Back to the old commons: historical learning to recover institutional memory

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ABSTRACT. Communities that have used common-pool resources for generations often preserve valuable knowledge about their governance history. This accumulation of knowledge concerning strategies, rules, and management practices has been called "institutional memory". However, institutional memory is constrained by personal and social memories, and therefore it is subject to a steady process of adjustment according to experience, i.e., rules that are employed over long periods of time are established whereas those that are not used are discarded and forgotten. In this paper, we consider the usefulness of historical regulations (herein labeled "historical knowledge") to recover institutional memory for the governance of agro-forestry commons. The background is the author's experience in research in northern Spain concerning common pastures co-managed by the government and local resource users. The findings show that historical knowledge can be useful to recover institutional memory at two levels: the first is the rules and management practices that the community employed at a given time, the second is strategies constituting a set of rules and management practices that the community used to deal with changes or crises. In addition, we find that historical knowledge can contribute to the enhancement of two major areas in co-management: linking the epistemologies that stakeholders use to make statements about the commons, and promoting community cohesion and pro-environmental attitudes. Finally, we propose a way to use historical knowledge in co-management through social learning methodologies.

Key words: agro-forestry commons; co-management; historical knowledge; institutional memory; social learning.

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1. INTRODUCTION

Experience in many countries has shown that it is possible to manage common-pool resources in a sustainable way through partnerships from the local to the international level, for example, involving user communities, NGOs, and government agencies (WCED, 1987; WRI, 2000; FAO, 2006). However, co-management practice is not easy because misunderstandings and conflicts among stakeholders often arise. For the purpose of reconciling interests, aims, and views and thus to coproduce knowledge about resource management, it has been demonstrated that social interaction methodologies are a valuable tool (Berkes, 2009). The concept "social learning" has been defined to contain these methodologies, because they are founded on learning-based approaches and "go beyond the individual to become situated within wider social units or communities of practice within society" (Reed et al., 2010).

"Scientific knowledge" and "user knowledge" are the main sources of knowledge in co-management, and an elementary distinction between them has been formulated considering their epistemological form. Users' knowledge is generally based on their personal experience with the resource, and thus it is founded on a "concrete" epistemological form, while scientists and government actors often use a more "abstract" approach, because this permits them to think about resource management in many contexts (Agrawal, 1995). The combination of both sources of knowledge offers great potential, because it helps to meet the challenge of dealing with changes in social and ecological dynamics, for example by combining analytical tools of scientists with the continuous observation of the resource made by users (Warren et al., 1989; Berkes, 1999, 2007; Folke et al., 2005).

In addition, if communities have used common-pool resources for generations, they are likely to have valuable knowledge about their governance history. The accumulation of knowledge concerning strategies, rules, and management practices has been called "institutional memory" (Folke et al., 2003). It has been argued that institutional memory is important to users, because it provides a basis for rule modification and thus increases the potential to design adaptive responses to cope with ongoing changes (Hilborn, 1992; Olsson and Folke, 2001; Folke et al., 2003; Ford et al., 2006). However, institutional memory is constrained by personal and social memories, and therefore it is subject to a steady process of adjustment according to the experiences of the moment (see, e.g.,

Halbwachs, 1992:183). Thus, regulations that are used for long periods of time by a community are incorporated as part of its institutional memory, and in the same way those that are not used are discarded and forgotten. This process will be more complex the longer the relationship of communities with the resource is.

The process of loss of institutional memory will be more substantial if the users' knowledge is transmitted by worth-of-mouth. However, this memory loss has occurred even when users have recorded their regulations in writing, for example, in statutes or village bylaws. Many regulations have been assigned to the village archive, and over the centuries they have physically deteriorated or they have become unintelligible to users because of their linguistic style. In addition, since the 19th century, many village bylaws have been included in archival and state archives—out of reach of user communities. In Europe, this dispersion of documents was mainly due to changes in the administrative configuration of the states and the consideration of historical records as a national heritage that had to be preserved (Cook, 1997).

Concerning agro-forestry commons, another process of institutional memory loss occurred in the 19th century but in a much more intense way. At the end of the 18th century, liberal thought was established in Europe and the common-property regime was criticized as being considered inefficient from an economic point of view. As a result, during the 19th century, many commons were enclosed (privatized) while others were converted into open-access resources because their regulations were totally or partially abolished (e.g., Van Zanden, 1998; De Moor et al., 2002; Demélas and Vivier, 2003). Thus, in a short period of time, a number of rules were ignored and an intense process of institutional memory loss affected many user communities.

The aim of this paper is to show the potential of "historical knowledge"—a source of user knowledge collected through archival research—to recover institutional memory. Specifically, our attention is focused on village bylaws or statutes—referred to as a body of rules containing a part of the management approach of user communities at a given time (Thompson, 1991:100-101; Winchester, 2008; De Moor et al., 2016). In addition, we hypothesize that historical knowledge can be useful in two major aspects of co-management: linking the epistemologies that stakeholders use to make statements about the commons, and promoting community cohesion and pro-environmental attitudes (Reid et al., 2006; Borrini et al., 2007; Berkes, 2009). The background is the

author's experience in research conducted in Cantabria (northern Spain) concerning co-managed common pastures (Vázquez, 2011; Menéndez et al., 2012). These studies were then used as a basis for the author's doctoral thesis (Vázquez, 2016). Some of the arguments put forward in this paper are part of ongoing research in which historical and present-day bylaws are being analyzed (Vázquez, *forthcoming*).

In the first section of the paper, village bylaws are contextualized within the broader source of knowledge that we labeled historical knowledge. In the second section, we argue the potentialities of historical knowledge. In the third section, we propose a way to use historical knowledge in co-management through social learning methodologies. Concluding remarks focus on future challenges to make historical knowledge a useful tool in co-management.

2. INTRODUCING HISTORICAL KNOWLEDGE

We use the term "historical knowledge" to refer to user knowledge collected through archival research, in contrast to the knowledge-in-use and memory of the users which are sources collected through interviews and direct observation (Huntington, 2000). Due to its written form, historical knowledge is knowledge with high longevity. For example, historical knowledge enables one to go back in time and to explore the rules and management practices used before the 19th century liberal reforms.

In European archives there are different sources of historical knowledge, and in addition to village bylaws, cadastres and judicial sentences are abundant. Cadastres contain detailed information about the commons, e.g., names, location, area. Judicial sentences contain references to the internal and external conflicts of user communities, and it is usual to find detailed references about the commons in these documents. But the most complete and abundant source in the archives concerning agro-forestry commons is the statutes or village bylaws, a body of rules that contains a part of the management approach of a user community at a given time, i.e., a mixture of rules-in-form (legally constituted) and rules-in-use (actually applied).

The village bylaws

Since late medieval times, it has been usual for European peasant communities to write down the rules for the governance of common-pool resources. The reasons that led the commoners to write down the rules were probably diverse. For example, internal (within the community) and external conflicts (with other communities) were usual, and by writing them down they had legal support to report cases of noncompliance. In other cases, it is likely that the commoners' intention was to promote rules which they considered suitable to achieve an appropriate use of the resource. However, it is likely that some rules would not be put into practice because of their contested nature. Likewise, it is also probable that customary practices would never be recorded; maybe this was not necessary because these practices were widely accepted. In addition, we must take into account the fact that the legal process of writing bylaws required paying the services of a notary (see Thompson, 1991:100-101; McCay, 2002; Winchester, 2008).

Some authors have shown that the initiative of writing bylaws came from the commoners themselves (De Moor et al., 2016). In other cases, it has been documented that it was the Crown or the jurisdictional lords who compelled the commoners to draft bylaws. For example, in the Spanish case, the formulation and writing of bylaws was imposed by the Crown on the villages in 1423 (Vázquez, 2016:337). The English case was similar, because bylaws were written by the jurisdictional lords in the manorial courts. Winchester (2008) argues that an evidence of this intervention is the similarity between sets of bylaws in large parts of England.

What do village bylaws contain?

The type of rules that can be found in village bylaws is diverse. In a comparative study in three European countries, De Moor et al. (2016) have found that the danger of an eventual overexploitation of the resource was the main concern of the commoners. Moreover, the authors have found that most rules were aimed at avoiding endogenous problems, that is, preventing free-riding and overexploitation by community members. This differs from studies carried out in other parts of the world, in which it has been found that the main efforts of communities have usually focused on avoiding exogenous conflicts—sometimes because of territorial and cultural identity concerns (McCay,

2002). The European case is probably related to the demographic and market growth that has taken place since early modern times (Parker and Jones, 2015), because this acted as a stimulus to increase internal pressure on the resource (e.g., Agrawal and Yadama, 1997; McCay and Jentoft, 1998; Ruiz-Pérez et al., 2004).

Ostrom (2005:186-215) has developed a useful system to classify rules in common-property regimes. Generally known as "the rule typology" (see also Kiser and Ostrom, 2000), this system classifies the rules by their aim, resulting in seven categories: (1) "position", which identifies the roles played by the participants; (2) "boundary", which identifies who is likely to occupy a position and what requirements must be met; (3) "choice", which establishes what a participant who occupies a position should, should not, or can do; (4) "aggregation", which addresses how multiple participants take joint decisions; (5) "information", which determines how information should flow among participants; (6) "payoff", which assigns external rewards or sanctions relative to distinct actions; and (7) "scope", which identifies required, desired, or prohibited results without necessarily referring to a set of actions.

Table 1 shows some examples of the content of rules that can be found in a village bylaw, following the Ostrom rule typology. We take as a reference a case study concerning the use of common pastures in Cantabria (northern Spain) where 40 modern bylaws (from the period 1559 to 1844) were analyzed (Vázquez, 2016:311-337). A subsequent analysis has shown that most of the rules contained in those bylaws correspond to rules of choice, information, and position (Vázquez, *forthcoming*).

Table 1. Rules contained in early modern bylaws in Cantabria (Spain).

Rule type	Example of content
Position	Villagers shall elect a mayor.
Boundary	Outsiders must pay an entry fee.
Choice	The mayor shall hire a shepherd each year.
Aggregation	Villagers must form a collective herd every morning.
Information	Villagers must meet every Sunday to report infractions.
Payoff	The villager who reports an infraction will receive a part of the fine.
Scope	The use of certain sectors is totally forbidden.

Source: adapted from Vázquez (*forthcoming*).

3. THE ROLE OF HISTORICAL KNOWLEDGE IN CO-MANAGEMENT

In this section, we consider the usefulness of historical knowledge in the three major areas of co-management that are the focus of our attention: (1) generating knowledge to coproduce policy designs, (2) linking the epistemologies that stakeholders use to make statements about the commons, and (3) promoting community cohesion and pro-environmental attitudes.

Generating knowledge to coproduce policy designs

User communities which have lived in the same place for generations possess knowledge concerning their governance history, that is, an institutional memory about strategies, rules, and management practices for dealing with social and ecological changes. It has been argued that this memory is invaluable because it enables us to understand these changes and the ways in which they can be addressed (Hilborn, 1992; Folke et al., 2003; Ford et al., 2006). But, as we have already stated, institutional memory has a temporal limitation because it is constrained by personal and social memories, and therefore it is subject to a steady process of adjustment, i.e., rules that are employed over long periods of time are established whereas those that are not used are discarded and forgotten.

We find that historical knowledge may be useful to recover institutional memory at two broad levels. The first level is the rules and management practices that the community employed at a given time. The second level is strategies constituting a set of rules and management practices that the community used to deal with changes or crises, not only in a premeditated way but also as part of a strategy that makes sense in the long run.

The usefulness of historical knowledge in providing strategies for dealing with changes and crises has already been argued. Some authors have shown that a thorough archival exploration, which includes series of documents with an ample chronology, enables one to detect responses to social and ecological change. For example, using historical records of religious ceremonies from the period 1577-1956, Gómez-Baggethun et al. (2012) have collected the reactions of a Spanish rural community to extreme climatic variations (mainly droughts), e.g., strategies such as transhumance-based mobility, storage of resources, and consumption restrictions (see other examples in Endfield,

2012; Grau-Satorras et al., 2016). There are also examples concerning socioeconomic changes. For example, through an analysis of European village bylaws from the period 1300 to the present, De Moor et al. (2016) have concluded that one of the greatest efforts made by user communities was that of adjusting rules on consumption restrictions (e.g., entry fees) to address demographic and market changes (see other examples in Baur and Binder, 2013; De Moor, 2015:121-151).

However, the usefulness of historical knowledge in providing the specific content of rules and management practices is problematic. Rules and management practices were conceived in respond to specific conditions and therefore their replicability is risky— both between distinct localities as well as from one time to another within the same locality. Thus, even using historical knowledge in local planning, that is, with the user community to which it belongs, historical knowledge must be used as reference knowledge to provide specific contents for rules and management practices. In the above-mentioned research (Vázquez, *forthcoming*), we have argued that there are two ways in which historical knowledge can be used. In cases where social and ecological changes have been great, historical knowledge must necessarily be subjected to a mid-range abstraction. For example, the users working as shepherds of a collective herd (a common practice in the past) is now unfeasible in many European rural areas because of the lack of manpower. Nevertheless, this rule in its abstract form (i.e., shepherding) can be applied to encourage users to undertake new collective action in this area, e.g., presenting them the advantages of jointly hiring a shepherd. However, in situations where social and ecological changes have been minor, historical regulations can be used in their concrete (site-specific) form. For example, in Cantabria (northern Spain), recent research based on toponymy indicates that grazing areas in the higher (summer) commons have hardly changed since the mid-18th century (Corbera, 2010:137; Puente, 2013; Vázquez, 2016:337-356). Thus, historical rules on the internal zoning of pastures, in addition to promoting new collective action, can be used as reference knowledge for designing new zonings. For example, an experimental reconstruction can serve to identify the criteria that villagers used in the past to conceive the zoning of pastures, e.g., seasons, and livestock species and categories.

Linking epistemologies among stakeholders

Bringing together scientific knowledge and user knowledge offers great advantages in the governance of the commons. However, this is not an easy task, and one of the main problems is differences in the epistemologies (abstract vs. concrete) that the parties employ to make statements about the resource (Reid et al., 2006; Davidson-Hunt and O'Flaherty, 2007; Berkes, 2009).

Generally speaking, there are two main sources of scientific knowledge that government actors and technical advisors employ as a reference in the governance of the commons: on the one hand, theories and tools concerning institutional analysis of common-property regimes; on the other, theories and tools focused on the physical variables of the resource (e.g., climate, forage stock) from agronomic, forest, or marine sciences. An example of the first type of knowledge is Ostrom's design principles—a meaningful analytical tool conceived as a "best practice" guide for the governance of the commons (Ostrom, 2010:653; see also Agrawal, 2003; Cox et al., 2010).

The "design principles" are in a part founded on historical regulations of user communities in Switzerland, Japan, Spain, and the Philippines. Ostrom considered these communities to be robust institutions because they have managed common-pool resources over long periods of time, and she systematized their regulations in a codified form to identify differences and similarities. This can be summarized as a process of making regulations abstract by discarding all their local particularities (e.g., places, words, and rituals) so that they can be systematically compared (see Ostrom, 1990:58-102). Afterward, it has been verified that the design principles were usual in many other historical commons, particularly in the case of European agro-forestry commons (e.g., Van Zanden, 1998; De Moor et al., 2002; Winchester, 2008; Pascua-Echegaray, 2011; Serrano, 2014).

Accordingly, we propose to use both sources of knowledge in a combined way, that is, the design principles as a reference guide for governance analysis and, if possible, the historical regulations of the user community being targeted. This enables us to make use of the broad epistemological spectrum that exists between both sources—from the most abstract forms (the design principles) to the most concrete ones (historical regulations). By doing so, we can bridge the different institutional epistemologies that the main parties in co-management employ to make statements about the commons. However, a

minimal codification of historical regulations is necessary, i.e., an abstraction so that they can be compared and easily understood, because they often have a complex grammar and linguistic style. But if we deprive these regulations of their cultural particularities (e.g., toponymy, protagonists) we will lose the anchor points that link users with them.

Appendix 1 illustrates this proposal through an example in which the first four design principles—those targeted at the lower level of governance and directly related to the elaboration of rules (Ostrom, 2005:271)—are confronted with some rules of the 1755 bylaw of Obeso, a village located in Cantabria (northern Spain). This exercise is part of the ongoing research already mentioned (Vázquez, *forthcoming*). The bylaw has been deconstructed by applying the "institutional grammar tool" (IGT), an extension of Crawford and Ostrom's grammar (1995) designed by Basurto et al. (2010) and Siddiki et al. (2011). This tool enables us to identify the rules contained in a given policy design through its deconstruction into basic components. Specifically, a rule contains six IGT components: (1) the "attribute", the actor in charge of performing the action; (2) the "object", the receiver of the action; (3) the "deontic", the prescriptive operator indicating whether action is required, permitted, or prohibited; (4) the "aim", the action itself; (5) the "condition", the spatial, temporal, and procedural circumstances under which the action is performed; and (6) "or else", the punitive penalty resulting from nonperformance of the action. An example of a rule contained in the bylaw analyzed shows the following syntax: "The mayor must hire a shepherd between 24 June and 29 September, or pay a fine", where the attribute is "mayor", the deontic is "must", the aim is "hire", the object is "shepherd", the condition is "between 24 June and 29 September", and the "or else" is "pay a fine".

Promoting community cohesion and pro-environmental attitudes

There is a growing interest in including the study of human values (such as emotion) in environmental planning with the aim of ascertaining its influence on human-environment relationships. The trajectory that has been followed by scholars has changed from a partial approach, mainly focused on physical aspects of the resource, to a more holistic one: at first including social variables and now encompassing aspects of human cognition from fields such as environmental psychology, cultural anthropology,

and human geography (see a chronology of the concept "social-ecological system" in Berkes and Folke, 1998; Adger et al., 2005; Ostrom, 2009; Persha et al., 2011; Chapin et al., 2012; Jones et al., 2016).

The term "sense of place" was defined some time ago to analyze the attachment of an individual or a community to the environment (see Tuan, 1977). This attachment can vary greatly in intensity, from immediate sensory pleasure to a deep feeling of emotional attachment (Williams et al., 1992). In a recent study, Masterson et al. (2017) have proposed a clarification of the concepts associated with sense of place to solve the existing terminological confusion. The authors have defined sense of place from two basic components: "place attachment" and "place meaning". Place attachment is the emotional link between individuals or groups and their environment, and in turn includes two sub-domains: "place dependence", which is the utilitarian relationship between individuals or groups and their environment and which depends on the ability of the environment to satisfy their basic needs; and "place identity", which is the self-identification of individuals or groups with their environment involving ideas, feelings, or preferences. Place meaning, the second of the basic components, consists of the descriptive statements that individuals or groups make about their environment and therefore contrasts with the cognitive character of place attachment—the first basic component.

Concerning rural communities, sense of place is largely influenced by the history of relationships of the community with its environment, and it is supported especially by the accumulation of material and immaterial heritage that concerns the historical process of transformation of the environment through generations (Lewicka, 2011). For example, the environment of rural communities in temperate Europe has been subjected to a centuries long process of anthropic transformation, from a "space" (physical environment) to a "place" made up of productive areas that have reshaped the original vegetation cover: e.g., buildings, orchards and grainlands, hay meadows, pastures, and open forests (Ellenberg, 1988). Thus, communities that have lived in the same place for generations visualize as their heritage the set of material elements (e.g., hay meadows with huts and dry-stone walls) and immaterial (e.g., tales and legends, and toponymy) associated with the process of "place making".

It has been argued that divergences in the sense of place within a user community constitute an obstacle in environmental planning, because this can lead to its members having different aims and views on resource management. However, shared senses of place can mobilize the communities to adopt management strategies, especially if they perceive that the resource is threatened. Their mobilization will be all the more intense as more sense of place components are common among them. Thus, efforts of many scholars and practitioners have focused on designing strategies to stimulate shared senses of place within a community or between stakeholders in environmental planning (e.g., Williams and Stewart, 1998; Uzzell et al., 2002; Manzo and Perkins, 2006; Chapin and Knapp, 2015).

We find that historical knowledge can contribute to building shared senses of place and also to their increase, especially through the components of identity and place meaning. Particularly, village bylaws contain two elements that can build bridges between the past and present and thus generate sense of place: the toponymy (place-names) of the commons, and the surnames of the people who made the bylaws. On the one hand, toponyms were and still are used by villagers to accurately name the places where they exercise their activities. For example, because of the open character (without walls or fences) of common pastures, bylaws often include an internal zoning of pastures using toponymy. On the other, the names of the villagers are generally referred to in the bylaws and, as has been argued, it was usual for the whole community to get involved in their elaboration (De Moor et al., 2016).

With greater or lesser linguistic variations, the toponymy of European agro-forestry commons has hardly changed over the centuries. In fact, in the field of medieval archeology the toponymy is an important source of data along with the search for material remains of infrastructures and settlements. For example, Oosthuizen (2005) bases her hypothesis about the early medieval origin of the open-field system in England on toponymy (see other examples in Rippon, 2008; Calvo-Iglesias et al., 2012). Some toponyms even date back to pre-Roman times, although most of them come from medieval times in a process of cultural production that extends to the present (Kadmon, 2000). Thus, the accumulation of toponyms becomes considerable. For example, in a study conducted in a rural community located in Spain, Tort (2000) collected ratios of 23.7 toponyms per square kilometer.

The level of family-line continuity of a rural community determines the fact that the villagers referred to in the bylaws are direct ancestors of the present-day villagers. Research in the field of historical demography indicates that, in many cases, this continuity is low as a result of phenomena such as emigration, wars, and epidemics (Goody, 1983). In some European rural communities, however, the level of family-line continuity is quite high. In his seminal work on the village of Törbel in the Swiss Alps, Netting (1981:70-89) obtains surname persistence rates of 58% in 270 years. This is explained by a patrilineal continuity based on the stem-family system that the author relates to the geographic isolation and ecological limitations in the Alps. Similar examples have been documented in other European mountain areas, e.g., Viazzo (1989), Arrizabalaga (2005), and Fauve-Chamoux (2006).

4. HOW TO USE HISTORICAL KNOWLEDGE?

In social learning practice, there are different methodologies based on participatory workshops whose main objective is to create an arena to bridge and coproduce knowledge among stakeholders. For example: "participatory scenario building", as a collaborative process in which stakeholders analyze management alternatives through probabilistic scenarios (Peterson et al., 2003; Bennett and Zurek, 2006; Oteros-Rozas et al., 2015); "participatory mapping", in which stakeholders analyze management alternatives through geographic information (Sheil et al., 2002; Chambers, 2006; Haddaway et al., 2017); and "participatory video and art production", in which stakeholders analyze management alternatives through audiovisual media (Mistry et al., 2014; Johansson and Isgren, 2017).

We propose the term "historical learning" to refer to a collaborative process in which stakeholders visualize, analyze, and discuss historical documentation to coproduce new rules and management practices. In 2011, this approach was primarily tested in a project carried out in the Rionansa valley (Cantabria, northern Spain) to promote efficient and sustainable use of co-managed common pastures (Menéndez et al., 2012). With the aim of achieving more user involvement in decision-making, a series of participatory workshops with government advisors and users was organized, and the technical team linked some of its proposals with local documentation of the 18th century, i.e., bylaws, judicial sentences, and cadastres. This was a preliminary test of the role of historical

knowledge in co-management, but it served as a stimulus to take the first steps in this novel approach.

Appendix 2 shows (a) an example of a slide used during the workshops in the Rionansa Valley project. The original manuscript and the transcription are in Spanish. The document is a judicial sentence of 1776 in which an internal zoning of common pastures was established according to seasons and livestock species. Specifically, this document was used by the technical team as a reference to argue the need of zoning the pastures to avoid over- and underutilization processes (e.g., Vázquez et al., 2011). Appendix 2 also includes photographs of different stages of the project: (b) a meeting with users to collect toponyms, and (c) a participatory workshop conducted in a parish located in the Rionansa valley.

5. CONCLUSIONS

In this paper, historical knowledge has been defined as a source of user knowledge collected through archival research, in contrast to the knowledge-in-use and memory of the users which are sources collected through interviews and direct observation. In relation to conventional sources of knowledge in co-management, its advantage is its written form and therefore its age and durability. However, we have argued that historical knowledge has also disadvantages, mainly due to its written form and particularly when using village bylaws or statutes. Above all, we claim historical knowledge as an institutional heritage that users and other actors involved in the governance of common-pool resources should value and take into consideration for policy design.

Much effort is still needed to make historical knowledge a practical tool in co-management. We recognize that a major challenge is to design a methodology to make historical knowledge accessible. Generally, historical documentation is foreign to users and technical advisors, because they cannot interpret it or simply because it is dispersed through regional and state archives. This paper suggests some initial steps to achieve this goal. First, we have proposed the maintenance of historical knowledge at a middle-range abstraction to preserve their local particularities (e.g., toponymy, calendars of use, and protagonists), and to use the broad epistemological spectrum that exists between historical knowledge and scientific knowledge to connect the ways in which the main

parties make statements about the resource. Likewise, we have shown the utility of the institutional grammar tool (Siddiki et al., 2011) in facilitating the process of displaying and analyzing historical regulations. We consider this tool very suitable when one has to confront policy designs written using different epistemologies (abstract vs. concrete) and historical linguistic forms (early modern vs. contemporary). Second, we have suggested making use of historical knowledge through social learning methodologies, and we have proposed the term historical learning to refer to a collaborative process in which stakeholders visualize, analyze, and discuss historical documentation to coproduce new rules and management practices.

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Appendix 1. Combining Ostrom's design principles with some rules included in the 1755 bylaw of Obeso.

Design principle	Heading	Clearly defined boundaries.
	Description	Individuals or households who have rights to withdraw resource units from the common pool resource must be clearly defined, as must the boundaries of the resource itself.
Bylaw rule	Content	Villagers may not introduce livestock in the St. Martin *dehesa* from St. John's day in June until the day of Our Virgin in August, unless the Council decides otherwise. The penalty will be 400 *maravedíes*.
	Abstraction	Villagers + May not + Use + Sector A + [2 conditions] + Or pay a fine.
Design principle	Heading	Congruence between appropriation and provision rules and local conditions.
	Description	Appropriation rules restricting time, place, technology, and/or quantity of resource units are related to local conditions and to provision rules requiring labor, material, and/or money.
Bylaw rule	Content	Villagers use mastiff dogs, and keep them all year round according to the number of cows they have. The penalty for non-compliance will be 60 *maravedíes* per day.
	Abstraction	Villagers + Shall [implicit] + Use + Mastiff dogs + [1 condition] + Or pay a fine.
Design principle	Heading	Collective-choice arrangements.
	Description	Most individuals affected by operational rules can participate in modifying the operational rules.
Bylaw rule	Content	Villagers who are in or around the village will attend Council, unless they are far from the village or occupied with livestock. The fine for each omission will be 60 *maravedíes*.
	Abstraction	Villagers + Shall [implicit] + Attend + Council + [3 conditions] + Or pay a fine.
Design principle	Heading	Monitoring.
	Description	Monitors, who actively audit common pool resources conditions and appropriator behavior, are accountable to the appropriators or are the appropriators.
Bylaw rule	Content	Whoever denounces an infraction will obtain as reward a third of the amount of the fine.
	Abstraction	Denouncers + Shall [implicit] + Receive + Reward + Or pay a fine [implicit].

Source: Ostrom (1990:90); Vázquez (*forthcoming*).

Appendix 2. Some stages in the Rionansa Valley project.

a

Pleito entre Celis y Lamasón, año 1776
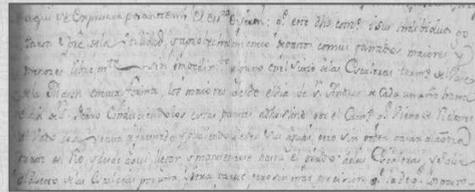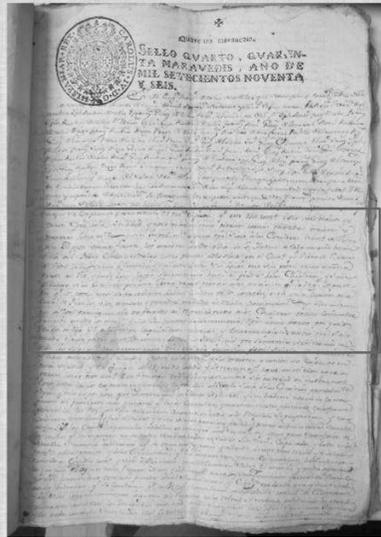
[...] decimos que este citado concejo de inmemorial tiempo a esta parte, tanto que memoria de hombres ni noticia de escritos hay en contrario, ha tenido el paso para sus ganados vacunos desde su dehesa al término común del Valle por la cumbre de Hozalba y demás que nacen aguas vertientes a Lamasón y este Valle, por aquella venda tan sabida por los vecinos de una y otra jurisdicción en tiempo de primavera hasta el día de San Juan, y para volver dichos ganados de citado puerto desde el día de San Miguel, veintinueve de septiembre, de cada un año [...]

Fuente: Archivo Histórico Provincial de Cantabria. Protocolos Notariales. Legajo 2.476/2. Folios 82, 83 y 84.

b

c