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## Livestock Farmers and Researchers Perceptions about Ecosystem Services Provided by Rio de la Plata Grasslands

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# Livestock farmers and researchers perceptions about ecosystem services provided by Rio de la Plata Grasslands.

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**Key words:** natural grasslands; livestock production; TESSA methodology.

## Abstract

The perception and valuation that livestock farmers have about ecosystem services provided by natural pastures is of fundamental importance to their management decisions and the conservation of this resource. This work aims to reveal results of a project carried out in Brazil, Paraguay, Argentina and Uruguay using the TESSA (Toolkit for Ecosystem Service Site-based Assessment) methodology to compare the perceptions of different ecosystem services among livestock farmers and researchers. The methodology was participatory workshops, two by country, one with livestock farmers participating in the Grassland Alliance (at least 50% of natural grassland in the livestock production system) and another with researchers working in grassland based livestock production. Main services targeted by producers were their way of life, water quality, water regulation, scenic beauty, meat quality, and fodder production. On the other hand, the researchers target ecosystem services related to forage production (food and fiber), water regulation, erosion control, carbon sequestration, soil fertility, and tourism. Farmers value their habitat in a more sensitive way and place more importance to intangible services that benefit their well-being and future generations. At the same time, researchers mainly point to quantitative benefits of pasture, soil and water as well as the potential for tourism.

## Introduction

Considered one of the most altered ecosystems in the world, native grasslands need conservation strategies and adequate user management. The grasslands of the region are among the least conserved vegetation groups, with no more than 30% of their original coverage remaining (Henwood 2010). Management based on an integrated approach aims to manage natural resources and biodiversity by maintaining the processes, functions, and ecosystem services (Leslie et al, 2007).

The perception and valuation that livestock farmers have of the ecosystem services provided by natural grasslands is of fundamental importance for their management decisions and the conservation of this resource. This paper aims to reveal a portion of the results of a pilot project, carried out in Brazil, Paraguay, Argentina, and Uruguay using the TESSA methodology (Peh et al, 2017). The goal of this project was to compare the perceptions that producers and researchers have regarding different ecosystem services. The results presented here served as an antecedent for a doctoral project that compares two evaluation methods, the TESSA, and the Grassland Conservation Index. This index allows identifying and qualifying who are the actors in the rural sector that promote the restoration and conservation of grasslands, favoring the provision of the various ecosystem services that they contribute to society in general (Parera y Carriquiry, 2014). Additionally, this project presents evaluations for both social and service provision (forage production, water quality), regulation (carbon sequestration, soil fertility), support (richness and abundance of birds) and cultural (ways of life).

## Methods and Study Site

The methodology consisted of two participatory workshops per country, one with participating livestock farmers associated with the Grassland Alliance (at least 50% natural grasslands of the total area of the farm), and another with researchers working in grassland-based livestock production. A total of 54 producers, 56 researchers, and more than 22 institutions involved in the four countries contributed to this study. All the workshops were treated as individual case studies given that they took place in specific regions. However, all participants either farm or conduct research in the same type of ecosystem (the Rio de la Plata grasslands according to Soriano et al 1992). The localities where this research took place are described in figure 1.



Figure 1. Location of participatory workshops with producers and researchers in Brazil, Argentina, Uruguay, and Paraguay.

The participatory workshops method consists of working with 6 to 20 actors, at most, for 4 to 5 hours. The work is initially done in groups of 3 to 5 people and then a plenary session takes place where the results are reviewed and verified using numerical scales for perceptions at all times. The group works together on the distributed tables. For this article, the results of the four countries were used regarding the part of the method for identification of ecosystem services.

A sheet is provided with a brief explanation of what the ES are, and their classifications and beneficiaries. The following step involves identifying all the benefits provided by the natural grasslands in the study region (with the support of a map detailing the area). This was used to evaluate the wide range of services provided by the sites nationwide. In the first column, all benefits are scored from 0-5. 0 = not relevant, 1 = of little importance, 5 = very important. Then, based on the highest-scoring benefits on the list, participants agreed on five priority benefits for the site in its current state.



Figure 2. Method used in the producer workshop

## Results

A priori, the researchers point out a greater number of ecosystem services provided by livestock in natural grasslands than livestock farmers, however, they do not prioritize by degree of importance, but rather they have the opinion that all services have their role in nature.

### Producers' perceptions

The main services identified by the producers were those that affect their way of life: water quality, regulation of the water cycle, scenic beauty, meat quality, and forage production. They value their habitat in a more sensitive way as they give more importance to intangible services, those that benefit their well-being and future generations.

### Researchers' perceptions

The researchers focused on ecosystem services related to forage production (food and fiber), water regulation, erosion control, carbon sequestration, soil fertility, and tourism, however they chose the gaucho lifestyle and / or culture as an important ecosystem service. In most of the surveys, the researchers assigned a score of 5 to all the ecosystem services presented.

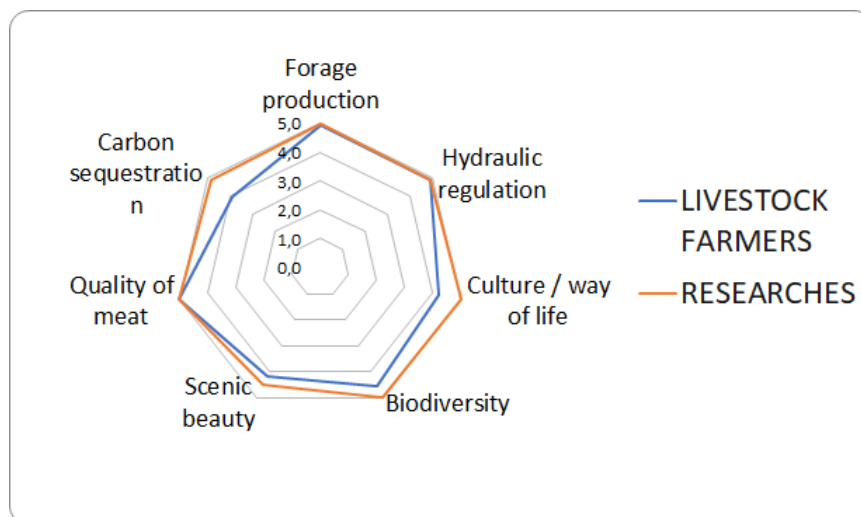


Figure 3. Importance score of the main ecosystem services assigned by livestock farmers and researchers involved with topics of native grasslands and the Grassland Alliance in Brazil, Argentina, Uruguay, and Paraguay.

Service	BRASIL		PARAGUAY		ARGENTINA		URUGUAY	
	Livestock Farmers	Researchers	Livestock Farmers	Researchers	Livestock Farmers	Researchers	Livestock Farmers	Researchers
Way of life / Culture	●				●		●	
Hydraulic Regulation		●	●	●	●	●		
Water quality	●	●	●	●			●	●
Scenic beauty	●							
Quality of meat	●		●					
Forage production				●		●	●	
Biodiversity			●		●	●		●
Carbon sequestration			●	●		●		●
Meat / wool production		●			●		●	●
Feeding Wildlife							●	
Erosion Control		●						●
Genetic resources				●				
Climate regulation		●						
Cultural distance children	●							
Tourism / Recreation						●		
Natural Capital					●	●		

Table 1. Result of the five main services identified by livestock farmers and researchers in the local participatory workshops.

### Discussion

The priorities between researchers and farmers are different, this is seen in tables 2 and 3 (degree of importance of 0 -5, where 5 is more important).

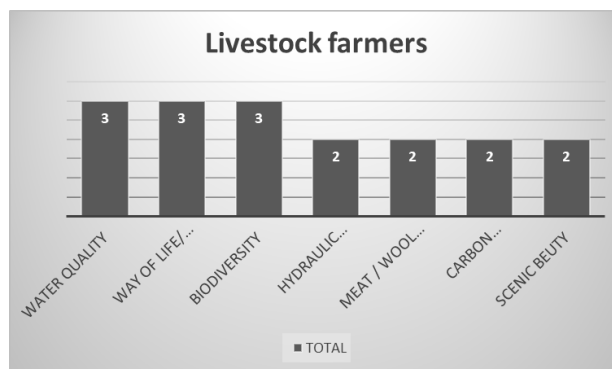
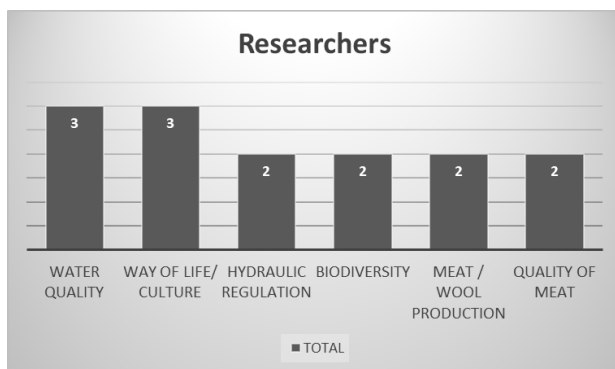


Table 2 and 3. Main ecosystem services perceived among Researchers (1) and Livestock farmers (2).

Research and extension objectives should become more integrated with social objectives and the lifestyle of livestock farmers, as well as the development of specific public policies. There are already some initiatives that contemplate this vision, but it is still necessary to include the opinion of users and their perceptions in all development processes.

This pilot analysis found different groups of stakeholders with complex positions, but broadly complementary to one another. These groups should interact more with this type of participatory methodologies and with comparison metrics. Another important factor is the scale of both scientific and governance evaluation, which should be within the same region with its particularities of soil, production and culture. TESSA is based on 200,000m<sup>2</sup> and the results are positive when this type of evaluation is performed in more homogeneous environments on a landscape scale.

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