Extract from lada local manual on local tools

First an inventory can be made of SLM best practices, Technologies and Approaches, in each district/province, based on information from government, NGO and project personnel (Tables are available to help make this inventory)

A number of sustainable land management (SLM) best practices should be identified in each of the study areas (catchment, transboundary area, etc.) and their effects observed on natural resources (soil, water, vegetation and biodiversity) and impacts on livelihoods and ecosystem services determined through observations and discussions and interviews. The land users and households should be questioned on their use, effectiveness and whether there are any constraints to adoption.

The project teams are encouraged to use the questionnaires that have been developed and perfected by WOCAT, over many years and in all regions, to evaluate a wide range of sustainable land management technologies (QT) and associated SLM approaches (QA) in croplands, grazing and forest lands and to also assess effects on the productive, ecological and socio-cultural services provided by ecosystems.

WOCAT Framework for Documentation and Evaluation of SLM Technologies:
http://www.wocat.net/fileadmin/user_upload/documents/QT_and_QA/TechQuestE.pdf
This helps technical experts who are very familiar with a specific technology on the ground (technicians or extension staff) to collect relevant information with land users/ farmers on the specifications of the given Technology, where is it used (natural and human environment), and what impacts it has.

WOCAT Framework for Documentation and Evaluation of SLM Approaches
http://www.wocat.net/fileadmin/user_upload/documents/QT_and_QA/AppQuestE.pdf
This helps those same persons, for the selected SLM technology/practice, to address the questions of how implementation was achieved and who achieved it. It provides complementary data to QT

Annex xx provides a description of possible Ts and As but there may be others that are also worthy of documentation. The recent TerrAfrica book “SLM in practice” prepared by WOCAT (link) in English and French provides further descriptions and case studies that are obtained from completing the QT and QA questionnaires, and then entering the data into the on line databases, available on the WOCAT website and currently being updated to an online version to allow direct entry into the WOCAT Technologies and Approaches databases.
http://www.wocat.net/en/knowledge-base/technologiesapproaches.html

Specific templates are available for entering the data and graphics and generating very clearly presented 4 page case studies.
http://www.wocat.net/en/methods/case-study-assessment-qtqa/output-format.html

Annex 2: Sustainable Land Management technologies

Common types of SLM Technologies/management practices are described in Table 31 below

Table 1 - SLM Technologies

SLM Technology	Description
Integrated Soil Fertility Management (mainly agronomic measures)	Benefits from positive interaction and complementarities of a combined use of organic and inorganic plant nutrients in crop production. - **Organic matter management** such as manuring, composting, mulching and nutrient management using local plants such as Tithonia- these practices enhance soil structure, rainwater infiltration and moisture retention and replenish nutrients; and - **Fertilizer use** to overcome nutrient deficiencies. Precision farming is used to optimize fertilizer use (as well as other inputs seed, water etc.
Conservation agriculture (CA) (mainly agronomic measures)	CA is a system characterised by 3 basic principles: - minimum soil disturbance i.e. zero or minimum tillage and direct planting, (to prevent damage to soil structure by repetitive tillage) - permanent soil cover (to the extent possible) to improve soil structure, infiltration, and reduce erosion by water and wind), - crop rotation.to optimise use of the soil It is suitable for large- as well as small-scale farming.
Organic agriculture	A holistic production system which promotes and enhances agro-ecosystem health (biodiversity, biological cycles, soil biological activity). It emphasises the use of management practices in preference to the use of off-farm inputs. Agronomic, biological, and mechanical methods, are used where possible, as opposed to using synthetic materials, to fulfil functions within the system. Many of the techniques used (e.g. inter-cropping, crop rotation, double-digging, mulching, crop- livestock integration) are practised under other agricultural systems. What makes organic agriculture unique, as regulated under various laws and certification programmes, is that: (1) almost all synthetic inputs are prohibited (i.e. those harmful to human and environmental health) and (2) `soil building' crop rotations are mandated (i.e. designed to steadily improve soil tilth and fertility while reducing nitrate leaching, weed, pest and disease problems.
Cross-slope barriers on sloping lands (vegetative or structural, often combined with vegetative and agronomic measures)	These include a range of measures on sloping lands for reducing runoff velocity and soil erosion They may be in the form of : - **earth or soil bunds, stone lines** - **vegetative strips** often grasses or trees that may lead to the formation of bunds and terraces due to the downslope movement of soil during cultivation.. - **terraces** vary in form from forward-sloping terraces to level or backward-sloping bench terraces, with or without drainage systems. Irrigated terraces (e.g. for paddy rice) are a special case in terms of water management and terrace design.
Rotational cropping systems	Sustainable rotational systems are characterized by the rotation of different land use and management intensity such as a few years of intensive crop production followed by a period of low intensity use allowing natural regrowth (fallow) or replanting of grasses, legumes,

	trees etc. followed by intensive use and clearing of the vegetation. - **Shifting cultivation** is an agricultural system in which plots of land are cultivated temporarily then abandoned. This system often involves clearing of a piece of land followed by several years of wood harvesting or farming until the soil loses fertility. Once the land becomes inadequate for crop production, it is left to be reclaimed by natural vegetation, or sometimes converted to a different long term cyclical farming practice. - **Slash and burn** refers to the cutting and burning of forests or woodlands to create fields for agriculture or pasture for livestock, or for a variety of other purposes Natural regeneration of soil fertility is an important aspect
Integrated Crop-Livestock Management	These systems optimise the uses of crop and livestock resources through interaction and the creation of synergies. For example wastes from livestock replenish soil nutrients, secondary products of crops (i.e. straw and residues) are used for livestock feed and grass leys and fodder crops may be included in the system Specific practices include - Night corralling - Rotations and manuring and composting - Grazing and fodder production
Sustainable grazing land management (management practices with associated vegetative and agronomic measures)	Improved management of grazing land relates to changing control and regulation of grazing pressure. It is associated with an initial reduction of the grazing intensity Examples include - fencing, followed either by rotational grazing - cut-and-carry of fodder, and vegetation improvement and management change.
Pastoralism and rangeland management	Sustainable grazing 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. Practices include for example - Rotational grazing - Dry season fodder reserves - improved well/borehole distribution
Agroforestry (mainly vegetative, combined with agronomic)	These are land use systems where woody perennials are grown in association with agricultural crops or pastures for livestock for a variety of benefits and services including better use of soil and water resources, multiple fuel, fodder and food products, habitat for associated species. There is a wide range of systems such as - shelterbelts - trees to provide shade for tea, coffee etc - multi-storey cropping e.g. home gardens
Sustainable Planted Forest Management	Planted forests can be either commercial or for environmental / protective use or for rehabilitation of degraded areas. Sustainability of new planted forests depends on what they replace, i.e.. this should avoid loss of natural forest This includes,for example: - Afforestation (e.g for watershed protection ; tree belt for halting desertification) - Replanting of forests - improved forest (e.g. species composition, health) - protection against fires, - improved management of forest use and felling of trees

Sustainable Forest Management - in drylands - in rainforests	This encompasses administrative, legal, technical, economic, social and environmental aspects of the conservation and use of forests. Examples include - Assisted Natural Regeneration of Degraded Land - Indigenous Management of specific woodlands/species - Forest be keeping - Community forest management
Water harvesting	Water harvesting is the collection and concentration of rainfall runoff for crop production – or for improving the performance of grass and trees – in dry areas where moisture deficit is the primary limiting factor. It may also be used for livestock and domestic uses Examples include Tassa /Zai planting pits, Small earth dams. and Floodwater farming
Surface and ground water management	All measures that lead to an improved regulation of the water cycle, reducing flood flows, improving water infiltration in the soil and the recharge of the groundwater table or in case of salinity to lower the ground water table and improve water availability and quantity. This includes - improved irrigation techniques for water use efficiency (e.g. drip irrigation). - salinity regulation - control of storm water and runoff from sealed surfaces i.e measures designed to deal with extreme events:
Smallholder Irrigation Management	Aims to achieve higher water use efficiency through more efficient water collection and abstraction, water storage, distribution and water application. This may include for example, small or large scale, schemes and low pressure or high pressure (gravity fed, sprinkler, or drip) systems, market gardens, spate irrigation and irrigated oases
Water quality improvements:	- Measures that primarily aim at improving water quality such as sedimentation traps, - filter / purification system, - infiltration ponds.
Gully control and other land rehabilitation measures	There is a whole range of different and complementary measures, though structural barriers dominate – often stabilised with permanent vegetation. - gully control using structural barriers, reshaping to reduce landslip and vegetation stabilisation - mining rehabilitation, topsoil storage, sloping and revegetation.
Sand dune stabilization:	Fixing surfaces from being blown and transported by wind, such as sand dunes, light structured soils (e.g. as loess soils. The aim can be to reduce the material from being blown and / or to stop the shifting of dunes. Also includes stabilization of mine dumps.
Riverine and coastal bank protection	Vegetative and structural measures that protect land and infrastructure from erosion of river banks and coasts by flowing water, tides and impact of waves.
Protection against natural hazards:	Measures to mitigate effects of floods, storms, earthquakes, stone falls, avalanches, landslides, mudflows
Waste management:	Organic and inorganic waste management, include solid waste (sewerage), rubble littering, effluent tailings, bio-waste and chemical waste
Biodiversity conservation and sustainable use	- Agricultural biodiversity conservation and sustainable management including maintenance of a wide range of plant varieties and

	livestock breeds and indigenous agricultural heritage systems for their current and potential future value - Conservation and sustainable use of natural habitats and rare and endangered or highly valued species (plant animal and microbial).
Protected areas	Certain areas may be protected to conserve - Forests - Wetlands - Biodiversity i.e specific species and habitats - Watersheds for water supply etc They may be supported through ecotourism

Source: LADA-WOCAT National land degradation assessment manual (QM) and WOCAT Terrafrica handbook on SLM

Annex 3 Sustainable Land Management Approaches

A list of widely known SLM approaches in most regions is provided in Table 32, derived from the WOCAT database.

Table 2- SLM Approaches

SLM Approaches	Description
Participatory Research and Development (PRD) which includes **Participatory Learning and Action (PLA):**	A pool of concepts and approaches that enable people to enhance their knowledge of SLM and strengthen land users' innovative capacity. It is bottom-up, demand-driven and has partly evolved from technology development and dissemination efforts. It includes adaptive management of technologies to suit local contexts; and the wider sharing and use of technology options and local innovations that build on local knowledge and resources PLA refers to systematic learning processes to facilitate empowerment and capacity development of local people, including • Participatory Rural Appraisal (PRA): approaches for analysis by rural people of their own realities and incorporation of the knowledge and opinions in planning and management of projects. (e.g.. transect walks, maps, calendars, matrices, diagrams using locally available materials). • Participatory Monitoring and Evaluation (PME) primarily used in impact assessment and project management. Local people, community organisations, NGOs and other stakeholder agencies initiate and decide together how to assess results and who benefits, to analyse findings and identify follow-up actions.
Participatory Land Use Planning (PLUP)	Approaches for planning of communal or common property land, /communal lands which are often the most seriously degraded and where conflicts over land use rights exist. As a complement or alternative to national policy, new arrangements can be regulated through negotiation among all stakeholders and communally binding rules for SLM, based on planning units, such as social units (e.g. village) or geographical units (e.g. watershed) can be developed. • ***Gestion des Terroirs*** a participatory catchment approach used in francophone West Africa. It associates groups and communities with a traditionally recognised land area, aiding these

SLM Approaches	Description
	communities in building skills and developing local institutions for implementation of sustainable management plans. It has focused on village/community level NRM through: i) technical projects (e.g. soil conservation); ii) organisational structures within which people arrange their livelihood strategies; and iii) the legal /administrative system by which use rights are enforced in practice. • **Participatory and Negotiated Territorial Development (PNTD)** contributes to SLM and rural development through negotiation, participation, dialogue, and creating partnership among stakeholders that leads to the consolidation of a territorial social pact to overcome the social and economic inequalities that affect rural populations (food insecurity, inequitable access rights, social marginalisation etc.)
Integrated watershed/ landscape management (IWM)	These approaches aim to improve both private and communal livelihood benefits from a range of technological and institutional interventions across a specific watershed (the main geographic unit of intervention). The concept of IWM goes beyond traditional integrated technical interventions for soil and water conservation, to include proper institutional arrangements for collective action and market related innovations that support and diversify livelihoods. This concept ties together the biophysical notion of a watershed as a hydrological landscape unit with that of community and institutional factors that regulate local demand and determine the viability and sustainability of such interventions (i.e. SLM).
Community-Based Natural Resource Management (CBNRM):	The concept embraces, a variety of concepts around participatory, community-driven, and collaborative natural resource management, often with a focus on resources subject to communal rights. It is effective where decentralisation assist in institutionalising and scaling-up popular participation, and moving from project-based approaches toward legally institutionalised popular participation, It is critical that there is sufficient transfer of powers to local institutions. - **Landcare** is a community-based approach focused on building social capital to voluntarily resolve local problems affecting the community while preserving land resources. It is based on an effective partnership with government and the broader society, including the business sector, in the form of financial and technical advice. In this way, technical knowledge from scientific sources can be integrated with indigenous knowledge and the skills of local people.
Community development / investment funds:	Funds made available to communities for their own development efforts through decentralization processes. Depending on the specific situation (i.e. donor, context, local needs) the funds may be open or earmarked for specific purposes. The basic concept is that the community has sovereignty over and decides on the use of these funds within a specific domain (e.g. for agricultural intensification). Funds may be paid back by individuals after some years to form a local 'revolving fund. Some such schemes broaden their scope and become, effectively, savings and credit schemes benefiting the community as a whole.
Extension, advisory service and training	Investment in training and extension to support the capacity of land users and other local and national stakeholders is a priority to adapt better to

SLM Approaches	Description
	changing environmental, social and economic conditions, and to stimulate innovation. For example - **Participatory Technology Development (PTD),** - **Promoting Farmer Innovation (PFI)/ Participatory Innovation Development (PID),** - **Training and Visit (T&V),** - **Information and Communication Technologies (ICTs),** - **Commodity/market driven extension,** - **Entrepreneurship to support value chains**, etc. These may be multiple strategy combining e.g. awareness-raising, extension worker to farmer visits, training workshops and seminars,, exposure visits, hands-on training, and demonstration plots. Or they may focus on Informal farmer-to-farmer extension and exchange of ideas: this was the only form of 'extension' for thousands of years, and is being rejuvenated through progressive projects. Trained 'local promoters' that become facilitators / extension workers under a project/programme. Or Contracting extension services to NGOs/other third parties: e.g. strategic partnerships by NGOs with government agencies, private sector and grassroots organizations to strengthen technical capacities for scaling-up successful initiatives while piloting innovative approaches.
Innovative extension approaches that empower farmers' groups and innovators	**Farmer Field Schools (FFS) for SLM (and 'Farmer Study Circles' which are more informal):** A group learning approach which builds knowledge and capacity among land users to enable them to diagnose their problems, identify solutions and develop plans and implement them with or without support from outside. The school brings together land users who live in the similar ecological settings and socio-economic and political situation in the field. FFS provides opportunities for learning-by-doing. Extension workers, SLM specialists or trained land users facilitate the learning process. **Initiatives for supporting local innovators** identify traditional practices with a SLM potential and support recent innovations (e.g. self-help groups, self teaching). The 'approach' is basically through transfer of knowledge within a community and through generations. Land users continuously adapt and experiment with new seeds and plants, as well as new practices and technologies, in order to cope with changing environments and new problems. Spontaneous spread may have occurred either recently or through the ages as a tradition. Adoption can be supported by local institutions / community organisations such as land user groups, marketing cooperatives, irrigation and range management associations, women's groups, land user to land user extension groups etc. More attention and support should be given to local innovation as well as to traditional systems, rather than focusing solely on project-based SLM implementation of standard technologies.
Payments /Rewards for Ecosystem Services (PES)/	A recent approach that includes - **Carbon markets (CDM and voluntary markets)** in particular, offer incentives to mobilise investments to conserve or rebuild forests and vegetative cover, in favor of higher biomass, as well as other co-benefits (e.g. higher productivity, sustaining water and energy resources and resilience to climate change). - The **Clean development Mechanism** (CDM) allows emission-

SLM Approaches	Description
	reduction (or removal) projects in developing countries to earn certified emission reduction (CER) credits, each equivalent to one tonne of CO_2. These CERs can be traded and sold, and used by industrialised countries to meet a part of their emission reduction targets under the Kyoto Protocol. The mechanism stimulates sustainable development and emission reductions, while giving industrialised countries some flexibility in how they meet their emission reduction / limitation targets. It was developed more for reduced emissions from the energy sector and works less well for productive forests and deos not yet include agricultural lands - **Payments for Reduced Emissions from Deforestation and Degradation (REDD and REDD+)** a well funded process supporting reduced GHG emissions form forest lands (not yet including agricultural lands) - **Pro-Poor Rewards for Environmental Services in Africa (PRESA)** a project providing technical and policy support to small-holder PES projects. - **Payments for improved water supply** downstream to land users for their contributions to upstream watershed management - **Payments for biodiversity conservation and sustainable use:** e.g. management and controlled harvesting of wild species, maintenance of traditional varieties and animal breeds through - **Labelling for specific products from designated areas of origin** (e.g. Champagne.) or for sustainable practices used in their production e.g. Fair trade tea and coffee

Source: LADA-WOCAT National land degradation assessment manual (QM) and WOCAT Terrafrica handbook on SLM