

Briefing note - 1 26th October, 2023

A comprehensive framework for assessing the sustainability of socialecological landscapes

Summary

This Briefing Note proposes a framework for status assessment and performance evaluation of social ecological landscapes. Two important application of this framework is envisaged:

- It can facilitate inclusive decision-making by multiple stakeholders working in the same landscape by explaining
 interactions, synergies, and trade-offs among SEL goals and landscape components; and,
- When SEL related bundles of innovations are successful (or otherwise), the framework can help document same, reinforcing the case for (not) adopting and scaling up/out.

Introduction

At the center of a sustainable Social-Ecological Landscape (SEL) is the improvement of the management of land and the natural resource base in such a way that land use concurrently meets three goals:

- Provision of products (e.g., food) and services on a sustainable basis,
- Support for sustainable livelihoods for all social groups, and
- Conservation of the full complement of biodiversity and ecosystem services.

Globally, sustainable SEL approaches such as inclusive landscape management, agroecology, eco-agriculture and integrated landscape management are already being applied, with promising results in places where food production, poverty alleviation and conservation of biodiversity, water, and ecosystem services are all high priorities *(Kozar et al., 2014; Sayer, 2013)*. These approaches are applied on productive landscapes with different forms of land use (e.g., forestry, agriculture, extraction of minerals, conservation/protected areas, and settlements) that are symbiotic. Therefore, SEL state and performance assessment frameworks that focus exclusively on, for example, the conservation of natural resources on the one hand or agriculture and other land uses, on the other hand, can at best give an inadequate overview of the SEL. Considering the varied SEL goals, there is need for a comprehensive and iterative assessment framework that consider the drivers of land use and the complex interactions among different land uses and interventions across the landscape.

DPSIR-SEL Framework

Building on existing assessment frameworks from relevant fields (e.g., Ecoagriculture, Agroecology, Integrated Landscape Management, etc.), a Drivers-Pressure-State-Impact-Response (DPSIR) for SEL (DPSIR-SEL) framework is proposed for situational analysis and performance evaluation of target SELs under the <u>West and Central African Food Systems Transformation</u> (TAFS-WCA) initiative (Figure 1 and <u>Atampugre et al. 2022</u>). The purpose here is not to present an entirely new framework for analyzing socialecological landscapes (SEL). The aim is to draw insights from the works of Musumba et al. (2017), Dale et al. (2015), Scherr et al. (2014), and Buck et al. (2006) to develop a comprehensive assessment framework for understanding the social and ecological driving forces and pressures that underpin changes in the state of SELs as well as their implications for human well-being, ecosystems services, and sustainable landscape management in general. To effectively utilize the framework across varying socio-ecological landscapes, researchers need to consider comparable indicator metrics (see Figure 2).



Landscape with plantation and mining site. (photo: Emmanuel Mensah)



Figure 1: DPSIR-SEL assessment framework

Indicators under the DPSIR-SEL assessment framework

A SEL in the context of TAFS-WCA and within the frame of DPSIR-SEL consist of mutually interdependent set of agricultural, semi-natural, and natural ecosystems, where land management practices actively govern this interdependence. The concept of sustainable and inclusive landscape management implies managing agriculture and natural resources simultaneously for food and fiber production, support of biodiversity and ecosystem services, and fostering overall contributions to human well-being. In this regard, the DPSIR-SEL framework enables synergies and trade-offs among ecological, economic, cultural, and social objectives to be examined at a larger-than-farm scale to reveal how interactions among different land uses are complementary and/or competing. Management strategies within and across these four objectives, thus, can then be assessed and negotiated to produce an optimal balance within the given landscape context. Consequently, the <u>sustainable intensification assessment framework</u> (SIAF) is adopted as a guide for the selection of context-specific indicators and variables for the purposes of assessing SEL state and SEL performance under innovations (Figure 2). SIAF provides a synthesized list of indicators and metrics and means to explore all the domains of sustainability. It is an objective-oriented framework organized into six domains critical for sustainability: productivity, economic, environment, human condition, social and institution domains. The process of selecting variables/indicators under each domainis key to the reliability and validity of the chosen indicator/variable. In using this framework for the landscape situational analysis under work package 3 of the TAFS-WCA initiative (See https://hdl.handle.net/10568/128221), the researchers used the selection process as recommended by (Dale et al. 2015).



Source: Adapted from Musumba et al. (2017)

Process of selecting SEL assessment indicators

Being able to select the core set of landscape indicators is an essential process in landscape performance assessment. The stage where it is determined what will and will not be measured as part of the sustainability assessment. It is recommended that selection must involve engagement with stakeholders and scientists working in different disciplines. This process will bring divergent perspectives, enabling an improved understanding of different aspects of sustainability and lead to a robust set of indicators. The process of indicator selection should be transparent, well defined, and robust to ensure that it is credible (Latruffe et al., 2016; Dale and Beyeler, 2001). It is critical to select indicators that are balanced to consider all the domains of sustainability and ensure that the relevant stakeholders are involved (See Figure 3 for an illustration of the selection process).



Figure 3: Illustration of the process of selecting indicators for landscape assessment Source: Adopted from Dale et al. (2015)

Conclusion

The researchers recognize that different CGIAR centers working on TAFS-WCA initiative may have different interests in understanding the status and performance of target social-ecological landscapes in the various initiative countries. Consequently, this framework is generic for a wide range of landscapes, allowing for the selection of place-specific indicators/variables for the purposes of situational analysis (e.g., https://hdl.handle.net/10568/128221) and performance evaluation (at end of initiative).

Glossary

SOCIAL ECOLOGICAL LANDSCAPE (SEL)	Landscape that consists of natural and/or human-modified ecosystems that are influenced by distinct ecological, historical, political, economic, and socio-cultural processes and activities.
INCLUSIVE LANDSCAPE MANAGEMENT (ILM)	The integration of social and ecological systems, local participation, and sustainable resource use within landscapes by the local government and/or other implementers.
DRIVING FORCE	Factors that motivate human activities and fulfill basic human needs, which have been consistently identified as the necessary conditions and materials for a good life, good health, good social relations, security, and freedom.
DYNAMIC PRESSURES	Human activities derived from the functioning of Social and Economic Driving Forces that induce changes in the environment or human systems.
ІМРАСТ	Changes in the structure, functioning and composition of the ecosystem will impact the production of ecosystem goods and services and, ultimately, human well-being
RESPONSE	Responses are actions taken by groups or individuals in society and government to: prevent, Compensate, ameliorate, adapt to changes in the state of the environment, modify human behaviors that contribute to health risks, and directly modify health through medical treatments or to compensate for social or economic impacts of the human condition on human well-being. Responses may be directed at driving forces, pressures, landscape state, or impacts (as can been in Figure 1).

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Source

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CGIAR Initiative on West and Central African Food Systems Transformation

The CGIAR Initiative on <u>West and Central African Food Systems Transformation</u> aims to help realize the potential of agriculture to improve nutrition and food security by developing nutritious, climate-adapted and market-driven food systems. The TAFS-WCA initiative is a collaborative effort of nine centers including six CGIAR centers, namely the Africa Rice Center (AfricaRice), the International Institute of Tropical Agriculture (IITA), the Alliance of Bioversity International and the International Center for Tropical Agriculture (Alliance Bioversity-CIAT), The International Water Management Institute (IWMI), the International Center for Potato (CIP) and the WorldFish and three international centers namely the West and Central African Council for Agricultural Research (CORAF), The World Vegetable Center (WorldVeg) and The International Centre of Insect Physiology and Ecology (icipe). The initiative further collaborates with national partners in different countries.

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