Conservation and sustainable use of Brazil’s non-forest ecosystem: 
the case of South Brazilian grasslands

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Conservation in Brazil: more than forests

Around the world, Brazil is known for its tropical forests and for their high diversity, and the conservation problems of these systems are an issue in the international debate. While this certainly is important, it often is overlooked that one third of the country was originally covered by non-forest systems, such as grasslands, savannas, and open woodlands, and that these systems also are characterized by high biodiversity – but likewise suffer from rapid land use change. Currently conservation policy in Brazil does not sufficiently address these problems. Due to their distinct ecological characteristics of these ecosystems, the strategies adopted for Brazilian forest systems are not adequate for many non-forest systems, principally because of the important role of disturbances – in other words: management! – for conservation. This is especially true for the Brazilian Pampa, the extensive grasslands in the south of Brazil.

The South Brazilian grasslands: a conservation challenge

The Pampa region in southern Brazil, Uruguay and northern Argentina is characterized by biodiverse natural grasslands, that provide important ecosystem services. Importantly, these systems have a high potential for quality meat production in large-scale grazing systems, and grazing is a land use practice that can contribute to biodiversity conservation. Nonetheless, these grasslands are increasingly converted into other land uses (e.g. afforestation with exotic trees or agricultural plantations) or are grazed above their carrying capacity, with negative consequences both in ecological and economic terms. At current, land use change here is much higher than, for instance, in the Amazon region, principally due to expansion of agricultural (soy bean) and silvicultural (pine, eucalypt) areas, but protection levels are low.

The development of public policies for sustainable management of these grasslands, i.e. management that links economic return with conservation, is impeded by poor ecological knowledge of these grasslands, by lack of consideration of the specificities of these systems for management, and by implementation problems of legislation. Further, and maybe more importantly, the recognition of the specific conservation needs of non-forest systems is not easy in a country where forests have traditionally been in the focus of conservation and where land-use and conservation are separated areas of policy.

Conservation through management

South Brazilian grasslands are extremely rich in biodiversity. The grasslands in the state of Rio Grande do Sul harbour around 2,600 plant species. The record in species richness per square meter at current is at 57 species. Recent research shows that these systems can be considered as ‘old-growth grasslands’, i.e. systems that have been shaped by the presence of grazing animals and fire throughout their history. In contrast to a forest, where ‘old-growth’ is evident in the diameter of the trees, in grassland in can be seem in the high species richness, in the presence of storage organs below ground, and in the capacity of the great majority of species to resprout after biomass loss due to fire and grazing animals. This points to the important role of these ‘disturbances’ for maintenance of the ecosystems. As no more native grazers exists in Brazil, domestic animals, such as cattle, can be used to take their role. However, the use of ‘exotic’ animals for conservation purposes often still is
considered as a taboo in Brazil. A change in perspective is necessary in Brazilian conservation policy: the inclusion of use of these grasslands and with this the inclusion of ecosystem services will help to conserve these systems and their biodiversity. At the same time, grazing allows for economic outputs, and it has been shown that, on the long run, suitable grazing practices can be compatible with more intensive land uses in economic terms. Conservation policy in Brazil thus should embrace the concept of the ‘cultural landscape’, at least for those ecosystems that depend on management, such as the South Brazilian grasslands. The idea of ‘wilderness’, at current prevailing in Brazilian conservation, is applicable for many forests, but not for ‘old-growth grasslands’.

**Research needs**

This has implications for the research agenda of these grasslands: effects of different types of management and land use on grassland biodiversity and ecosystem processes need to be studied in much more detail. We know that, in general terms, intermediate grazing pressure maximizes biodiversity and productivity. While there still is the necessity to describe biodiversity, we also need to look at other variables of these systems (e.g. above- and belowground productivity, carbon storage, habitat function, etc.) in order to devise appropriate and long-term conservation strategies. Additionally, restoration of degraded grassland is currently becoming an important issue. Degraded areas often span hundreds of hectares, and their restoration also only seems possible if we include grazing animals.

**Sustainable use of grasslands – a global issue**

The question of how to reconcile conservation and production is an issue not only in Brazilian grasslands, but in different ecosystems around the world. Especially grasslands in the tropics and subtropics have been neglected in the conservation debate, even more so recently in the wake of the Climate Change debate that focusses on increases in tree cover as a means to increase carbon storage. The important role of grasslands for this and other ecosystem services often is not considered. In other regions and ecosystems we also need to devise strategies to efficiently conserve biodiversity, and how to finance this. The integration of use and the payment for ecosystem services are important approaches for this. Of course grassland systems in different parts of the world are very distinct, depending on their specific environmental conditions, but also culture and tradition. Nonetheless, the same ecological principles apply, independent if we are in a grazed grassland in the Brazilian Pampa or in a mowed grassland in Bavaria. Conservation of biodiversity today is a global issue, and drivers of land use change also work at the global scale. The integration of production and conservation is a challenge in different regions of the world, and we can and need to learn from approaches made in other regions. Research on the relations between biodiversity, ecosystem processes and productivity and the links to society and culture will help us to advance in the search for sustainable ways of land use. These issues will be addressed by further research cooperations between UFRGS and TUM, and I thank the Hans-Eisenmann-Zentrum and the Bayerische Bauernverband, as well as Professor Weisser and all other colleagues at TUM Weihenstephan, for the opportunity to advance in this during my stay at TUM Weihenstephan.