Application of the TESSA Methodology in a Pilot Protocol for Participatory Evaluation of Ecosystem Services and Agents of Change in the Pampa Grasslands. Method Description and Lessons Learned

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Key words: grasslands; TESSA methodology ; participatory methodologies

Abstract

The Toolkit for Site-Based Assessment (Landscape) of Ecosystem Services (TESSA) is intended to be an accessible guide for low-cost methods to assess the benefits that people receive from nature at particular sites in order to generate information that can be used to influence decision-making (Pehl et al 2015). However, TESSA does not have defined protocols for grasslands ecosystems. This article focuses on the description and discussion of the lessons learned in the participatory workshops that include engaging with policy and decision-making actors. The work consisted of identifying 1) the area occupied by each coverage or use, 2) the threats and agents of change, 3) the ecosystem services and 4) a detailed description of the most important services in the area. The methodology was applied in the grassland ecosystems in the countries of Brazil, Argentina, Uruguay, and Paraguay (Schossler et al 2016). A total of 54 livestock farmers, 56 researchers and more than 22 institutions were involved with this study. Results involve the perceptions of the actors involved with the topic of interest in the four countries of interest, in addition to the potential changes and trends presented by the agents of change that most affect the ecosystem. In this paper we discuss the initial steps of the TESSA methodology. The protocols used at the field level and their results will be published as self contained articles within the doctoral thesis of the primary author.

Introduction

The flow of ecosystem services (ES) from rural environments are overexploited and shifted to other uses worldwide due to the continuous failure of financial incentive policies and decision-making processes. Identifying benefits and demonstrating the importance of what these ecosystems provide to people and users can therefore strengthen conservation arguments and help highlight the broader impacts that changes have in natural settings.

The Toolkit for Ecosystem Service Site-Based Assessment, TESSA (http://tessa.tools/)) is intended to be an accessible guide for low-cost methods to assess the benefits that people receive from nature in particular places. Using this toolkit allows for the generation of information that can be used to influence decision-making processes (Pehl et al 2015), however, TESSA does not have defined protocols for rural ecosystems. This article focuses on the description and discussion of the lessons learned in the participatory workshops using TESSA as a method proposed by BirdLife International, which includes engaging with policy and decision-making actors. The doctoral dissertation of the first author will present the protocols used in the following steps of application of the methodology at the field level, and the results found in the process.

Methods and Study Site

The steps of the TESSA methodology are described in Figure 1. and were applied in rural ecosystems of Brazil, Argentina, Uruguay, and Paraguay (Schossler et al 2016). During the implementation of this methodology a total of 56 researchers were involved, in addition to more than 22 institutions, and 54 participating producers of the Grassland Alliance (at least 50% of natural grasslands in the livestock production system (http://www.alianzadelpastizal.org/)).

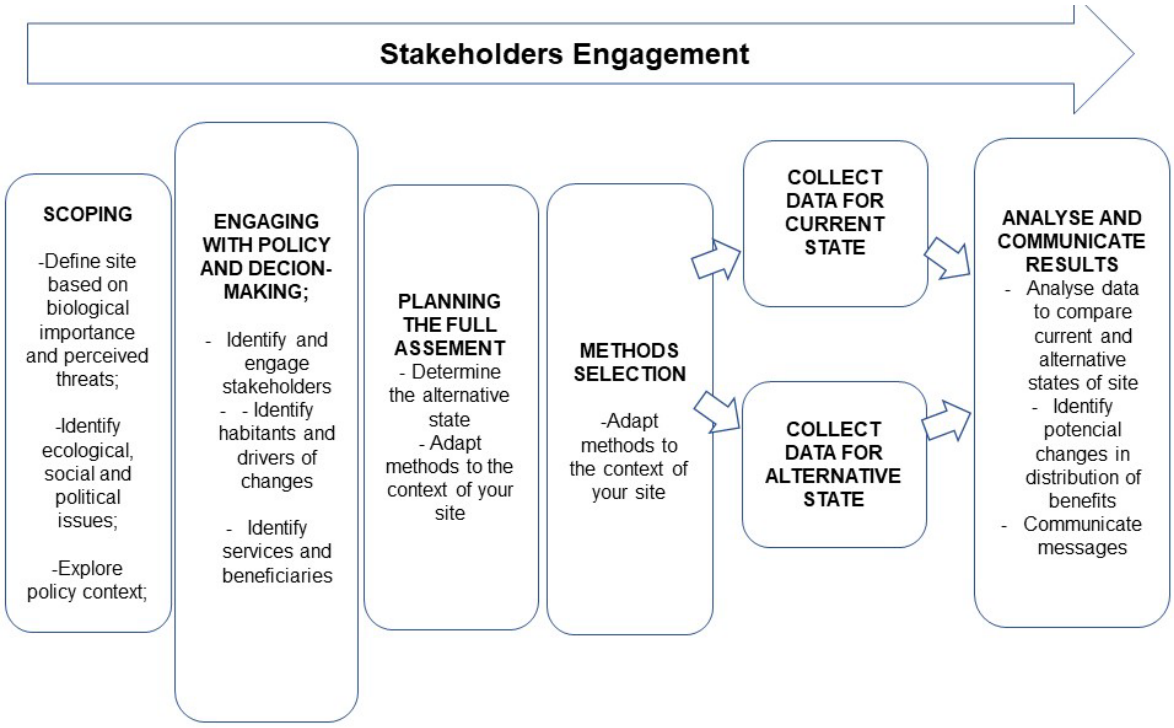
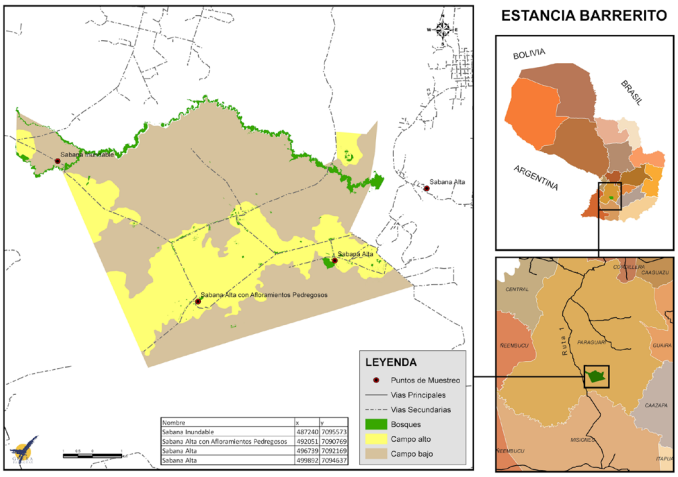


Figure 1. Steps of the TESSA methodology proposed in the guide by Pehl et al 2017.

The stakeholders were identified based on their history of environmental certifications with the ICP (Pastizal Conservation Index (Parera and Carriquiry, 2014). The actors were chosen based on 1) 200,000 m^2, which is the size of the study area proposed by the TESSA methodology, 2) the ease of communication and organization with the actors, 3) and interaction of the producers with other projects and institutions that focus on the thematic of native grasslands.

The participatory workshops were composed of 6 to 20 actors at most, which allowed for the production of a wealth of information based on the group discussions. The success of the work starts with bringing awareness to the actors regarding the importance of the activity and the results obtained, the proper publication



of the data, and commitment to return. A brief explanation is made of what ecosystem services are, how they are classified and examples in native grasslands.

The groups are made up of 3 to 5 people and each group works on the same table (completing part 1 and 2 described below). Throughout the workshop, the general tables are built and discussed in a plenary format. Along with the tables, a map was provided (figure 1) of a rural property with soil types and land uses that represent the area of local actors. Additional important information such as the total area to be evaluated and different types of grasslands was provided.

Figure 2. Map used in the workshops of Paraguay

Results

PART 1 - a. Identify the area occupied by each land use/land cover as ecosystem services are offered at the habitat level and are directly associated with certain types of land cover. Habitats are classified using the map on figure 2. The methodology proposes several ways to access the maps, but the easiest and most understandable alternative for producers is to use a printed topographic map made using Google Earth, and drawing the habitats on it so that their area can be calculated. Classify the main habitats by making a table with the total area in hectares of each type of habitat, and the percentage of the site occupied by each type of habitat. Groups comment on associated habitat types. b. identify threats and agents of change such as causes or factors like agricultural and/or forestry exploitation, but also impacts of management policies and positive actions by people and institutions. Actors complete Table 1 and describe a probable future (within 10 years, caused by current trends at the site without any intervention to mitigate these trends), considering a) What are the current and potential change agents for the site (now or in the next 10 years)? b) How immediate are these changes ?; c) How likely are these changes to occur ?; d) How will these agents of change affect the habitats and biodiversity of the site in terms of area (scope) ?; e) How will these agents of change affect the habitats and biodiversity of the site in terms of the magnitude of the effect? (i.e. degree of habitat degradation, effect size). This scenario is called "alternate state".

Site threats (pressures)	**Time (next 10 years)** 1. Over 4 years 2. In 4 years 3. now	**Scope (proportion of the site that is affected)** 1. Small area 2. Something from the area 3. Most of the area	**Severity (i.e. degree of habitat degradation, effect size)** 1. Low 2. Moderate 3. High	**Impact (Time + Range + Severity)**

Table 1. Sample table of the threats distributed to the participants.

PART 2 - a. Identification of ecosystem services: A sheet is provided with a brief explanation of what ES are, their classifications and beneficiaries. The first step is to identify all the benefits provided by native grasslands in the region of study. This will be used to assess 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 = little importance, 5 = very important. Based on the highest ranked benefits on the list, all participants agree

on five priority benefits for the site in its current state. Then, the same is done for the alternate state (if the threats noted above influence the site) using the repaired description and the habitats present, identifying all the benefits that could be provided in the alternate state and their importance. As before, all participants identify five priority benefits for the alternate state.

Benefits	**Actual state (Score 0-5) 5 = very important**	**Alternate state (Score 0-5) 5 = very important**	**Five prioritized services in the alternate state**

Table 2. Table used to identify ecosystem services (benefits) of the current and alternate state, their importance scores and prioritizations.

b. Detailed description of the most important ecosystem services: For all the benefits identified as priority in table 2 (both for the current state and for the alternate state, or both). In plenary, the questions in this table are discussed and the answers are completed.

Table A Profit	**Who benefits? Local / District / National Global** (select all that apply and circle the category that benefits the most)	**How has availability changed in the last five years?** 2. Big increase 1. Little increase 0. No change -1. Little decrease -2. Big decrease	**How will this benefit change in alternate status?** 2. Big increase 1. Little increase 0. No change -one. Little decrease -2. Big decrease	**What are the main agents of change (causes / factors) of this change?** (select all that apply from the list in Part 1 table B)

Discussion [Conclusions/Implications]

The explanations and introductory material during the beginning of the workshop are fundamental and decisive for the quality of the results of the workshop (eg Figure 3), which facilitates the organization and commitment of the actors. The map should have as much information as possible because doubts generate noise between groups. The total study area (200,000m^2) proposed by TESSA is adequate and the homogeneity and productive capacity of the study area must be taken into account in case there are two very different areas within the area the realities of the producers would affect the results.

The discussion of the alternate state is complex, and the driver of the methodology needs to be prepared to suggest fixed alternate states chosen by the group of people. As an advance in the methodology, the use of the alternate state map at the beginning of the process, as suggested by the method, was excluded. The change was positive, and the alternate state came to be the natural environment under which the impacts of the main threats were pointed out in the process.

Local stakeholders felt like they were part of the process when the facilitator had an appropriate language and understands their demands and realities. The workshop evaluations were positive, and the main contributions emerged during quality group discussions and were related to the understanding of ecosystem services.

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