

E-Conference on Sustainable Grasslands

FAO, 2-30 September 2013

Executive Summary

Objectives and participation

The FAO E-Conference on Sustainable Grasslands took place from 2-30 September, 2013, with the following objectives:

- Highlight the multiple functions of grasslands. Demonstrate the potential of grasslands to enhance food security and environmental, economic and social sustainability.
- Promote a better understanding of grasslands by conducting a stocktaking of the current state of grasslands knowledge, identifying critical research gaps and future priorities.
- Build a network of grassland experts, practitioners and stakeholders and encourage the sharing of best practices from different agro-ecological regions of the world.
- Initiate a dialogue and process towards building global guidelines for sustainable grassland management.

The target audience were grasslands practitioners and experts including farmers, pastoralists, conservationists, scientists and researchers. Participation was free and open to all. The initial invitation was sent through various mailing lists of individuals and organizations associated with grasslands research, producers' groups and NGOs, including the FAO Animal Feeding list (2600 subscribers), IFAD network (2000), CELEP list, European Scientists list, and other informal networks. Participants were asked to circulate the invitation amongst their own networks.

In total, 356 people from 70 countries registered to participate in the E-Conference. The highest number of participants registered from a country were from Indonesia (36), followed by India (26), the United States of America (25), and Brazil (23). By world regions, 25.3% were from Asia and 25.3% from Latin America and the Caribbean, followed by Europe (23.0%), Africa (12.9%), Oceania (8.4%), and North America (5.1%).

Process

The E-Conference took place as an online discussion. Each week was dedicated to a particular theme: grasslands productivity; multiple functions of grasslands; management challenges; and best practices. Key questions relating to each weekly topic were suggested. Additionally, participants were able to create their own new discussion threads.

As an input to the E-Conference, a Working Paper was presented. Compared to the baseline forecasts for 2050, various scenarios involving a shift from concentrate feeding to greater grassland-based livestock production were considered using the SOL-model.¹ The preliminary results suggested that a grassland-based food system could meet the food security demands of a growing world population, while alleviating environmental pressures from various indicators, including energy and nutrient use, Global Warming Potential, land degradation, deforestation, toxicity, grassland overexploitation and biodiversity loss.

These initial results illustrate the potential of greater grassland based-livestock production to contribute to social and environmental sustainability. However, the model takes a broad, global-scale perspective and relies on a number of assumptions where data availability is poor. To refine these aspects, the first two weeks of the E-Conference concentrated on a stocktaking of scientific and practical knowledge relating to the productivity of grassland-based livestock systems (week one) and the wider range of ecosystems services and social benefits provided by grasslands (week two). The key objectives were to gather scattered datasets and identify the critical research gaps that still need to be addressed. Some examples were suggested based on the data gaps identified during the modelling process. Participants were encouraged to add further priorities to outline a broad research agenda for grasslands sustainability.

Following an exploration of the productivity and other multiple functions of grasslands, the remainder of the E-Conference concentrated on key topics in sustainable grassland management. Critical challenges were discussed in week three, and best practices in week four. As a starting point, the Sustainability Assessment of Food and Agriculture systems (SAFA) framework was introduced.² SAFA is based on four dimensions of sustainability: environmental, economic, social and governance. These dimensions and sub-themes provide a conceptual example of a sustainable food system. Using these dimensions as a skeleton, a more specific framework for sustainable grassland food systems could be developed based on best practices. The E-Conference discussions during weeks three and four can be seen as the initial steps in this process.

¹ SOL-m is a mass flow model built to evaluate the sustainability of food systems and make development scenario projections. This model covers the entire agricultural sector (rather than specific crops), includes environmental impacts (non-renewable energy use, nitrogen and phosphorus eutrophication, land degradation and pesticide use), and allows for the analysis of interrelated topics, such as food availability and food supply and demand linkages on a global scale: www.fao.org/fileadmin/templates/nr/sustainability_pathways/docs/SOL_Concept_Note.pdf

² More information on SAFA is available at: <http://www.fao.org/nr/sustainability/sustainability-assessments-safa/en/>

E-Conference Outcomes

Data stocktaking and improvements to grassland-based livestock modelling

A number of participants provided data on the carrying capacities of grasslands from different agro-ecological regions and under different management systems (e.g. Chile, India, New Zealand, Iran, UK, Ukraine, and Kazakhstan). Examples were cited where carrying capacity had been enhanced by improving forage species composition and fertilisation, and through the use of management practices such as fodder trees, silvopastoralism and mob grazing.

The wider ecosystems services provided by grasslands represent a further research gap. Data sources were identified for specific ecosystems services and agro-ecological regions (e.g. carbon sequestration in tropical grasslands). While many important ecosystems services provided by grasslands were described in qualitative terms, their quantification and monetary valuation remain a challenge. This could provide an important tool for analysing trade-offs and adding value to grassland ecosystems, and should be considered as a future priority.

In addition to suggesting further data sources to refine the assumptions, many participants provided valuable feedback on ways to improve the modelling of grassland-based livestock scenarios outlined in the Working Paper. In particular, two priorities for improving the grasslands modelling are to analyse the viability and impacts of different scenarios from an animal nutrition perspective, and to incorporate variability of climatic conditions and productivity in the context of climate change.

A more specific definition of the term 'concentrate' was seen as critical. Classifications of by-products should be introduced and forage crops that are not grown on grasslands but are not concentrates (e.g. forage maize) need to be separated. Furthermore, temporary grasslands (i.e. grasslands on arable land) need to be distinguished from permanent grasslands in order to appropriately address the trade-off between feedstuff and foodstuff production.

From a nutritional perspective, a critical question is whether a small amount of concentrates used in ruminant production increases the feeding efficiency of grasslands through improved fibre degradation, particularly in those areas where grassland quality is poor. This requires more interdisciplinary research in order to determine possible impacts on yields, environmental impacts and ecosystem services.

Variability in productivity was another important issue. The productivity of grasslands fluctuates during the course of the year and between years in many regions due to rainfall or temperature variations. Therefore, stockpiling and forage conservation needs to be planned and improved techniques need to be developed in order to feed livestock throughout the year. Careful consideration and planning of livestock numbers is important not to overuse grasslands in unfavourable years.

Challenges and best practices in sustainable grassland management

The SAFA model was welcomed as an appropriate template for assessing grasslands sustainability by a number of participants. In particular, the pillars of environmental, economic, social and governance sustainability were useful to analyse sustainability challenges and examples of good practices in grassland management. Critical issues relating to each sustainability dimension are highlighted below.

Environmental sustainability

Anthropogenic threats to grasslands were a recurring theme throughout the E-Conference. Examples of the increasing conversion of grasslands to alternative land uses were cited across different agro-ecological regions and socio-economic conditions. One important driver was population pressure and urban development. Agricultural support policies and market forces were other motivating factors to switch to more profitable modes of production such as intensive livestock or annual and cash-crop production.

These large-scale changes have a double impact on the environment. For example, in dry areas that face extreme seasonal change, grassland ecosystems are rich in biodiversity that has adapted to cope with erratic water availability, high soil salinity and low nutrients. They provide water capture and storage, while helping to prevent nutrient and soil losses. The reduction in grassland area implies a loss of ecosystem services while the intensification of agricultural production is associated with negative externalities including increased air and water pollution, land degradation and loss of soil fertility.

A further challenge stems from land degradation associated with inappropriate management systems. Degradation leads to a loss or reduction in ecosystem services.

In each of these examples, a crucial challenge is to recognise and value the multiple ecosystem services that grasslands provide and incorporate these values into land-use planning and economic decision making.

Social sustainability

The importance of grassland-based food systems as the backbone supporting smallholder ruminant production was illustrated through examples from India and West Africa. In the West African savannah, 47.1% of people were said to rely on an extensive system of livestock production for their livelihoods.

The principles of Fair Trade were seen as a valuable strategy to ensure social and economic sustainability by supporting decent livelihoods. Fair prices would allow pastoralists to derive a better income from supplying urban and international markets. This is an example of how social and economic sustainability were closely inter-linked during E-Conference discussions.

Cultural sustainability was recognised as critical to the long-term status of grasslands. When grasslands are viewed as an integral part of the landscape they are valued and protected by local communities. A related concept was the idea of building social capital to instill an ethic of good stewardship.

Economic sustainability

The concept of economic sustainability needs to extend beyond a narrow definition of economic interest, based solely on maximising profit. For example, the traditional grassland-based systems across South America are increasingly converted into crop fields to meet feed demand for monogastric and ruminant production in Europe. In this instance, a globalised food production chain causes negative environmental consequences on both sides of the Atlantic, threatening to undermine the productive base itself. Options for a more resilient economic system that were advocated during the E-Conference include: labeling and promoting the health benefits of grass-based red meat, developing fair trade and ecotourism markets, nearer food chains and greater food self-sufficiency within regions.

Strengthening the multi-functionality of grasslands can also aid economic and social resilience. For example, developing eco-/agro-tourism offers an opportunity for smallholders to diversify their revenue streams. Bioenergy, ecosystems services and carbon markets are further prospects for the future but they are currently under-developed.

Governance sustainability

The multiple functions of grasslands are inherently complex. The environmental, social and economic sustainability dimensions are interrelated with different issues and challenges cutting across multiple categories.

Desertification of grasslands across the US, Africa, Australia, Asia and South America is a prime example of a complex governance challenge affecting grasslands. Inappropriate management leads to degradation and desertification – an environmental issue with profound economic and social implications. In turn, desertification is a driver of climate change, aggravating the impact of droughts and floods, poverty, abuse of women and children, and competition for increasingly scarce resources. In the worst scenarios this competition has resulted in violence and war.

Land tenure and access rights are another key governance challenge for grasslands. Tenure and access rights are complicated in pastoralist systems of production due to seasonal migration, cross-boundary territories and customary access rights to resources. Because systems of tenure rights define and regulate access to natural resources, they are crucial for the development of sustainable livelihoods, ensuring food security and supporting environmental sustainability. Therefore, good governance of tenure is critical to support the environmental, social and economic dimensions of sustainability.

To reflect the complexity and interrelatedness of challenges and respond effectively, it is important that grasslands governance incorporates holistic and systems-based approaches. This was a strong message reflected in the E-Conference discussions. Examples of holistic and integrated grassland management practices that have proven successful include silvopastoralism, crop-livestock integration and ecological intensification.

For a number of critical challenges threatening grasslands sustainability, a narrow conception of economic interest is overriding the environmental and social dimensions of sustainability. A key challenge for sustainable governance of grasslands is to realign agricultural, food and trade policies to achieve a greater balance between the environmental, social and economic dimensions of sustainability; Good governance is the fourth pillar to achieve sustainable food systems in which each of these dimensions are equally nurtured.

The Way Forward

Closing data gaps

There is a need for future research to concentrate on closing the data gaps identified during the E-Conference and in other fora. In terms of ecosystems services, the multiple functions that grasslands provide have been well publicised,³ with many participants sharing examples of significant ecosystems services provided by grasslands from different agro-ecological regions. An important next step will be to collate these data in a structured way. FAO is currently conducting a survey to obtain information on the ecosystem services provided by specific populations of grazing livestock in specific grassland locations. The results will be used as an input to the preparation of *The Second Report on the State of the World's Animal Genetic Resources for Food and Agriculture*.⁴

Technical and policy guidelines based on best practices in sustainable grassland management

During the E-Conference, there was broad support for the idea of developing global guidelines for sustainable grassland management, based on a holistic approach covering the four dimensions of environmental, social, economic and governance sustainability. The E-Conference called for the definition of global technical and policy guidelines based on best practices. It was emphasised that prospective guidelines should focus on improving the livelihoods of livestock farmers. They should support the cultures and traditions of pastoralists including their traditional ecological knowledge. Guidelines could be based on a synthesis of success stories from grasslands around the world, organised by agro-ecological zones, with local solutions reflecting local conditions.

Already, a number of case studies illustrating best practices from different regions have been shared during the E-Conference. For example, the South Asia Pro Poor Livestock Policy Programme (SA PPLPP) works to support community management of common property resources. Good governance of community tenure and access rights, through democratic and equitable village institutions, have

³ For example, through the EU project MultiSward: <http://www.multisward.eu/multisward/>

⁴ The email-based survey has been distributed to participants in the FAO E-Conference on Sustainable Grasslands who are encouraged to participate. For more information see: www.fao.org/ag/againfo/programmes/en/A5.html

contributed to positive outcomes in terms of environmental restoration, increased output, improved livelihoods for marginalised households and enhanced food security.⁵

Following on from the E-Conference, a searchable online database has been created on the FAO Sustainability Pathways website.⁶ The aim is develop a repository of good practices and success stories that others can learn from. Ultimately, a synthesis of best practices from different agro-ecological regions and socio-economic conditions can be used to form the basis of technical and policy guidelines for sustainable grassland management. Participants are encouraged to share their experiences that will be featured on the FAO website.

Feedback and suggestions

FAO invites any feedback or suggestions on the next steps outlined in this document, as well as any further ideas on how to proceed in developing technical and policy guidelines for best practices in sustainable grassland management. Thank you to everyone who contributed valuable inputs to the E-Conference. We hope you will continue to follow these developments and look forward to future opportunities for cooperation.

⁵ For more information refer to: <http://saplpp.org/goodpractices/CPR-Livestock/SAGP13-Securing-Community-Tenure-over-Common-Lands/>

⁶ The database of best practices will be available in November 2013 on the Sustainability Pathways website: <http://www.fao.org/nr/sustainability>