



Workshop Report

Restoration of Degraded Lands in Mali: a review on lessons learnt and opportunities for scaling

11 – 12 April 2017

Bamako, Mali



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Workshop Organized in the framework of EU-IFAD project ***“Restoration of degraded land for food security and poverty reduction in East Africa and the Sahel: taking successes in land restoration to scale”*** IFAD Grant # 2000000520 and EU Grant # 2000000976



RESEARCH
PROGRAM ON
Forests, Trees and
Agroforestry



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PROGRAM ON
Dryland Systems

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EXECUTIVE SUMMARY

The rapid growing population and the need of economic development is leading to a number of environmental issues, notably forest and degradation of land, resource depletion (water, mineral, forest), environmental degradation, public health, loss of biodiversity, loss of resilience in ecosystems and livelihood security for the poor. These problems are most intense in the tropics and sub-tropics, which together cover nearly 30% of the earth's surface and comprise half the surface area of the world's developing countries. In Africa, it is estimated that the annual rate of degradation is almost 50 per cent of the deforestation rate.

The Sudano-Sahelian region has been increasingly plagued by land degradation, and this process has led to a southward extension of the Sahara Desert in the last several decades. In addition, the region is still suffering from the repercussions of the drought-induced famines of 2005, 2008, 2010, and 2012, and this further intensifies pressures on land, as population and economic growth needs have to be satisfied within the limited natural resources in the region. Pervasive unsustainable energy production and land-use practices in the region threaten significantly not only current development opportunities for local people, but also future generations' livelihoods.

Major drivers for land degradation are both climate-related extreme events like droughts and heavy precipitation or human-induced factors. The human activity affecting the landscape should be viewed in the context of the panoply of disturbance events and the dynamism that characterizes the ecosystem. Common degrading activities include: • Large-scale and open savanna fires. • Collection of fuelwood and non-wood forest products • Production of charcoal • Overgrazing • Over cultivation and pollution. These processes have resulted in widespread ecological degradation. In Mali, satellite imagery on cropland use intensity reveals a significant number of areas in a high land-use intensity state, where active cropland constitutes over 90 percent of available land. Thus, livelihood of local people is vulnerable in many rural areas and is likely to sharpen due to anticipated climate change. Land degradation reduces both the agricultural productivity and soils' holding capacity for water, which over time leads to decreasing agricultural production, while demand for it is increasing as population grows.

Many efforts have been deployed in the Sudano-Sahelian region to build resilience of the agricultural landscape through combating land degradation and desertification. The Inter-State Committee for Drought Control in the Sahel (CILSS), innovators farmers and many programs and projects have developed different strategies and approaches of restoration of degraded lands. Some success has been achieved but often initiatives have failed. Hence, the major challenge is: what approaches or strategies for "scaling" of those successful experiences and what lessons from failure can help device policy in a way that it overcomes degradation, restores some of the key ecological processes and functions of rural landscapes, at the same time, and improves the livelihoods of the rural people?

In Mali the EC-IFAD funded initiative on "Restoration of degraded land" is contributing to the effort of scaling-up and restoring degraded areas and returning them to effective and sustainable tree, crop and livestock production system. A community of practice was formed and met from 11-12 April 2017. Close to 30 experts from 21 organizations (including NGO, Research Institution, National Technical Services, Farmer organizations, the International organization including International Fund for Agricultural Development-IFAD, Wetland International, Permanent Interstate Committee for Drought Control in the Sahel) gathered in Bamako, Mali to reflect on the theme "Restoration of Degraded Lands in Mali: a review on lessons learnt and opportunities for scaling".

The general conclusion that can be drawn from this reflection workshop of land restoration programme in Mali is that the experiences are so diversified. The diversity of land restoration initiatives seems to be an indication of the dynamism of farmers, development agencies and researchers to improve the management, conservation and rehabilitation of degraded lands. Also there is no single factor which can be singled out as the key to successful and failed land restoration initiative. Success can generally

be attributed to a combination of factors which have led farmers to adopt, and continue to use the rehabilitation practices. Furthermore, whether farmers do accept restoration practices appears to depend at least as much on socio-economic factors as on the physical effectiveness of the practices advocated. Farmers use different approaches or combination of different approaches for land restoration depending on contextual factors and across the different agro-ecological zone. The effectiveness and cost effectiveness of these options will be rigorously evaluated within the framework of the Restoration Project, either through small-scale participatory field trials and complementary action learning initiatives. This will build evidence for farmers and other actors on what works, for whom, how, and at what cost across heterogeneous contexts.

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I. BACKGROUND

Agriculture in the Sahel region is characterized by its low productivity largely due to poor rainfall conditions, low nutrient content of the soil, low utilization of external inputs and the poor management of production systems. In addition, there is strong population growth leading to an increase in the demand for plant products (food for humans and animals, timber and energy), which puts pressure on natural resources and in particular on land and agro-pastoral systems. In such a context, fallow land which was the traditional means of restoring soil fertility is no longer practiced. The result is deforestation and worrying desertification. If nothing is done, land degradation is expected to worsen in the Sahel in the coming years under the adverse effects of climate change.

The Sahelian countries have certainly invested efforts to fight against land degradation, desertification, deforestation and for the protection of the environment which are part of the missions of the Inter-State Committee for Drought Control in the Sahel (CILSS). Many programs and projects have been implemented in the area of sustainable land management and the restoration of degraded lands (RTD). There have been successes but also failures. Success stories are most often well-known and documented, as opposed to unsuccessful cases. These, however, are opportunities to capture lessons learned and feed / guide future initiatives.

This workshop is intended above all as a framework for reflection by stakeholders to identify ways to promote the restoration of degraded landscapes in Mali. It will share information on the state of forest landscape degradation in Mali, past experiences in restoration of degraded land, strengthen partnership for revitalizing the unproductive land for agricultural production and ecosystem services. Moreover the country has committed itself on several land restoration initiatives including AFR100, Bonn initiative, Land degradation neutrality, the Great Green Wall etc... There is a potential for development actors and research institute to help the countries meeting its commitments and also facilitate the engagement of other countries to these initiatives.

Project goal:

The goal of the project “Restoration of degraded land for food security and poverty reduction in East Africa and the Sahel: taking successes in land restoration to scale” is to reduce food insecurity and improve livelihoods of poor people living in African drylands by restoring degraded land, and returning it to effective and sustainable tree, crop and livestock production, thereby increasing land profitability and landscape and livelihood resilience.

Project objectives:

The project has five interrelated objectives:

- 1. Lessons Learned and Best Practice (Output 1):** to identify and articulate lessons learned and develop good practice guidelines for restoring productive capacity of drylands through critical review of experience at five contrasting sites in Africa, and literature on past successes and failures.
- 2. Proof of Application (Outputs 1, 2 &3):** to obtain detailed information on the impacts of land restoration on ecosystem services and livelihoods through action research involving multiple stakeholders, providing feedback for refinement of tools for scaling up land restoration at five contrasting sites.
- 3. Tools, Methods and Guidelines for Scaling Up (Outputs 2 & 3):** to develop and test a set of tools, methods and guidelines for scaling up successes in land restoration for profitable and sustained land management. Targeting combinations of options to local circumstances and embedding structured learning within development initiatives.

4. Tools, Methods and Guidelines for Scaling Out (Outputs 3 &4): to identify areas suitable for out-scaling based on lessons learned through the review of experience and literature and the implementation of tools, methods and guidelines in the up-scaling process. The learning process is iterative and feeds into continual refinement of these tools, methods and guidelines.

5. Knowledge management, dissemination and capacity development (Output 5): to convert the empirical knowledge generated by the program into knowledge products and make these globally available while involving all program actors interactively in knowledge development leading to knowledge exchange and capacity strengthening.

II. Workshop overview

1. Objectives

A workshop was organized with the aims to document the reasons for the successes and failures of the many previous land restoration and desertification control experiences, and to make them useful references for the development of future strategies to be implemented in the field. It was more specifically about;

- 1) Make an inventory of projects and programs carried out in the field of land restoration in Mali;
- 2) Analyze the approaches used;
- 3) Analyze results and impacts on people and the environment;
- 4) Analyze the causes of success or failure in each case;
- 5) Suggest strategies and approaches for scaling up of evidence-based technologies for restoration of degraded lands.

2. Expected results

- (i) Programs and projects carried out in the field of land restoration are examined
 - programs and projects are inventoried
 - the approaches used are identified and analyzed
 - results and impacts are described and evaluated
 - the achievements, and their causes are identified and analyzed
 - the failures encountered, and their causes are identified and analyzed
- (ii) New approaches to land restoration are suggested
- (iii) A Synthesis Paper on "Restoring Degraded Land in Mali: Lessons Learned and Scaling Opportunities" is produced and made available to participants
- (iv) A community of practitioners is formed.

3. Working method

The workshop will bring together specialists and resource persons from the field of restoration, research institutions, national technical services and NGOs. Three types of activities are planned for the workshop.

1. A presentation of ICRAF's desk review on land restoration in Mali. This first presentation will be followed by other from guest speakers active in the field of restoration from NGOs, grass root actors and farmers associations, fighting against desertification / land degradation; research organization, national technical services (agriculture, livestock, environment) and sectoral projects / programs to combat desertification;
2. Group work to better support the results of the review. This will help review restoration initiatives (context, approaches used, existing partnership, reasons for success, and areas for improvement)
3. A plenary session of restitution of group works
4. A plenary session to discuss and summarize the main conclusions of the workshop

III. Workshop proceedings

Day # 1

1. *Welcome and Objectives of the workshop*

On day 1 (April 11), after the welcome address by Dr Antoine Kalinganire, the Sahel Node Coordinator, opportunity was given to the workshop participants to introduce themselves.



Dr. Bayala then presented the agenda of the workshop for adoption by the participants and gave an overview of the workshop highlighting the objectives, the expected results and the working method (see section II. Workshop overview for further detail). He then gave the floor to the presenter of the following topic: **“Restoration of degraded drylands for agricultural, forestry and pastoral production: a review of key concepts”**. This was an introductory presentation given by Patrice Savadogo

As an entry point he introduced the concept of “Disturbance” which is defined as any relatively discrete event in time that disrupts ecosystem, community or population structure and changes resources, substrate availability, or the physical environment.” (Pickett and White (1985)). Disturbance are inherent part of the ecosystem and leave behind biological and physical legacies which influence recovery processes in the post-disturbance ecosystem. Tree cover removal (deforestation) is one of the major disturbance occurring in the terrestrial ecosystem and leading to degradation and its consequences on livelihoods. Globally, about 1 billion ha is reported to be degraded forests and forest lands; this represent about 25% of the world’s forest area. About 80% of the total degraded forest area is located in the tropics (GPFLR 2010). Soil degradation caused by deforestation is also a serious threat in Africa. Deforestation exposes the soil to high temperatures which break down the organic matter, increase evaporation and make the soils vulnerable to erosion. The trends in land degradation is worrying and various policies are put in place for ecosystem restoration and rehabilitation. Restoration and rehabilitation aim at re-establishing the self-sustaining ecosystems and a sufficient resilience to repair the ecosystems following natural or human disturbance (restoration more strictly). He explained the pathways for ecosystem repair (see below Figure 1). This was an opportunity for all the participants to get familiar with some of the jargon used in restoration. Communalities and differences between reclamation/reallocation, rehabilitation and restoration were used explained and discussed in plenary. The presentation also covered also the linkage between ecological integrity and human well-being (Figure 2).

Figure 1. Pathways for ecosystem repair

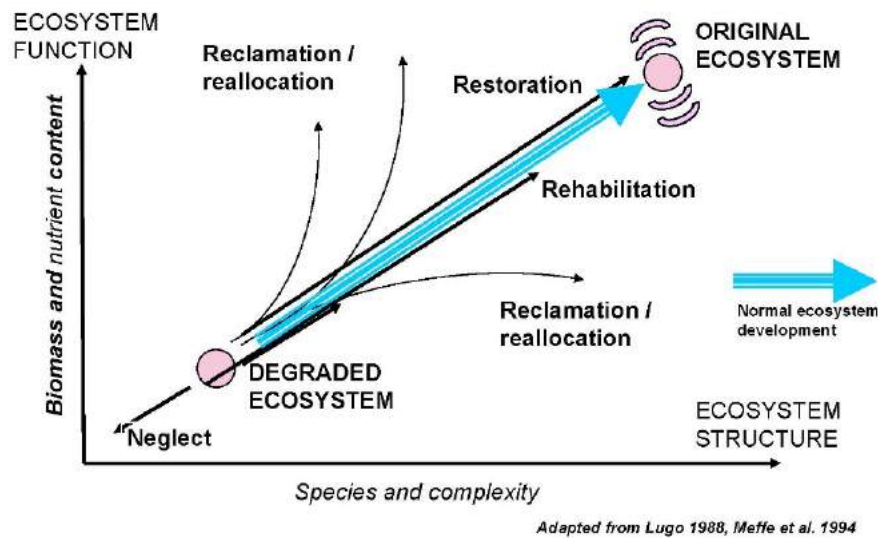
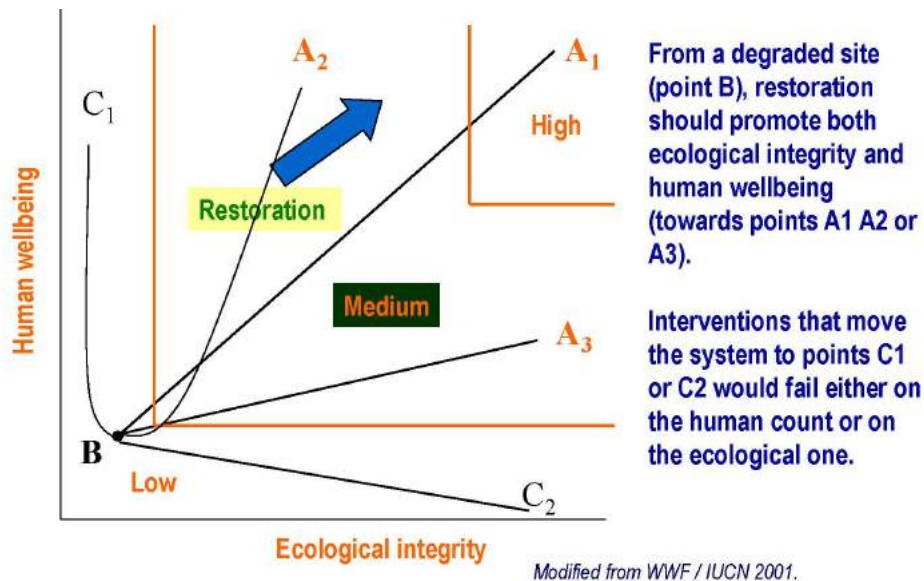
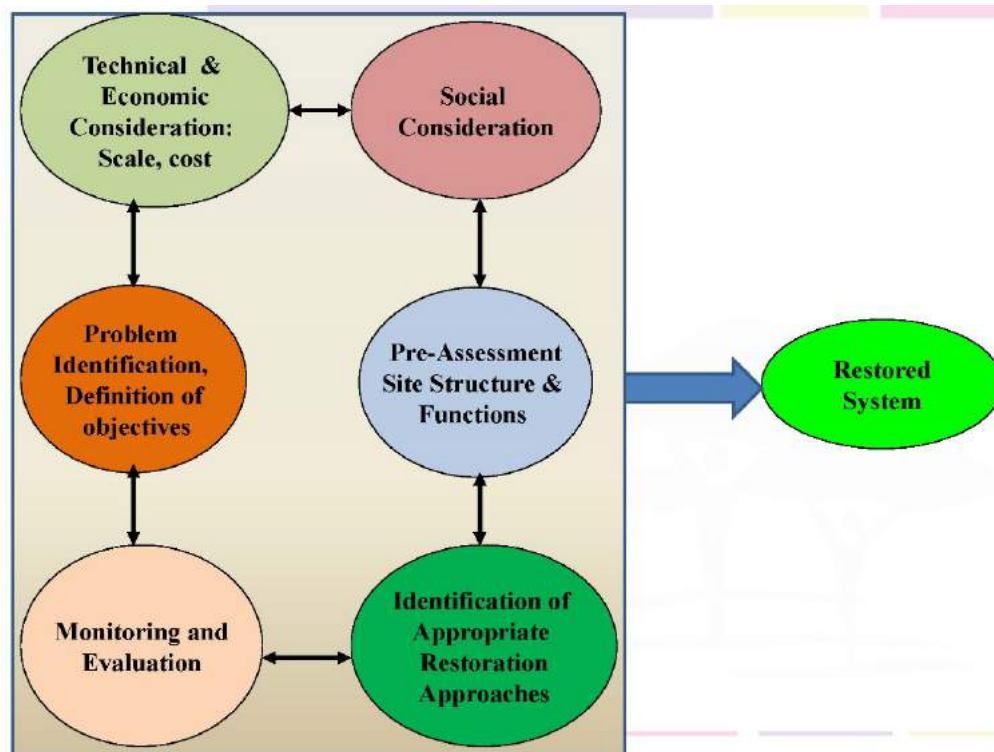


Figure 2. Forest Landscape restoration: integrating ecological integrity and human well-being



He later explained some general considerations to have in mind as a restoration practitioner. There are six pillars: problem identification and definition of objective, technical & economic consideration, social consideration, initial site status, identification of the appropriate option of restoration and monitoring and evaluation. It is a cyclical process which need to be maintained all the time for the ecosystem to preserve its ecological integration and provision of services.

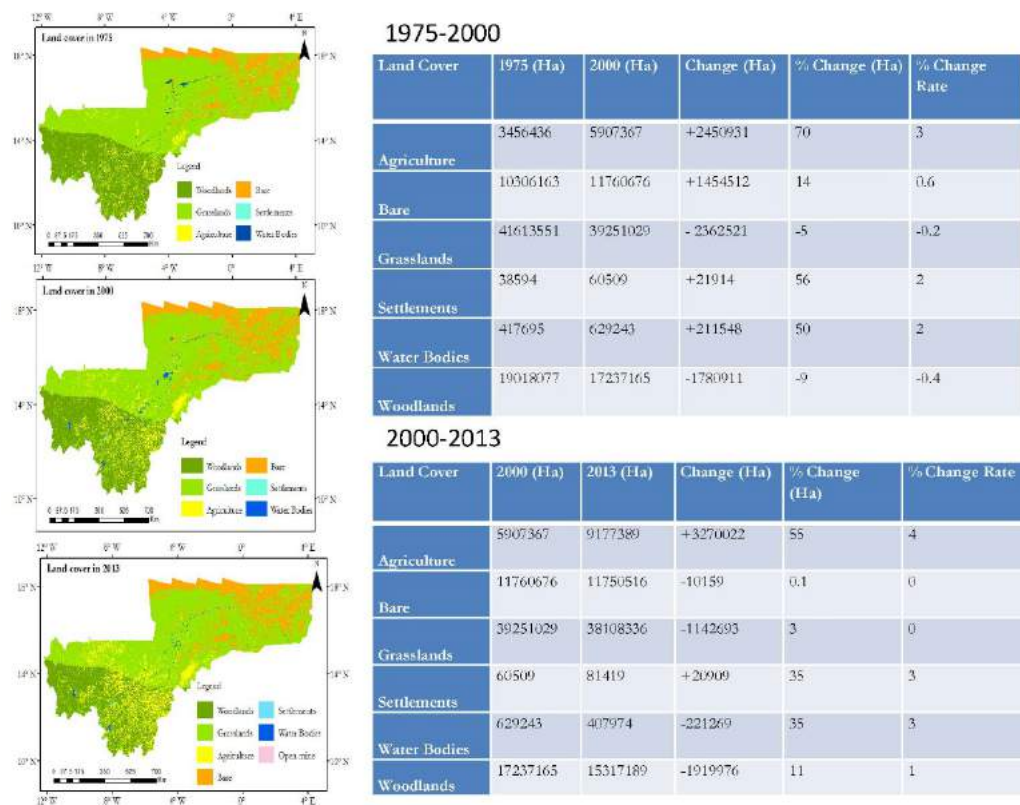
Figure 3. Framework for ecosystem repair



2. *Land Use, Land Cover and Trends in Mali* (Patrice Savadogo)

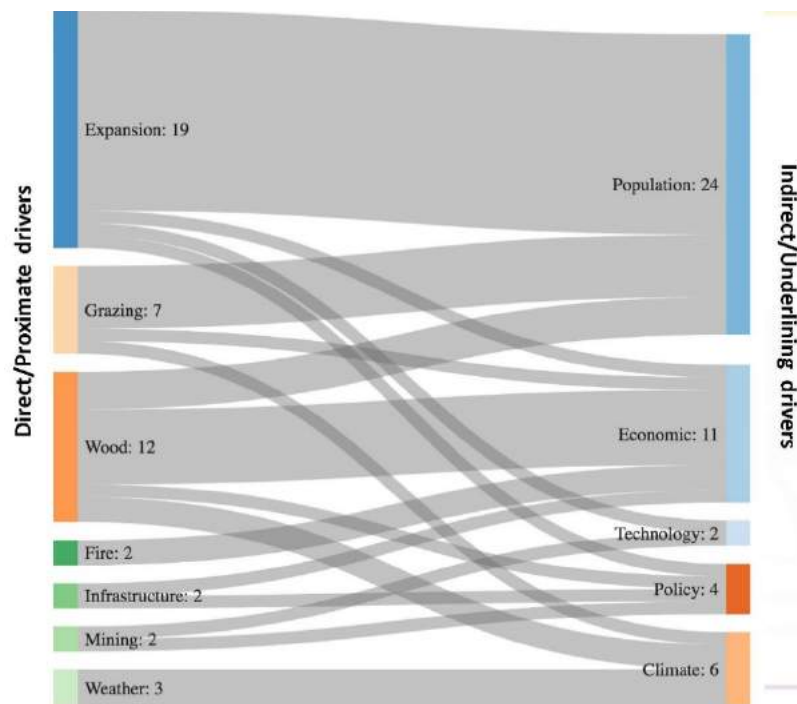
This was the second plenary presentation. According to recent land use, land cover and trends mapping in Mali (Figure 4), overall, steppes, Sudanian savannas and Sahelian short grass savannas have experienced dramatic losses during the last 38 years, yet they remain the predominant land cover classes, accounting for 30 percent, 18.5 percent, and 15 percent of the mapped area, respectively, in 2013 (Figure 4). At many places the environment is characterized by: soil degradation and loss of vegetation cover, desertification, agricultural landscape expansion, pervasive unsustainable energy production and land-use practices.

Figure 4. Mali land covers time series (1975, 2000, and 2013). US Geographical Service



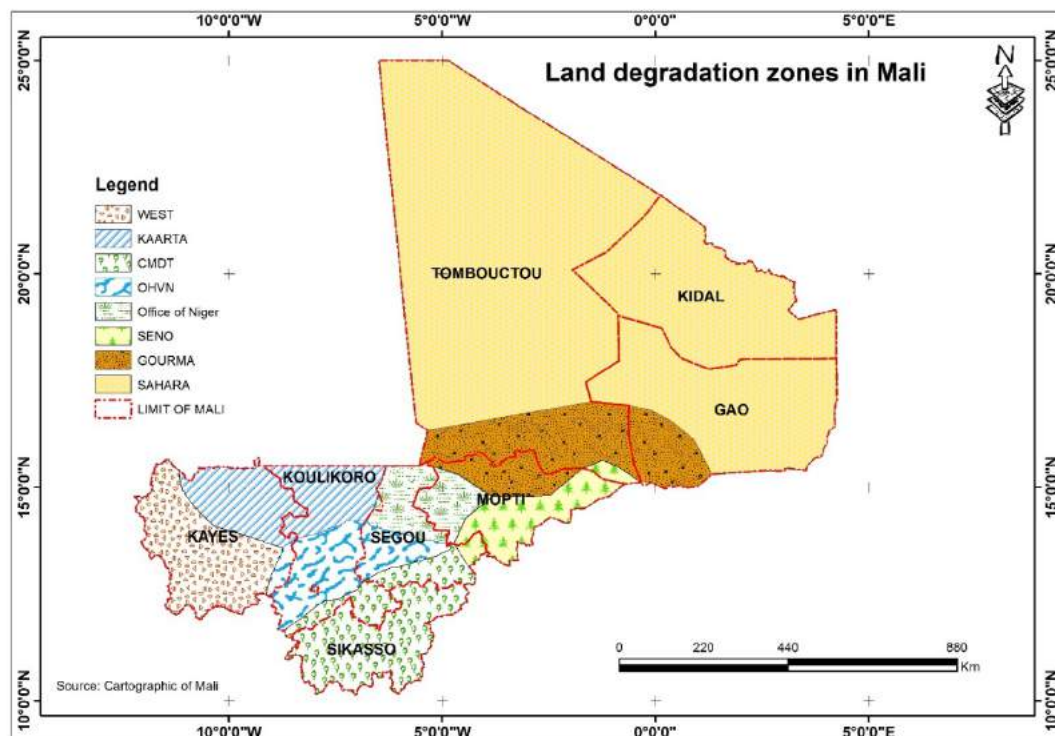
Land degradation is generally understood to be the reduction or loss of biological or economic productivity resulting in decreased yields, incomes, food security, and the loss of vital ecosystem services. These impacts, in turn, serve to undermine the peace and stability of land-dependent communities. Thus, there appears to be a demonstrable link between land degradation and human security, especially when we consider how poverty and hunger lead to migration and conflict. The health and resilience of our land resources (e.g., soil, water, and biodiversity) are largely determined by our management practices, governance systems, and environmental changes. Based on a systematic review process of published literature proximate and underlining drivers of degradation can be described; moreover, there is some relationship exists amongst the proximate and underlining drivers (Figure 5). The conversion of natural ecosystems or the unsustainable use of fertilizers, pesticides, and irrigation for food production contributes not only to land degradation at the local level, but also to increased carbon emissions, reduced biodiversity which are considered to be intertwined threats to human security that contribute to a downward spiral in the productivity and availability of land resources.

Figure 5: Proximate and underlying drivers of land degradation in the Sahel region



Based on climatic and geographical conditions and soil degradation, Mali can be divided into 8 zones (Figure 6): Sahara (arid), Gourma (semi-arid), Seno, Niger Office (ON), the Office of the Upper Niger Valley (OHVN), the CMDT, the KAARTA and the West. The most degraded areas, between the towns of Gao and Mopti, include the Gourma, the Seno and the Office du Niger.

Figure 6: Land degradation zone in Mali



3. *Regional perspective on land degradation and restoration initiatives* (Sangare Sheick Khalil)

This presentation gave a regional perspective on **land degradation in the Sahel of Africa: causes, impacts, technologies used for restoration, elements of success or failure and recommendations**. The Sahel region is largely dependent on agriculture as the main economic activity, with about 80-90% of the population actively engaged in agriculture. Land degradation is however a major environmental issue affecting the region, with negative consequences on agriculture. The sub-region of CILSS (The Permanent Interstate Committee for Drought Control in the Sahel) is experiencing an increase in land degradation caused by salinity, erosion and the loss of soil fertility. Unsustainable agricultural practices in the region in turn promote land degradation. Land degradation in the Sahel is found to be characterized by soil degradation, mainly due to wind erosion. This is caused by climatic factors such as drought and diminishing rainfall, compounded by anthropogenic factors, including population growth, agricultural intensification and overgrazing. Climatic and anthropogenic factors may act independently or have effects on each other. These factors result in the reduction of vegetation cover, decrease in fallow periods and a reduction in the balance between fallow areas and cultivated fields, which are vital to maintaining soil fertility and reducing losses from erosion. Agroforestry, integrated farming and practices that promote vegetation cover are proposed as sustainable land practices in the Sahel region. These will provide soil cover to protect soils against agents of erosion, increase agricultural productivity per unit land area and diversify farmers' sources of income, resulting in benefits for agricultural production and addressing land degradation. Various projects have been conducted by CILSS and currently there are capitalizing and disseminating the achievements of successful land restoration practices. Currently there are 350 technologies identified across the 9 countries.

Table 1. Number of successful restoration practices identified per countries in the CILSS region

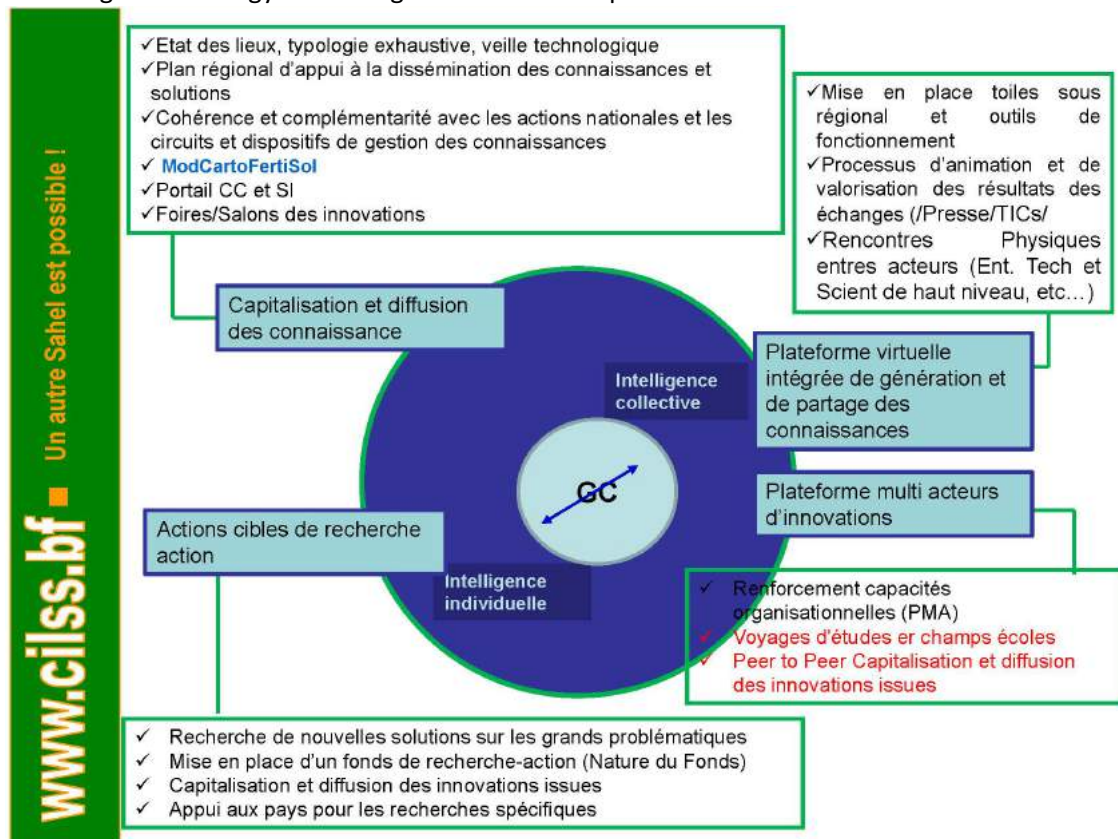
Nature	Benin	Togo	Ghana	Nigeria	Burkina	Mali	Niger	Senegal	Mauritanie	Total
Soil and water Conservation	2	7	14		8	9	7	13	12	82
Agricultural practice including crop varieties	1	7	4	1	3	2	1	1		22
Fertilization	2	7	2	1	5	5	3	3	4	37
Forestry / agroforestry,	1	7	2	1	9	5	6	9	1	44
Natural Resource management		3	9		8	9	2	3		34
Water management	1	7	4	1	6	0	1			23
Landscape management		3	5	1	10	3	12	7	15	64
Social and organizational		4	4		11	0	5	9	0	44
Total	7	45	44	5	60	33	37	45	32	350



Photo: Soil and water conservation strategies : half-moon, contour bund with stone, banquet

The scale of success of various restoration practices are variables. The ingredients of success comprise direct and indirect incentives. Among other, localities where restoration practices are being scaled up have benefited from: (i) recognition of local knowledge; (ii) policies and institutional support for implementation of restoration activities; (iii) income generating initiatives through marketing and value adding of natural resources. He ended his presentation by giving an overview on the CILSS strategy for scaling up which is summarized on the below graph (Figure 7):

Figure 7. Regional strategy for scaling land restoration practice



4. *International NGO (World Vision) perspective on land degradation and restoration initiatives* (Mme GNAMBELE Jane FANE)

In her "critical review of the restoration of degraded lands: technologies used, elements of success and failures of different initiatives", she first provided overview on i) the list of projects and programs carried out in the field of land restoration by World Vision in Mali; ii) analysed the approaches used, iii) analysed the results; highlighted the achievements and challenges and finished with their strategies and

approaches of scale evidence and technologies. In terms of approaches they use farmer field school, cascade training to reach thousand of farmers and give them opportunity to improve their livelihood and resilience to climate change. They mainly focused on practices that promote vegetation cover such as the use of trees and hedges as windbreaks, the use of cover crops on slopes and green manuring that can help protect soils from the agents of erosion and farmers managed natural regeneration.

5. *International NGO (Wetland International) perspective on land degradation and restoration initiatives* (Beteo Zongo)

Wetland International is a global not-for-profit organisation dedicated to the conservation and restoration of wetlands. Wetlands are the source of water that supports all forms of life. Despite international community efforts to promote their importance, loss and damage to wetlands and their biodiversity continues. Their approach is building on: **Knowledge, Policy and Practice**: connect technical knowledge, policy dialogue and practical projects in the field. Using scientific knowledge and powerful demonstration projects to inspire people to act. They engage in advocacy on topics for which they have developed knowledge and experience. **Empowering local communities**: policies and investments can be strongly influenced through a bottom-up process; hence by working with local partners and building the capacity of local communities whose lives closely connect to wetlands, Wetland International empower civil society with knowledge and skills. **Strategic partnerships**: engage in partnerships as a means to enable both the public and private sector to safeguard and restore wetlands.

In Mali Wetland International priorities span from i) Integrated water resources management ii) Sustainable Management of Aquatic Ecosystems and Biodiversity iii) Development of decision support tool iv) Accompanying communities to increase their resilience in the context of climate change. On the ground they implement activities on open cast mine restoration along the delta river, sand dune fixation, regeneration of the *Echinocloa stagnina* pastures (see photo) along the Niger Delta , restoration of various community forest and enrichment planting activities.



Photo: Regeneration of the *Echinocloa stagnina* pastures along the Niger Delta

As an approach Wetlands International has adopted Bio-Rights in Niger Delta sustainability initiative. Bio-Rights is a microcredit finance mechanism that combines poverty reduction and environmental

improvement (restoration or/and conservation). Wetlands International provides funding to local communities to be actively involved in environmental conservation and restoration activities in return for the communities' support to refrain from unsustainable practices. Micro-credits are converted into definitive payments upon successful delivery of conservation or/and restoration services at the end of a contracting period.

6. *Local NGO (AMEDD) perspective on land degradation and restoration initiatives*

(Oumar B. Samake)

Malian Association for Awareness Raising and Sustainable Development (AMEDD): AMEDD was established in 1998 and operates in Koutiala in the region of Sikasso. Its core areas of expertise include natural resource management (NRM); value chain development; rural land tenure; food security and nutrition; agroforestry; and capacity development. AMEDD core activity on land restoration is contour bund management to reduce erosion and increase soil water holding capacity. In their intervention area, maize farmland under contour bund management increase 35-38 %. For millet and sorghum yield increase reached 30 to 60%. The second type of activity is community forest management which comprises, improve stove technology to reduce fuel wood consumption, direct seeding of grass on grazing corridors, enrichment planting, capacity development of local community to undertake their local forest management. The third set of activities which are integrated comprise contour bund management, bio-amendments, liming, mulching.



Photo: contour bund with earth (Oumar B. Samake)

7. *Restoration Approaches and Practices: A Synthesis of Knowledge on Mali (Jules Bayala)*

This presentation attempted to provide a descriptive report on land restoration practices in Mali based on a desk review of various scientific journals and reports on agriculture and land degradation in the Sahel region. It focused on approaches of restoration of forests and tree resources as well as restoration of soil fertility for long-term and short-term results.

8. *Group work on: Community knowledge of degradation issues and their responses*

This presentation built on the fact that there are various forms of land degradation depending on the context of the different region in Mali (**Figure 6**). Participants were therefore asked to elaborate based on their experience on: What are the impacts of degradation that are already experienced in the different climatic zones in Mali? Are local communities aware of degradation? How do communities

respond spontaneously to resource degradation? A summary of the key responses is presented on the below table 1. Generally Local communities are aware to different degrees according to social groups and climatic zones. The community's consciousness is reflected in the decline in agro-pastoral productivity, the decrease in production, the decrease in vegetation cover, the drying up of rivers and decreasing opportunities for livelihood. Various local initiatives are put in place to halt the process and reduce its impact on livelihood. Communities respond differently to land degradation through the adoption of several initiatives: soil fertilization through the supply of organic manure, the use of improved seeds, the adoption of agricultural technologies, etc.

Table 2. Classification per region in Mali of the causes, impact and local initiatives on land restoration

Region	Causes	Impact	Local initiatives
Sahara	<ul style="list-style-type: none"> - Low rainfall - Overgrazing of transhumant livestock, - Collection of woody vegetation for use in the form of fuelwood or for construction 	<ul style="list-style-type: none"> - Fragile soil structure - Rising temperature - Vulnerabilities of local communities to climate change 	<ul style="list-style-type: none"> - Sand dune stabilisation - Controlled grazing
Gourma	<ul style="list-style-type: none"> - Water and wind erosion - Deforestation due to human and animal - Overgrazing - Reduced rainfall - Soil acidification - Removal of woody vegetation for use in the form of firewood 	<ul style="list-style-type: none"> - Depletion of natural resources - Low-yield of farm and pastures - Low soil fertility - Continuous soil erosion. 	<ul style="list-style-type: none"> - Soil and water conservation practices - Farmer-managed natural regeneration (FMNR) - Agroforestry - Crop diversification
Kaarta	<ul style="list-style-type: none"> - Soil acidification - Mismanagement of soil and land resource - Low rainfall - Water and wind erosion - Overgrazing - Clearing of crop residues 	<ul style="list-style-type: none"> - Depletion of natural resources - Low-yield of farm and pastures - Low soil fertility - Continuous soil erosion. 	<ul style="list-style-type: none"> - Use of improved seed - Soil amendment techniques - Soil and water conservation - Plantation
CMDT	<ul style="list-style-type: none"> - Population increases - Abusive land use for agriculture - Overgrazing - Clearing of crop residues - Extraction of woody vegetation for use in form of fuelwood - Acidification and low level of stable manure production 	<ul style="list-style-type: none"> - Low-yield of farm and pastures - Low soil fertility - Continuous soil erosion 	<ul style="list-style-type: none"> - Use of improved seed - Soil amendment techniques - Soil and water conservation - Agroforestry and tree planting
OHVN	<ul style="list-style-type: none"> - Over concentration of livestock in this area - High demand for wood products and firewood causing deforestation around cities, which has reached its peak 	<ul style="list-style-type: none"> - Depletion of natural resources - Low-yield of farm and pastures - Low soil fertility - Continuous soil erosion. - Decrease of arable areas leading to seasonal migration 	<ul style="list-style-type: none"> - Use of improved seed - Soil amendment techniques - Soil and water conservation - Plantation
Niger office	<ul style="list-style-type: none"> - Alkalization and salinization of irrigated land - High population pressures 	<ul style="list-style-type: none"> - Decline in soil fertility - Soil pollution - Loss of water, degradation of resources - Social conflicts between local communities 	<ul style="list-style-type: none"> - Regeneration of pasture - Reduced used of chemical fertilizer
Seno	<ul style="list-style-type: none"> - Overgrazing - Clearing of crop residues - Soil acidification - Mismanagement of soil and land resource - Water and wind erosion - Climate 	<ul style="list-style-type: none"> - Considerable decline in soil fertility - Reduction in vegetation cover, arable land and viable rangelands - Low-yielding soil cultivation 	<ul style="list-style-type: none"> - Pasture land restoration - Soil fertility improvement - Water harvesting techniques

		- Loss of vegetation cover which leads to a decrease in grazing areas with social conflicts	
West	- Mining - Overgrazing - Clearing of crop residues - Climate	- Soil contamination due to mining - Decrease of agricultural production which generates food insecurity - Increase erosion - Degradation of soils related to gold panning (South and West)	- Mines sites restoration - Tree planting

Day # 2

The second day of the workshop started with a synthesis of all the session of day # 1 followed by question and comment. The rest of the day was dedicated for group work all mainly focused on: (i) Make an inventory of projects and programs carried out in the field of land restoration in Mali; ii) Analyze the approaches used; iii) Analyze results and impacts on people and the environment; iv) Analyze the causes of success or failure in each case; v) Suggest strategies and approaches for scaling up of evidence-based technologies for restoration of degraded lands.

Group work #1

A. How do we support communities: inventory of restoration projects and programs in Mali, causes of success and failure

1. What are the major projects and programs (government support for actions, NGO support) for restoration in Mali in recent years? What are their goals?

There are various project and programme with technical and financial support from government, international development agencies, international and local NGOs as well as regional bodies. A tentative list of all major projects and programs is in Annex 3. All these projects and programmes aim to increase agro-silvo-pastoral production. The specific objectives: i) Strengthen food security; ii) Recover degraded areas and biodiversity; iii) Reduce the vulnerability of communities to climate change.

2. How / how were these programs relevant to the restoration?

All these projects and programme were relevant in restoring soil Carbone and increasing of cultivable areas. However, they all have some limitation in terms of acreage and number farmers reached.

3. What innovations have led to success (institutional, social ...)?

Most of those projects use various innovative approaches which have led to success.

- Participatory approaches
- Coherence of activities
- Appropriate technologies to their context
- Capacity enhancements
- Intervention adapted to the context
- Integration of several technologies: holistic approach

4. What are the indicators of success?

The indicators of success are:

- Rehabilitated area in terms of acreage and improved soil fertility;
- Number of technologies adopters
- Increased yields
- Increased woody land cover
- Increase in the area of restored humid forests
- Reduction of social conflicts
- Improvement of household income

- Improvement of food security

5. What are the reasons for their failures if there are any

There are often different reasons which led to failure or limited delivery.

- Top down approaches which;
- Weakness of the monitoring and evaluation mechanism;
- Non-continuation of activities by the beneficiaries after support project end;
- Not integration of the preparation of the post-project;
- Inadequate duration of projects: inefficient planning of project phases;
- Administrative heaviness of projects (State and donors).
- Insufficient qualified staff

B. Prerequisites for the dissemination of innovative practices in restoration

1. What are the ingredients for scale-up of evidence-based restoration technologies in Mali?

a. Political aspects

- o Agricultural Orientation Act;
- o Pastoral and Forestry Code;
- o Land tenure code
- o Mining code;
- o Mali committed itself on several land restoration initiatives including AFR100, Bonn initiative, Land degradation neutrality, Paris agreement etc...
- o Membership in regional and international organizations helps to scale
- o Decentralization code;
- o Water Resource Code;
- o Strategic Framework for Sustainable Land Management (Under development);
- o Registration of evidence-based technologies in the PDSEC (Social and Cultural Economic Development Program);
- o Political will to accelerate the transfer of natural resources to local communities;

b. Organizational aspects

- o Promote the local conventions of management of natural resources;
- o Chamber of Agriculture;
- o Territorial communities;
- o Farmer organizations;
- o Establish stakeholder consultation frameworks;
- o Mapping actors and technologies
- o Establishment of a multi-actor capitalization and orientation exchange platform for degraded land restoration

c. Training of actors

- o Develop adapted training tools,
- o Train NGOs and state technical services so that they can train trainer
- o Put the resources at the disposal of the trainers to train the beneficiaries;

C. What strategies and approaches to scaling up evidence-based restoration technologies?

- o Harmonize the interventions of the different actors;
- o Develop projects and programs in a participatory way with beneficiaries;
- o Capitalize successful experiences;
- o Communication
- o Advocacy for land restoration
- o Mobilize financial resources for the diffusion of technologies;
- o Motivate field agents for the diffusion of technologies.

D. Prospects: what types of activities are needed in the short and medium term in Mali?

Participants were asked to list according to their understanding relevant priorities for reducing the impacts of land degradation on rural populations. A set of those priorities are:

- o Improving land tenure
- o Improving communication and awareness raising
- o Building on local knowledge and using bottom-up approach
- o Prioritizing scalable technologies options per region
- o Making use of innovative approaches such as Bio-right for land restoration
- o Elaborating joint project and building strong partnership
- o Setting a community of practice on land restoration
- o Advocacy for increased use of renewable energy source (providing subsidies for the butane gas for household use, solar energy)
- o Large scale adoption of efficient fuelwood use
- o Advocacy for long term vision and approach to land restoration
- o Promoting integrated soil fertility management
- o Support NGO to scale up successful initiatives in their area of intervention
- o Developing adapted training tools and train communities on the innovative approaches to land restoration
- o Using the options x context approach
- o Implementation of proven technologies
- o Imbedding land restoration initiatives into local development plan

E. Perspective and assessment of the meeting

The meeting ended with the evaluation from participants and their suggestions. Generally, there was a common agreement that the workshop brought together experts that were able to exchange enriching experience. There were lessons learnt from attending the meeting and good suggestions.

• What are the main lessons you remember?

- There are many actors working on land restoration issues but there is no synergy of action
- Need of setting a good platform of monitoring and evaluation of the different intervention
- The concept of restoration, rehabilitation, reclamation which often are confusing were made clear.

• What suggestions do you have for following up on such a workshop?

- Formation of a community of practice on land restoration
- Designing intervention bearing in mind the option by context approach
- Come up with a joint project with various actor (scientist, farmers, development practitioners)
- Organizing joint meeting with development organizations and decision makers
- Continue sharing information

• Do you have any suggestions for improving the organization of such a workshop the next time?

- Inviting grass root actors (locally elected people, media, lead farmers etc..) to participate in similar workshop as they harbor often wealth of knowledge
- Getting a functional community of practice and organizing regular meeting to exchange knowledge
- Getting each participating institution making commitment to take action towards land restoration with a specific community
- Organizing joint field visit to see successful experience

- Allocating more time to most participating organization to present on their work on land restoration
- Sharing documentation
- Inviting other potential participants: Agence de l'Environnement et du Développement Durable (Mali), official from the national assembly in charge of land restoration
- Issue certificate for each participant

IV. CONCLUSIONS

In the Sahel of Mali, agricultural extensification and intensification due to population growth and unsustainable agricultural practices that reduce vegetation cover on lands have contributed to land degradation. Soil degradation through soil erosion is the main form of land degradation in the Sahel, resulting in nutrient loss, soil physical degradation and salinization and consequently reducing agricultural productivity. Extensification and the decrease of fallow periods may yield benefits for farmers in the short term. In the long term however, land degradation is exacerbated through exposing newly cultivated lands to the forces of erosion, a decline in soil fertility and the reduction in the balance between fallow and cultivated areas, leading to net losses of saltation material in the system.

With land degradation being a major problem in the Sahel, the use of sustainable agricultural and land use practices that promote vegetation cover on lands can help protect soils from erosion. These practices include agroforestry, growing of cover crops, grasses and drought resistant trees. Integrated farming is proposed to maximize land use per unit area and diversify farmers' sources of income as favourable croplands are limited in the region. Practices that promote organic matter additions to soils such as mulching and addition of organic manure can also have positive benefits for both agricultural production and addressing land degradation.

Annex 1. Workshop agenda

Agenda		
Tuesday 11 April 2017		
08.30 – 09.00		
Arrival of participants at ICRISAT conference room		
09.00 – 9.30		
Welcome address (Antoine Kalinganire, ICRAF Sahel Node Coordinator) Participants introduction Bayala Jules		
Session		Questions – Activities - Information
1	9.30 - 9.45	Chairperson: A. Kalinganire
	Review and adoption of the workshop agenda (Bayala Jules)	Rapporteur: Ibrahim Touré
	9.45 – 10.00	
	Presentation of the context objectives of the meeting (Bayala Jules)	<u>Documents:</u> Video on land degradation
	10.00 - 10.30	
	Restoration of degraded drylands for agricultural, forestry and pastoral production: a review of key concepts (Patrice Savadogo)	
10.30- 11.00 Group Photo and Coffee Break		
	11.00 - 11.20	Chairperson: Bayala Jules
	Summary of the state of land and natural resources (land and vegetation) in Mali (Patrice Savadogo)	Rapporteur: Mrs GNAMBELE Jane FANE & Djibril Dayamba
	11.20 - 11.40	<u>Presentation</u>
	* CILSS / Sahel Institute (Sangare Sheick Khalil)	- Overview of degradation zone

2	<p>Regional Perspective</p> <p>11.40 - 12.00</p> <p>* Wetlands-International (Beteo Zongo)</p> <p>Perspective on the humid zones</p> <p>12.00 - 12.20</p> <p>* World Vision (Mme GNAMBELE Jane FANE)</p> <p>Perspective from WV intervention area</p> <p>12.20 - 12.40</p> <p>* ONG-AMEDD (Oumar B SAMAKE)</p> <p>Perspective from AMEDD intervention area</p> <p>12.40-13.00</p> <p>Discussion on the presentations</p> <p>Bayala Jules</p>	<p>- Conversion of land, habitat change and degradation: drivers</p> <p>- Climate change and extreme weather events</p> <p><u>Presentations:</u></p> <p>"Critical Review of the Restoration of Degraded Lands: Technologies Used, Elements of Success and Failures of Different Initiatives"</p> <p>- Restoration approaches and practices</p> <p>- Successful practices and prerequisites for dissemination</p> <p><u>Sub-regional experience of CILSS</u></p> <p><u>Wetlands International's Experience</u></p> <p><u>ONG-AMEDD's Experience</u></p> <p><u>World Vision Experience</u></p>
13.00 – 14.15 Lunch break		
3	<p>14.15 – 14.45</p> <p>Restoration Approaches and Practices: A Synthesis of Knowledge on Mali</p> <p>Dr. Bayala Jules</p>	<p>Chairperson : Binam Joachim</p> <p>Rapporteur : Catherine Dembélé & Oumar B SAMAKE</p> <p><u>Presentation:</u></p> <ul style="list-style-type: none"> • Restoration of forests and tree resources • Restoration of soil fertility <ul style="list-style-type: none"> - Objectives of the approaches - Long-term results - Short term results

	14.45 – 16.00 Community knowledge of degradation issues and their responses <u>Group work:</u> (2–) 3 working groups: Addressing essential issues Plenary summary of the results of the group work	<u>Key questions:</u> <ul style="list-style-type: none"> • What are the impacts of degradation that are already experienced in the different climatic zones in Mali? • Are local communities aware of degradation? • How do communities respond spontaneously to resource degradation?
16.00 – Coffee Break and End of the Day		
<i>Wednesday April 12th</i>		
	Session	Questions – Activities – Information
4	09.00 – 9.15 Synthesis of day 1 Patrice Savadogo	
5	9.15 – 10.15 How do we support communities: inventory of restoration projects and programs in Mali, causes of success and failure <u>Group work :</u> 2–3 working groups Addressing essential issues Plenary summary of the results of the group work.	Chairperson : Bayala Jules Rapporteur : Dayamba Djibril & Soumaila Sogoba The essential questions: <ul style="list-style-type: none"> • What are the major projects and programs (government support for actions, NGO support) for restoration in Mali in recent years? What are their goals? • How / how were these programs relevant to the restoration? • What innovations have led to success (institutional, social ...)? • What are the indicators of success? • What are the reasons for their failures if there are any
10.15– 10.45 Coffee Break		
	10.45 – 13.00	Chairperson : Bayala Jules

6	<p>Prerequisites for the dissemination of innovative practices in restoration</p> <p><u>Group work :</u></p> <p>2–3 working groups</p> <p>Addressing essential issues</p> <p>Plenary summary of the results of the group work.</p>	<p>Rapporteur : Binam Joachim & Lassana Traoré</p> <p><u>Reporting:</u></p> <ol style="list-style-type: none"> 2. What are the ingredients for scale-up of evidence-based remediation technologies? <ol style="list-style-type: none"> a. Political aspects b. Organizational aspects c. Training of actors d. Any other aspect 3. What strategies and approaches to scaling up evidence-based remediation technologies?
13.00 – 14.00 Lunch		
7	<p>14.00 – 15.00</p> <p>Future prospects: what types of activities are needed in the short and medium term in Mali?</p> <p>Bayala Jules</p>	<p>Chair person : Sangaré S. Khalil</p> <p>Rapporteur : Patrice Savadogo</p> <p><u>Key questions:</u></p> <p>What are the 4 relevant priorities to reduce the impacts of land degradation on rural populations?</p>
8	<p>15.00 – 15.30</p> <p>Perspective and assessment of the meeting</p> <ul style="list-style-type: none"> • Are the goals achieved? • What are the main lessons you remember? • What suggestions do you have for following up on such a workshop? • Do you have any suggestions for improving the organization of such a workshop the next time? 	<p>Rapporteur : Dayamba Djibril</p> <p><u>Key questions:</u></p> <ul style="list-style-type: none"> • Are the goals achieved? • What are the main lessons you remember? • What suggestions do you have for following up on such a workshop? • Do you have any suggestions for improving the organization of such a workshop the next time?
<p>15.30–15.45</p> <p>Closing session</p> <p>Antoine Kalinganire, Sahel-ICRAF Node Coordinator in Bamako</p>		
16.00 – Coffee Break and end of the Workshop		

Annex 2. List of participants

N°	PRENOM/ NOM	INSTITUTION	LOCALITE	Adresse Email
1.	Antoine KALINGANIRE	ICRAF	Bamako	a.kalinganire@cgiar.org
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26.	Idrissa Ag MOUSTAPHA	SOS Sahel International	Bamako	idris.agmoustapha@gmail.com
27.	Joachim BINAM	ICRAF	Bamako	J.binam@cgiar.org
28.	Ibrahim TOURE	ICRAF	Bamako	I.TOURE@cgiar.org

Annex 3: List of project and programme working on issues related to land restoration

Programme/project	Organisations	Objective
Programme d'Accroissement de la Productivité Agricole au Mali (PAPAM)	FIDA	Son objectif environnemental global (GEO) consiste à accroître l'utilisation des pratiques de gestion durable de la terre et de l'eau (GDTE) dans les systèmes et zones de production ciblés.
Global Climate Change Alliance in Mali	EU	Contribute to improvements in, and actual implementation of, climate change-related policies and strategies.
Le Programme de Lutte Contre l'Ensablement dans le Bassin du Niger	Netherlands	The Program to Combat Silting in the Niger Basin
Projet de la Grande Muraille Verte au Mali	African union	
Projet LED JIGIYA de Helvetas SWISS Interprofession	Swiss Development	
Programme d'appui aux secteurs de l'eau potable de l'assainissement et des ressources en eau (PASEPARE II)	EU	
Plan National de Lutte contre la Désertification et l'Avancée du Désert (PNLCD)	Etat	
Projet d'urgence pour l'appui à la sécurité alimentaire et le développement rural (PUSADER)		
Projet Intégration de la résilience climatique dans la production agricole pour la sécurité alimentaire au Mali	EU	
Projet d'Amélioration de la capacité d'adaptation et la résilience face aux changements climatiques dans le secteur agricole du Mali		
Programme de de Gestion Décentralisée des Forêts (GEDEFOR)	EU	
Programme Appui aux initiatives au Reso climat Mali pour l'adaptation aux changements climatiques		Construction de la resilience à travers la restauration des terres
Programme d'Appui au Développement Durable de l'Élevage au Sahel Occidental (PADESO)		Focus on livestock and pasture resource
PRAPS-Projet Regional d'Appui au Pastoralisme au Sahel	World Bank	Focus on pastoralisme and pasture restoration
Projet de Développement de l'Élevage dans la région du Liptako Gourma (PDELG)		
Développement du Système de Riziculture Intensif (SRI) à Tombouctou		

Programme d'appui a l'adoption aux changements climatiques dans la zone sahelienne (PAACC/SAHEL)		
Programme regional de resilience a l'insecurite alimentaire P2RS		
Projet Nogos GRN		
Projet d'intensification agro-écologique		
Projet s'équiper en reboisant		
SmAt Scaling	ICRAF-USAID	
Africa Rising	ICRISAT-USAID	
BAM-GIRE	Wetlands International Mali	Le programme vise à assurer « un Bassin du Niger vivant, où les moyens d'existence et la biodiversité sont sécurisés dans un environnement changeant ».
Bio-Right	Wetlands International Mali	
VRES		
Projet IKI	Wetlands International Mali	
PASSIP		
Wetlands and Poverty Reduction project (WPRP)	Wetlands International Mali	
Wetlands and Livelihoods project	Wetlands International Mali	
Restauration des ressources durable à Kaye		
Amélioration des moyens d'existence des populations et du lac de Magui		
Reverdir Ségou et Mopti		
Programme PRRE/Sous composante 2	SOS	Restauration, GIRE,
Projet Gestion intégrés de la fertilité du Sol		
GHENIS (Gestion Hydroécologique du Niger Supérieur)		
GIRENS (Gestion intégrée des ressources en eau du Niger supérieur)		