Assessing land condition as a first step to achieving land degradation neutrality: A case study of the Republic of Srpska

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ABSTRACT

Land Degradation Neutrality (LDN) is a key voluntary and aspirational target of Sustainable Development Goal (SDG) 15 which urges countries to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. A first and critical important step in the implementation of LDN is assessing the current land condition using not only active restoration of degraded land, but also targeting land degradation drivers behind the land degradation process. In a first step to achieve these goals, countries were provided a global dataset for three sub-indicators of land degradation: land cover (LC), land productivity dynamics (LPD) and soil organic carbon (SOC). Here, we report on trends in these sub-indicators for the Entity Republic of Srpska (RS) as a part of Bosnia and Herzegovina, which is a key analysis to inform the frame of reference or baseline conditions for the region to evaluate LDN across this region. Global data for LC for the RS indicates a 0.5% loss of forests (6400 ha) over the time period from 2000 to 2010. Of this area, 5000 ha were converted to cropland and an additional 1400 ha was converted to shrubs, grasslands and sparsely vegetated areas. LPD declined over 2.5% (63,500 ha) of the region. SOC declined on land use changed areas by 15.6% (74,609 Mg ha^{-1}) over the same time period. Based on global data, we estimated that 3% of the country is in a degraded state. Based on interviews with local stakeholders in 31 local communities, the primary land degradation drivers were identified and validated by team experts. Depopulation and migration to urban centers were identified as the important underlying drivers of land degradation that most municipalities are facing. The most frequent direct drivers of land degradation across this region were land abandonment, floods, drought, erosion and urbanization. Land abandonment, more specifically, has resulted in conversion of agriculturally productive lands to lands dominated by a wide range of invasive species over the last 25 years. Continued land degradation is underpinned by the lack of understanding by stakeholders of the importance of land as a resource. In evaluating the status, trends and drivers of land degradation for this region, we have identified key areas or "hot spots" that may be targeted for restoration options and may be used to achieve LDN targets by 2030.

1. Introduction

Land Degradation Neutrality (LDN) is a new concept of the Sustainable Development Goals (SDG) under the UN 2030 Agenda for Sustainable Development. This is a voluntary and aspirational target of SDG 15 which urges countries to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. In a recent paper, soil has been pointed out to be of high importance to realize many of the SDGs, and especially SDG 15 (Keesstra et al., 2016). LDN sets the ambitious goal of stabilizing or increasing the amount and quality of land resources necessary to support ecosystem functions and services and enhance food security across the globe by 2030 (UNCCD, 2014). A first and critical important step in
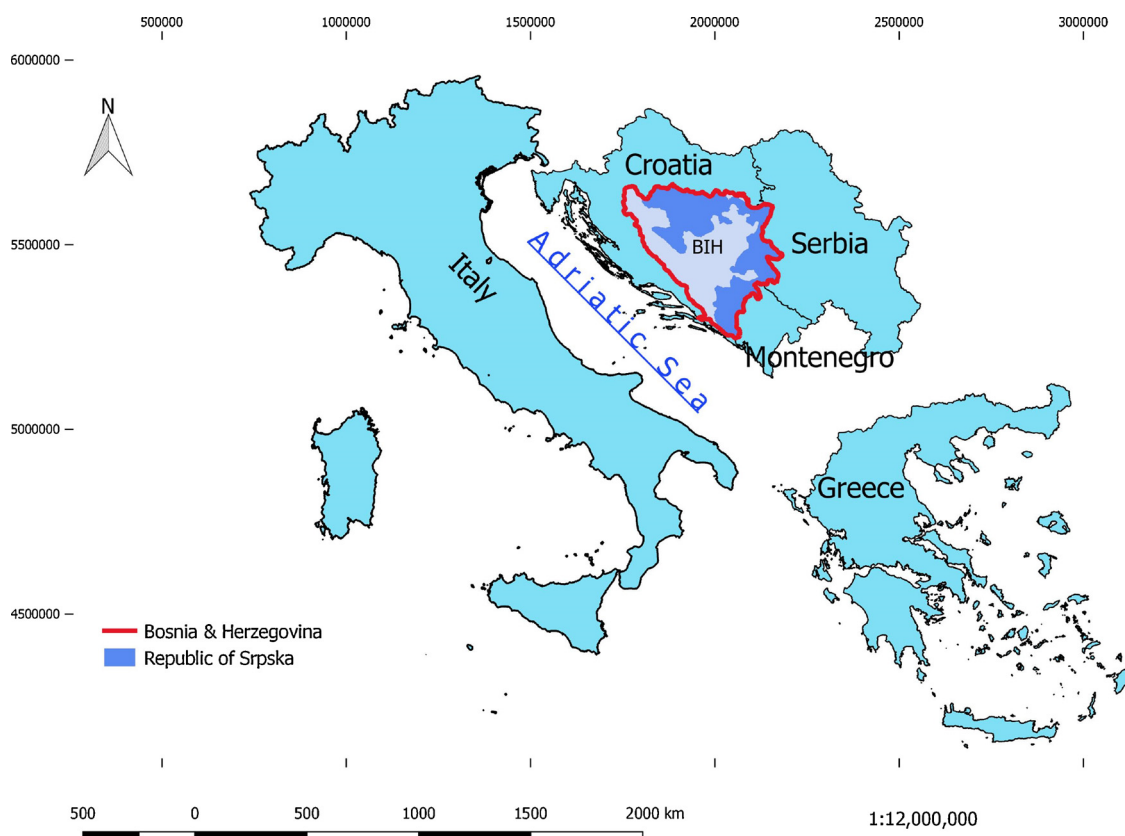

Fig. 1. Geographical location of the RS (BiH).

implementation of LDN is assessing current land condition using not only active restoration of degraded land, but also targeting land degradation drivers behind the land degradation process, such as unsustainable land practices, weak legal framework, lack of incentives, low level of awareness and others. UNCCD (2014) provided guidance (UNCCD, 2012, 2014, 2016, 2017) to countries which are invited to estimate state of land resources, trends of land degradation, and define national voluntary target and measures to achieve LDN by 2030.

Bosnia and Herzegovina (BiH) is a sovereign state with parliamentary state regulation and a decentralized political and administrative structure. The Republic of Srpska (RS) Entity is one of three administrative units regulated by the Dayton Peace Agreement. Land and land resources are under exclusive jurisdiction of the entities, therefore land is regulated by the Entity and not State legislation. Following this, diverse land use patterns, especially focused on forestry and agricultural, exist across the region for example, natural forests, forest plantations, cropland, pastures, meadows, orchards, vineyards, etc. An important and more recent driver of land use patterns over the last 25 years are migration and land abandonment due to land mines resulting from the Bosnian War of 1992 (Witmer and O'Loughlin, 2009).

BiH ratified the United Nations Convention to Combat Desertification in 2002, and the LDN target setting process began in 2016. Having recognized the importance of the LDN process, the Government of the RS voiced its interest in participating in the LDN process and took an early and leading role, which intensified interest of local stakeholders and decision makers in land planning, land management and land conservation. The important strategic document at the state level is the Action Program (AP) to Combat Land Degradation and Mitigate the Effects of Drought in Bosnia and Herzegovina (United Nations Environmental Programme (UNEP, 2017)), adopted in 2017 by the Council of Ministers of BiH. In accordance with the AP, the state of land resources is assessed, main pressures of land degradation are identified, and priorities to combat land degradation have been analyzed and defined. The RS is a very heterogeneous region in terms of climate, parent material, vegetation and land use patterns that, together with shortage of national data and lack of interest in LDN as a national priority, complicate the target setting process.

Existing national statistical data for land cover/use are not compliant with LDN land cover (LC) categories and relay on outdated cadastral data that local communities use for reporting to the Republic Institute of Statistics every year. The logical choice for the RS without reliable national data was to use global data for the LDN baseline, target and associate measures. BiH, thus the RS, is a developing country in socio-economic transition, where land resources under active depopulation are a topic of a secondary importance. The legislative framework of the RS generally recognizes and respect sustainable land management where land protection is part of multiple sectoral regulations. However, LDN is not officially recognized by existing regulation/legislation. Policy and legal frameworks often mainstream sustainable land management (SLM) practices, but significant barriers exist for their effective implementation. Development and implementation of new SLM practices should build on existing local knowledge or, alternatively, regional experiences from similar conditions and environments (Cerdà et al., 2018; Motavalli et al., 2013; Schwilch et al., 2012; Liniger et al., 2011). Knowledge and awareness of decision makers is mostly insufficient, together with general public perception about land degradation, in spite of the increased frequency of extreme events caused by climate change, drought and floods, excessive and illegal deforestation, wildfires, urbanization, landslides and land contamination over the last 20 years. This paper describes the process of assessing land condition, as a fundamental requisite for LDN target setting. To this end, RS (BiH) is used as case study, and the paper identifies land degradation trends and drivers in the selected study area, and main gaps, challenges and opportunities for the implementation of the LDN target by 2030 in the RS.