Grasslands, Savannahs and the UN Decade on Ecosystem Restoration

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Abstract

Grasslands and savannahs are suffering heavy losses from degradation and conversion. The UN Decade on Ecosystem Restoration offers important opportunities to address these losses through a range of restoration techniques. Conversely, if poorly planned the Decade could undermine remaining natural and semi-natural grassland and savannah ecosystems by encouraging afforestation on these areas, thus acting as a perverse incentive. This paper outlines the main issues and the steps that need to be taken to ensure that the Decade creates positive outcomes for these important habitats: (i) Better understanding of status and trends in degraded and converted grasslands and savannahs; (ii) making the case for grassland and savannah restoration; (iii) ensuring post 2020 target address all natural ecosystems; (iv) improving selection tools for restoration; and (v) identifying successful grassland and savannah restoration approaches

Introduction

The United Nations plans a “Decade on Ecosystem Restoration”, from 2021-2030. To date the main emphasis is being placed on restoration of degraded or converted forests (linked to the Bonn Challenge), mangroves and corals, but the Decade is theoretically aimed at any kind of ecosystem restoration.

It provides both opportunities and risks for grasslands and savannahs. There are clear opportunities to make the case for restoration of degraded or converted grasslands and savannahs, with both ecological and socio-economic incentives, and thus to use the Decade as a way to help build knowledge, capacity and funding for restoration of these habitats. But there are also some risks, in particular that heavy-handed efforts to restore forests might have the perverse result of establishing forests over natural or important semi-natural grassland and

savannah habitat. This paper addresses both issues and suggests a strategy for ensuring that the decade results in positive outcomes for these ecosystems.

The challenge of degradation and loss in grassland and savannah ecosystems

There have been few global studies of grassland and savannah status. It is twenty years since the World Resources Institute produced their overview of global grasslands,[i] almost as long since High Conservation Value Grasslands were identified for southern South America,[ii] and six years since WWF and partners pulled together a global map of grasslands.[iii]

More recently, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) estimates that land degradation has reduced the productivity of 23 per cent of the global land surface, much of this will be on grassland ecosystems.[iv] Similarly, the *Global Land Outlook* from the UNCCD estimates that 1.3 billion people live on degrading agricultural land.[v] Both figures almost certainly underestimate the conservation challenges facing natural grasslands and savannahs, which include both degradation and loss; see Table 1 below.

No global figures exist for degradation or conversion of grasslands and savannahs, and statistics for establishment of crops such as soya and oil palm tend to focus on tropical forests, while the conversion of grasslands such as pampas are overlooked. Nevertheless, there is good current monitoring data available on some of the areas with the highest global levels of grassland and savannah conversion caused by soft commodities expansion, in the South American Cerrado[vi,vii] and the North American Great Plains.[viii] Similar information is still lacking for new emerging frontiers, such as in the sub-Saharan savannahs and Asian steppes.

Concepts of naturalness in grasslands and savannahs are emerging from recent studies[ix], indicating that these are mostly ancient ecosystems, with adaptations to natural fire and grazing developed over millions of years.[x,xi,xii,xiii] Many herbivores, their predators and our own species emerged from this long history[xiv,xv]. Degradation and loss have major impacts on a wide range of ecosystem services, including carbon storage, water security, soil stabilisation and biodiversity.

Table 1: **A simplified range of impacts on grasslands and savannahs**

Impacts	**Details and examples**
Degradation	
Simplification	Loss of key species due to over- and under-grazing, alien and invasive species, agrochemical use, air pollution, etc
Partial loss of vegetation cover	Through overgrazing, compaction by heavy machinery, pesticide misuse, climate change
Total loss of vegetation cover – leading to desertification	Through persistent over-grazing, vehicle use, large-scale pollution
Conversion	
Alien grasses	Replacement of natural species with monocultures of non-native, high productive species for grazing, golf courses etc.
Crops	Replacement with mixed agriculture or with monoculture crops such as soya, oil palm, corn, wheat, cotton etc

Trees	Planting non-native, fast-growing species such as *Eucalyptus*, *Acacia* or some conifers.
Built environment	Replacement by roads, rail links, airports, urban areas, industrial complexes, etc

The particular challenge of forest restoration replacing grassland and savannah

Efforts to conserve forests have not infrequently resulted in displacement of activities into grasslands and savannahs, classically in the case of the Brazilian Cerrado, which has suffered partially in consequence of efforts to protect the Amazon. The same effect occurs in new frontiers such as Congo Basin, displacing pressure onto regional savannahs. Similarly, degraded grasslands and savannahs are sometimes planted with commercial trees or restored as "natural" forests. These perverse results could continue in the Decade on Ecosystem Restoration, if narrowly focused forest "restoration" takes place in natural, old-growth grassland [xvi] or savannah,[xvii,xviii] or more locally on semi-natural ecosystems that have important associated flora and fauna.[xix] The political momentum behind the Bonn Challenge is persuading governments to set ambitious targets without necessarily having the space on which to plant. Identification of areas suitable for reforestation, for example by the World Resources Institute,[xx] have been criticised as including important natural grassland areas.[xxi]

Restoration potential

At the same time, we know grassland and savannah can be restored, even in conditions where it is highly degraded, although under conditions of climate change, restoration will not always mean recreating an exact replica of the ecosystem before degradation. Simple and affordable methods may involve removing pressures and allowing natural recovery,[xxii] or improving fire[xxiii] and grazing [xxiv] management, frequently using knowledge from traditional and indigenous communities. Direct seedling, [xxv, xxvi] enhancement planting, [xxvii] and in arid areas the use of irrigation, are all sometimes employed to speed up the process and to replace species that have disappeared from the seed pool. There are debates about the extent to which grazing is a critical part of the restoration process in different ecosystems, what intensity of grazing is optimal and whether rotational or continuous grazing is most effective.

Spectacular examples of grassland and savannah[xxviii] restoration have been achieved in a few years; there are real opportunities to see positive results during the period of the Decade on Ecosystem Restoration which may in itself encourage governments to take part.

For the purpose of climate change mitigation, restoring grasslands and savannahs represent a huge and widely overlooked potential. A conservative calculation estimated the total carbon stored by grasslands and savannahs at 470 Gt, (i.e. one fifth of the total carbon contained in terrestrial vegetation and topsoil worldwide), an average of 150-200 tons of carbon per hectare[xxix]. Restoring grasslands and savannahs facilitates carbon sequestration from the atmosphere relatively quickly and resiliently,[xxx] as most of the carbon is stored underground and protected from droughts and wildfires.

Next steps in preparing for the Decade on Ecosystem Restoration

Making sure that the Decade produces positive results for grasslands and savannahs requires some work. Below we identify steps that should be taken in the short term.

1. **Better understanding of status and trends in remaining natural grasslands and savannahs**: We still know comparatively little about rate of loss, levels of threat, and the location of many degraded grassland and savannah ecosystems. Information exists but has yet to be assembled and analysed, other data are still lacking. There is an urgent need to pull together information, to provide an overall picture of the status of and threats to grassland and savannah, with emphasis on conservation priorities.

2. **Making the case for restoration**: A series of publications and initiatives, already underway, will be needed to ensure that grassland and savannah restoration is addressed in the Decade. Issues to focus on involve ecosystem services, values, threats and conservation needs. It may be worth exploring a high-level call for action from prominent conservationists to build momentum.

3. **Ensuring post 2020 targets address all natural ecosystems**: Grassland and savannah conservation needs the global attention given to forests, for area-based conservation, sustainable management and ecological restoration. Current debates in the CBD and UNFCCC are important. Targets to reduce or eliminate deforestation need to address more general loss or conversion of any natural ecosystems as current ecosystem destruction tend to happen more intensely in grasslands and savannahs, and to reduce the amount of leakage taking place. Proposed measures of terrestrial conservation success based narrowly around changes in forest cover should be modified to consider all natural terrestrial habitats, in order to avoid perverse results. Targets to reduce or eliminate grassland and savannah conversion should be set.

4. **Improving selection tools for restoration**: planning tools for forest restoration need to give effective weight to what is being replaced; this is currently not always the case. Working with partners, for instance in the Forest and Landscape Restoration Initiative, to ensure that restoration addresses all ecosystems equally, that tree plantation incentives respect all types of natural habitat, and that the trade-offs between different restoration strategies are assessed to ensure optimal results at a landscape level, would be important steps in addressing the imbalance.

5. **Identifying and mainstreaming successful grassland and savannah restoration approaches**: early research for the WWF Grasslands and Savannah Initiative showed a lack of capacity; most grassland research focuses on agricultural systems; there is no journal of natural grassland research, few professional organisations and a lack of easily accessible information. There is however a lot of practical experience and quickly vanishing traditional knowledge. Drawing together specialists, practitioners and grasslands and savannahs populations to provide guidance on successful approaches to grassland and savannah restoration, with case studies, at the start of the Decade on Ecosystem Restoration, would be a valuable contribution.

There is still much to be learnt, about the specific dynamic of grasslands and savannahs, their history, their soil microbiota, the long-term role of fire and of grazing in their evolution and restoration, the interplay between pastoralists and grassland ecosystems, and so on. Some entrenched positions exist that are not necessarily backed up with hard evidence. Building a stronger and widely shared knowledge base about restoration of grassland and savannah could be one of the longer-term aims of the Decade, along with ensuring the existence of many restored ecosystems around the world.

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