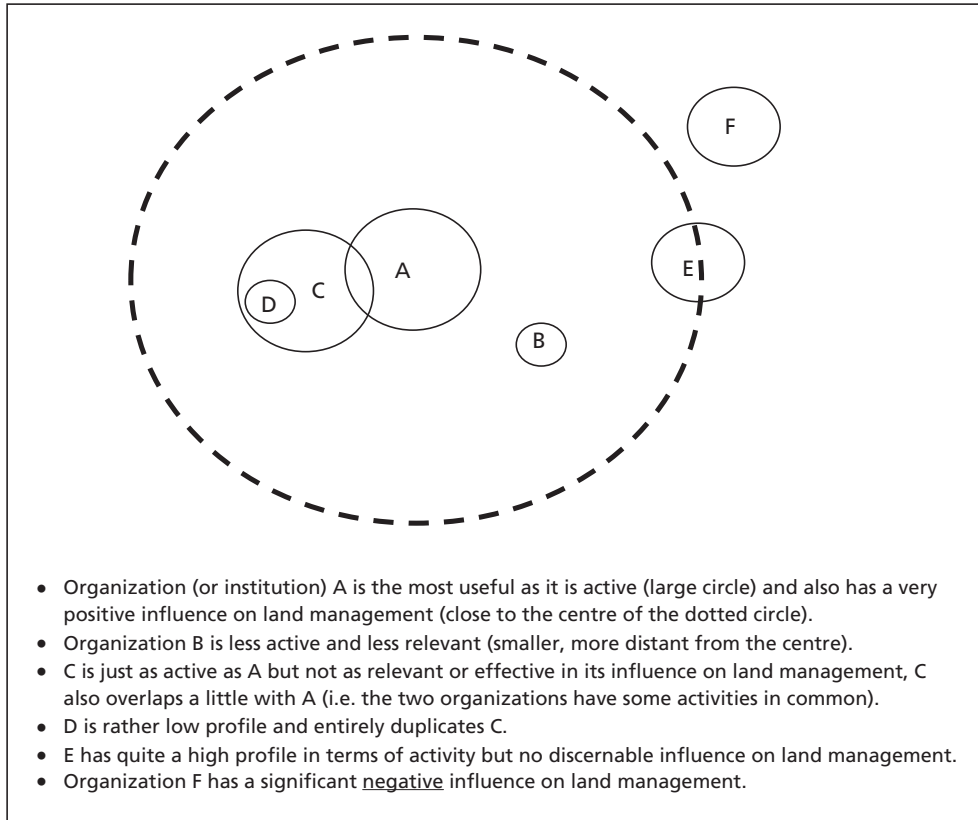


FIGURE 1 Example of a Venn diagram

the information in the final report (see Chapter 7, Part 1 (FAO, 2011a).

Tool 1.4 Study area mapping

Sketch mapping is used to provide a graphical representation of the study area, or the part of it relating to the community territory, from the perspective of community members (at least 4-5 members, male and female) who have participated in the community focus group discussion. This sketch map should be prepared by the land users (farmers, herders, forestry

workers, state farm managers etc.) but other persons knowledgeable of the study area, such as extension workers or local authorities, could provide suggestions of other things that the land users should add to the map (taking care that they do not take over!).

Various visual aids can be used to facilitate discussion and representation of the situation, such as the LADA national land use and degradation maps, aerial photographs, satellite images, more detailed topographic or thematic maps, etc. It is important to include the community members' perceptions and

assessments of the land resources conditions, also the causes and impacts of land uses and management practices on those resources. The community members may wish to divide into groups to map different issues.

The map should show and give relative locations of:

- ✗ boundaries of the study area;
- ✗ main areas for settlement, the roads and locations of markets and other services;
- ✗ important land units differentiated by the community in terms of slope, quality of soils, vegetation, water resources etc. as well as by land use (cropping, orchards, grazing, forest, wetland, etc.) and management practices, etc.;
- ✗ water sources (natural and manmade) in the territory such as rivers, streams, lakes, ponds, wells, boreholes etc.;
- ✗ types and locations (distances – either in km or estimated time to walk) of key resources located beyond the community boundaries but used by the community such as communal pastures and water sources;
- ✗ areas suffering from land degradation (significant erosion features – sheet wash, rills, gullies, landslides, etc. and other significant areas/types of soil, vegetation and water degradation and any land use/management features they seem to be associated with (e.g. newly planted forest, recent logging, poorly developed (thin) forest stand, roads, water points, etc.).
- ✗ areas of successful soil and water conservation/ land degradation control / specific sustainable land management measures.

Remember that the map should clearly show the legend / key for the different symbols used.

All the information described below will be important subsequently for locating the transects and selecting sites for the detailed assessments (see Chapter 3, Part 1 (FAO, 2011a)).

Step 1: The assessment team members should ask the community members to draw the above issues on the mapping sheets without too much prompting or intervention so that it reflects their own perspectives. The male and female members can be asked individually if they agree with the representation or if they have additional features to add; as they may not all have the same vision. This initial base map should be photographed and eventually the original copy left with the community.

Step 2: This base map of the community territory and its relationship to the wider study area can then be used to stimulate discussion on land units (terrain) and land resources that are differentiated by the community in terms of quality of soils, vegetation, water resources and in relation to land use (cropland, grazing lands, forest, wetland) and management. For example, in Figure 2, land-users distinguish several land units in terms of soil types. The map makes it possible to estimate the relative importance of the land units (different slopes, plateau, floodplain etc) and soil types (fertile, poor, waterlogged etc.) in terms of area and the location / share of cropland compared to other uses (grazing, forest, settlement). To distinguish soil types, farmers should be encouraged to pay special attention to visible aspects of the soil, such as colour, plant indicators and soil characteristics that have direct management implications, such as ease of ploughing (which is influenced by the texture of the topsoil and rainfall).

The map legend includes infrastructure, water resources, land units, areas of degradation etc.



FIGURE 2 Community territory map drawn by Diagaly community, Barkedji, Senegal

Step 3: The community territorial map should also encourage discussion with land users and show the location, extent and severity of different types of land degradation (soil erosion, soil properties, natural and planted vegetation, water resources) and their causes. This could also provide information on the history of land use, e.g. how long cropped or forested, previous land uses, crops and tree types grown, agroforestry and agropastoral systems, etc. Discussion could also identify the location and effect of significant weather conditions, such as intense rain events, flash floods, greater than or lower than average rainfall in recent years, etc. It could also provide information on how land productivity has changed in the recent past, e.g. “the land used to produce larger and better crops”, “now with

every rain event we lose more soil”, “the streams are full of soil after every rain”, etc.

Step 4: It should also show interventions by the community and other actors (projects, technical sectors, investments etc.) to address the various types of degradation, and their effects on land resources and productivity such as:

- ❌ communal soil and water conservation measures to protect uplands and enhance production;
- ❌ control of bush or grassland burning to safeguard vegetation cover and biodiversity;
- ❌ grazing management / control to allow restoration of pasture / range and improve livestock productivity;

- ⊗ improved crop and / or livestock rotations and agronomic practices to restore soil fertility and crop and livestock productivity;
- ⊗ control of settlement expansion to prevent loss of productive lands;
- ⊗ crop expansion into fragile lands or loss of wetlands and their functions;
- ⊗ control of irrigation and drainage to prevent over exploitation of limited water supply and reduce risk of salinity and increase productivity.

Step 5: This information should then be used to initiate discussion on the effectiveness of existing interventions, or the need for interventions to address degradation, conserve, restore or improve land resources. This may also raise issues in regard to land use planning,

legislation, local bye-laws / regulations or other interventions in land use / management that have been developed or applied, or that may be considered. Constraints and opportunities for their implementation can also be discussed.

Step 6: If available, the community mapping can be later complemented by use of high resolution satellite images (such as “Quickbird”) or lower resolution Google Earth images (note usually several years old) of the local assessment area. With only very limited manipulation, such images may be more recent than topographic maps and can be used to cross-check (with community members) and supplement the completed hand-drawn study area map, or serve as a basic picture on which to draw the community map.

[This form refers to the questionnaire check list (Tool 1.1). The questions have to be reviewed by the team prior to the focus group discussion, in order to adapt the questionnaire to the local context and terminology.]

Study area or community name: _____ Name of record keeper: _____
Date of discussion: _____

1. Population size and number of households: _____

2. History, migration and pattern of settlement:

3. Land units, land use types and water sources in the study area as differentiated by community members

Land Units (biophysical)	Land use types (includes management practices)	Water Sources (natural and manmade)

4 & 5. Main livelihood / productive activities during rainy and dry seasons, also associated resource uses and products generated.

Livelihood Activities	Season R- Rainy D- Dry B- Both	Resources used G- Grazing lands M- Medicinal plants W- Wild food W- Water sources F- Forest/tree O- Other	Products F- Food W- Wood E- Energy G- other products I- Income
1.			
2.			
3.			
4.			
5.			
6.			

6. Important types of land degradation in the study area, their causes, the impacts, and changes (trends) over the last 10 years.

Land degradation			
Types	Causes	Impacts	Changes (trend)
Erosion by water (splash, rill, gully - specify which)			
Erosion by wind (dust storms, sand blow, sediment deposits, dunes, etc)			
Soil physical degradation (compaction, surface sealing, crusting, pulverisation, etc.)			
Soil biological degradation (loss of soil organic matter or soil life, declining fertility)			
Soil chemical degradation (nutrient mining, salinity, acidity pollution, etc)			

Bullet points 7 to 10 below are used to record, as appropriate, relevant details on soil, vegetation, water and / or socio-economic aspects of land degradation:

7. Indicators and causes of soil degradation – including erosion and deterioration of soil properties, as perceived by the community

Locally perceived Soil Indicators	Causes of Soil degradation

8. Indicators and causes of degradation of natural vegetation and biodiversity, as perceived by the community in crop land, in grazing land and in wood/forest land (specify).

Vegetation Indicators	Changes/Trends (Yes/No; L, M, H)	Causes
Deforestation		
Composition of vegetation (structure and species diversity)		
Health and quality of grazing lands		
Health and quality of forests		
Abundance of useful species (edible, palatable, medicinal, used for energy, building or crafts, etc.)		
Presence of invasive, harmful or less useful species (toxic, pests, less palatable species)		
Bush encroachment		
Evidence of frequent or severe burning		
Extent and vegetation of wetlands		
Diversity of habitats in the area		
Other (specify)...		

9. Livestock management measures and their problems in terms of land degradation or benefits in terms of sustainable land management

Livestock management measure	Presence High, Moderate, Few, None	When and Why? (reasons)	What problems do they cause?	What are the benefits?
Range enclosures				
Rotational grazing				
Ranching				
Stall fed (zero grazed) animals				
Seasonal livestock movements (agro-pastoralism)				
Permanent livestock movements (nomadic pastoralism)				
Cattle grazing corridors				
Use of bye laws, other measures, to control livestock numbers, burning, etc.				
Other				

10. Forest management measures

Forest management measure	Presence High, Moderate, Few, None	When and Why? (reasons)	What problems do they cause?	What are the benefits?
Clear logging				
Selective felling				
Coppicing or pollarding				
Livestock grazing in forest				
Fire control (fire breaks etc)				
Use of bye laws, other measures, to control forest use and exploitation of products and wildlife				
Other				

11. Changes and causes of water quantity and quality

Water	Changes (trends)	Causes
Quantity <ul style="list-style-type: none"> • Rainfall • Drought • Flood • Demand -surface water • Demand - groundwater (wells, boreholes) • Irrigation area/use • Other uses 		
Quality <ul style="list-style-type: none"> • Drinking water • Irrigation • Other uses 		

Who practices irrigation in the community? Have the area / crops / seasons changed?

Are community members paying for:

- drinking water? _____
- watering animals? _____
- irrigation? _____

What are the implications?

Bullet points 12 to 13 below are used to record livelihoods problems and coping mechanisms

12. Main livelihoods problems relating to land use / management and degradation:

- 1.
- 2.
- 3.

Specific issues relating to:

- Occurrence of conflict(s) _____
- Food Insecurity _____
- Poverty _____
- Drought/Flood _____
- Access rights/tenure _____

13. Main coping mechanisms and strategies:

- 1.
- 2.
- 3.

14. Sustainable land management practices for land degradation control or land restoration

SLM practices	Reasons for implementation	When, and by whom	Results

15. Importance of organizations influencing sustainability of land management at local level:

Organizations (specify)	Influence on sustainability of land management (LD / SLM)		
	Importance H- High, M-Medium, L-Low	Influence + or -	Remarks
Informal group			
Cooperative of land users			
NGO local/international			
Private sector			
Local leader			
Government authorities			
Research agencies			
Other			

16. Main informal and formal systems of tenure and rights to access land resources in the community

Land tenure system	Details	Influence on SLM
<ul style="list-style-type: none"> • Ownership • Allocation • Share • Rent • Communal 		
Access rights system	Details	Influence on SLM
<ul style="list-style-type: none"> • Cropping lands • Grazing lands • Forest Lands • Trees • Water 		

17. Effects of laws, rules and regulations concerning land resources on land degradation and / or conservation / SLM

Laws, rules and regulations	Effects on land degradation / SLM

18. Major social divisions affecting community members' access and management of natural resources
(e.g. poverty / wealth status, religious or caste groupings, pastoralists or settled farmers, irrigators or rain-fed farmers)

Social divisions	Effects on access and management of natural resources

19. Record any other relevant information arising during the discussion: