

CHAIRS' SUMMARY PAPER: Social and Economic Aspects of Grasslands

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INVITED PAPERS

The invited papers described social and economic changes impacting grassland and forest grazing in India (Gnosh) and Latin America (Vera and Rivas). They discussed how these factors are affecting grazing areas in a high (India), and low (Latin America and Caribbean) population density area of the world.

India with less than 2.5% of the world's land mass supports 15% of the world's people, 15% of the world's cattle, 15% of the world's goats, 50% of the world's buffaloes and 4% of the world's sheep (Gnosh). Growing populations of people and livestock has placed natural resources (grasslands, forests and watersheds) under increased environmental stress. Grazing resources have decreased with the expanded cultivation of grasslands and privatization of common property grazing resources while, simultaneously, livestock numbers have increased (60% from 1951 to 1992). These trends have increased forest grazing with approximately 88% of India's forests used for 'unofficial' open access grazing, or 'common property grazing'. This in turn has increased the environmental degradation of the forests and watersheds. 'Top-down' and centrally planned social forestry programs, which have attempted to address these concerns, have not succeeded where they failed to meet the needs of the tribal people increasingly dependent on the forests for their fodder and fuel resources.

Three case examples described by Gnosh showed that a participatory 'bottom-up' approach to common property grazing resources was successful in rehabilitation of degraded grazing lands while addressing social, economic and environmental issues. The success of this approach appears to be predicated on three essential conditions for ensuring the people's involvement in community resource management. They are: Control of resource management decisions by the community at a level where the priorities of the poorer people were uppermost; Unity within the community about the resource management decisions at a level where direct responsibility for the resource could be assumed by the community without external interference; and Equity in distribution of benefits to each member of the community from the implemented changes in land management. Where these three conditions (CUE) were fulfilled, the rural people directly involved with the day to day grazing management decisions took a long term view to protect their assets and natural environment which resulted in regeneration of the associated forests, decreased erosion and improved watershed functions.

The Latin America and the Caribbean region (LAC), with approximately 16% of the world's land mass, support 8.4% of the world's people and about 26% of the world's cattle (Vera and Rivas). This region is characterized by a high, and increasing, degree of urbanization (85% predicted by 2005) resulting in a low rural population density compared to Africa and Asia. The LAC cattle industry has historically been a highly sustainable low input/low output grazing system based primarily on native grasslands. The opportunity for continued expansion of this type of extensive cattle grazing system in the LAC is very limited.

The opening of this region to international agricultural markets in the 80's and 90's has resulted in land use changes associated with agricultural intensification. Native grasslands are being cultivated for annual crops or more intensive forage production. Of particular

significance is the active and extensive introduction (50 million ha to date) of 3-4 genotypes of *Brachiaria* spp. from Africa for more intensive pasture production (see also Macedo - Session #15). This has raised potential colonization ("Africanization") and disease concerns (Vera and Rivas). There has also been an increase in the use of forested, or deforested, areas for cattle grazing in the LAC.

Important policy gaps for land use and environmental issues are emerging given the historic role of the grassland-based cattle industry in the LAC. For example, an assessment of pasture research options indicated that the greatest economic benefits would come from research on the extensive savanna and deforested forest margin ecosystems. This is concurrent with decreasing public resources for pasture research. While privately funded forage research is increasing for intensive forage production, like cultivar development, it is doubtful that private funding will support research on the environmental consequences of the new economic policies and technologies, or exploration of alternate pathways for the development of the grazing and farming sectors with consideration of environmental protection concerns. There is a need for scientists to be involved in addressing the policy gaps and to be more proactive in predicting environmental consequences for the rapidly changing land use systems.

POSTER PAPERS

Grassland and forest grazing patterns in Greece have changed over the last 500 years with changing demographic, political and economic forces (Thanopoulos). Like India and the LAC, the Greek grassland-forest ecotone has been a sensitive zone to changing socioeconomic forces and changing grazing patterns over time.

Grazing organizations, policies and information in developed countries are beginning to capitalize on evolving Internet technologies (Hannaway et al., Massengale). The Universities of Nebraska and Oregon are providing on line North American examples for local and international exchange of grassland and forage information.

The more effective integration of economic analysis into decisions of grassland policy and research was argued for in three poster papers. Appropriate inclusion of economic analysis in evaluation of rangeland conservation decisions for open access and common-resource ownership situations was encouraged (Pamo). More effective inclusion of economic parameters into the initial design of forage research projects by agronomists through inclusion of animal scientists and economists in their initial experimental designs was also encouraged (Burton). The need to more effectively recognize the economic aspect of pasture diseases problems was also presented (MacLeod). In addition, a deeper international understanding of the how temperate grass/clover pastures responded to nitrogen applications was also demonstrated in order to avoid pendulum shifts in attitudes by producers and researchers over the use of either clover-based pastures or highly N-fertilized pastures (Eckard et al.).

FUTURE IMPLICATIONS

The invited papers, read together, present an important tension. Effective restoration and use of common property grazing resources can be accomplished, perhaps most effectively, at a village level with minimal interference by 'higher' government policies or authority as illustrated in the Indian examples. At the same time, historic grazing use patterns can be rapidly and radically altered in response

to international economic forces as described in the LAC examples. The absence of appropriate and 'higher' government research and policy for crucial environmental issues like native grassland retention may result in their loss. In this tension, there is an important proactive role to be played by scientists in predicting various scenarios for changing land use systems, developing appropriate government policy based on the best available science, while at the same time encouraging effective locally implemented restoration of degraded natural resources and ecosystem functions.

In addition, there is a need for further consideration of the following in the future. The biological, social and economic issues associated with the increased grazing of grassland-forest interfaces in response to the economics of agricultural intensification as reflected in the experiences of Greece, India, and LAC. The more effective integration of economics into grassland and natural resource science and resource management policies. The evolving Internet potential, where it is available, for communication of grassland and forest grazing science and policy.