

## Taking sanctioning seriously

### The impact of sanctions on the resilience of historical commons in Europe

De Moor, Tine; Farjam, Mike; van Weeren, René; Bravo, Giangiacomo; Forsman, Anders; Ghorbani, Amineh; Ale Ebrahim Dehkordi, Molood

**DOI**

[10.1016/j.jrurstud.2021.08.009](https://doi.org/10.1016/j.jrurstud.2021.08.009)

**Publication date**

2021

**Document Version**

Final published version

**Published in**

Journal of Rural Studies

**Citation (APA)**

De Moor, T., Farjam, M., van Weeren, R., Bravo, G., Forsman, A., Ghorbani, A., & Ale Ebrahim Dehkordi, M. (2021). Taking sanctioning seriously: The impact of sanctions on the resilience of historical commons in Europe. *Journal of Rural Studies*, 87, 181-188. <https://doi.org/10.1016/j.jrurstud.2021.08.009>

**Important note**

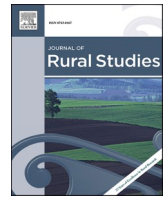
To cite this publication, please use the final published version (if applicable).  
Please check the document version above.

**Copyright**

Other than for strictly personal use, it is not permitted to download, forward or distribute the text or part of it, without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license such as Creative Commons.

**Takedown policy**

Please contact us and provide details if you believe this document breaches copyrights.  
We will remove access to the work immediately and investigate your claim.



# Taking sanctioning seriously: The impact of sanctions on the resilience of historical commons in Europe

Tine De Moor<sup>a,\*</sup>, Mike Farjam<sup>b</sup>, René van Weeren<sup>c</sup>, Giangiacomo Bravo<sup>b</sup>, Anders Forsman<sup>d</sup>, Aminah Ghorbani<sup>e</sup>, Molood Ale Ebrahim Dehkordi<sup>e</sup>

<sup>a</sup> Rotterdam School of Management, Erasmus University Rotterdam, Burgemeester Oudlaan 50, 3062 PA, Rotterdam, the Netherlands

<sup>b</sup> Linnaeus University, Department of Computer Science and Media Technology, 3022, Hus K, Växjö, Sweden

<sup>c</sup> Utrecht University, Department of History and Art History, Drift 6, 3512 BS, Utrecht, the Netherlands

<sup>d</sup> Linnaeus University, Department of Biology and Environmental Science, 44004, Hus Vita, Kalmar, Sweden

<sup>e</sup> Delft University of Technology, Department of Engineering Systems and Services, Jaffalaan 5, 2628 BX, Delft, the Netherlands

## ARTICLE INFO

### Keywords:

Commons  
Sanctioning  
Institutions for collective action  
Free-riding

## ABSTRACT

In their studies of collective exploitation of common-pool resources, Ostrom and other scholars have stressed the importance of sanctioning as an essential method for preventing overuse and, eventually, the collapse of commons. However, most of the available evidence is based on data covering a relatively small period in history, and thus does not inform us about the evolution of rules, including sanctions, over time. In this article, we demonstrate, based on historical sources covering several centuries, that sanctioning was not always the preferred way of preventing or dealing with free-riding in institutions for collective action, but that the legal context is decisive to understand why commoners in some countries were using more sanctions than those in others to regulate commoners' behavior. Commoners that could self-govern their resources used fewer sanctions, and when they did, it was mainly to avoid overuse of their most vulnerable resources. Moreover, graduated sanctioning seems to be less important than suggested in Ostrom's famous Design Principles, and was reserved primarily for immediate threats to the commons' resources. We also show the importance of other types of rules, such as differentiated rules, which have hardly been taken into account in literature to date.

## 1. Introduction

In literature, it is generally assumed that sanctioning – perceived as second-order, remedial rules – is an effective and efficient way of dealing with free-riding within a collective action setting, where ‘social dilemmas’ are constantly challenging those involved to choose between the communal benefit of a cooperative strategy versus the temptation to defect (not cooperate), in order to maximize one's own benefits (Fehr and Gächter, 2000; Sefton et al., 2007). Besides the actual need for sanctions to avoid free-riding in general (Fehr and Gächter, 2002; see also Dreber et al., 2008; Hauser et al., 2014; Sigmund et al., 2001), it has been claimed that particular types of sanctioning, such as graduated sanctioning, are more effective than others in enhancing the robustness and resilience of organizations (Baggio et al., 2016; Cox et al., 2010; Ostrom, 1990; Potts, 2019). This particular attention given to graduated forms of sanctioning goes back to Design Principles Illustrated by

Long-Enduring CPR Institutions (Ostrom, 1990), in which the fifth principle is dedicated to graduated sanctioning, or sanctions increasing in intensity with the number/severity of offences, as compared to non-graduated sanctions, which remain the same for each offence. Although Ostrom clearly noted that her list of design principles was still quite speculative and could not be considered as a panacea (Ostrom et al., 2007), the Design Principle list has since been used by many scholars and commons-activists as a list of key principles, as the conditions which an institution for collective action should meet to become resilient. In this article, we first of all question the actual need for sanctioning in a collective action setting. Most literature in this domain underestimates the social, organizational and financial costs of developing adequate sanctioning in a self-governing situation (for a more nuanced perspective, see Guala, 2012). Not sufficiently taken into account are the costs of assigning a sanction to the free-rider and all the costs that may ensue if the free-rider needs to be reminded of the

\* Corresponding author.

E-mail addresses: [demoor@rsm.nl](mailto:demoor@rsm.nl) (T. De Moor), [mike.farjam@lnu.se](mailto:mike.farjam@lnu.se) (M. Farjam), [r.vanweeren1@uu.nl](mailto:r.vanweeren1@uu.nl) (R. van Weeren), [giangiacomo.bravo@lnu.se](mailto:giangiacomo.bravo@lnu.se) (G. Bravo), [anders.forsman@lnu.se](mailto:anders.forsman@lnu.se) (A. Forsman), [A.Ghorbani@tudelft.nl](mailto:A.Ghorbani@tudelft.nl) (A. Ghorbani), [M.AleEbrahimDehkordi@tudelft.nl](mailto:M.AleEbrahimDehkordi@tudelft.nl) (M. Ale Ebrahim Dehkordi).

<https://doi.org/10.1016/j.jrurstud.2021.08.009>

Received 21 December 2020; Received in revised form 21 July 2021; Accepted 11 August 2021

Available online 20 September 2021

0743-0167/© 2021 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

sanction or even has to be taken to court. In contrast to what all too readily has been assumed, there might in fact be good reasons to avoid using sanctions as the main method of limiting and punishing free-riding, as it can turn into a costly affair. In commons-studies, this possibility – that sanctions might be too costly to design, let alone implement, and that other instruments might be more effective – has received little attention in field studies. In experiments, the costs of sanctioning and the potential of alternative instruments have indeed been studied (see e.g. Heckathorn, 1990; Horne and Cutlip, 2002, or e.g. Mulder et al., 2006) and there are some references to contemporary commons where no or very limited sanctions are used, but the long-term effects on the resilience of very few organizations have been studied in depth (Baerlein et al., 2015). Of course, many informal sanctions are possible as well, and some of them might be rather cheap. In our study we limit ourselves to formal sanctions, as, logically, the informal version can no longer be retrieved from the historical archives. Secondly, we also study the effects of sanctioning on the long-term functioning of the commons. Here we consider long term as a period longer than the generation of those who designed the rules and sanctions initially, as this gives us a clear indication of how well the rules and norms have been passed on through generations. Without an empirical study of the long-term evolution of the rules and sanctions, it also remains unclear to what extent sanctioning – in all its varieties – can really be an effective instrument to achieve the long-term resilience in the commons.

## 2. Discussion

Several studies have stressed the importance of sanctioning in the commons. The collective exploitation of common-pool resources often results in a social dilemma, which, if not solved to the benefit of the collectivity, would be described as free-riding on the collective resources. This may – if persistent – lead to overexploitation and the collapse of the common in due course (Ostrom, 1990). In the case of institutions for collective action, rules are designed in order to prevent such free-riding and explicit sanctioning is often integrated in the regulation of commons in order to prevent such free-riding behavior, and if needed, to actually punish the free-rider for such behavior. It is assumed that the rules need to prevent free-riding, to damage or loss of the resource to unentitled users, or, possibly, to avoid the over-exploitation of the resource system.

More specifically, graduated sanctioning has been regarded as one of the defining features of robust collective action institutions, included by Ostrom in her List of 8 Design Principles for Robust Institutions for Collective Action, as published in her seminal work *Governing the commons. The evolution of institutions for collective action* Ostrom (1990). A number of subsequent studies have confirmed and also nuanced Ostrom's original insights and further investigated how commoners devise and enforce sanctions to prevent a tragedy from occurring (Boyd et al., 2018; Chavez Carrillo et al., 2019; De Moor et al., 2016; Feeny et al., 1990; Freeman, 2010; Ostrom, 2009). Whereas graduated sanctioning has received ample attention, very little interest has so far been given to other types of sanctioning within commons studies. In fact, Ostrom's work contributed to nuancing the previously existing supposition among game theorists that a self-governing commons arrangement could work only if the users committed to a 'grim trigger' approach (Ostrom, 2010), a kind of mutually assured destruction strategy where any free-riding behavior by any user would be met by free-riding behavior by all users in retaliation. As such, she put the role of sanctioning in perspective, also by stressing that the significance of graduated sanctions is not so much that they are sanctions but that they are initially forgiving.

In this article we will also address another type of sanctioning, which we will refer to as *differentiated* sanctions, i.e. sanctions that would be different for the same rule breach, depending on the circumstances of the trespass or depending on the status of the offender. By doing so we can, on the basis of longitudinal, empirical data, show the enormously

broad variety of sanctions commoners had available to them for centuries to prevent and, if needed, punish free-riding.

In our paper we consider sanctions as a particular type of rules (second-order, remedial rules, next to first-order rules), inherent to the formalization of agreements in collective-action institutions in order to settle conflicts around common-pool resources (see also Ostrom and Basurto, 2011). According to Ostrom, resource exploitation within a lawless 'state of nature' in which no rules exist unavoidably leads to a conflict between different users trying to make their respective claims prevail above those of the rest. If unregulated, the non-excludability (or impossibility of restricting use to a single or a few individuals at an affordable cost) and the subtractability (or impossibility of joint consumption: what one takes is no longer available for the rest) of the resource system give rise to tensions and conflicts between the users (Ostrom, 1990, 2009). Facing the significant costs that such a situation would impose upon them, users favor the emergence of a more beneficial governance arrangement. The design of an institution for collective action appears as one of the possible options at users' disposal in order to mitigate conflicts and increase social welfare.

If encouraged by certain factors, the transition from a lawless 'state of nature' to a self-governed regime puts a number of interrelated changes in motion. The first step consists of demarcating the boundaries which define the new regime clearly – both in geographical and in personal terms (Ostrom, 2011). Simultaneous to this, the formalization of a collective-choice arena occurs. Once boundaries are clear enough and collective-choice rules are well understood and shared by all members, the process of institutional change eventually boils down to a constant process of 'tinkering' through which the norms and rules are designed and adjusted as a result of changing circumstances (Ostrom, 2005, 2011; Ostrom and Basurto, 2011). The basic intuition that emerges from the model sketched by Ostrom and her co-authors is that users have to be able to rely on the pool of past and current local knowledge in order to guarantee a satisfactory process of rule innovation within a changing environment, upon which they are heavily dependent for their daily livelihoods (Anderies et al., 2004). Designing and adjusting sanctions is part of such rule innovations.

However, most of the available evidence on how this formalization process takes place and its associated effects are restricted to at most a few decades of time, thus providing little empirical basis to inform us about the really long-term effects of regulation in general or sanctioning in particular. Moreover, most of the work investigating this issue relies on contemporary case studies, all situated in the modern era, thus not covering the major transitions, such as the period of the Industrial Revolution, which put a lot of stress on natural resource management. The importance of longitudinal analysis has been recognized by scholars such as Ostrom, but until now there has not been a systematic study of the rules of commons for various comparable cases for several subsequent centuries.

The path followed by sanctioning in a common-pool institution setting over the long run also appears to be inextricably linked to the broader process of institutional change. In the late work of Ostrom and in the work of other scholars, sanctioning appears as one of the most fundamental elements in the governance regime regulating the collective exploitation of common-pool resources (Crawford and Ostrom, 1995; Ostrom, 2005). If institutions are understood as rules, and rules only exist when an explicit sanction (or second order, or remedial rule) has been foreseen, then sanctioning becomes the defining element of any institutional arrangement among them (for an alternative view on institutions (institutions as behavior equilibria), see the works of Avner Greif (2006) or Masahiko Aoki (2001)). To a very large extent, it is thus the existence of, and change in sanctions that allow us to talk about the existence of, and change in institutions.

In this article we investigate how sanctioning changed over several centuries. What, if any, are the persistent patterns in the long-term evolution of sanctioning as found in the historical commons? How important was sanctioning really? Which factors underly changes in

those sanctioning patterns? And which types of sanctions were important to achieve resilience?

### 3. Materials and methods

To improve our understanding of these long-term dynamics, we analyzed the data collected as part of the Common Rules Project ([http://www.collective-action.info/\\_PRO\\_NWO\\_CommonRules\\_Main](http://www.collective-action.info/_PRO_NWO_CommonRules_Main)), which aimed to understand how efficient and effective regulation can be developed and executed by well-functioning institutions for collective action. From the Common Rules database we selected a number of commons in (areas which currently correspond with) the Netherlands, Spain and England on the basis of two criteria: they had to have lasted for at least 180 years and should have had in that period registered – new or renewed – rules during at least three different years, in order to ensure that we focused on dynamic organizations that adapted their rules to changing circumstances. This dataset allowed us for the first time to analyze the relation between sanctioning and the longevity (as a ‘resilience-indicator’) of commons over a long-term period (De Moor, 2015; De Moor et al., 2016; Laborda Pemán and De Moor, 2013; Laborda Pemán and De Moor, 2016; Van Weeren and De Moor, 2014). We fully recognize the possibility that the date range represents not the full life of the common from creation to demise but rather the survival of documentary evidence of regulations. For the English material for example, it is likely that there were regulations long before the manor court records survive.

The data have been coded using a detailed coding method that allows us to identify the type of sanction, the type of offender, the offended parties involved, the differentiation in sanctioning, the type of resource involved, etc. (<https://tinyurl.com/codebook-CR-Oct14>). The coding methodology was developed specifically for the categorization and based on the analysis of historical cases (De Moor et al., 2016). This coding is an instrument that differs from for example the ADICO-grammar of institutions (Basurto et al., 2009; Crawford and Ostrom, 1995; Wall, 2014), which mainly uses a typology of rules, with the intention of syntax-analysis. Our choice of European regions included in the analysis also allows us to identify the impact of different (historical) legal systems on the use of sanctioning. Although the selection of commons made per country is (due to the labor intensity of the enormous data collection) limited, our analysis gives a consistent view per country, over several centuries of time.

During the lifetime of the institutions that were recorded, some spanning more than six hundred years, groups of commoners regularly created new rules or adapted existing rules on the use, governance and management of resources (henceforth, ‘regulatory activities’). The database contains background information on Dutch, English, and Spanish cases that were studied, a literal transcription of regulatory activities as taken from the original archival sources, and a translation into modern English of these activities. For the comparison between countries, 24 cases (10 Dutch, 7 English, and 7 Spanish) were selected, each common meeting the previously mentioned selection criteria of minimum life span and minimum of rule changes. In general, the cases encountered very similar natural circumstances within each country (see Table 1).

**Table 1**  
Number of commons and averages per country.

	Netherlands	Spain	UK
Number of commons	10	7	7
Average lifespan in years	331.9	241.7	153.6
Number of regulatory activities	368.8	183.6	65.5
Regulatory activities per year	1.11	0.76	0.43
Ratio of sanction-related activities	0.42	0.45	0.79
Ratio of graduated sanctions	0.07	0.01	0.00
Ratio of differentiated sanctions	0.01	0.27	0.00
Ratio of regulatory activities on subsoil resources	0.12	0.00	0.18

Rules were written down independently for each case, and as such, the style of the formulation of the rules and sanctions could differ across cases. Nevertheless, the formation of bodies of rules followed a more or less similar procedure: in most cases, lists of rules (or rule changes) would be drawn up and approved by the assemblies of users or neighbors or by the manorial court: the *markeboeken* in the Netherlands, the ‘paine lists’ in England, and the *ordenanzas* in Spain. The latter two sources are rather clear-cut lists: they consist of a list of articles, each of them containing a number of prohibitions, obligations or permissions regarding the behavior of users, officials or authorities involved. These articles frequently included a penalty for non-compliance with the rule concerned. In the Dutch *markeboeken* however, these lists sometimes existed, but were usually incorporated in a book not only containing these lists, but also minutes of commoners’ meetings; This is also true of the English evidence – rules are incorporated in the records of the sittings of manorial courts. Some rules and regulations, therefore, needed to be ‘extracted’ from these minutes instead of being clearly ‘on display’ on a list of do’s and don’ts. Text parts containing actual decisions and/or rules were thus distilled from the lists and texts, transcribed and subsequently translated into modern-day English. Next, these rules were entered into the database as ‘Original Rules’. Given the fact that rules were not always presented in the way we would expect them nowadays – listed in a formal and consistent way – the Dutch part of the database can be considered as an overview of both the formal and informal rules, though the latter were not implicit but made explicit in the *markeboeken*.

In order to obtain sets of rules per case that were similar in composition and could subsequently be coded, analyzed, and compared, we followed a specific, well-defined procedure. To be able to analyze rules on specific topics properly, these ‘Original Rules’ were split up into several ‘Individual Rules’; between original and individual rules, there could be a one-to-one relationship, but also a one-to-many relationship in case the text contained more than one decision within the same sentence (e.g., in a rule of the Dutch commons Exel from 1634, in one and the same sentence both a standing prohibition on digging and transporting peat was prolonged, and exemptions were mentioned for specific commoners and purposes). The Individual Rules-level formed the basis for the actual data analysis. In the next step of the coding process, for each Individual Rule it was determined which domain the rule referred to: whether the rule concerned primarily the use of resources, the access to the common and its resources, the management system of the common, the governance structure, or other domains. Next, it was determined per Individual Rule whether its nature was permissive, prohibitive, creating an obligation, a rejection of a proposed rule, or more general. Also, by comparison with previous rules in the same source, it was determined whether the rule was introduced for the first time (‘first mentioning’), an adjustment of a previously existing rule, or a repetition of a previously existing rule. In order to do this, the coding per source needed to be performed preferably by one and the same coder, as this coder was most aware of the rules previously coded. By comparing coding samples with other coders, consistency within the coding group was checked and preserved. After coding all rules, the status of rules that were initially mentioned as ‘first mentioning’, but did not have any related petition or adjustment within the source, was changed to ‘singular mentioning’. In the last stage of qualifying the Individual Rules, it was determined to whom the rule referred: to all commoners, just to the management of the common, or to specific (groups of) commoners.

At the next level of analysis and coding, the sanctions that were mentioned within the regulations (or first order rules) for disobeying the recorded rules were identified. For each sanction, various information was extracted and coded: the nature of the sanction (e.g. monetary, physical), the type of trigger that would lead to the execution of the sanction, the person(s) affected by the disobedience, the type of sanctioning (per case/measure), and the type of damage done. In some cases, an Individual Rule included various sanctions within the same rule. In those cases, each of these sanctions was coded separately and linked per

sanction to the Individual Rule it referred to. Sanctions (different sanctioning IDs) that belonged to the same Individual Rule-ID were counted as separate sanctions (thus every Individual Rule-ID is counted only once). This was also registered as such in the database. In addition, whether the sanction included a liability clause was also recorded; i.e., sanctioning of those commoners who were aware of offences committed by others, but did not report this to the proper authorities of the common. Such a liability clause in fact stresses the importance of each individual member for the well-being of the group, as those who do not report free-riding on the common they belong to also may get punished. For a complete description of the coding methodology and the composition of the database we refer to [De Moor et al., 2016](#).

**Example 1.** (mark Exel, Netherlands, June 21, 1621 ([Beuzel, 1988: 32](#)))

Is made vast gestalt also daer gesustineert wort dat daer bij sommige te veel schaepen worden geholden, soo is verstaen, dat die schaepen bij ijder daer toe berechtigt geholden sullen getelt worden op Sint Lammert of als van olt gebrueckelijck en al de geene bevonden worden meer te hebben als hij berechtigt is sal voor ijder betaelen voor de eerste reijse betaelt worden 6 str. en de tweede mael dubbelt en voor de derde mael prijs ende wort geauthoriseert neffens de heer erfmarkenrichter Borgemr. B. Schoemaecker en Scholte en de markckenschrifer.

[Also, it has been stated that some people are keeping too many sheep, hence it has been understood that the sheep of everyone who is entitled to own sheep will be counted on Saint-Lamberts-Day (Sept. 27) or on the usual date. Those found to be keeping more sheep than they are allowed to will have to pay 6 stuivers for each sheep at the first offence, double that amount at the second offence and a price [to be determined] at the third offence. Next to the chairman of the assembly of the mark, the mayor B. Schoemaecker, Scholte, and the scribe of the mark have been authorized to execute this regulation].

Liability clause: No  
 Party Suffering: Community  
 Party Offending: Offender is member/entitled user  
 Rule Trigger: Upon rule breaking  
 Graduated: Graduated  
 Differentiated: Non-differentiated  
 Harm Type: Damage through unjustified profit

**Example 2.** (mark Raalterwoold, Netherlands, June 13, 1704 ([Han-nink, 1992: 81](#)))

Angaende het weijden van schapen en plaggen in de marschen is goetgevonden palen te setten binnen welke niemant sal mogen plaggen nogh schapen weijden en dat op een boete van twee goltguldens voor jeder reijse te verbeuren en indien de gesworens de boete van de breukvallige niet komen an te geven, is verstaen dat sij deselve vier dubbelt sullen hebben te betalen en daer voor convenibel zijn.

[Regarding the grazing of sheep and the collecting of sods on the marshlands, it has been agreed to plant boundary markers, no one being allowed to collect sods nor graze their sheep within these boundary markers, each offence to be fined at 2 goudgulden; in case the sworn members will not report this offence, it has been stated they will be held to pay four times this fine and they will be liable for this.]

Liability clause: Yes  
 Party Suffering: Community  
 Party Offending: Offender is official  
 Rule Trigger: Upon rule breaking  
 Graduated: Non-graduated  
 Differentiated: Differentiated (Official)  
 Harm Type: Damage through Negligence

## 4. Data analysis

### 4.1. Sanctioning intensity

The analysis of the basic information included in the database on each of the commons for all three countries already reveals some clear differences across Europe, with the English cases showing a distinctly different picture than the continental cases. Basic information on the data per country is shown in [Table 1](#) (above), showing considerable differences between the three countries with respect to the use of sanctions. With this ratio we check to what extent first-order rules were accompanied by second-order, remedial rules, as the database contains many rules that were not accompanied by a sanction, which is not what we would expect from literature which in general stresses the importance of designing sanctions to make rule enforcement possible and effective (see above). Our data show that while in the Netherlands and Spain less than half of the rules were accompanied by a sanction, this ratio was 0.79 in England. Clearly, sanctioning was in many cases not deemed necessary by commoners in the Netherlands and Spain, while it was a far more popular instrument in England.

[Fig. 1](#) shows us also how the ratio of sanctioning regulatory activities developed over the course of a common's existence. This may provide some further suggestions as to why we find these striking differences. To make commons with different lifespans and different start and end years comparable, we show the development over *standardized time*, where 0 represents the first year of recorded activity for a common and 100 the last year ([Farjam et al., 2020](#)). The figure shows that while the ratio of sanctioning rules was stable in the case of Spain and even decreasing in the case of the Netherlands, it was increasing for England, where for the final years almost all rules were accompanied by a sanction. We also see that in the case of Spain, regulatory activities mainly occurred during the very beginning and end of the lifespan of a common. This makes it impossible to identify non-linear time trends for Spain. Because of these huge differences between countries with regard to the number of different years during which regulatory activities occurred, we did not analyze differences with respect to time dynamics in more detail.

### 4.2. Historical background

The concept of commons probably existed way before the first historical proof of their existence, as shows from the invocations of some of the earliest documents of commons preserved (e.g. the first lines of the *markeboek* of the Zelhemmer Hattermer marke state that '... these customs and privileges specified below have always been in the possession of, and used and enjoyed by the commoners of the Hattermermark, not being hindered by any of the consecutive lords nor damaged by anyone'<sup>1</sup> ([Gelders Archief, 1598](#); see also [Dorsett, 2002](#); [Hale, 1713](#)). This was even already recognized in previous centuries when common law was abundantly in effect ([Hale, 1713](#)). The earliest recordings of commons' regulations however date back until medieval times ([De Moor and Tukker, 2015](#); [De Moor et al., 2016](#); [Dorsett, 2002](#); [Van Weeren and De Moor, 2014](#)). The population increase in Europe and the subsequent increased pressure on common resources within communities, leading to overuse and subsequently degrading of these resources ([De Moor et al., 2002](#)), may have incentivized the formalization and institutionalization of the functioning of the commons, and with the writing down of the rules for use, monitoring and management of the commons' resources as the physical proof of these processes ([Forsman et al., 2020](#)). Another incentive may have been the diversity in jurisdictions due to the feudal system in place, potentially making it

<sup>1</sup> Original text: 'Item diese gewoenten ind rechte hier-nabeschreven, hebben die marckgenoeten van Hardtmermarcktt van aeldes ind altoes gehadt, gebruecktt ind besetten van Heeren tot Heeren onbehindertt ind onbeschedigett van ijemande'.

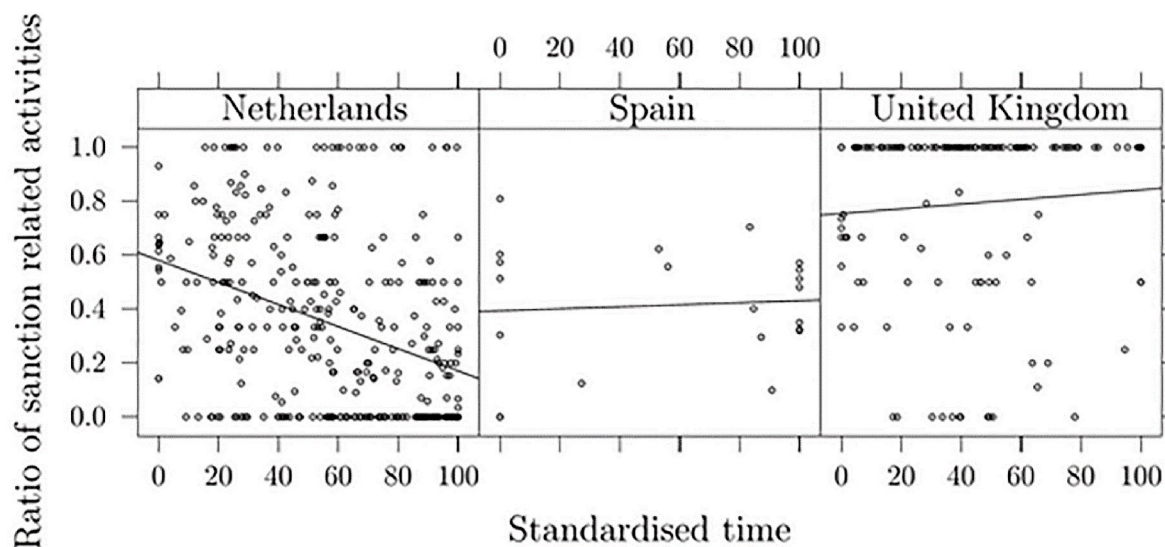


Fig. 1. Graph displaying ratio of sanction-related activities, standardized time grid.

increasingly complex to solve small judicial issues within communities in a efficient and effective way (Dorsett, 2002). Although examples of written by-laws are known from as early as the 14th century (De Moor et al., 2016), the major part of all commons' regulations preserved dates from after 1500. During later agricultural developments such as the invention of artificial fertilizer and mechanization in the course of the 19th century the common lands that previously were too labor intensive for efficient cultivation, became increasingly attractive to landowners and governmental institutions to be developed for crop growing. Governments facilitated and in some cases simply ordered (Brakensiek, 2000; De Moor, 2002) the cultivation of previously common land by means of legal and fiscal changes making it on the one hand increasingly difficult for commoners to afford using their common property rights and on the other hand making it far easier for those with sufficient means to appropriate commons. In England, the Enclosure Act of 1773 for example not only strengthened the existing legislation on enclosure, but also provided large landowners with almost absolute decision power on land issues. In the Netherlands, land tax laws of 1810 and 1837 imposed heavy tax burdens on uncultivated lands, while at the same time offering attractive tax deductions for those who sought to cultivate previously uncultivated land. Effects on Spanish mountainous commons have been less intense, as these commons were less suitable for extensive cultivation because of their mountainous surroundings (Lana Berasain, 2014). Today, mountain commons are still in existence. Also in England, numerous commons are still in existence (at least de jure) and initiatives are being deployed to reclaim common land (Shrubsole, 2018). In the Netherlands, most commons disappeared in the second quarter of the nineteenth century, with the sole major exception of Het Gooi, located in the central part of the Netherlands (Kos and Abrahamse, 2009), which existed until its formal dissolution in 1979.

#### 4.3. The legal context

The differences between the prevalence of sanctioning in England versus continental Europe may be related to the legal context of the commons' regulation, which varied per country (De Moor et al., 2016). Common land in the Low Countries usually consisted of land that was hardly profitable for commercial use due to low fertility or inaccessibility. Although this land was usually privately owned by either private landowners (free farmers, but also local noblemen) or by institutions (e.g., the nearby town or village, or by the church) (Slicher van Bath, 1957), its daily use, management and government was delegated to assemblies of entitled users, the so-called *markegenootschappen*. User

entitlement was in most cases related to the ownership or tenancy of specific farms and estates within the area, the so-called '*gewaarde erven*' (Van Zanden, 1999); when an owner sold his estate, his voting rights were transferred to the new owner. The *markegenoten* usually decided jointly at annual meetings (*markevergadering* or *holtink*) about how the common resources were allowed to be used, and they also personally monitored commoners' compliance with rules set by the assembly of users and sanctioned offenders. The rules established at these meetings were laid down in writing in specific registers (*markeboeken*), of which the oldest examples date back to the fifteenth century; some of these *markeboeken* included copied texts from even considerably older documents, like the *markeboek* of the *marke Berkum* from 1648, which started off with a 1648 copy of a (lost) set of rules dating from c. 1300 (Historisch Centrum Overijssel, 1656). The situation in the Spanish commons has some resemblance with the Dutch cases, but was explicitly and legally linked to the local political organization. User rights belonged to all *vecinos* (entitled users in the village organization) and were regulated by the village council, in which the *vecinos* participated.

The institutional situation of the English commons, however, differed in some aspects from that of the Dutch and Spanish commons. In England, the commons usually consisted of parts of wasteland belonging to a manor or landed estate. The composition and adjustment of rules as well as the sanctioning of offenders belonged to the jurisdiction of the manorial court. Commoners were involved in the sanctioning process (e.g. as appointed members of a manorial court jury), and the rules usually were custom-made to the specific common (*lex loci*). A major difference between the English and Dutch cases however lies in the broadness of their respective original jurisdictions. Commoners' assemblies in the Netherlands usually confined themselves to infringements on commons' arrangements on use, governance, management and maintenance (Hoppenbrouwers, 2002); the jurisdiction over and sanction of criminal offences was reserved to the local judicial authorities or, in case of severe crimes, to the higher courts (e.g. Schlüter, 1994). Although manor courts in England also were the source of the many paine lists used to govern and manage the local commons (e.g. Kerridge, 1992; Neeson, 1993; Winchester, 2000), they also had jurisdiction on issues as trade, migration, and some criminal offences (Dilley, 1997; Webb and Webb, 1908). In the course of the seventeenth and eighteenth centuries however, developments within higher jurisdictions diminished the role of manor courts in persecuting criminal offences (Waddell, 2012). As a result, the actual jurisdiction of manor courts was limited to mainly issues on use, governance, management, and maintenance of common resources, and hence became more similar to the jurisdiction that was

already in effect in the Netherlands. The intense involvement of the commoners in the Dutch cases in the decision-making process may have led to a better ‘internalization’ of the reasons to change rules and a greater sense of responsibility towards their collectively used and managed resources. Commoners who had less control over the design and implementation of their rules, may have found less opportunities to meet and discuss the need for specific restrictions of their resource use and other measures taken. With a lesser involvement of commoners in the actual management of the commons, as in England, there may have been a higher need for sanctioning, in order to prevent free-riding.

#### 4.4. Types of sanctioning

As indicated, the data collected in the Common Rules project is sufficiently specific to also allow us to analyze the types of sanctions that could be issued in case of rule breach. We focus in this article solely on formal sanctions, as the informal sanctioning can by no means still be retrieved from the archival documents. A popular distinction between different types of sanctions is usually made between *non-/graduated* sanctions (see above). Our data also allowed us to distinguish between *non-/differentiated* sanctions, i.e. whether the sanction for the same rule breach would be different, depending on the circumstances of the trespass (e.g., there could be different sanctions for the same trespass, the level being determined by the fact whether the offence was committed during daytime or at night), or depending on the status of the offender (e.g., different levels of monetary fines for the same offence, determined by the social status of the offender within the common’s assembly). A combination of graduated and differentiated sanctions could also be applied (see [Example 3](#) below). Sanctioning could take several forms, too, either material (fines, penning up animals grazing astray, impounding possessions), or immaterial (‘blaming and shaming’), and even physical punishments in some cases (De Moor et al., 2016). Sanctions could also be higher for commoners in office, taking up an assigned duty, who would be expected to set an example for others. Furthermore, as can be seen in [Example 3](#) below, we can identify the type of resources that sanctions were supposed to protect from free-riding as well.

**Example 3.** (Mark Raalterwoold, August 26, 1806 ([Hannink, 1992](#)): 139)

Dat voor het schutten van schaapen of varkens voor een troep van 25 en daeronder sal moeten voldaan worden f. 2.-. Voor een troep van 25 tot 60 3.-. Voor een troep boven de 60 5.5.- Voor ‘t plaggen binnen de schutkuijlen 3.-. Voor ‘t garen van mist, veel of weijnig iedermaal 2.-. ‘t 2e maal hiervan overtuijgt 6.-. ‘t 3e maal 12.-. en voorders iedermaal 12.-. voor ieder gans -.0.1.-

[Obligation to pay for the shutting in of a herd of sheep or pigs of 25 or less a fine of 2 gulden; for a herd of 25 up to 60 a fine of 3 gulden; for a herd of more than 60 a fine of 5 gulden and 5 stuivers. For the digging of peat within the boundaries of the fields used for shutting in lost animals a fine of 3 gulden has to be paid. For collecting manure, be it in either a small or a large amount, a fine of 2 gulden has to be paid for the first offence; the second proven offence will be fined at 6 gulden, the third one at 12 gulden, every subsequent offence to be fined again at 12 gulden. For locking up geese a gulden will be have to be paid for each goose.]

In [Table 1](#), we see that graduated sanctioning was only applied in the Netherlands, while Spanish commons were the only ones in which differentiated sanctioning played a substantial role. Another noticeable difference between commons in the three different countries concerns the ratio of regulatory activities on subsoil resources. Subsoil resources are of particular interest because they were the only non-renewable resources in our data and, therefore, may have been treated differently by the administrators. While these non-renewables did not play a role in Spain (given the mountainous environment), a substantial share of regulatory activities in the Netherlands and England concerned such resources. Non-renewable resources were—and still are—clearly among

the most vulnerable type of common goods a common could have, and thus would have demanded a type of sanctioning which would have an immediate effect. For instance, in the Dutch common where graduated sanctioning occurred most frequently in the regulations (marke Coevorden), 25 out of the 99 sanctions that concerned graduated sanctions in fact all referred to 3 issues that would have posed an immediate threat to the growth and harvesting of crops and the health of livestock: a failure to brand horses, insufficient burials of deceased animals, and insufficient maintenance of fencing and ditches.

**Example 4.** (Marke Coevorden, 1617 (Drents [Archief, 1617](#) [1586]: 1))

Ende omme alle frauden, dien angaende, voer te komen, is ten darden goet gevonden ende gesloten dat niemant sal eenige beesten offte peerden mogen op die gemeene marcke drijven, voer ende alleer hij die selvige ter presentie vanden stats dienaer bij eenen smidt, bij de burgemeesters daer toe te ordonneren, sal hebben laeten brennen ende teijckenen, betalende aen den smidt voer elck beest I ort stuijvers. Tot welcken eijnden die burgemeesters voerscr. elcke reijse, voor dat die beesten in die weijde sullen geslagen worden, eenen seeckeren dach sullen bestemmen, ende den selvigen bij publicke aenpleckinge offte proclamatie den burgers ende inwooners laten verkundigen, omme op alzulcken dach haere beesten, soe sij gedencken in die weijde te brengen, te laten mercken ende brennen, ende, indien jemant hierinne soude suijmich wesen, ende sijne beesten ongebernt in die marcke drijven, sal voer die eerste reijse verbuert hebben I daler, ende in cas dat hij opt nieuw vermaent sijnde, in mora soude blijven binnen den tijt van acht dagen naestvolgende, sijn beesten t’laten bernen, I daler, ende ten darden gewaerschouwet sijnde, ende hem noch weijgerich stellende, sal dieselvige d’ongebernde beesten verbuert hebben, tot profijt half vanden heeren ende half van de stadt.

[And to prevent any fraud, it has thirdly been decided that no person will herd any animals or horses on the common before he has presented them to a city official, a smith to be appointed by the mayors, to have them branded and registered, and pay 1 ort stuiver, and on a certain day, to be announced by the mayor, all the animals that are to be put on the common are to be brought together and marked, and if any person neglects this, and herds his unbranded animals onto the common, he will be fined 1 daalder, and have his animals marked within 8 days, at the penalty of 1 daalder, and if he fails to do so again, the animals will be confiscated, half for the lords, half for the city].

#### 4.5. Reasons for sanctioning

To get a more detailed understanding of what triggered commons to initiate sanctioning-related regulatory activities, we estimated a logistic regression model predicting whether a regulatory activity included a sanction or not. The model includes fixed effects for the type of resource that is regulated through the regulatory activity, differentiating between subsoil and renewable resources (primarily topsoil resources). We also control for the country in which a common was located and a country-specific time trend with respect to sanctions during a common’s existence. Note that in the case of Spain, all regulatory activities were related to renewable resources. Therefore, the data from Spain were not included in the model. Furthermore, the model includes random effects for the common in which the regulatory activity took place. The estimates in [Table 2](#) show a positive and significant effect of a regulatory activity relating to subsoil resources on the probability of it including a sanction. However, the also significant interaction effect with the dummy for England is negative and of a similar magnitude, implying that the positive association between sanctions and subsoil resources could only be found in the Netherlands, while in England there was no association. It is likely that due to the limited involvement of commoners in designing rules, sanctions and the monitoring mechanisms, the importance of diversifying rules also decreased. Diversification of rules through graduation or differentiation is especially useful in a system that

**Table 2**

Logistic regression model predicting the likelihood of an regulatory activity being sanction related (1 = yes). The model includes random effects for individual commons and the country in which a common was set.

	Estimate	Std. Error	z value	p-value
intercept	9.12	0.60	15.21	0.00
subsoil	0.87	0.09	9.77	0.00
England	-6.46	3.69	-1.75	0.08
time standardized	-5.96	0.34	-17.66	0.00
subsoil X England	-1.14	0.29	-3.96	0.00
time standardized X England	5.30	2.21	2.40	0.02

depends heavily on group norms, as it uses the characteristics of the members of the group to diversify the sanctions. The delegation of power on commons in England to the manor court most likely reduced the autonomy of commoners in ruling their own commons and thus also the importance of group norms in those commons.

## 5. Conclusions

Our analysis of 24 commons across the Netherlands, Spain and England sheds new light on a number of issues. To start with, sanctioning was clearly not always the preferred way of preventing or dealing with free-riding, given that in some countries the number of rules on sanctioning was rather low. Secondly, the difference between Spain and the Netherlands on the one hand and England on the other suggests that the legal system and the room for self-governance it offered to citizens may have had an impact on the use of sanctioning to avoid free-riding. Thirdly, upon identification of the types of sanctions that were effectively included in the regulation, we cannot, as was suggested in the work of Elinor Ostrom and many of those who have built upon her work, attribute an important, let alone decisive role for graduated sanctioning. Our empirical analysis does not find such type of sanctioning frequently among the commons studied. Interestingly, it became clear that there were many more forms of diversification of rules in place including, for example, taking into account who actually committed the offence or at what time of the day the offence took place in the formulation of the sanction. This suggests that the use of sanctions in the management of institutions for collective action was subject to a very subtle procedure, which took into account many more aspects of the ‘crime scene’ than merely the number of times the rules had been breached (as in graduated sanctioning). In this sense, it is not simply the actual breach of rules that decides upon the sanction, but also the context and the identity of the (potential) free-rider. The subtlety that speaks to and consequently also the time and effort it may have taken to design and implement such sanctions, also offer an explanation for the many rules without a sanction attached to them, in particular in the Netherlands and Spain. In those two countries, where the degree of self-governance allowed for it, commoners instead used instruments other than sanctioning to keep all commoners in line. Moreover, a positive association between sanctions and subsoil resources could be found for the Netherlands, suggesting that in case of high levels of self-governance, and thus heavy involvement in designing rules, sanctions, and monitoring mechanisms, the importance of diversifying rules was likewise elevated. In England, where self-governance was somewhat more limited in comparison to the continental situation, the diversification of rules seemed to have mattered less. As such, a higher rate of sanctioning does not necessarily go together with more diversified sanctioning. We do recognize that our study is based on a limited number of cases, and though we have included a very large number of rules in our longitudinal approach, the regional concentration of the cases we have analyzed per country may have influenced our results. They do, however, show that the importance of formal sanctioning as an instrument to prevent free-riding in a collective action setting may be less consequential than generally assumed in studies on the resilience of institutions for collective action, such as commons.

## Author statement

Tine De Moor, Conceptualization, Methodology, Writing - Original Draft, Supervision, Mike Farjam, Methodology, Formal analysis, Investigation, Data curation, Writing - Original Draft, Visualization, René van Weeren, Investigation, Resources, Data curation, Writing - Original Draft, Project Administration, Giangiacomo Bravo, Conceptualization, Writing - Review & Editing, Supervision, Funding acquisition, Anders Forsman, Conceptualization, Writing - Review & Editing, Amineh Ghorbani, Conceptualization, Writing - Review & Editing, Moloud Ale Ebrahim Dehkordi, Writing - Review & Editing.

## Funding

This article is based on research of the project Modelling institutional dynamics in historical commons (MIDI), an international cooperation between Linnaeus University (Sweden), Utrecht University and Delft University of Technology (both Netherlands). The MIDI-project is funded by the Riksbanken Jubileumsfond. For full project info, see <https://1.nu.se/en/research/searchresearch/forskningsprojekt/project-modell-ing-institutional-dynamics-in-historical-commons/>

## Declaration of Competing interest

All authors declare to have no conflict of interest.

## Acknowledgements

The authors would like to express their thanks to Angus Winchester for his thorough reading of and commenting on earlier versions of this paper.

## References

- Anderies, J.M., Janssen, M.A., Ostrom, E., 2004. A framework to analyze the robustness of social-ecological systems from an institutional perspective. *Ecol. Soc.* 9 (1), 18 [online] URL: <http://www.ecologyandsociety.org/vol9/iss1/art18/>.
- Aoki, M., 2001. *Towards Comparative Institutional Analysis*. The MIT Press, Cambridge MA/London.
- Archief, Gelders, 1598. *Markeboek van de Zelhemse Hattemermark 1598-1678*. Archive 0366, inv. no. 884.
- Archief, Drents, 1617. *Verordening van drost en stadsbestuur op het gebruik van de marke, de rechtspraak, het burgerrecht en de bevoegdheden van bestuursorganen [1586], 1586; afschrift, 1617*. Archive 0116, inv. no. 1051.
- Baerlein, T., Kasymov, U., Zikos, D., 2015. Self-governance and sustainable common pool resource management in Kyrgyzstan. *Sustainability* 7 (1), 496–521. <https://doi.org/10.3390/su7010496>.
- Baggio, J.A., Barnett, A.J., Perez-Ibarra, I., Brady, U., Ratajczyk, E., Rollins, N., Rubiños, C., Shin, H.C., Yu, D.J., Aggarwal, R., Anderies, J.M., Janssen, M.A., 2016. Explaining success and failure in the commons: the configurational nature of Ostrom’s institutional design principles. *Int. J. Commons* 10 (2), 417–439. <https://doi.org/10.18352/ijc.634>.
- Basurto, X., Kingsley, G., McQueen, K., Smith, M., Weible, C.M., 2009. ‘A systematic approach to institutional analysis: applying Crawford and Ostrom’s Grammar’. *Polit. Res. Q.* 63 (3), 523–537. <https://doi.org/10.1177/1065912909334430>.
- Beuzel, G.-J., 1988. *Markeboek van de marke Exel (1616-1837)*, s.l.: s.e.
- Boyd, R., Richerson, P.J., Meinzen-Dick, R., De Moor, T., Jackson, M.O., Gjerde, K.M., Harden-Davies, H., Frischmann, B.M., Madison, M.J., Strandburg, K.J., Mclean, A.R., Dye, C., 2018. *Tragedy revisited*. *Science* 362 (6420), 1236–1241. <https://doi.org/10.1126/science.aaw0911>.
- Brakensiek, S., 2000. *Gemeinheitsteilungen in Europa. Neue Forschungsergebnisse und Deutungsangebote der europäischen Geschichtsschreibung*. *Jahrbuch für Wirtschaftsgeschichte/Economic History Yearbook* 41 (2), 9–16. <https://doi.org/10.1524/jbwg.2000.41.2.9>.
- Carrillo, Chavez, I. I., Partelow, S., Madrigal-Ballesteros, R., Schlüter, A., Gutierrez-Montes, I., 2019. Do responsible fishing areas work? Comparing collective action challenges in three small-scale fisheries in Costa Rica. *Int. J. Commons* 13 (1), 705–746. <https://doi.org/10.18352/ijc.923>.
- Cox, M.A., Arnold, G., Villamayor Tomás, S., 2010. A review of design principles for community-based natural resource management. *Ecol. Soc.* 15 (4), 38. <https://doi.org/10.5751/ES-03704-15043> [online] URL: <http://www.ecologyandsociety.org/vol15/iss4/art38/>.
- Crawford, S.E., Ostrom, E., 1995. A grammar of institutions. *Am. Polit. Sci. Rev.* 89 (3), 582–600. <https://doi.org/10.2307/2082975>.
- De Moor, M., 2002. *Common land in flanders*. In: De Moor, M., Shaw-Taylor, L., Warde, P. (Eds.), *The Management of Common Land in North West Europe*, C. 1500–



1850. Turnhout: Brepols, pp. 113–142. <https://doi.org/10.1484/M.CORN-EB.4.00176>.
- De Moor, T., 2015. The Dilemma of the Commoners. Understanding the Use of Common Pool Resources in Long-Term Perspective. Cambridge University Press.
- De Moor, T., Tukker, A., 2015. Survival without sanctioning: the relationship between institutional resilience and methods of dealing with free-riding on early modern Dutch commons. In: Grüne, N., Hübner, J., Siegl, G. (Eds.), *Jahrbuch für Geschichte des ländlichen Raumes [Rural History Yearbook] 12*. Institute for Rural History, St. Pölten, pp. 175–206.
- De Moor, M., Shaw-Taylor, L., Warde, P., 2002. Comparing the historical commons of north west Europe. An introduction. In: De Moor, M., Shaw-Taylor, L., Warde, P. (Eds.), *The Management of Common Land in North West Europe, C. 1500-1850*. Turnhout: Brepols, pp. 15–32. <https://doi.org/10.1484/M.CORN-EB.4.00172>.
- De Moor, T., Laborda-Pemán, M., Lana-Berasain, J.M., van Weeren, R., Winchester, A., 2016. Ruling the commons. Introducing a new methodology for the analysis of historical commons. *Int. J. Commons* 10 (2), 529–588. <https://doi.org/10.18352/ijc.760>.
- Dilley, R., 1997. Rogues, raskells and turkie faced jades: malediction in the Cumbrian manor courts. *Transactions of the Cumberland & Westmorland Antiquarian & Archaeological Society (series 2)* 97, 143–151. <https://doi.org/10.5284/1061419>.
- Dorsett, S., 2002. ‘Since time immemorial’: a story of common law jurisdiction, native title and the case of tanistry’. *Melb. Univ. Law Rev.* 26 (1), 32–59. <https://doi.org/10.2139/ssrn.3037780>.
- Dreber, A., Rand, D.G., Fudenberg, D., Nowak, M.A., 2008. ‘Winners don’t punish’. *Nature* 452, 348–351. <https://doi.org/10.1038/nature06723>.
- Farjam, M., De Moor, T., van Weeren, R., Forsman, A., Ale Ebrahim Dehkordi, M., Ghorbani, A., Bravo, G., 2020. Shared patterns in long-term dynamics of commons as institutions for collective action. *Int. J. Commons* 14 (1), 78–90. <https://doi.org/10.5334/ijc.959>.
- Feeny, D., Berkes, F., McCay, B.J., Acheson, J.M., 1990. The tragedy of the commons: twenty-two years later. *Hum. Ecol.* 18, 1–19. <https://doi.org/10.1007/BF00889070>.
- Fehr, E., Gächter, S., 2000. Cooperation and punishment in public goods experiments. *Am. Econ. Rev.* 90 (4), 980–994. <https://doi.org/10.1257/aer.90.4.980>.
- Fehr, E., Gächter, S., 2002. Altruistic punishment in humans. *Nature* 415, 137–140. <https://doi.org/10.1038/415137a>.
- Forsman, A., De Moor, T., van Weeren, R., Bravo, G., Ghorbani, A., Ale Ebrahim Dehkordi, M., Farjam, M., 2020. Eco-evolutionary perspectives on emergence, dispersion and dissolution of historical Dutch commons. *PloS One* 15 (7), e0236471. <https://doi.org/10.1371/journal.pone.0236471>.
- Freeman, D.M., 2010. *Implementing the Endangered Species Act on the Platte Basin Water Commons*. University Press of Colorado, Boulder CO.
- Greif, A., 2006. *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade*. Cambridge University Press, Cambridge MA.
- Guala, F., 2012. Strong reciprocity is real, but there is no evidence that uncoordinated costly punishment sustains cooperation in the wild. *Behav. Brain Sci.* 35 (1), 45–59. <https://doi.org/10.1017/S0140525X1100166X>.
- Hale, M., 1713. In: Gray, C.M. (Ed.), *The History Of the Common Law Of England (Re-issued)*. The University of Chicago Press, Chicago, 1971.
- Hannink, G., 1992. *Markenboek van de marke Raalterwoold, s.l.: s.e.*
- Hauser, O.P., Nowak, M.A., Rand, D.G., 2014. Punishment does not promote cooperation under exploration dynamics when anti-social punishment is possible. *J. Theor. Biol.* 360, 163–171. <https://doi.org/10.1016/j.jtbi.2014.06.041>.
- Heckathorn, D.D., 1990. Collective sanctions and compliance norms: a formal theory of group-mediated social control. *Am. Socio. Rev.* 55 (3), 366–384. <https://doi.org/10.2307/2095762>.
- Historisch Centrum Overijssel, 1656. *Markenboek 1300–1648 (composed 1656)*.
- Hopenbrouwers, P., 2002. The use and management of commons in The Netherlands. An overview. In: De Moor, M., Shaw-Taylor, L., Warde, P. (Eds.), *The Management of Common Land in North West Europe, C. 1500-1850*. Turnhout: Brepols, pp. 87–112. <https://doi.org/10.1484/M.CORN-EB.4.00175>.
- Horne, C., Cutlip, A., 2002. Sanctioning costs and norm enforcement: an experimental test. *Ration. Soc.* 14 (3), 285–307. <https://doi.org/10.1177/1043463102014003002>.
- Kerridge, E., 1992. *The Common Fields of England*. Manchester University Press, Manchester. <https://doi.org/10.2307/4051048>.
- Kos, A., Abrahamse, K., 2009. *Erfgooiers: Ten Eeuwigen Dage*. Waanders, Zwolle.
- Laborda Pemán, M., De Moor, T., 2013. A tale of two commons. Some preliminary hypotheses on the long-term development of the commons in Western and Eastern Europe, 11th-19th centuries. *Int. J. Commons* 7 (1), 17–33. <https://doi.org/10.18352/ijc.355>.
- Laborda Pemán, M., De Moor, T., 2016. History and the commons: a necessary conversation. *Int. J. Commons* 10 (2), 517–528. <https://doi.org/10.18352/ijc.769>.
- Lana Berasain, J.M., 2014. ‘Esta especie de socialismo campesino...manso y tranquilo’. Un estado de la cuestión desde la historia rural española. *Rev. Mexic. Soc.* 76 (Supplement), 167–196. Available online via: <http://mexicanadesociologia.unam.mx/index.php/v76sup/127-v76sup-a7>.
- Mulder, L.B., van Dijk, E., de Cremer, D., Wilke, H.A.M., 2006. Undermining trust and cooperation: the paradox of sanctioning systems in social dilemmas. *J. Exp. Soc. Psychol.* 42 (2), 147–162. <https://doi.org/10.1016/j.jesp.2005.03.002>.
- Neeson, J.M., 1993. *Commoners: Common Right, Enclosure and Social Change in England, vols. 1700–1820*. Cambridge University Press, New York.
- Ostrom, E., 1990. *Governing the Commons: the Evolution of Institutions for Collective Action*. Cambridge University Press.
- Ostrom, E., 2005. *Understanding Institutional Diversity*. Princeton University Press, Princeton NJ.
- Ostrom, E., 2009. Building trust to solve commons dilemmas: taking small steps to test an evolving theory of collective action. In: Levin, S.A. (Ed.), *Games, Groups, and the Global Good*. Springer Verlag & Bollier, Berlin, pp. 207–228.
- Ostrom, E., 2010. Analyzing collective action. *Agric. Econ.* 41, 155–166. <https://doi.org/10.1111/j.1574-0862.2010.00497.x>.
- Ostrom, E., 2011. The challenges of achieving conservation and development, 2011–2012. In: *The Annual Proceedings of the Wealth and Well-Being of Nations*, vol. IV, pp. 21–26. Available: <https://ssrn.com/abstract=2176268>.
- Ostrom, E., Basurto, X., 2011. Crafting analytical tools to study institutional change. *J. Inst. Econ.* 7 (3), 317–343. <https://doi.org/10.1017/S1744137410000305>.
- Ostrom, E., Janssen, M.A., Anderies, J.M., 2007. Going beyond panaceas. *Proc. Natl. Acad. Sci. Unit. States Am.* 104 (39), 15176–15178. <https://doi.org/10.1073/pnas.0701886104>.
- Potts, J., 2019. *Innovation Commons: the Origin of Economic Growth*. Oxford University Press, New York NY.
- Schlüter, D., 1994. *Met den koorde of door het zwaard. Criminele rechtspraak, dood-en lijfstraffen in Twente vanaf de middeleeuwen*. Twents-Gelderse Uitgeverij De Bruyn, Oldenzaal.
- Sefton, M., Shupp, R., Walker, J.M., 2007. The effect of rewards and sanctions in provision of public goods. *Econ. Inq.* 45 (4), 671–690. <https://doi.org/10.1111/j.1465-7295.2007.00051.x>.
- Shrubsole, G., 2018. Waves of Change: Reclaiming the Commons. *Guy Shrubsole Interviews Veteran Landrights Campaigner George Monbiot*. *The Land* 22: 12-15. Available: <https://www.thelandmagazine.org.uk/articles/reclaiming-commons>. (Accessed 18 December 2020).
- Sigmund, K., Hauert, C., Nowak, M.A., 2001. Reward and punishment. *Proc. Natl. Acad. Sci. Unit. States Am.* 98 (19), 10757–10762. <https://doi.org/10.1073/pnas.161155698>.
- Slicher van Bath, B.H., 1957. *Een Samenleving Onder Spanning : Geschiedenis Van Het Platteland in Overijssel*. Van Gorcum, Assen.
- Van Weeren, R., De Moor, T., 2014. Controlling the commoners: methods to prevent, detect, and punish free-riding on Dutch commons in the early modern period. *Agric. Hist. Rev.* 62 (2), 256–277. Available: <http://www.jstor.org/stable/43697980>.
- Van Zanden, J.L., 1999. The paradox of the marks: the exploitation of commons in the eastern Netherlands, 1250-1850. *Agric. Hist. Rev.* 47 (2), 125–144. Available: <https://www.jstor.org/stable/40275568>.
- Waddell, B., 2012. Governing England through the manor courts, c.1550-1850. *Hist. J.* 55 (2), 279–315. <https://doi.org/10.1017/S0018246X12000040>.
- Wall, D., 2014. What Elinor Ostrom taught: democratic control is not only possible, it’s normal [Online]. Available: <https://www.opendemocracy.net/en/opendemocracyk/what-elinor-ostrom-taught-democratic-control-is-not-only-possible-its-normal/>. (Accessed 21 November 2019).
- Webb, S., Webb, B., 1908. *English Local Government, Vols. 2-3, from the Revolution to the Municipal Corporations Act: the Manor and the Borough, vols. 1 and II*. Longmans, Green and Co, London.
- Winchester, A.J.M., 2000. *The Harvest of the Hills: Rural Life in Northern England and the Scottish Borders*. Edinburgh University Press, Edinburgh, pp. 1400–1700.