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# **Water Theft As Social Insurance: Southeastern Spain, 1851-1948: The Long Run**

Donna, Javier D. and Espin Sanchez, Jose

University of Florida

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## Water Theft As Social Insurance: Southeastern Spain, 1851-1948

By [Javier D. Donna](#) y [Jose-Antonio Espin-Sanchez](#)

The tragedy of the commons, when all members of a community suffer from each other's overuse of a common good, is a pervasive problem. Communities that use a common good seem doomed to conflict and overuse. Conflict resolution with imperfect information in self-governed communities poses an important trade-off. Low punishments encourage overuse while high punishments inflict pain on those who need resources. Historically, however, many self-governed communities have managed to solve the collective-action problem.

Among self-governed communities, irrigation districts in Mediterranean Spain stand out for having lasted the longest, from the Middle Ages to the current day. We study conflict resolution in a self-governed community in the city of Mula (Spain), where we collected information from trials of farmers charged with violating the community's bylaws.

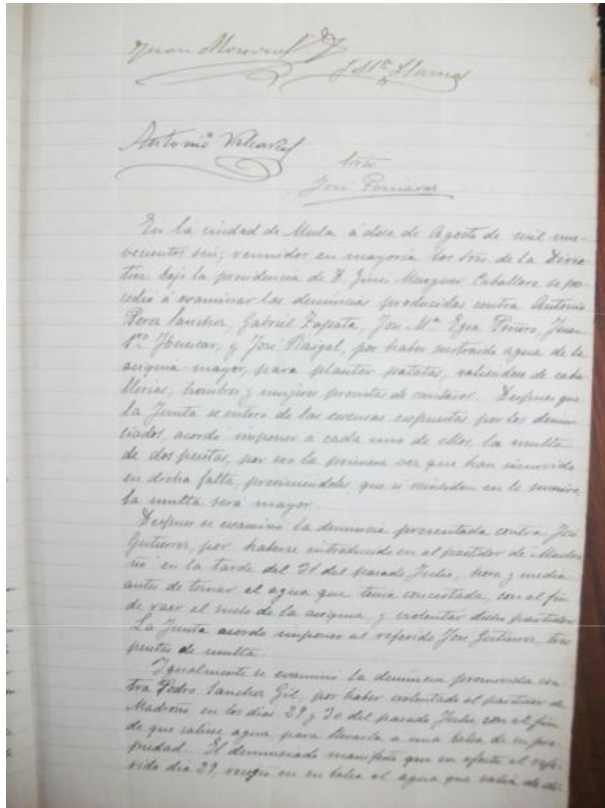
Following Gary Becker classic work, the economics of crime argues that harsh punishments lower offense rates. Elinor Ostrom, however, emphasized that, in self-governed communities, mild formal punishments can maintain low crime rates when informal punishments—including shame, humiliation, and social ostracism—are present. Ostrom further emphasized:

‘For at least 550 years, and probably for close to 1,000 years, farmers have continued to meet with others sharing the same canals for the purpose of specifying and revising the rules that they use, selecting officials, and determining fines and assessments’.

We argue that allowing certain crimes can increase social welfare. Consider the case of farmers who needed to irrigate their fruit trees but were liquidity constrained and unable to purchase water after a negative shock. Unable to bid for water in the auction, farmers may steal from their neighbours. A harsh punishment would deter farmers from stealing but their trees would wither without water. A mild punishment would allow farmers to save their trees during the negative shock. If the punishment were always mild, however, farmers not subject to the negative shock would also steal. Punishing recidivists more harshly would deter opportunistic farmers from taking what they did not need. Therefore, small fines can coexist with low offense rates. We develop a dynamic model that allows us to reconcile low offense rates with low punishments, similar to Elinor Ostrom, while using formal punishments, similar to Gary Becker. We introduce two features motivated by the empirical regularities of our setting: a transitory individual state that captures whether the farmer needs water, and a persistent individual state that describes whether the farmer is dishonest, or greedy, and thus suffers less from punishment. The optimal punishment depends on available information: public signals, farmers' individual characteristics, and farmers' offense history. When a farmer is caught stealing for the first time, the fine is low, as in the sample sentence in Figure 1. However, when the farmer steals, the option value of free stealing is lost. Losing this option value can be costly in the future, when the farmer may need the water more due to a contingency like a drought. Thus, losing the option value acts as a harsh punishment deterring the commission of offenses. Our model's predictions are consistent with farmers' behaviour in Mula. First, fines were very low for first-time offenders but high for recidivists. Second, fines were larger when the defendant had a Don honorific title, reflecting their lower probability of needing water. Third, fines were lower when the victim had a Don honorific title, indicating they typically had more water with a lower marginal return, and thus fewer damages. In a Beckerian world, only

greed matters. In an Ostromian world, only needs matter. Our model combines both worlds to account for the specifics of judges' and farmers' behaviour.

**Figure 1: Sample of Sentence**



“En la ciudad de Mula a doce de Agosto de mil novecientos seis; reunidos en mayoría los señores de la Directiva bajo la presidencia de D. Ginés Meseguer Caballero, se procedió a examinar las denuncias producidas contra Antonio Pérez Sánchez, Gabriel Zapata, José María Egea Piñero, Juan Francisco Huéscar, y José Raigal, por haber sus-traído agua de la acequia-mayor, para plantar patatas, valiéndose de caballerías, hombre y mujeres provistas de cantaros. **Después que la Junta se enteró de las excusas expuestas por los denunciados, acordó imponer a cada uno de ellos la multa de dos pesetas, por ser la primera vez que han incurrido en dicha falta, previniéndoles que si reinciden en lo sucesivo, la multa será mayor.**”

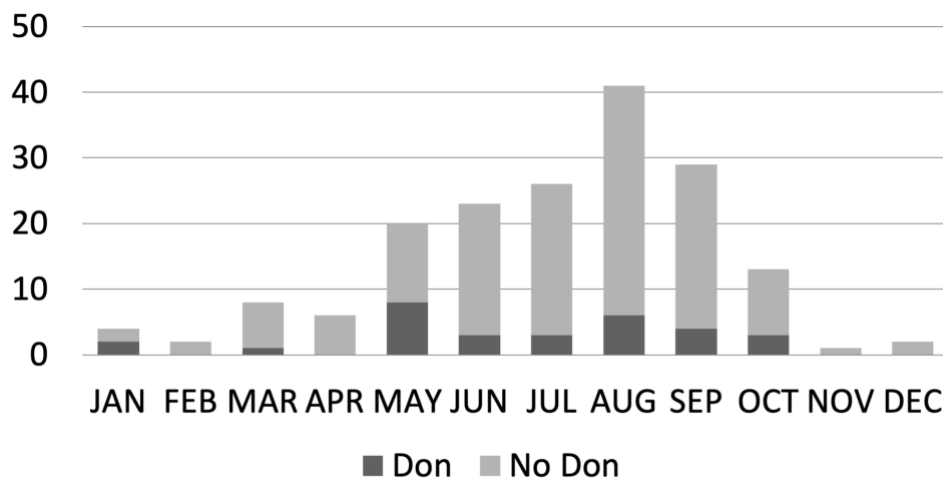
*Notes: Left: Caption of the first page of a sentence, corresponding to a single trial, on August 12, 1906, from the Archivo Municipal de Mula, section Heredamiento de Aguas, in Mula (Spain). Right: Transcription in the original Spanish. Authors' translation of the first paragraph and authors' bold: “In the city of Mula, on August 12, 1906; with the majority of the board under the presidency of Don Ginés Meseguer Caballero, they proceeded to examine the accusations against Antonio Pérez Sánchez, Gabriel Zapata, José María Egea Piñero, Juan Francisco Huéscar, and José Raigal, because they stole water from the main canal, to irrigate potatoes, using horses, men and women with jugs. After the board learned about the excuses claimed by the defendants, they agreed to impose a fine of two pesetas, to each of them, because it was the first time that they incurred in such a misdemeanor, warning them that if they recidivate in the future, the fine would be larger.”*

In summary, we present robust empirical evidence that, for the same offense, recidivists were punished more harshly than first-time offenders and that the punishments were stricter when the defendant was wealthy or the victim was poor. This evidence is consistent with our theoretical model, where judges trade off crime deterrence and social insurance focusing on efficiency. In other words, our evidence is consistent with judges implementing a progressive punishment system to account for the fact that a positive number of offenses was socially optimal. Allowing farmers in extreme need to commit offenses created an efficient insurance of last resort, a social insurance, in a volatile environment.

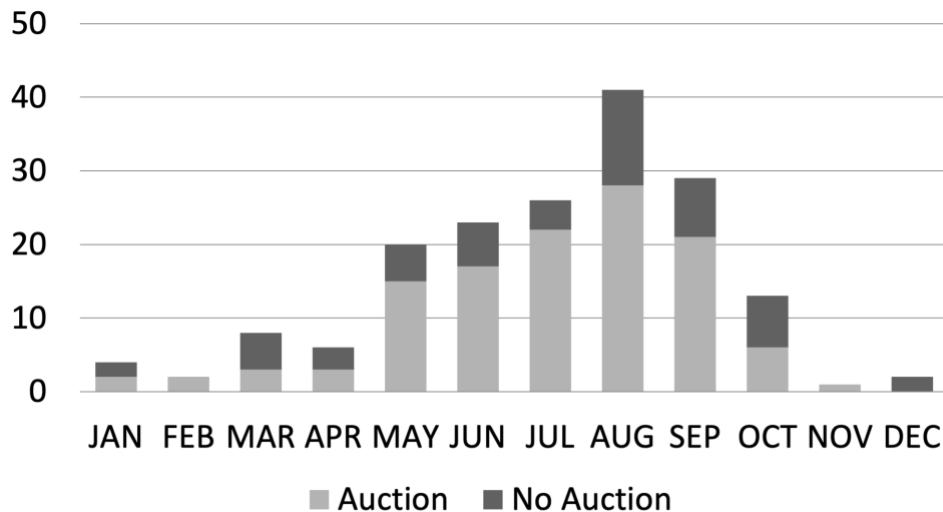
One important insight from our work is that low punishments levels, typically viewed as evidence of suboptimal contracts, were intended to increase efficiency rather than equality. In other words, the disadvantageous treatment of wealthy farmers as captured by the Don honorific title, whether as defendants or victims, was a consequence of efficiency. For the wealthy, their marginal utility of water was lower, the damage inflicted by their stealing was higher, and the damage or marginal disutility they experienced from theft was lower. Similarly, favourable treatment of poor farmers was a consequence of efficiency.

**Figure 2: Seasonality of auctions and guilty *dots*.**

**Panel A. Crimes: Seasonality of crimes where the defendant had Don honorific title.**



**Panel B. Trials where there was an auction the previous week.**



Notes: Data using the 174 trials where the defendant was found guilty. Panel A shows the number of crimes (subset of trials where the defendant was found guilty), where the victim had a Don honorific title (dark) or not (light), for each month. Panel B shows the number of trials where there was an auction the previous week, for each month.

Javier D. Donna,  
University of Florida and Rimini Center for Economic Analysis

Jose-Antonio Espin-Sanchez  
Yale University

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