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Session 7.29. Target setting in a resource constraint world

Targets for sustainable land use: rationale, reflections and research needs

Summary

Targets help to set a clear orientation, provide guidance and prioritize actions toward achieving objectives. This presentation will take a closer look at the state of research on global land use targets for cropland and forestry. It examines the role and rationale for land use targets, identifies research needs and reflects on how such targets could contribute to a green transformation. It argues that balance is the key concept behind global land use targets, with the aim being to connect what may be sustainably produced on the supply side with how much may be consumed under those conditions on the demand side. A target of 0.2 hectares per person for cropland and 0.45 m³ timber per person for forest in the year 2030 are presented, and the implications of meeting such targets for the EU are discussed, considering both current and expected EU cropland and forest land footprints.

Extended abstract

The need to address unsustainable consumption has been recognized repeatedly as an integral aspect of reaching both international (UN 1992; UN 2012) and EU (e.g. EC 2011) visions. However, little, or painstakingly slow, progress has been made toward a coordinated, comprehensive and structured reduction of environmental footprints. One reason is that visions picturing a world characterized by sustainable resource production and consumption have not been adequately turned into targets for sustainable resource use. Without clear targets for what a sustainable level of resource consumption entails, there is no reference for knowing whether consumption levels for specific resources are pushing the limits of the planet beyond what may be considered sustainable.

Scientific understanding on the planetary boundaries has improved significantly in recent years, notably through the flagship publications of Rockström et al. (2009a,b). Those publications have developed the concept of a “safe operating space”, which will allow humanity to continue to develop and thrive within the biophysical boundaries for keeping the Earth within the Holocene. The challenge is linking the safe operating space to quantifiable, concrete and transparent targets for the consumption of natural resources. This presentation will take a closer look at the state of research on global land use targets for cropland and forestry. It examines the role and rationale for land use targets, identifies research needs and reflects on how such targets could contribute to a green transformation.

The role of targets

Targets help to set a clear orientation, provide guidance and prioritize actions toward achieving objectives. If properly enforced and supported by an appropriate policy-mix to ensure fair (global) market conditions and a level playing field, they can be a powerful approach to addressing environmental issues in alignment with other objectives. Long-term objectives provide actors in society, particularly governmental organizations and companies, certainty, stability and time to achieve the target in the most efficient manner. As such, they may be used to frame policies and drive innovation. For example, targets may serve as the rationale for policy intervention, offer a benchmark for both new and old policies, and contribute to policy coherence. Finally easy-to-communicate targets are one way to raise awareness about the need for change.

Why land use targets

Land use targets are needed to link EU consumption levels to the global safe operating space in order to better take the global implications of European consumption into account. As regards cropland, the EU is already import dependent and has disproportionately high consumption levels compared to the global average. A literature review of research on cropland footprints has shown that the EU-27 requires around 0.30 ha/cap of cropland to meet its total demands for food, bioenergy and biomaterials. This area is larger than the domestically available cropland by around one-quarter and higher than average global consumption levels by around one-third. Future demands, in particular in the context of a growing bioeconomy, could further increase EU land footprints and raise pressures on land resources abroad. The impacts of land use change, such as biodiversity loss and deforestation, change local ecosystems with global implications (like climate change).

As regards forests, total EU timber consumption is estimated to be roughly in the order of 500 Mm³, or requiring around 125 Mha of forest to grow annual demands. This equates to around 1 m³/cap or a footprint of 0.25 ha/cap, and means that the EU consumes around 12% of annual global timber production and uses around 7% of the global forest area available for wood supply. In the future, demand is expected to increase significantly. In particular, meeting the EU Renewable Energy Directive (EU 2009) targets would cause the total timber demand between 2010 and 2030 to increase by around 55% (under moderate economic growth conditions) to 70% (under high economic growth conditions). This implies that the EU is quickly approaching a supply-demand gap, in which expected future demand surpasses the sustainable supply potential of European forests.

What are the suggested targets and the rationale behind those targets

Balance is the key concept behind global land use targets. The aim is to provide an orientation on the balance between what may be sustainably produced on the supply side with how much can be consumed under those conditions on the demand side. As such, targets should be based on the concept of using “a fair share” of the global safe operating space for the EU. In other words, targets should lead to both a level of consumption that is within the planetary boundaries and in which activities do not cause the transgression of other planetary boundaries.

As regards cropland, Rockström et al. (2009a,b) suggest that no more than approximately 15% of the global ice-free land surface should be converted to cropland, implying that an expansion of around 400 Mha (from 2005) would be within the safe operating space to prevent the climate related impacts of land use change. Bringezu et al. (2012) suggest that a strong sustainability target would be to halt global cropland expansion in the year 2020. This would imply a global land target of around 1,640 Mha (or approximately 12.6% of global ice-free land area) with the rationale based on halting the loss of biodiversity through land use change. UNEP (2014) adopted this suggestion to promote a per capita target of 0.20 hectares (1,970 m²) in the year 2030.

As regards forests, the increasing demand for timber, driving both deforestation and degradation in forest quality (e.g. replacing native forests with monoculture plantations), points to the need to consider a safe operating space for maintaining forest cover. A cautious global target of 0.45 m³/cap is suggested as an orientation for the consumption of timber in 2030. This is based the same assumptions as the UNEP (2014) study; namely, halting all changes in forest area by 2020 regarding both natural forests and fast-growing plantations, in order to halt the loss of biodiversity. However, it is somewhat more complicated for forestry than cropland because forests grow at different rates, making annual comparisons difficult. As such, the safe operating space for timber consumption requires considering both a land use change boundary, and also how that land is used under conditions of sustainable forest management. The latter is approached in three steps: estimating the area available for wood supply (ha), the productivity on that area (m³/ha) and the amount of annual growth that can be removed on a sustainable basis (m³).

Research needs

Overall, the setting of land use targets requires (a) understanding where the global boundaries are, (b) normative discussions on risk and the precautionary principle to determine the safe operating space below these boundaries, and (c) translating global boundaries into national targets. Research is needed to strengthen processes at all three steps. In particular, research is needed to

- strengthen the link between safe operating space and targets in a scientifically sound way
- support the process of setting targets by analyzing the interlinkages and trade-offs between them and a variety of higher objectives;
- make national (or global) targets both meaningful and implementable at different levels of application and across different time scopes
- adequately address the question of fair shares of global resource use considering widely different endowments of countries with natural resources

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