*Tanja Bärlein**

BEHAVIOURAL APPROACHES FOR SOLVING COMMON-POOL RESOURCE DILEMMAS LESSONS FROM THE COMMON-POOL RESOURCE MANAGEMENT IN KYRGYZSTAN

*Таня Bärlein**

ПОВЕДЕНЧЕСКИЕ ПОДХОДЫ К РЕШЕНИЮ РАЦИОНАЛЬНОГО ИСПОЛЬЗОВАНИЯ РЕСУРСОВ НА УРОКАХ ДИЛЕММЫ КЫРГЫЗСТАНЕ

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Вопрос о рациональном управлении общественных ресурсов является актуальной темой исследования. По последним полученным данным известно, что пользователи ресурсов способны сотрудничать по управлению общественными ресурсами и решать социальные дилеммы самостоятельно при определенных условиях, например при соответствующих институциональных параметров. Тем не менее, каждое сообщество отличается, когда речь заходит о учреждениях, то есть о формальных и неформальных правил. Целью исследования является анализ существующих институциональных параметров двух сообществ в Киргизии, которые пытаются добиться устойчивого развития пастбищ и ирригационных систем. Главным вопросом исследования является: будут ли пользователи ресурсов соблюдать само разработанные правила больше чем официальные правила и чем это объясняется? Для того чтобы исследовать неофициальные правила разработанные участниками будет проведен эксперимент с помощью ирригационной игры. Предварительным результатом ожидается повышенный уровень соблюдения собственных правил из-за материальных и нематериальных стимулов. Полученные результаты дополнят актуальные научные исследования обществ, поведения пользователей ресурсов и соблюдения эндогенных правил.

How to best govern common-pool resources is a highly debated topic in research. New findings reveal that resource users may be able to successfully cooperate in management of common goods and solve social dilemmas by themselves if certain conditions are given e.g. appropriate institutional settings. However, each community differs when it comes to institutions, i.e. formal and informal rules. This study aims to analyse the current institutional settings in two communities in Kyrgyzstan, which struggle with the sustainable management of pasture and irrigation systems. The focus is laid upon the question of whether resource users will present higher levels of compliance using a self-designed rule and how it could be explained. In order to study the informal rules developed by the participants, a field experiment, using a water irrigation game, will be executed. Expected results include higher levels of compliance due do material and non-material incentives. The findings will complement field research on different communities, users' behaviour and endogenous rule obedience.

Introduction

Today´s world faces severe environmental problems such as pollution and deforestation, which are not only caused by increasing industrialization of most societies and a rapid population growth but also by human behaviour. Furthermore, an increasing scarcity of natural resources and their overexploitation threaten the lives of people and livestock and cause problems within and between different countries. Some of these environmental problems, such as common-pool resource[13] dilemmas, require not only an economic analysis but also a consideration of behavioural characteristics. Common-pool resource dilemmas occur when individual and group interests collide, leading to a suboptimal outcome in the use of a common good (Ostrom et al., 1994: 15). When all individuals are driven by their self-interest harvesting high levels of shared resources such as fish or water for personal use, without considering the needs of others, the social dilemma becomes a "tragedy" because the resources cannot regenerate and becomes useless. This problem was first addressed in 1968 in the article "Tragedy of the commons" by the ecologist Garrett Hardin (Ostrom, 1990: 2). Two consequential policy recommendations to solve the "tragedy" are on the one hand privatisation of the commons and on the other state regulation. As argued by many economists, the lack of property rights is one of the main causes for overexploitation of valuable resources (Sethi & Somanathan, 2008). However, Ostrom (1990: 1) argues, based on her field studies, that "neither the state nor the market is uniformly successful in enabling individuals to sustain long-term, productive use of natural resource systems". The author adds that communities, which relied on alternative institutional arrangements (e.g. own defined rules) achieved better outcomes in managing the commons. Institutional settings, including formal and informal rules, do matter and are paramount for successful self-organised collective action[14] (Ostrom, 1990). For example, in irrigation system management "rules governing how water users interact […] are just as important to a project´s success as are well-constructed engineering facilities", so Ostrom (1992: vii). In relation to this, external coercion is not considered as necessary to achieve a high level of rule obedience within a

* Email address: t.baerlein@gmail.com

[13] Common-pool resources are "natural or man-made resource[s] from which it is difficult to exclude or limit users once the resource is provided by nature or produced by humans" (Ostrom, 2005: 151).

[14] „Action taken by a group (either directly or on its behalf through an organization) in pursuit of members' perceived shared interests" (Scott & Marshall, 2009: 151).

community nevertheless, internal monitoring and sanctioning arrangements are required (Ostrom, 1992).

An example of Ostrom's theory can be witnessed in Central Asia, where pasture and irrigation systems are important common-pool resources and are found in the country of Kyrgyzstan, in which the agricultural sector contributes with 30% to the total GDP (InDeCa, no date). As many other developing countries, Kyrgyzstan is struggling with the sustainable and suitable management of its resources. Although the Central Asian country underwent some shifts towards community-based natural resource management (CBNRM), after the collapse of the Soviet Union in 1991, the new top-down-implemented governance structures proved themselves inadequate for sustainable collective action. The newly created user associations such as the Pasture Users' Associations (PUAs) and Water Users' Associations (WUA) were developed without considering the experience in CPRM and the local conditions of the region e.g. the existence of informal institutions (InDeCa, no date). The absence and weakness of rules and institutions, as well as the lack of resource users' participation represent the major challenges for CBNRM (Crewett, 2013; Kasymov, 2014). Consequently, common-pool resources such as water and pasture land are not managed in an efficient and sustainable way. Therefore, the objective of this study is to analyse the situation in Kyrgyzstan concentrating on the behaviour of the resource users under a current institutional setting by means of field experiments. The main research question is: *do resource users present a higher level of compliance for their own-designed rule and why or why not?* The preliminary hypothesis is that informal rules implemented in the community will increase the chances of successful CPRM if resource users themselves design the rules. In other words, the efficiency in the resources and their distribution will be improved. Furthermore, the compliance level will be higher compared to formal rule under the condition that monitoring and sanctioning methods are in place (Ostrom et al., 1994). According to Cardenas (2011: 451) the compliance also depends on "how individuals value material and non-material incentives, and thus determine their decisions to either cooperate or over-extract resources from a common-pool.

Literature review

As previously mentioned, the world today is facing severe environmental problems, of which humans are responsible for the majority of them. For example, the latest report of the Intergovernmental Panel On Climate Change (2013) states that it is very likely (probability greater than 90%) that most of the observed warming since the mid-20th Century was caused by human behaviour. Hinrichsen & Robey (2000) point out that many economies are exploiting the resources much faster than they can regenerate in order to satisfy the needs of their increasing populations. In that case, researchers and scientists urge to develop more sustainable strategies for production and consumption to mitigate the consequences of environmental problems (Schaefer, 2008).

As mentioned in the introduction the "Tragedy of the commons" was first conceptualised by Hardin leading to the resulting policy recommendation of either privatisation or government intervention. Conversely, numerous scientists challenged the validity of Hardin's statement as a "general characterization of social behaviour when applied to local commons", suggesting that a group of people may be able to successfully cooperate in the management of common goods (Sethi & Somanathan, 2008: 251; Ostrom, 1990). Furthermore, privatisation and government intervention proved to be unsuitable for managing natural resources. Governments often lacked in information about the resource and people using it, applying wrong policy measures (Ostrom, 1990; Turner et al., 1994; Bruns, 1995; Klarl, 2013; Van de Laar, 1990). Furthermore, according to Van de Laar (1990: 21) "[t]he characteristics of [CPR] often indicate that more flexible arrangements are to be preferred over rigid property rights regimes". According to Ostrom (1990) many cases have proven that communities concentrating on collective action, rather than individual management of resources, achieved better outcomes following simple principles. These principles include monitoring, graduated sanctions, minimal recognition of rights to organise and others (Ostrom, 1990: 90).

Alternative approaches such as behavioural economics, institutional economics, experimental economics and others, enrich the standard neoclassical models with psychological insights in human behaviour by using tools such as laboratory or field experiments, which can be helpful in understanding how individuals organize and govern themselves (Camerer et al., 2004). Behavioural economics include sciences such as psychology, sociology and other social sciences and are thus much more broadly based and inductive than the neoclassical approach. (Earl, 1988; Camerer et al., 2004; Carlberg & Bolle, 2001; Baxter, 1993; Katona, 1980). Over the past years, important anomalies in the human behaviour - deviations from neo-classical theories – were discovered. Allcott & Mullainathan (2010) and Knetsch (no date) suggest that behavioural insights should become a more integral element in environmental economics, especially when designing environmental policies, in order to make these more efficient.

A further field worth mentioning is the field of institutional economics. As stated by Kasper et al. (2012), Samuels (1988) and North (1991), institutional economics differ from orthodox economics by the fact that they do not accept institutions as exogenous-given variables, but try to explain their origin and evolution. Furthermore, they point out the importance of institutions for societies because these help to avoid

conflicts, protect individual freedom and promote wealth. North (1991: 97) defines institutions as "humanly devised constraints that structure political, economic and social interaction." They consist of informal rules e.g. traditions and formal rules e.g. property rights and they facilitate the interaction between humans, making their actions more predictable. The institutional perspective views all human transactions as a collective activity, in which individual selections and preferences are restrained through institutions. Thus, the type and quality of institutions define which economic outcomes a community or society will achieve as a whole. Additionally, as suggested by Vatn (2005: 2), institutional economics offer a promising approach towards environmental problems because they examine "human interaction with and within ecological systems". Finally, the field of experimental economics emerged providing a connecting element between theory and observations. Experimental methods such as laboratory or field experiments can explore the accuracy of the theoretic assumptions and reveal weaknesses in previously made predictions. Additionally, they allow researches to design new experiments for testing novel or specific theories (Davis & Holt, 1993; Hay, 1994; Smith, 1990).

Methods

The research will be conducted with the mixed method approach. This approach includes literature reviews and a collection of quantitative and qualitative data via the experimental method. Firstly, an overview of the most important literature on the topic will provide a solid theoretical background. Complementary, the water irrigation game designed by Cardenas et al. (2013) will be used for acquisition of quantitative data in the two examined Kyrgyz communities. The design of the game is simple including only two decisions for each player – the decision to invest in a common irrigation system and the decision to harvest water – during several stages of the game. An important feature of the game is that in the first stage, resource users are playing without any extraction rules and without communication while in the second stage, participants can vote on one of the given (formal) rules, again, without communicating with each other. Finally, during the last stage of the game the players can communicate and design their own rule. The structure of the game allows comparing the second and third stages of the game focusing on the compliance levels for formal and informal (self-designed) rules. Once the quantitative data is collected and evaluated, qualitative data can be obtained via face-to-face interviews and questionnaires with selected players (randomly or according to a certain behaviour) and via group discussions with all participants concentrating on the motives of rule breaking or/and compliance. One of possible questions during the interviews or in the questionnaires could be: why did you break the formal rule? The answer possibilities are: a) I did not like the rule; b) I considered the rule unfair; c) I never follow rules; d) because the punishment for breaking it was very low e) other reasons. The later analysis of the answers provides the needed data for answering the research question revealing the reasons and motivations for certain behaviour of the participants. Finally, the results obtained in both communities will be compared in order to examine community specific features.

Results

It is expected to find valuable results using the above mentioned methods for answering the main research question *whether resource users present a higher level of compliance for their own-designed rule and why or why not.* The preliminary hypothesis is that community members will present higher compliance levels for informal rules. Consequently, higher rule compliance will lead to higher efficiency in the use of the resources and their destitution among the members. Furthermore, the qualitative data will provide reasons of why this is the case i.e. which incentives (material or non-material) drive the community members to follow an informal rule. It is anticipated that the motives, partially or fully, will be based on other-regarding preferences like reciprocity or fairness. As predicted in the theory by Zara et al. (2006), cooperation among the resource users of scarce natural resources is possible under a variety of conditions and institutional arrangements.

Discussion

Regarding the research method of this study, which includes a field experiment, different opinions about the validity of this approach can be found in the academia. Janssen (2010) states that "[e]xperiments are increasingly used to study decision making, test alternative behavioral models, and test policies". Experiments, such as the one of the methods of behavioural approaches, permit to analyse the conditions needed for a group to solve a common dilemma. Furthermore, field experiments have an added value because participants are those who face these dilemmas permanently (Cardenas, 2011). On the other hand, many scholars doubt the validity of this approach stating that participants often do not follow experimental instructions. Furthermore, the opponents claim that the experimental design is often too narrowly defined leaving important aspects out of focus (Teele, 2014). In conclusion, it is important to take both views into account. However, this paper considers the chosen approach as best fit for the purpose of this study.

Conclusion

The results of this paper contribute to the debate bout common-pool resource management. It will collect valuable quantitative and qualitative data about two communities in Kyrgyzstan and how these manage goods in common under different institutional settings. The study aims to reveal insights of users' behaviour when formal and informal rules are in place. Finally, it

aims to find out the motives of community users to obey or disobey a rule. This insights and findings are very important, and also innovative in relation to the two examined communities and will be valuable for policy makers, resource users and researches engaged in the similar topics.

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Collective action of resource users is essential for sustainability. Yet, often user groups are socioculturally heterogeneous, which requires cooperation to be established across salient group boundaries. We explore the effect of this type of heterogeneity on resource extraction in lab-in-the-field Common Pool Resource (CPR) experiments in Zanzibar, Tanzania.Â We find no aggregate effect of heterogeneity on extraction. However, this is because fishers from the two villages behave differently in the heterogeneity treatment. We find support for the hypothesis that cooperation under sociocultural heterogeneity is higher for fishers from the village with larger institutional scope. Common-Pool Resource (CPR) theory, as applied to forestry, largely focuses on the prospect for collective action to solve commons dilemmas at the local or village level (Tucker 2010 ; Araral 2014). While Land Use and Cover Change (LUCC) scholarship focuses on large-scale drivers of forest cover change, it is largely silent on the role of policy and governance (Rudel 2008).Â CPR theory focuses on the ability of people to act collectively to overcome the management dilemmas inherent to common-pool resources. The theory developed in response to the work of Olson (1965) and Hardin (1968) , both of whom argued that groups of people were not likely to work effectively together. Self-Governance and Sustainable Common Pool Resource Management in Kyrgyzstan. by Tanja Baerlein 1,â€ , Ulan Kasymov 2,â€ and Dimitrios Zikos 2,*,â€ 1.Â In order to solve the CPR dilemmas described above and thus achieve sustainable natural resource management, collective action is required. â€œCollective action occurs when a number of people work together to achieve some common objectiveâ€ [23]. The common aim would be to prevent the overuse of the resources and thus preserve them in the long-run.Â Group composition refers to the proportions of different behavioral types of individuals within a group. Ostrom et al. Cardenas, JC (2000) How do groups solve local commons dilemmas? Lessons from experimental economics in the field. Environment, Development and Sustainability 2, 305â€“322. Cardenas, JC (2011) Social norms and behavior in the local commons as seen through the lens of field experiments. Environmental and Resource Economics 48, 451â€“485. Carpenter, J, Kariv, S and Schotter, A (2012) Network architecture, cooperation and punishment in public good experiments.Â Experimental evidence from the field. Journal of Economic Behavior & Organization 70, 485â€“497. Vyrastekova, J and van Soest, D (2008) On the (in)effectiveness of rewards in sustaining cooperation.