



WOCAT

Department of Environment Bangladesh



HANDS ON WOCAT TOOLS

TRAINING MANUAL ON SLM DOCUMENTATION

PROJECT

**Establishing National Land Use and Land Degradation Profile
toward mainstreaming SLM practices in sector policies
(ENALULDEP/SLM)**

(Project ID: GEF-Report to Conventions Grant No. TF013026)

May, 2018

Author: Jalal Uddin Shoaib

TABLE OF CONTENTS

Preamble	i
Acronyms and abbreviations	ii
1.0 Introduction	01
1.1 Why WOCAT Tools	01
1.2 What is SLM, Land Degradation (LD), Land degradation Neutrality (LDN) and SLM best practices	01
2.0 Structure of the Manual	04
3.0 Target Users	04
4.0 Guiding principles	05
5.0 Composition of the team and Planning local assessment	06
6.0 Team Coordination	06
7.0 Selection of the Study areas and timing of field	07
8.0 Information of the study area	
10.0 Hands on SLM technologies and approaches	08
10.1 SLM technologies	08
10.2 SLM approaches	11
11.0 Annexes	13
Annex-1 Fieldwork materials	13
Annex-2 Sustainable Land Management Technologies (QT)	13
Annex-3 Case Study of a SLM Technology Assessment	
Annex-4 Sustainable Land Management Approaches (QA)	
Annex-5 Case study of a SLM approach Assessment	
Annex-6 Sustainable Land Management Mapping (QM)	
12.0 For information and reading	14

Note: Questionnaires on Technology (QT), Approaches (QA) and Mapping (QM) (Annex-2, 4 and 6) will be provided as hard copy during in house training.

Preamble

Land is the basic natural non-renewable resource that provides habitation and sustenance for living organisms, as well as being a major focus of economic activities. It is the part of the Earth's surface that encompasses all natural components that are normally stable or have predictable cyclical dynamics, and are located above the earth surface.

Land degradation as defined by GEF is *“Any form of deterioration of the natural potential of land that affects ecosystem integrity either in terms of reducing its sustainable ecological productivity or in terms of its native biological richness and maintenance of resilience”*.

On the other hand unsustainable soil, land and water resources management at all levels besides lack of appropriate governance and legal and regulatory frameworks to deal with increasing pressure on limited resources are leading to accelerating land degradation, which is the great concern of 21 century.

Effective knowledge management and decision support tools and processes are bare necessary to address land degradation and land resource management. Any intervention in an adhoc manner, all too often overlooking, ignoring, or only selectively applying useful knowledge and experience gained over the years could not be sustainable.

The project **“Establishing National Land Use and Land Degradation Profile Towards Mainstreaming SLM practices in sectors Policies (ENALULDEP/SLM)”** has included an initiative to build an efficient footprints on knowledge share at all levels through identification and documentation of SLM best practices in the country. It is funded by Global Environmental Facilities (GEF) cycle 5. This effort deals with paces to drive through WOCAT network, registering users, share global SLM technologies and approaches, SLM database, documenting SLM, generating database, uploading, editing and finally submitting in the network.

This Manual is arranged to build understanding on World Overview of Conservation Approaches and Technologies (WOCAT) network among the participants of the project. It is envisioned that the participants will competent to lead local teams while documenting Sustainable Land Management (SLM) technologies and approaches at local levels of the project.

Acronyms and abbreviations

BMDA	Barind Multipurpose Development Authority
CEGIS	Center for Environmental and Geographic Information System
DAE	Department of Agricultural Extension
DLDD	Desertification, Land Degradation and Drought
DoE	Department of Environment
Ec	Electrical conductivity
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
LADA	Land Degradation Assessment in Drylands
LADA-L	LADA Local
LD	Land Degradation
LDN	Land Degradation Neutrality
LUS	Land Use System
LUT	Land Use Type
MDG	Millennium Development Goal
MoEF	Ministry of Environment
NGO	Non-government organisation
SLM	Sustainable Land Management
SDG	Sustainable Development Goal
SRDI	Soil Resource Development Institute
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNCCD	United Nations Convention to Combat Desertification
WOCAT	World Overview of Conservation Approaches and Technologies

1.0 Introduction

The project ***“Establishing National Land Use and Land Degradation Profile Towards Mainstreaming SLM practices in sectors Policies (ENALULDEP/SLM)”*** will document 40 SLM Technologies and relevant Approaches spreading all over the country and of which 12 will be demonstrated. These technologies will be able to address Land Degradation situations to achieve SDG 15 Life on land: *“Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss”* by 2030. The outcome of this endeavour will be fact sheets on QA and QT.

One of the components of the project is to mainstreaming SLM practices to address land degradation in different sectors. Partners of the project will document SLM mainly from the hot spots (but not limit to) after getting one week orientation in DoE. This module is prepared to increase capacity of the project partners to document SLM best practices following WOCAT tools.

1.1 Why WOCAT tools

The **World Overview of Conservation Approaches and Technologies (WOCAT)** is a Network of Soil and Water Conservation specialists, dedicated to Sustainable Land Management (SLM), established in 1992 and launched efforts to compile, document, evaluate, share, disseminate and apply SLM knowledge as well as to build a knowledge and evidence base knowledge hub of individuals, institutional and consortium. It focuses to improve land resources and ecosystems (including soils, water, flora, and fauna) and people’s livelihoods by sharing, enhancing, and using knowledge on Sustainable Land Management (SLM). It maintains internet databases of technologies and approaches, that are freely available to all stakeholders around the world. In early 2014, WOCAT’s growth and on-going improvement culminated in its being officially recognized by the UNCCD as the primary recommended database for SLM best practices, including measures of adaptation.

WOCAT provides methodological tools and guidelines to national and regional institutions to carry out initiatives according to their needs. These tools and guidelines support planning and decision-making by allowing SLM specialists to identify fields of action, find appropriate SLM technologies and approaches, and share their valuable knowledge in land management. The tools can also help scale up identified best SLM practices. It provides is to support adaptation, innovation, and decision-making around SLM.

1.2 What is SLM, LD, LDN and SLM Best practices

Sustainable Land Management (SLM) combines technologies, policies and approaches /activities) that aim to integrate the [management of Physical \(land, water, biodiversity, and other environmental resources\)](#) and socioeconomic principles with environmental concerns to meet human needs while ensuring the

long-term [sustainability](#) of [ecosystem](#) services (biodiversity niches, [hydrology](#), [carbon sequestration](#)) and livelihoods. As a knowledge-based procedure it helps integrate land, water, biodiversity, and environmental management (including input and output externalities) to meet rising demands of land users at large. The term sustainable land management is used, for example, in [regional planning](#) and [soil](#) or [environmental protection](#), as well as in property and estate management. SLM offers solutions that go beyond technologic recommendations by including aspects of social participation and policy dialogue.

Land degradation (LD) as defined by Global Environmental Facilities (GEF) is “Any form of deterioration of the natural potential of land that affects ecosystem integrity either in terms of reducing its sustainable ecological productivity or in terms of its native biological richness and maintenance of resilience”. In LD process the value of the biophysical environment is affected by one or more combination of human-induced processes acting upon the land. It generally signifies the temporary or permanent decline in the productive capacity of the land (UN/FAO definition).

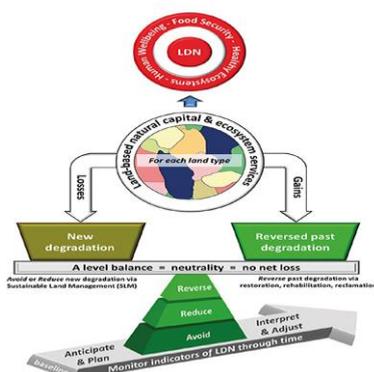
Land Degradation Neutrality (LDN) has been defined by the Parties to the Convention as: A state whereby the amount and quality of land resources, necessary to support ecosystem functions and services and enhance food security, remains stable or increases within specified temporal and spatial scales and ecosystems.

LDN is a new initiative intended to halt the on-going loss of healthy land through land degradation. Unlike past approaches, LDN creates a target for land degradation management, promoting a dual-pronged approach of measures to avoid or reduce degradation of land, combined with measures to reverse past degradation.

The objective is that losses are balanced by gains, in order to achieve a position of no net loss of healthy and productive land.

The objectives of LDN are to:

- Maintain or improve ecosystem services;
- Maintain or improve productivity, in order to enhance food security;
- Increase resilience of the land and populations dependent on the land;
- Seek synergies with other environmental objectives;
- Reinforce responsible governance of land tenure.



The Scientific Conceptual Framework for Land Degradation Neutrality
From The UNCCD SPI Science-Policy Brief 02/September 2016.

The figure illustrates the interrelationships among the major elements of the scientific conceptual framework for LDN. The target at the top expresses the vision of LDN, emphasizing the link between human prosperity and the natural capital of land – the stock of natural resources that provides flows of valuable goods and services. The balance scale in the centre illustrates the mechanism for achieving neutrality: ensuring that future

land degradation (losses) are counterbalanced through planned positive actions elsewhere (gains) within the same land type (same ecosystem and land potential). The fulcrum of the scale depicts the hierarchy of responses: avoiding degradation is the highest priority, followed by reducing degradation and finally reversing past degradation. The arrow at the bottom of the diagram illustrates that neutrality is assessed by monitoring the LDN indicators relative to a fixed baseline. The arrow also shows that neutrality needs to be maintained over time, through land use planning that anticipates losses and plans gains, and applies adaptive learning (where tracking impacts permits mid-course adjustments to help ensure neutrality is maintained in the future).

The **UNCCD** defines LDN as “a state whereby the amount and quality of land resources necessary to support ecosystem functions and services and enhance food security remain stable or increase within specified temporal and spatial scales and ecosystems”. Within the UNCCD this definition is intended to apply to affected areas as defined in the text of the Convention. The LDN conceptual framework has been developed to guide countries in operationalizing this definition.

SLM Best practices

The measures, methods or activities that perform best or achieve the highest impact according to predefined criteria assessed through a validation process. The activities that include (not restricted to)

- *Increased land productivity*
 - Water use efficiency
 - Soil fertility
 - Plants and their management
 - Micro-climate
- *Improved livelihoods*
 - Costs and benefits
 - Input challenges for land users
- *Improved ecosystems: being environmentally friendly*
 - Prevent, mitigate and rehabilitate land degradation
 - Improve biodiversity
 - Climate change: a fresh challenge – a new opportunity?
- *Triple-win solutions*
 - To Land degradation, drought and desertification
 - To Adapt and mitigate Climate Change (CC) vulnerabilities
 - To Address biodiversity

2.0 Structure of the Manual

The manual will guide to start on WOCAT network, familiarising Questionnaires on Technologies, Approaches and Mapping (In brief). It deals with paces to drive through WOCAT network, registering users, share global SLM technologies and approaches, SLM database, documenting SLM, generating database, uploading, editing and finally submitting in the network.

This manual is a pathway to the participants of the project **“Establishing National Land Use and Land Degradation Profile Towards Mainstreaming SLM practices in sectors Policies (ENALULDEP/SLM)”** to understanding WOCAT, LD, LDN, SLM and UNCCD; Guideline to track WOCAT network, rationale of using WOCAT tools for selection and documentation of SLM by and large. Participants will enable to share their experiences and knowledge on SLM with global database at the end of this training. It will facilitate participants to up scaling of technologies to avoid, reverse or restore land degradation processes in the country. The database developed through this process will be a strong back up of Department of Environment (DoE), MoEF during reporting to UNCCD on DLDD.

It has two parts:

Part one: Justification and understanding of WOCAT network, UNCCD, SLM, Questionnaires on Technologies (QT), Approaches (QA) and brief on Mapping (QM) for in house training.

Part two: Operating questionnaires QT and QA in field for SLM best practices documentation.

Objective of the Module:

- *To be acquainted with WOCAT network and UNCCD.*
- *To develop understanding on Sustainable Land Management (SLM) and decision making process.*
- *To provide hands on training on WOCAT questionnaires for documenting SLM best practices in field.*

3.0 Target users

In any documentation, the collection and analysis of data only becomes meaningful if it helps to deliver useful outputs. This manual gives guidance to make use of QA and QT of WOCAT network and developing factsheets as outcome. Other common outputs produced from an assessment include policy briefs and baseline data sets against which subsequent changes can be monitored. Additional outputs, tailored to specific stakeholders, may also be produced and these should be identified during the assessment planning stage so that relevant, targeted outputs and recommendations are produced.

Consultation with the main stakeholders during the planning phase is also an opportunity to access available data and link to other relevant on going land resources activities. In some cases it may be possible to add tools or increase the emphasis on particular components of the assessment to help deliver more targeted

or detailed information to meet an identified need. Biodiversity and climate change are referred to some extent but where required / relevant could be easily given more attention in the assessment through some additional observations and questions.

4.0 Guiding principles

To conduct a complete documentation through integrated local level assessment approximately one week (full-time) is needed with preparation (In house orientation), field work and interviews with land users and households, validation of findings with the community.

Documentation methodology will be integrated, participatory, field-based and robust in order to provide base-line data on land degradation and improvement for planning, priority setting and subsequent monitoring activities. In a number of key steps the approach relies on land users' knowledge for information, notably on the history of land-use, the dynamics of resource change, the drivers and impacts of land degradation and sustainable land management. If the relevance of the assessment is clear, it is more likely that land users will contribute information and respond to the findings. Likewise, the involvement of local policy makers and other professionals increases the likelihood that findings will influence policy processes and the design of future local land resources programmes.

Wherever possible, methods and indicators have been selected that are easy to use and interpret. The document does not require substantial laboratory-based measurements but provides accuracy and validity through combining quantitative and semi-quantitative field measurements with qualitative information from local informants. It is expected that the precision lost in some areas will be compensated for by the broader, deeper understanding of land degradation delivered by this integrated and participatory assessment. There are, however, situations where laboratory tests may be needed, for example to verify soil nutrient deficiencies, soil carbon stocks, water pollutants, also soil and water salinity.

The indicators will be selected and adapted for use across the main land use and ecosystems.

The primary emphasis in the empirical measurement is on the assessment of the current status and dynamics of the land resources – soil, water and vegetation - in delivering the main provisioning services land-users require from the land and the livelihood implications (food, fodder, fuel, water, income, etc).

A second important consideration is the need to identify and evaluate significant impacts of land degradation or sustainable land management on other key ecosystem services, particularly the supporting and regulating services that determine productivity and ecosystem resilience (inter alia nutrient and organic matter / carbon cycling, maintenance of the hydrological cycle and water supply, also conservation and sustainable use of biological diversity). Besides income and food security, other socio-cultural services provided by land use systems / ecosystems are also important (e.g. knowledge management, adaptation to change and organizational capacity of land users).

5.0 Composition of the team and Planning local assessment

Composition of assessment team, selection of study area, sampling strategy, discussions, interviews with end users are important areas of consideration during SLM documentation in field. It also covers the selection of study area (Hot spots) and sampling strategy; discussions and interviews with land users and advises on how to conduct the field work for the assessments.

General stakeholders:

Where possible, the team should be made up largely of experts from the area where the documentation will be done, however if this is not possible (e.g. lack of capacity or training in documentation methods), the team should be guided and supported by a technical staff from the district / divisional offices or relevant projects on the ground with some computer knowledge. Local policy makers and other stakeholders should be consulted and involved in the assessment where practicable as they will generally be interested in the assessment activities and results.

Proposed stakeholders for this project:

Government departments (DAE, SRDI, BARC, BRDB, BADC, LGED, Dept of Forestry, BBS etc.), Local authorities (Upazila and Union Parishad), Land users (Commercial and Subsistence farmers and users of biomass energy, other resources), Local institutions (Fertilizer dealers, water users associations, community leaders etc.), NGOs, Academician, Civil societies and other parties relevant to local situation.

It is most important to include at least one person with experience of socio-economic assessment and use of Participatory Rural Appraisal (PRA) tools such as focus group discussions, community/territory mapping, organizational analysis, household interviews, etc. Ideally the team members should include five to ten expertises in the following main disciplines:

Soil science and agronomy, Water resources management, Animal production/husbandry, Social sciences (e.g. land tenure, rights, gender, etc.), Agricultural economics (e.g. costs, benefits, tradeoffs, etc.), Ecology, Forest and land management, etc.

6.0 Team Coordination

A team leader is required to coordinate the team and process and to also lead the final analysis of the results and the documentation products (database, report, case studies and policy briefs). Experience of field work, team management, natural resources assessment, data collection and participatory and inter-sectoral assessment are all desirable qualities for the team leader. Moreover good communication, exchange and data sharing between all team members are essential.

The coordinator of the team should ensure that the required field tools and equipment are procured well before the assessment begins. Collection of information and data on Technology (QT) and Approaches (QA) with land use / management and livelihoods; vegetation, soil, water resources, land productivity, also other environmental and social services will be done by a multidisciplinary team to ensure that the assessment has both scientific rigour and delivers outputs which are relevant and accessible to all stakeholders. In addition, it involves the synthesis and analysis of the findings and the production of outputs.

7.0 Selection of the Study areas and timing of field

Study area (Hot spot/sampling area) selection should be driven by the aims of the project. LD / SLM information is required from the field that could be extrapolated to give a picture of land condition in larger land units or land use systems or of a particular location to understand apparent improvements in land management, a particular policy or project focus etc.

The timing of the field documentation in terms of seasonality is important and should be agreed with local stakeholders. It is mainly guided by the local situation, accessibility (Communication and season) in the area and availability of farmers/land users etc. Peak periods for farmers work in field, seasonality of target crops or land use/land cover, or any obligation of technical staff should be avoided in all cases.

8.0 Information of the study area

The following basic information require for the study area:

- The key stakeholders are to be identified, any NGO's or other organization potential for the study are to be selected.
- Conduct a reconnaissance field visit, ideally before the actual field work. At this time a walk or drive around the area with a few key informants will help the team to familiarise themselves with the study area, land uses, extent and severity of degradation, SLM features and technologies/approaches adopted etc. If this takes place before the documentation, it can reveal interesting land resources features and observations to catalyse discussion with the community. It can also help in subsequent selection of relevant areas and precise locations / directions for the traverse/ walks to cut across the various land uses, land user types and degradation / SLM features.
- Focus Group Discussion with the selected land users / village / community.
- Collect and review available secondary information sources.

10.0 Hands on SLM technologies and approaches

WOCAT focuses on efforts to prevent and reduce land degradation and restore degraded land through improved land management technologies and approaches.

A SLM practice can be either **SLM Technology** or **SLM Approach**.

The objective of documenting and assessing SLM practices is to share and spread valuable knowledge in land management, support evidence-based decision-making and scale up identified good practices, thereby contributing to preventing and reducing land degradation and to restoring degraded land. 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 are traditional or indigenous, newly introduced through projects or programmes, adopted and/ or adapted by land users, or recent innovations.

WOCAT offers the opportunity to discuss or share experiences with any of the WOCAT Technology Group in [WOCATpedia Community Platform](#). Definition of all of the Technology Groups could be found in the [WOCAT Glossary](#).

10.1 SLM technologies

An SLM Technology is a physical practice on the land that controls land degradation, and enhances productivity and/ or other ecosystem services. A Technology consists of one or several measures, such as agronomic, vegetative, structural, and management measures. WOCAT developed a format for documentation of SLM in field and a system of uploading documents in global database.

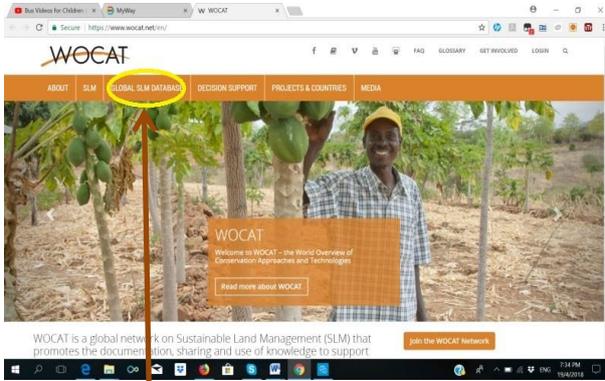
How to add data in QT

There are two options

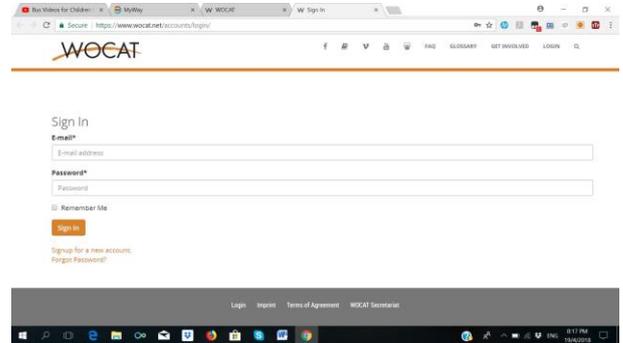
- a. Offline: Normally work on hard copy in field. QT hard copy will be provided to the participants.
- b. Online: Adding a data online in www.wocat.net.

In all cases of data uploaded in the data base of WOCAT and to get the fact sheet of each technology the steps are:

Steps to upload the data: From www.wocat.net/en WOCAT home page could be



appeared



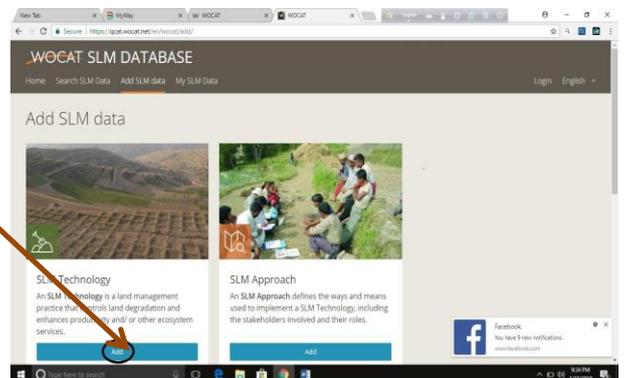
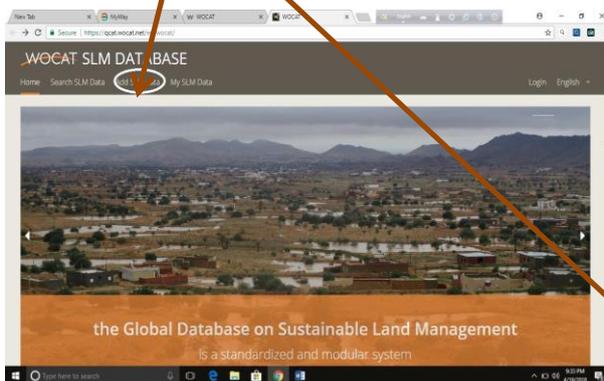
Either you may log-in or Register own account by providing few basic information

Step-1: Hit “Global SLM data base” on task bar of Home page

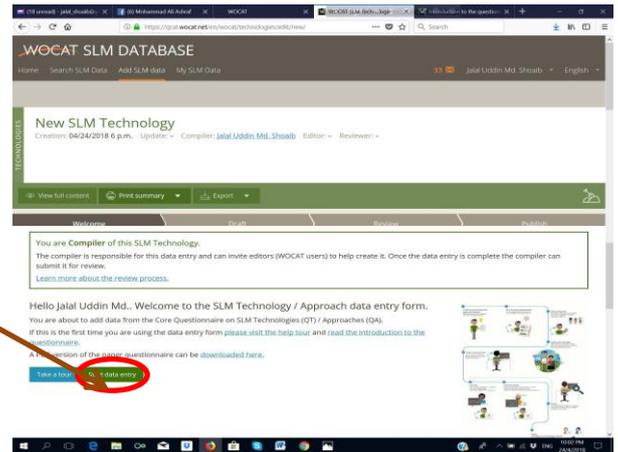
Step-2: Hit “Go to Global SLM Data base” at the bottom of the page

Step-3: Hit “Add SLM” at the task bar to go to WOCAT SLM data base’

Step-4: Hit “Add” icon at the bottom for SLM technology

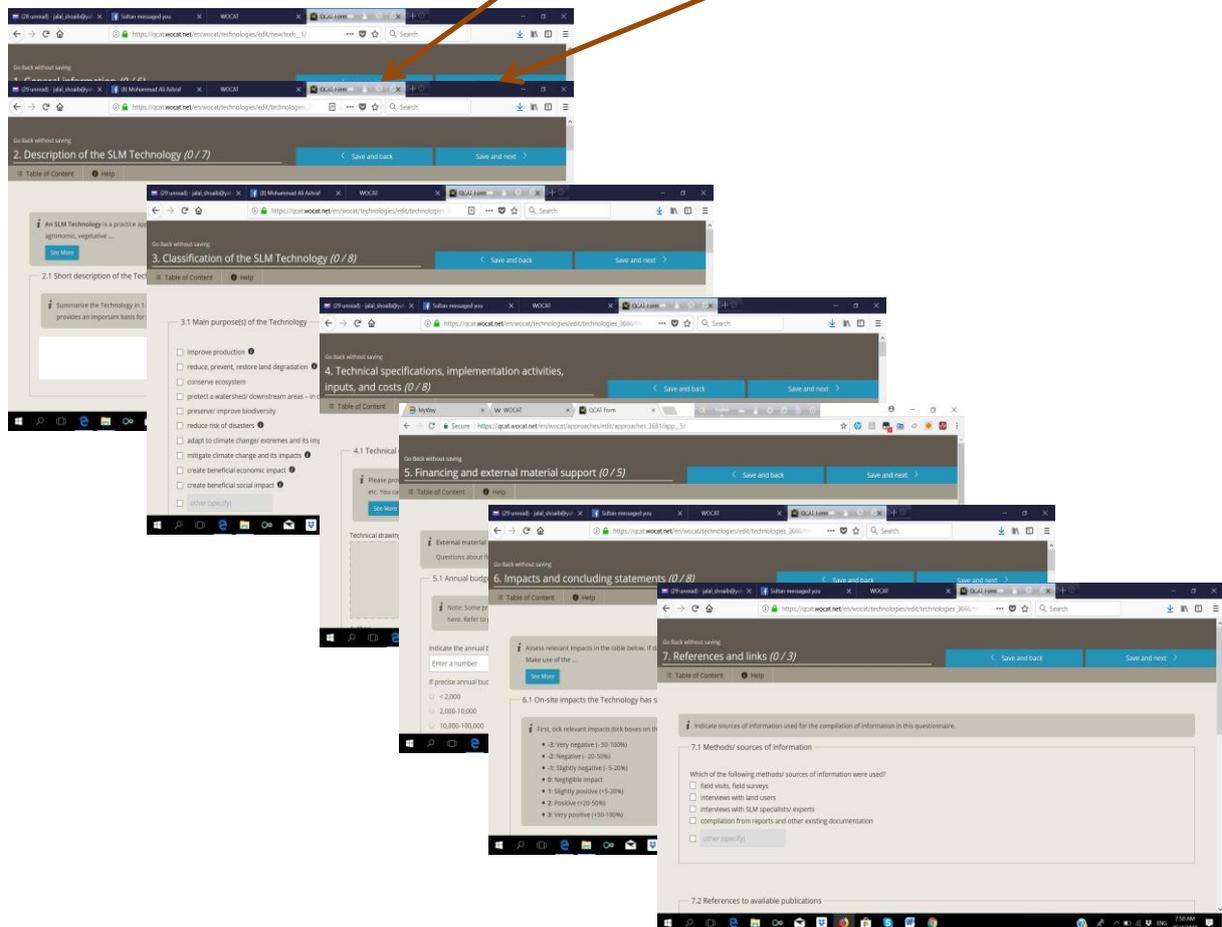


Step-5: WOCAT SLM DATABASE, New SLM Technology will appear. At the bottom left hit the **“Start Data Entry”** button to go to the Technology form. You are about to add data from the Core Questionnaire on SLM Technologies (QT) / Approaches (QA). If this is the first time you are using the data entry form please visit the help tour and read the introduction to the questionnaire.



Step-6: A window will appear **“1. General Information”** after clicking **“Start Data Entry”**. By this way you may fill up all seven sections. The steps will lead you to see the draft of the contents. There are Seven sub-sections, those will be filled up and provision inserting of image of the technology, which you want to show at the top of the fact sheet.

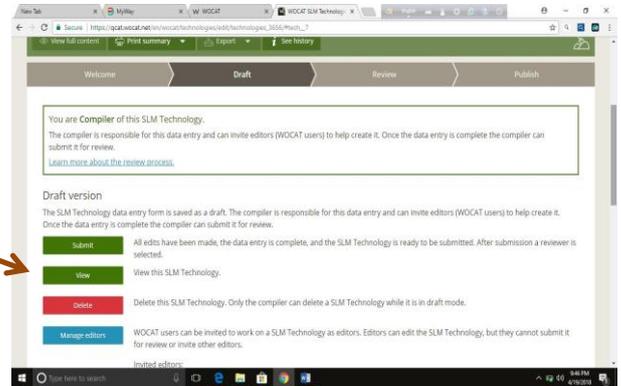
There are **seven sections** that have to be filled up as continuous process. You can stop some where you need by hitting **“Save and back”** or **“Save and next”** at top of the page.



At the bottom of each window **“Save and go to overview”** and **“Save and go to next section”** will facilitate you to look on what were the inputs you have given or to proceed to section of the form for data entry.

Step-7: After completion you will automatically lead to data **“Submit”**, **“View”/“Edit”**, **“Delete”** or **“Manage Editor”** in Draft section.

After submission WOCAT will review or Edit (if you ask). Finally it will appear in the list of technologies of Bangladesh.



10.2 SLM approaches

An SLM Approach defines the ways and means used to implement one or several SLM Technologies. It describes 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.

How to add data in QA

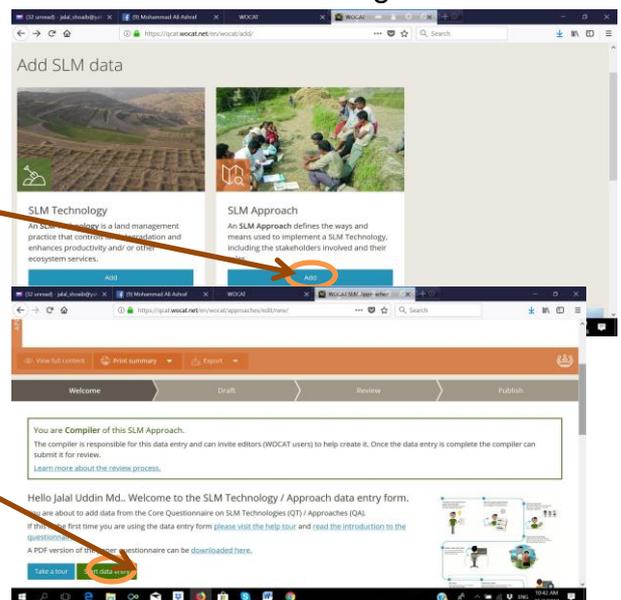
There are two options

- Offline: Normally work on hard copy in field. QA hard copy will be provided to the participants.
- Online: Adding a data online in www.wocat.net.

In all cases data will be uploaded in the data base of WOCAT and to get the fact sheet of each Approach. . The procedure is same as Technology up to **Step-3**.

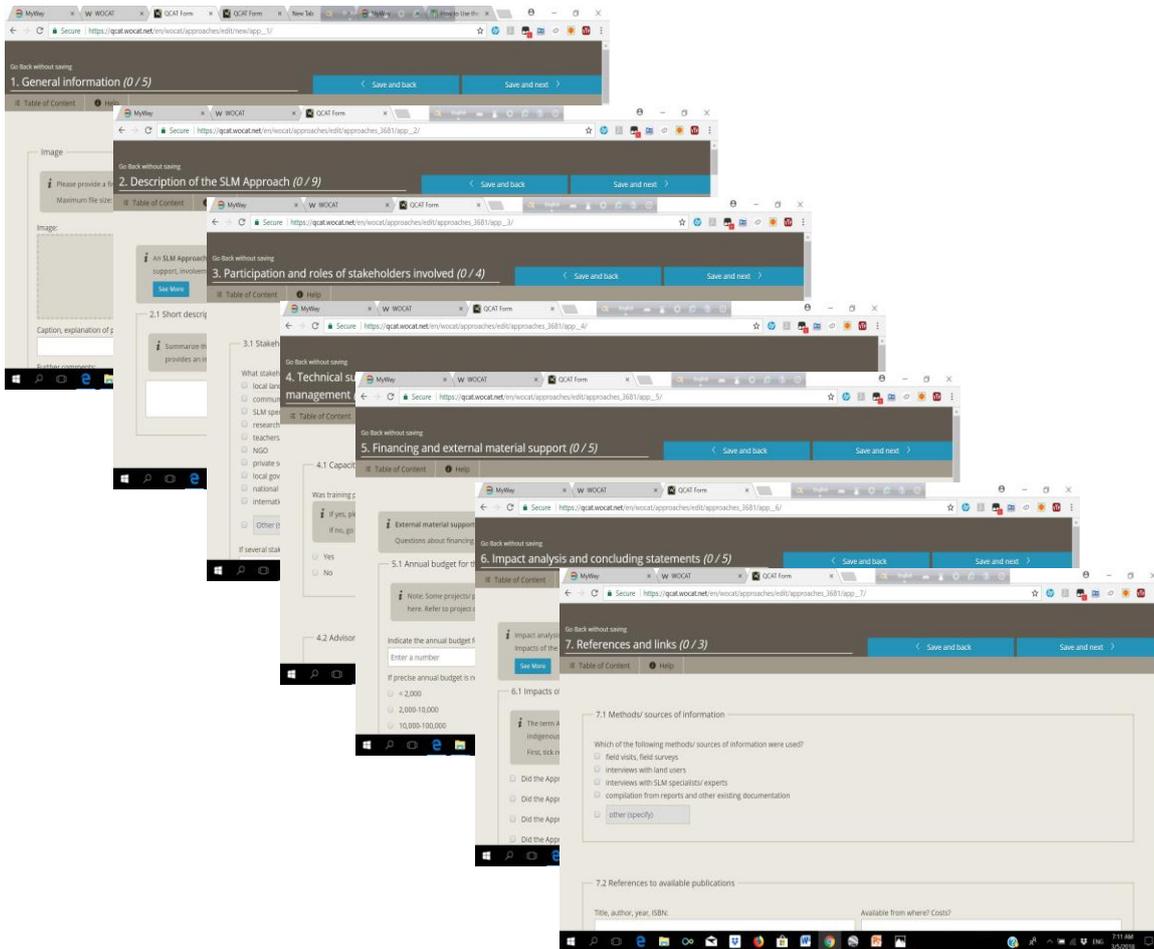
Step-4: Hit the **“Add”** button of SLM Approaches. New SLM Approaches window will appear.

Step-5: Hit the **“Start data entry”** icon.. If this is the first time you are using the data entry form please visit the help tour and read the introduction to the questionnaire.

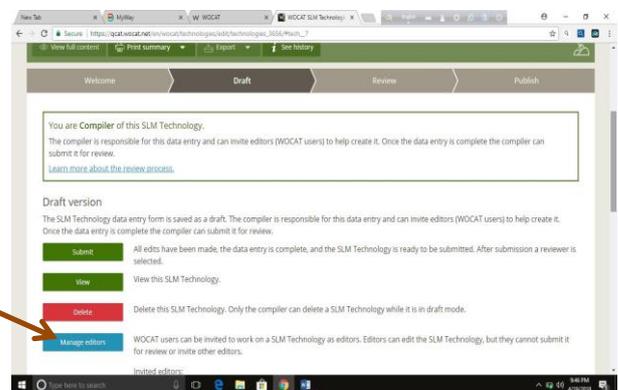


Like Technology (QT) form Approaches are same for **Step-6** and **Step-7**.

Seven sections of Approaches format and the procedure is same for all windows **“Save and go to overview”** and **“Save and go to next section”** at the bottom and finally submission.



After completion you will automatically lead to data **“Submit”, “View”/“Edit”, “Delete” or “Manage Editor”** in Draft section.



Please note that there are other paths or ways to get the same result. The user can adopt as his requirement.

11.0 Annexes

Annex-1 Fieldwork materials

Each member of the team should be well equipped with walking boots, Umbrella/waterproofs, a drinking water bottle and notebooks. The team should have a mobile phone and emergency numbers of the team leader and members. A tentative list of equipment for the field team will be provided. The equipment should be ordered well ahead of the start of the field assessment or trip. Among the equipment are GPS, Camera, Binocular, pH kit etc. Team members are recommended to be with field dress including field shoes, umbrella and water bottle etc. During documentation presses all events will be documented as good photographs, video and interviews, audio etc. Please be sure that all these documents are to be made available to the Project Director for Reporting.

Annex-2 Sustainable Land Management Technologies (QT)

Annex-3 Case Study of a SLM Technology Assessment

Annex-4 Sustainable Land Management approaches (QA)

Annex-5 Case study of a SLM approach assessment

Annex-6 Sustainable Land Management Mapping (QM)

Note: Questionnaires on Technology(QT), Approaches (QA) and Mapping (QM) (Annex-2 to 6) will be provided as hard copy during in house training and documentation in field.

For more information and reading:

1. <https://www.wocat.net/en/>
2. <https://www.wocat.net/en/about>
3. <https://www.wocat.net/en/global-slm-database>
4. <https://qcat.wocat.net/en/wocat/>
5. <https://qcat.wocat.net/en/wocat/add/>
6. <https://www.wocat.net/library/media/63/>
7. <https://knowledge.unccd.int/home/about-knowledge-hub/knowledge-hub-partners/overview-current-partners/world-overview>
8. <https://knowledge.unccd.int/knowledge-products-and-pillars/scientific-conceptual-framework-land-degradation-neutrality-overview>
9. <http://teca.fao.org/partner/wocat-world-overview-conservation-approaches-and-technologies-network>
10. <http://www.fao.org/>
11. FAO, 2011; Sustainable Land Management in Practice, Guidelines and Best practices in Sub-Saharan Africa (SSA), Field Application, A TerrAfrica partnership publication, Prepared by WOCAT and FAO, UN, 2011