Cooperating over the Commons in the Climate-Migration-Conflict Nexus

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1. Introduction

Last year, 2017, saw a record number of occurrences of weather related disasters, as well as experiencing the third warmest year in the 138 years of temperature recording (Levin, 2018). Although these occurrences are not proven a result of global warming, they certainly provided a rough awakening to what living in a warmer world could look like. Furthermore, these weather events forced thousands of people to leave the affected areas and relocate temporarily and permanently to other places. These catastrophic events and the consequent migration have given rise to the term “environmental refugees”, referring to people who have had to leave their homelands due to environmental problems (Myers, 2002).

Although these events peaked last year, the scholarly debate on the matter has been going on for some time and can be divided into two sub-fields: one focusing on the relation between environmental stress and migration and the other on climate and its relation to conflict (Selby & Hoffman, 2012). The debate is on whether one can say that environmental push factors are linked to migration and whether or not conflict can be associated with changes in climate. The connective link between these two fields is migration, with environmental stressors forcing the mass displacement of people, which in turn increases the likelihood of conflict. Even though the debate continues on whether a direct link can be made between these issues, most do agree that some important linkages do exist between environmental change, migration and conflict. Furthermore, in the coming decades these linkages are likely to intensify and multiply (Selby & Hoffmann, 2012).

However, what seems to be missing from the debate, and to which this paper hopes to contribute with, is the understanding that environmental changes are likely going to affect things that can be grouped into one category – commons. Pastoral lands, water sources, forests and rivers are all common-pool resources. Even though these resources are often finite and shared, the people using them have found ways to cooperate over their management, thanks to institutional arrangements created by their users (Runge, 1992). The important question then is not how changes to the environment will cause conflict, but rather what happens to the institutions and arrangements already in place that make cooperation possible when you have an event that
brings about the sudden displacement of people. Even more importantly, it is necessary to understand what function the state should have in forming and upholding these institutional arrangements, particularly in situations of climate change and migration, as it is ultimately the state’s responsibility to ensure that the right governance system is in place that can protect the commons and its users (Agrawal, 2001). If the world is to witness more frequent and harsher changes in the environment, then it is important to understand how these changes will affect the tools necessary to make cooperation over commons work.

The aim of this paper then is to try to understand what function the state can have in the creation and maintenance of institutional arrangements over commons that encourage cooperation in times of climate change and migration. Issues concerning climate change, migration and conflict are deeply complex and are not going to be solved with simple one-answer solutions. However, it is important to start somewhere and this study hopes to contribute by bringing into light another aspect that needs to be considered when looking at how issues related to climate change and migration can be mitigated, namely what involvement the state can have in institutional arrangements over commons. By looking at a case where there has been both cooperation and conflict as well as climate change and migration, we can examine how the state could act under events of climate change and migration that help to foster cooperation over commons rather than contribute to conflict.

One such example is the Senegal River and the conflict in the 1980s and 1990s between Mauritania and Senegal, which led to the deaths of thousands, the destruction of private property and the deportation of several thousands more (Human Rights Watch/Africa, 1994). Prior to these events the country lived through the extended Sahelian droughts of the 1970s and 1980s, which had the effect of altering transhumant patterns. Before the drought period, the different groups in society had founds ways of working together even under variable weather conditions.

The question that this paper wishes to answer then is: How did decisions by the Mauritanian government, beginning with the drought period of 1960s, affect the institutional arrangements devised to cooperate over the Senegal River and its surrounding grazing fields and thereby contribute to the outbreak of conflict?
This paper begins by summarizing the literature in the climate-migration field and the migration-conflict field respectively. The concepts and main underlying ideas on the research of common-pool resources are also presented, as well Oakerson’s framework for analyzing the commons that will be applied to understand the conflict in Mauritania. A brief explanation of the events occurring those years in Mauritania will be given and lastly, those events are analyzed in the light of previous work on institutional arrangements.

2. Climate – Migration

Although most would agree the term climate refugee is taking the concept too far (Selby & Hoffman, 2012), that does not mean people are not displaced and sometimes permanently forced to relocate due to changes in the environment. One figure commonly cited, though believed to be an exaggeration, is a projection by Myers (as cited by Black et. al., 2011) estimating that in 2050 there will be 200 million people displaced because of environmental change.

A problem in the field is that different definitions are sometimes used interchangeably, making comparisons difficult. For example, a distinction needs to be made between mobility, which is usually seen as a voluntary and planned move, usually to improve livelihood, and displacement, which is seen as the opposite end of the continuum. Displacement normally tied to rapid-on-set events that challenge safety and security, leaving little room for choice (Black, et al., 2011). Migration can happen internally within the same country or can become an international event. Migration can also be temporary, as is usually the case with extreme weather events, with people leaving only to escape danger and quickly relocate once possible. It can also be permanent, with some people never returning home (Black et. al., 2011).

A downside to the securitization of global warming and the connection made to migration is that migration is commonly framed as a problem and a threat. The current debate seems to be missing the crucial point that migration is a necessary phenomenon that is imbedded in a complex and global social system (Black, et al., 2011). Migration should not be seen just as a “last resort
Migration does have many positive qualities. Those who choose to migrate can end up strengthening their home communities by sending remittances to their families, making them more resilient to climate extremes. They can also help incorporate modern technology and transfer knowledge (Burrows & Kinney, 2016).

In many cases, migration has historically been used in areas that commonly suffer from environmental stress as a coping mechanism and a means to adapt to the surrounding physical conditions. As such, migration as a form of adaptation is recognized and included in the UN’s framework convention on climate change (Burrows & Kinney, 2016). Nomadic societies such as pastoralists tend to live in areas that are subject to erratic environmental changes and therefore use migration as a means to survive, moving to new locations when resources in the current one cannot be depended on. However, because of environmental changes, these groups are now facing new problems, running the risk of becoming trapped populations as migration is becoming limited as a means of adaptation. It is this type of constrained migration that has the potential risk of sparking regional and local tensions between coming and receiving groups (Freeman, 2017).

At the heart of the climate-migration debate lies the notion that changes in the environment can produce such environmental stress that an individual no longer sees staying in his home as feasible, therefore becoming the driving force behind the decision to migrate to a new location. However, it is understood that the decision to migrate is a complex one, where several factors come into play, making it difficult to trace movement to one single driver. For example, in cases where people migrate due to land degradation, can it be said to be due to the change in the environment, or is the movement because of a need to seek new economic opportunities? (Burrows & Kinney, 2016). The physical environment does not operate in a vacuum, so it makes sense to believe as Freeman does (2017) that other aspects surrounding environmental change, such as the social, political, demographic and economic context; determine the extent to which this change can drive migration.

The biggest issue facing this field is the fact that it is difficult to establish direct causal connections between climate change and weather events, (such as storms) as well as long-term weather processes, (such as desertification), yet alone make accurate future projections of
environmental stressors. Furthermore, there is no data and the tools are lacking on how to document the impact of climate change per se on migrations. What research does then is to use short-term extreme variabilities in the climate as stand-ins to try to see how these over the long-term can affect people (Burrows and Kinney, 2016).

There is agreement in the literature that more attention needs to be placed in future studies on the local context. Burrows and Kinney (2016) highlight that the local context is especially important in trying to determine how strong of a driver environmental stress is on migration. If the capabilities to mitigate the problem play a key role in determining how likely you are to leave a place, then places that lack the resources to mitigate will be particularly vulnerable (Reuveny, 2007). Meanwhile, countries whose economies rely on agriculture are particularly vulnerable, not just to rapid-on set events but also to periods of drought and land degradation that can set off major productivity failures (Black et al., 2011). Of the 262 million people affected in 2000 -2004 by climate disasters, 98% were living in the developing world (International Organization for Migration, 2010).

### 3. Climate – Conflict

A way to bring attention to the importance of global warming has been to link it to security threats (Black, et al., 2011). Some have tried to link the war in Syria with the period of drought that the area experienced prior to the conflict starting. Unemployment due to drought conditions drove people from rural to urban areas and it was in these areas where the first sparks of the conflict erupted. (Selby, Dahi, Fröhlich, & Hume, 2017).

As within the environment-migration field, the majority of the literature suggests that the environment can have an important effect on issues of resources competition, the economy and political unrest, but argues against assigning any direct causal link between the environment and conflict. Ethnographic studies have been unable to find any direct links between the outbreak of violent conflict and environmental scarcities, leading Freeman to state that “climate variability is a poor predictor of armed conflict” (Freeman, 2017, p. 357). Issues that appear to be about the
environment are, if you scratch the surface, about other issues. Environmental stressors seem then to be a catalyst, exacerbating already present underlying issues.

Interestingly, many of the studies within the field tend to use one definition of conflict, that of armed conflict. A problem within the subfield seems to be the lack of a common definition of conflict. Conflict can also mean events such as rioting or looting and can be unarmed as well as national or international. Reuveny (2007), for example, classifies conflict into four levels: (1) low, mostly unarmed non-state conflict, (2) medium semi-organized, semi-armed non-state violence, (3) high intrastate insurgency or inter-communal violence and (4) very high intrastate or interstate war.

One way in which environmental stress is being tied to conflict is through the neo-Malthusian idea of scarcity and resource competition. In areas that are low in resources, such as semi-arid and arid regions, agriculture and pastoralism can compete over the few resources available. Drought conditions can further exacerbate things, leading to friction and possibly conflict. Farmers can for example choose to expand their land by overrunning grazing areas, or herders can close in on watering wells on farmlands (Tubi & Feitelson, 2015).

Those who disagree with Malthusian ideas hold that, to the contrary, environmental scarcities facilitate cooperation rather than contribute to conflict. Farmers and herders are for example dependent and symbiotic relations that are not just dependent on the resource but rather on a complex social play of political, economic and social factors working on different levels. The mutual interests of these groups can actually be heightened by added resource stress. Furthermore, it is ultimately the presence of other stressors, such as inequalities and weak governments that together with resource stress increase the likelihood of conflict (Tubi & Feitelson, 2015).

Regardless of one’s view of the connection between resource scarcity and conflict, there is still need for concern that resources may become increasingly scarce. Burrows and Kinney (2016) believe that in areas such as the Middle East and North Africa, water scarcity will be too great to not escape negative consequences. These areas are already the most water-scarce in the world
and it is believed that they will most likely, through global warming, experience even more dry spells through more frequent and intense droughts. It is also worth considering what environmental scarcity would do to agriculture, especially in those places whose economy is dependent on it. Studies on agricultural productivity have shown that there could be a substantial loss in productivity over the next century in many regions, particularly in developing countries (Burrows and Kinney, 2016). Adaptation is not always a possibility as these regions also have poor infrastructure and low levels of technology.

4. Migration – Conflict

An important question worth positing is through what channels environmental disasters are more likely to lead to conflict. Drawing on several studies, Ghimire, Ferreira and Dorfman (2015), believe one of those possible channels is mass population movements. Extreme weather and environmental stress can lead to mass displacement and if the receiving areas have weak institutions and poor socio-economic characteristics, this mass displacement can increase the likelihood of civil conflict.

The sudden influx of displaced people to a place following an environmental problem can put extra pressure on the resources of the receiving area. This can create scarcities and thereby ignite conflicts. Reuveny (2007) found in his work that conflict was less likely at the intrastate level, probably because people were of the same nationality and/or ethnicity, meaning that ethnic tension can exacerbate problems and spark conflict. Burrows and Kinney (2016) concur that competition over work and social benefits can be exacerbated by perceived ideas of “otherness.” Not all groups are affected by scarcities equally. This can lead to notions of injustice, whereby one person or group perceives itself as being victimized and wishes then to blame someone else, whether it be the perceived “other” or the government (Ghimire, Ferreira and Dorfman, 2015).

Migration in itself does not mean that conflict will ensue. Other factors, both political and economical, need to be present as well for conflict to arise (Burrows and Kinney, 2016). It can serve as the gasoline to ignite sparks already present, especially in the context of Malthusian
resource scarcity, but its presence does not immediately correspond to violent conflict. This is backed up empirically by the fact that since the 1950s, several countries have been the recipients of migrations flows, which have not resulted in armed conflict (Ghimire, Ferreira and Dorfman, 2015). So far, states have shown to have the power to withstand the stresses associated both with rapid-on set weather episodes and with slow-onset events. They also have the power to stop and mitigate conflicts, as well as develop new technology to help keep issues of climate change at bay (Burrows and Kinney, 2016). However, the previously mentioned characteristics do not apply to all states, as some states are too weak to carry out the functions that may be necessary to stop the effects of climate change.

5. The Commons

Things such as an ocean, a lake, a forest, an irrigation system are commons. Commons are natural or man-made resources, such as the Internet, that are shared by a group of consumers and producers, and once they are provided or produced, it is difficult to exclude others from using them. All partake of their benefits, regardless of whether or not they have contributed to their maintenance or creation, making them non-excludable (Ostrom, 2005). These resources can be fugitive such as fish or can have a fixed location as well as be renewable or non-renewable. They can also be indivisible, making it impossible to be divided into private property, (such as the ozone), or be easily divided into private parcels (Oakerson, 1992). Commons, like private goods, are shared but unlike private goods, they cannot be divided privately among their consumers. They are also subtractable, meaning that what one consumer consumes becomes unavailable to another. This is why commons are also referred to as common-pool resources. (Oakerson, 1992).

5.1. Understanding Social Dilemmas

A social dilemma arises when temptation causes the users of a common-pool resource to want to take more than their share leading them to overuse the resource. Here, behavior that is individually reasonable, such as appropriating more for myself, leads to a situation where the rest of the group ends up in a worse situation than they otherwise might have been. The collective
ends up in an irrational situation brought about by a rational individual decision (Kollock, 1998). Mancur Olson developed this thesis, asserting that no rational individual would ever contribute to the production of a public good (Ostrom, 2000).

What characterizes social dilemmas is that they contain a deficient equilibrium, meaning that there is at least one other outcome that would be mutually beneficial for all but since it is in equilibrium no one has the incentive to alter their behavior (Kollock, 1998). In a social dilemma, two people face one decision but are given two options, to cooperate or to defect. In the Prisoner’s Dilemma, a model commonly used to understand the logic behind social dilemmas, two prisoners are kept apart in two cells and are given the option of either testifying against the other (defection) or keeping silent (cooperating). Whatever choice one’s partner makes one is better off testifying against one’s partner. Cooperating while one’s partner defects would be the absolute worst outcome, which explains why defection is the most likely choice. Both end up defecting even though they would both have had a better outcome if they had cooperated, meaning this situation has a deficient equilibrium (Kollock, 1992).

**5.2. Cooperation through Strategic and Structural Solutions**

How can social dilemmas be avoided? Some scholars have focused on how institutions have been formed for collective action that make possible cooperation over the management of commons (Ratner et. al., 2013). One such institution is that of rules and social norms. Players bring these norms with them into the game that support the cooperation needed to overcome dilemmas (Ostrom, 2000). Placed within a context where the parties can communicate, a social norm has the power to work just as well as an external system placed by an outsider. External rules can in fact have the effect of diminishing the cooperation that has been created by internal norms (Ostrom, 2000). The worst possible outcome however comes when rules are externally implemented but are combined with a weak sanctioning and monitoring system that does not make sure they are enforced (Ostrom, 2005).

Ostrom (2000) believes the game is not only played by the rational egoist presented by Olson but you also find conditional cooperators that encourage some rational egoists to cooperate, as well
as willing punishers who ensure others follow the rules of the game. An alternative model to the Prisoner’s Dilemma, the Assurance Game, shows how common property institutions can make it rational to cooperate, if for example people are given the assurance that others will not misuse the commons. What the Prisoner’s Dilemma fails to take into account is the fact that other people’s behavior does have an effect on the individual’s own choice. The choices of those involved are interdependent and these individuals do have the ability to change their expectations of others. Free-riding behavior is therefore not always the dominant strategy due to the effect norms and rules have over the individual’s behavior. It is this interdependency that can give individuals some assurance that others will cooperate and thereby also give them the incentive to cooperate themselves (Runge, 1992).

Ostrom also identifies other factors that are important for generating cooperation such as learning how to play the game better through repetitive interactions with the same players, building trust and reciprocity. Ostrom (2000) has found that resource regimes that have survived and flourished are characterized by eight design principles, which are:

- The presence of clear boundary rules.
- The local rules used by the group limit the amount, timing and technology of harvesting the resource; they allocate benefits proportionally to required inputs and are crafted to consider local conditions.
- The users design their own rules.
- Local users are responsible for enforcing these rules.
- The enforcers use graduated sanctions.
- In case conflicts arise between users and officials, there is rapid access to low-cost, local arenas where these conflicts can be solved.
- Unanimity must be the rule to change rules.
- If the common-pool resource is large, there must be a presence of governance.

As the majority of Ostrom’s design principles seem to point out, Ostrom would seem to favor a bottom-up approach to solving collective action problems, where the users find ways to arrange
themselves without much, if any, interference by the state. However, scholars such as Mansbridge (2013) believe that labelling Ostrom anti-state is too simplistic. Ostrom can rather be seen as believing in the concept of polycentrism, seen in the last design principle, and which believes that local collectives make local decisions based on local needs, but must be paired with a higher governmental unit, this in most cases being the state. The state does play a role but it does so at a higher level.

In the case study Ostrom examines in *Governing the Commons* (1990), groundwater depletion in Los Angeles, the state is involved and offers support by providing neutral information to the parties involved and pushing the stakeholders to resolve their issues by threatening to step in through its court system if an agreement is not found within a reasonable time. Assurances sometimes also need to be given by the state if parties are to be convinced that a monitoring and sanctioning system will be effective. The state then is not absent when governing the commons, but rather lives in symbiosis with the users, a higher level providing support and assistance to the lower local level (Mansbridge, 2013).

This paper will depart from Ostrom’s work on the ability of strategic and institutional solutions to foster cooperation, as well as the design principles needed to ensure cooperation. If these strategies and principles need to be present to ensure cooperation over a common-pool resource, then it is important to examine how decisions by the state can help to encourage and uphold these principles or to destroy them. That way we can begin to make conclusions as to how the state’s involvement in the institutional arrangements of commons can contribute either to cooperation or to conflict.

In order to help analysts look at problems with commons, Oakerson (1992) developed a framework that can help collect information about common-pool resources in a variety of settings, by looking at four attributes shared by all commons. By examining the relationships between these attributes, you can analyze what has gone wrong and why in a particular situation and offer solutions. This framework will be used to guide this study and collect information about the Senegal River.
Oakerson believes that at the heart of social dilemmas lies a problem between the institutional world built for a common-pool resource, which hasn’t been fitted to align and match with its physical world. The lack of congruence between these two variables has the capacity to form a perverted structure of choice, and provide certain obstacles and incentives that lead to subpar patterns of interaction that result in unwanted outcomes. Departing from a symbiotic view of the state and using Oakerson’s framework, we can find out what role the state can play to ensure that unwanted outcomes do not come about. In analyzing the framework’s attributes, we will look at how involvement by the Mauritanian state affected each attribute, thereby also affecting the relationships between the attributes, ultimately leading to unwanted results.

The four attributes used by Oakerson are:

1. The physical attributes of the resource and the technology that is used in appropriating the resource.
2. The decision-making arrangements (organization and rules) that govern relationships among its users, as well as relevant others.
3. The mutual choice of strategies and consequent patterns of interaction among decision makers.
4. Outcomes or consequences.

Each attribute relates to the other, although some relationships are stronger than others, which is why the line between Point 1 and Point 2 is bolder in the figure below. The patterns of interactions that are observed (point 3) are affected by the physical and technological attributes (Point 1) together with the decision-making arrangements (Point 2). In turn, the outcomes (Point 4) are produced by the combination of patterns of interaction (Point 3) combined with the physical and technological attributes of the common-pool resource (Point 1). (See Figure 1)
6. Research Design and Method

Most of the studies in the field prioritize large N-studies (Selby and Hoffman, 2012), which is why there is a call for more localized research to be done in the field. Burrows and Kinney (2016) for example, believe that we cannot expect a general theory of where climate-migration-conflict will occur in the future. This means our best hope lies instead in preparing plans and policy decisions that can help mitigate impacts, which is why place-based research is important. In order to help fill this hole, a qualitative method is preferred, and a case study is chosen for this paper. The limitation of this type of study is that no general conclusions can be made, although it can help by producing hypotheses than can later be tested across several cases. The subject being studied would have been best served by carrying interviews and observations in the field and without the addition of these methods; it will be difficult to make assertions regarding the strength of relationships.

Developing countries are both expected to be affected harder by climate change and have the weakest institutions to mitigate its effects, so it is of particular interest and importance to choose a developing country for the case study. Africa is of interest as the area is predicted along with Asia be the human-inhabited continent most severely affected by climate change. Furthermore, it
is particularly vulnerable to these changes as it is strongly reliant on rain-fed agriculture. Some projections forecast that average temperatures in Africa may rise by as much as 4°C by the 2080s (Njiru, 2012). Africa also has the highest rate of non-state-based conflicts, which makes the area helpful in drawing attention to the fact that wars between nations should not be the only measure of violence and that a more locally oriented view is necessary (Freeman, 2017).

As it is impossible to predict in which places conflict will arise due to environmental migration, what we can do is cautiously draw from history and use examples of past conflicts to try to answer the questions posed in this study. One such example can be taken from Reuveny’s (2007) study where he assembles environmental emigration episodes and uses his four-level category of conflict to classify them. Mauritania in the 1980s-1990s is classified as a four, meaning very high conflict (Reuveny, 2007, p.664). The case of Mauritania is also helpful as there have been instances of both cooperation and conflict over commons, meaning that an analysis can be carried out to determine what made possible the outbreak of violence and thereby help answer the question of what is necessary for cooperation over commons. Other variables to be examined in this paper are also present, such as environmental stress and migration, and more importantly the presence of commons, in this case the Senegal River basin and its surrounding grazing land and water wells. These are all resources that are shared, subtractable and non-excludable. As the focus of the study is environmental stressors on migration, the period being studied will begin just prior to the occurrence of consecutive droughts that severely affected the area in the 1960s, (Magistro & Lo, 2001), stretching to the early 1990s when the conflict subsided (Human Rights Watch/Africa, 1994). As the conflict was also international, occurrences of violence will be also be looked at in neighboring Senegal.

7. Material

The material being used for this paper consists only of secondary sources. Unfortunately, no primary sources have been found for this study as the rules and norms operated by the users of the common-pool resources in Senegal prior to the conflict had not been written down. Furthermore, no official government records on the arrangements or the conflict itself have been found either translated to English. This means that the study has to rely solely on secondary
sources describing the Mauritanian-Senegal conflict, consisting in part on the report done by Humans Right Watch Africa. Although the report was carried out by an organization that prides itself in being accurate and impartial (Human Rights Watch, 2018), there is the possibility that due to the organization’s agenda to highlight human rights violations, there may be some bias in their reporting towards being overly critical of the Mauritanian and Senegalese government’s actions. The Pastoral Code, implemented after the conflict, constitutes the first time the arrangements governing the commons have been legislated and put to print in Mauritania. However, for this study a secondary source is used to understand the Pastoral Code as it is written in French, which the author does not speak.

8. Oakerson’s Framework for the Commons

In order to help us understand what was happening with the commons in Mauritania, this paper will use Oakerson’s framework, consisting of the four attributes previously mentioned. The strength of Oakerson’s framework is that it is a bare-bones tool meant to help analyze how a particular situation regarding a common-pool resource (such as conflict) has arisen, and at the same time opens up the possibility of alternate solutions. We will now look at each variable used in Oakerson’s framework and expand on each attribute in order to help us identify and classify the events occurring in the Mauritania case. For three of the attributes, as outcomes are simply the result of the interplay between the other attributes, we will also ask direct questions regarding the role of the Mauritanian government, in order to help us understand how the involvement of the state helped shape each attribute. As Oakerson suggests the analyst begin by working his way backwards in the relationships, beginning with outcomes, his variables will now be presented here in the inverse order as previously.

8.1. Outcomes

Physical outcomes are produced by the patterns of interactions that can be evaluated. According to Oakerson the analyst himself can stipulate the criteria for evaluation and its consequences on the commons (Oakerson, 1992).
For this paper, we will ask - what is the outcome of the pattern of interactions between users? Two criteria will be used to determine outcomes, that of cooperation and conflict. These two should not be viewed as simple opposites but rather as existing on a continuum, ranging from armed-conflict to collective actions to secure peace. As this case does not require the need to quantify conflict and cooperation but rather show its presence, it will suffice to use Tubi and Feitelson’s (2015) four-stage continuum, exemplifying how acts and events can be viewed as either being conflictive or cooperative. (See Figure 2). Conflict and violence will also be understood within the wider perspective previously discussed by Reuveny (2007), as ranging from low-degree acts of looting to high-violence instances of armed conflict against another nation.

Figure 2

The four-stage continuum of conflict and cooperation (Tubi & Feitelson, 2016)

<table>
<thead>
<tr>
<th>Severe</th>
<th>Moderate</th>
<th>Economic</th>
<th>Meaningful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confictive</td>
<td></td>
<td>Cooperative</td>
<td></td>
</tr>
</tbody>
</table>

8.2. Patterns of Interaction

Individuals make calculations and choices based on the physical attributes of the common-pool resource as well as the decision-making arrangements that exist. Out of these choices emerge different patterns of interactions (Oakerson, 1992). In order to understand the pattern of interactions in the Mauritanian case we will ask – what are the strategies being employed by the users?

In the Prisoner’s Dilemma two strategies can be chosen, to cooperate or to defect. Cooperation in this case is identified as showing restraint in using the resource whereas defection is manifested
in competition over the resource. When managing the commons, an individual shows restraint not for his own benefit but for that of others. Each individual in turn draws a much larger benefit in the long run not because of his own restraint but because of the joint restraint practiced by others. It is only if all or enough of a majority agree on a pattern of mutual restraint that individuals receive the benefit of the joint decision to restrain (Oakerson, 1992).

The Assurance Game holds that a user can cooperate if he somehow can be assured that others will cooperate. This assurance can be given through fostering the interdependency between users and encouraging reciprocal acts (Runge, 1992). When looking at the case of Mauritania, we must also ask – is there interdependency between the users? What is happening to reciprocity? Interdependency can be understood by how dependent users are on one another and reciprocity as “behaviour in which two people or groups of people give each other help and advantages” (Cambridge Dictionary, 2018).

Functioning at a higher level the state can also be useful in providing assurance to the local level, (Mansbridge, 2013), so in analyzing the state’s role in the patterns of interaction we can ask – is the Mauritanian government making decisions that foster interdependence and reciprocity between users?

8.3. Decision-making Arrangements

Arrangements of collective decision-making are designed to help individuals overcome the challenges of free-riding and help the group cooperate over the common-pool resource. In analyzing the Mauritanian case, we will begin by looking at the institutional arrangements present during the time being studied. These institutional arrangements are understood as being the rules established collectively by a group of individual appropriators that put limits on individual use and thereby protect the yield of the common-pool resource through an institutional foundation (Oakerson, 1992). One of the key components when creating these arrangements according to Ostrom (2000) is that the rules need to be locally devised. We will then ask – have the rules been locally devised?
Second-order strategies, such as monitoring and sanctioning systems can be used to help enforce the decisions (Oakerson, 1992). We will then also ask – **how are the institutional arrangements enforced?** Purely local sanctions for defection can produce “escalating retribution with feuds, raids and overt warfare (Ostrom, 1990, p. 21). A higher-level actor such as the state can help give assurances to parties entering agreements that sanctions will be implemented (Mansbridge, 2013). Therefore, we need to also ask **if the state is involved, and if so how, in enforcing the rules behind institutional arrangements.**

As the study ultimately wishes to understand the involvement and function of the state in institutional arrangements this analysis would be incomplete without looking at external arrangements, that is to say the decision structures outside of the group that affect the management of the commons. **Is there legislation controlling the group of users?** Malthusian scholars hold that technological changes can increase conflict over resources, which is why we will also ask **if there have been any technological changes to the common-pool resource during the period.**

8.4. Physical and Technical Attributes

The root of the problems of commons lies in the constraints imposed by their given nature and the arrangements created to appropriate them (Oakerson, 1992). When referring to the nature of the commons Oakerson uses terms derived from economics when trying to conceptualize these problems – jointness, exclusion and indivisibility. As the focus of this study is not about the carrying capacity of the resource itself, which is what jointness addresses, only exclusion and indivisibility will be examined. Commons are always characterized by problems of access-control to some degree (Oakerson, 1992), which is why we will look at exclusion, meaning **how individual users are being excluded or being limited in their access to the common-pool resource. Is the state involved in this exclusion or limitation of users?** Indivisibility deals with how the common-pool resource is divided among its users. **Who is diving the common-pool resource - the state or the users themselves? Is the division of the resource suited to the needs of the users?**
9. Mauritania – torn between two identities

The West African country of the Islamic Republic of Mauritania is geographically placed in between Arab North Africa and black Sub-Sahara Africa. The country is an artificial creation linking the largely nomadic Arab-Berber north with the sedentary black African south (Diallo, 1993). Since independence from France in November 1960, the country has been effectively ruled by the beydanes, literally meaning “white men”, who are of Arab-Berber descent (also known as Moors). Meanwhile, the black population is divided between two categories: the first being the heratines (or Black Moors) who are the former black slaves of Moor masters and who remain loyal to them. The remaining black population consists of the ethnic groups of the Halpulaar (or Fulani), which is the largest population, the Soniké, the Wolof and the Bambara (Human Rights Watch/Africa, 1994). Population numbers are disputed, but reliable sources hold the black African population close to 60% of the entire population (Diallo, 1993). With three-quarters of the population being nomadic, the economy at the time of independence was based on the raising of livestock. Trade was carried out by the beydanes and the communities living around the Senegal River were both socially and economically marginalized (Human Rights Watch/Africa, 1994).

9.1. Life in the Senegal River Valley

For the people who lived on the riverbank, the river was the center of society. People and animals seeking refuge from the harsh and variable conditions of the semi-desert Sahel found it in the basin of the river. Families lived and farmed on both sides and movement was unrestricted from one side to other. To the people living there the idea that the river was actually a border marking two political and administrative different nations went against their local customs and traditions (Human Rights Watch/Africa, 1994). The Senegal River was used to create a physical yet imagined boundary by 20th century France when separating Mauritania from Senegal. On independence in 1960, life continued as usual for the black residents in the area, despite now being divided by nationality due to the creation of two distinct nations. Those living on the north
side of the bank, now referred as Mauritanians, continued attending their lands on the south (now Senegal), and those who resided on the south bank and were now called Senegalese would still farms fields in the north, now Mauritania (Parker, 1991). Unless applying for secondary school in the cities, there was no need for official documents such as identity cards, so most blacks had no way of proving nationality (Human Rights Watch/Africa, 1994).

Mauritania was hit in the beginning the late 1960s by a series of consequent drought periods. The worst period was the Sahelian drought of 1968-1974, which in a single year (1973) claimed more than 100,000 lives due to famine among other causes. Some research has suggested that possibly due to climate change, the Sahelian droughts may become a long-term feature of the area rather than sporadic events (Magistro & Lo, 2001).

9.2. Conflict in Mauritania and Senegal

In 1989, Mauritania found itself dealing with ethnic violence and almost at the brink of war with neighboring Senegal. The event that sparked this conflict was the killing of two Senegalese farmers after a dispute arose with Mauritanian farmers on April 9 in Diawara, a village located on an island in the Senegal River. Prior to this, in the beginning of the farming season of 1988, black farmers on the left side of the river were prohibited from cultivating land on the Mauritanian side by Arabs. In retaliation, Senegal prohibited the grazing of the fields in their side by Mauritanian camels (Diallo, 1993).

Mauritanian border guards were blamed for killing the Senegalese, after these rushed to help the Mauritanian farmers. The Mauritanian farmers had clashed with the Senegalese after these had confiscated their cattle due to them trespassing on their land (Parker, 1991). According to a report by Human Rights Watch Africa (1994), the events that followed can best be understood within a racial context rather than a national one. The white beydanes saw their fellow black Mauritanians as synonymous with Senegalese and therefore white Mauritanians responded to the killings by attacking black Mauritanians.

Although there had always been racial tensions in the country, people were not expecting the events that followed. People in the cities took to the streets and vandalized up to an estimated
40,000 Mauritanian shops. Meanwhile in the countryside, under the supervision of white beydane patrons, black heratin carried out the systematic executions of at least 200 black Africans. The total number of Senegalese killed both in cities and the countryside is believed to be between 200 – 1000 (Human Rights Watch/Africa, 1994).

In May, many Mauritanians living on the right bank of the Senegal River began crossing the border into Senegal, seeking refuge from prosecution. Parallel to this, the Senegalese government began expelling Mauritanian nationals from Senegal (Magistro, 1993). The Mauritanian government used the dispute as an excuse to expel blacks from the country, under the false pretense of them being Senegalese. What followed would be a campaign of terror by the government, confiscating their lands with the use of extrajudicial executions and torture. The confiscated lands of blacks were then given to beydane businessmen. This campaign escalated between late 1990 after the government accused blacks in military and civil service of planning a coup, arresting without charge 3000 people and killing 500 (Human Rights Watch Africa 1994). Senegal received by the late 1980s an estimated 70,000 Mauritanians and another 13,000 fled to Mali. Some have the total figures of refugees as high as 170,000 (Magistro, 1993).

9.3. Historical injustices

The conflict in Mauritania cannot be properly understood without knowing about the deep historical asymmetries and injustices that have existed in the country for years against black Africans. Living between two distinct racial and religious identities in Africa, it is not surprising that there have always been tensions between its Arab white population and African blacks. However, up until the time after independence, there was no apparent racial discrimination by the state. This would change with the first Mauritanian government led by Ould Daddeh who would push for an Arabization of the country, at the expense of the black population. Black representation in government was reduced to only 20% in the 1980s and blacks were excluded from any high governmental position as well as from all branches of the army. Arabic was imposed on all schoolchildren and TV programs in African languages were banned at certain hours, enforcing cultural imperialism over black Africans (Diallo, 1993).
During ancient times, as in the rest of Africa, slavery was common. Up until the arrival of the French in the 19th century, Arabs and Berbers mounted raids against black Africans and during the Afro-Arab, Arabs stole thousands of Africans and forced them into slavery. (Diallo, 1993). Slavery took on a color characteristic as no white-skinned person was ever taken by them. Despite of slavery being abolished for the third time as late as in 1980, slavery is still rampant in Mauritania. Of the half a million people who still live in slavery by Arabs, not a single white-skinned person will be found among them. Former slaves (Heratin) and current slaves (Abids) constitute about 30% of the total population (Diallo, 1993).

9.4. Migratory strategies

In order to survive under volatile weather conditions, the people in the Sahel region created adaptive strategies of migration. Prior to the extended drought period that began in the late 1960s, the white beydanes lived a modest existence mostly in the deserts as nomadic herders, receiving tribute in form of grain from their subordinate heratin farmers, who lived on the fertile lands on the right bank of the Senegal River. The river served very much as corridor between the Maghreb region and Sub-Saharan Sudan, with people and goods moving freely across it (Human Rights Watch/Africa, 1994).

The patterns of movement for herders would follow the wet and dry periods, with Senegalese herders crossing the river north to graze their animals during the rains in the grasslands of southern Mauritania. With the coming of the dry season, Halpulaar herders residing in the interior of Mauritania would pasture their animals on the floodplains after the harvest, crossing the river south to do so. During the open grazing period after the harvest, cattle was permitted on the landholder lands, enriching the manure and thus securing the survival of both communities. Even though the herders and farmers belonged to different ethnic groups, their relations were manifested in mutual but contradictory associations, exemplified in the fact that many Moor nomads survived previous drought periods thanks to the use of Woolof tribal and pastoral routes. There was also commercial interdependence as well between herders and framers through the exchange of camels and cattle (Human Rights Watch/Africa, 1994).
These migratory strategies and spatial boundaries, as well as the underlying social order, were reconfigured and altered with the beginning of the droughts. The beydane were hit the hardest, as they were the most dependent on rain-fed agriculture. In one year alone, in 1972, the beydane lost an estimated 25% of their animals, although figures as high as 80% of animal loss were not uncommon (Human Rights Watch/Africa, 1994). During the drought years of 1968-1973, 1976, and 1982-1984 national herd losses were estimated at 45%. The dry years of 1982-1983 were extremely difficult and in the following year, the Senegal River hit its lowest level since 1904, severely reducing the amount of productive land for agriculture (Parker, 1991).

As scarcity became an issue due to desertification, herders began moving south, encroaching on lands traditionally owned by black Peul nomads and farmers, as these lands provided water and much-needed grassland for their animals. Herders became more sedentary and the population who led a nomadic life dropped from 80% to 23% between 1970-1980 (Parker, 1991). The lands along the valley become then the most coveted and valuable asset as it represented the economic future of the country, in the form of food supply and land for pasture. Food became a sensitive issue as agricultural products increased in price, forcing the beydanes to pay higher prices for their grains. (Human Rights Watch/Africa, 1994). Those who did not move closer to the river chose instead to migrate to desert towns or cities like Nouakchott, often becoming squatters, living in shantytowns. Urban population in this period rose from 2% to 40% (Parker, 1991).

The drought did not however affect all population groups in the same manner. Black farmers and herders were still able to continue their living near the river and even benefited from the increased price of agricultural products. Those black farmers and herders who were hit by the drought responded to it by seeking new work opportunities in Dakar or in Europe. The remittances sent back to Mauritania amounted to more than the entire foreign aid to the country, (about 1.45 billion CFA), and were sent mostly to Soniké communities who were able to use the money to better their economic standing. All these elements combined helped improve the standing of the black community, contrary to that of the beydane community (Human Rights Watch, 1994).
9.5. Traditional Tenure Regulations

Land tenure, according to Adams, Sibanda and Turner (1999, p.2) can be defined as ”the terms and conditions on which land is held, used and transacted.” Multiple users can sometimes use a land for grazing or for its products, making it a ”commons” land. This type of land can be divided into two types of categories: controlled access commons, whereby a group has some control or at least some ability to exclude non-members, or an open-access, the name itself explaining that there is no system of control.

Up until the time of independence and during the entire colonial rule, traditional or customary tenure rights were exercised and accepted, within the framework of a controlled access system. Up until the droughts of the 1970s and 1980s, serious land ownership issues were uncommon (Diallo, 1993). The people abided by rules and regulations that were particular to each ethnic group and where the users and residents used each plot of land under a complex system of appropriation and exploitation that was well understood. For example, the Halpulaar could authorize the use of some of the most coveted recession lands in arrangements such as rentals, sharecropping or lending a parcel in exchange for compensations. So-called landowners were in fact seen more as traditional guardians of the land that managed overlapping properties according to different arrangements, in which access to different lands depended on the position one held in the caste system. If there were any land disputes, these were solved locally by mechanism of traditional arbitration (Salmone, 1998).

9.6. Nomadic User Rights

In order to survive, nomads had created their own rules and rights, basing themselves on the notion that permission can be given to use a common-pool resource intermittently. There is no exclusivity to the use of resources such as a grazing area or a watering place as this could mean the demise of a group and its herd. These resources are usually abundant or scarce due to their cyclical nature, and are renewable if used reasonably. Tribes may have grounds specified for the grazing of their group, but can also at times share the same space with other tribes. Nomadic rights do not operate on an open-access system but rather under custom and traditions that
regulate who has the right to use the resource. This system is understood by its users and follows a fair system that also ensures the resources can regenerate, which is crucial to the survival of the group. Social controls exist to make sure that rules are followed and are based on sharia Muslim law and notions of justice and sharing. The users follow the rules, as they understand that their survival depends on it, but also fear committing a religious transgression by breaking the rules (Wabnitz, 2009).

9.7. The OMVS and investments in the Senegal River

The countries of Mali, Mauritania and Senegal established in March of 1972 “L’organisation pour la mise en valeur du Fleuve Senegal” (OMVS), whose goal was to coordinate research and develop the resources of the Senegal River. The project included the construction of the Manantali dam in Mali, for hydroelectricity, as well as a Diama, a salt barrier between Mauritania and Senegal, which was built to clean the river’s navigation channel, ensuring the irrigation of 400,000 hectares of river valley land (Diallo, 1993).

With the creation of the OMVS came new development projects and aid from donor agencies, such as the World Bank and IMF. These institutions encouraged the government to push for a land system based on individual private ownership. With the receiving money, the administration chose to prioritize the interests of the sedentary populations rather than that of the nomadic herders and black farmers (Wabnitz, 2009). According to Human Rights Watch Africa, (1994), many residents of the river basin believed that the government agreed so early and easily to instituting individualized tenure as this would give cover to permitting Beydanes to expand their land holdings in the area. As the state took over land rights, they became stripped of all previous cultural and religious content, which had ensured users would comply with the rules. The areas that were previously at the disposal of herders become vulnerable to the trespasses of farmers, as these were, without fear of repercussion, able to encroach into the herders grazing zones (Wabnitz, 2009).

Investments poured into the river area, and with it being the last remaining area of arable land, it became increasingly attractive for Arab agribusiness. The government saw this as an opportunity
to concentrate development projects on the north but also deliberately sought to underdevelop the south by expropriating lands. Investment in the private sector was encouraged, which meant investing in the beydanes (Diallo, 1993).

National property was legislated in 1964 and divided into four categories, (urban, wildlife, forestry and pioneer), with the further addition in 1980 of the valley. This meant that the state now had the right to unclassified lands (Salmone, 1998). In order to create a legal basis to confiscate black-owned lands in the south, the country imposed Land Reforms Act No 83.127 in June 1983 and 119/DB in 1988 (Diallo, 1993). The state enacted its previously established power to allocate resources in the basin in 1983, leading to the sudden influx of farmers from the north to the fertile lands of the river, at the same time as new irrigation projects were being initiated due to the construction of the dams. In 1988, traditional tenure was abolished and lots that had previously belonged to customary-land holder were expropriated, primarily to make room for beydanes from Noakchott who had more modern farming techniques. These techniques ensured that they fulfilled the requirements of the law of having “the means to develop” the land, thereby ensuring their right to the land over the original holder (Salmone, 1998).

10. Results and Analysis

10.1. Outcomes – cooperation and conflict

The relations between the users of the Senegal River and grazing land could be characterized as mostly being cooperative. Even though the users corresponded to different ethnicities and operated under harsh climate conditions, following Tubi and Feitelson’s four-stage continuum, the acts carried out by the users can be labeled as cooperative. They were both economically cooperative with the exchange of commodities between them, such as camels and cattle, as well as cooperating meaningfully, with Woolof assisting the Moor nomads during the dry period by allowing them to use their pastoral routes (Human Rights Watch/Africa, 1994).

However, with the installment of private land tenure, the relations between the users took on a more conflictive nature. The events that led prior to the outbreak of intra- and international
conflict in Mauritania can be traced back the inhibition of access of black farmers to lands by the Arabs, (Diallo, 1993), thereby finding ourselves on the opposite end of the four-stage continuum, with severely conflictive outcomes.

10.2. Patterns of interaction – restraint and competition

Turning back the Prisoner’s Dilemma, we find that after the situation in Mauritania evolves into a social dilemma, as it possesses a deficient equilibrium. For years the strategy between users had been to cooperate, that is to say they showed restraint in using the common-pool resource, as they knew that this result in the long run would result in the best for all the group. However, as one groups of users, the Arab Moors began being favored by the government, the need to restrain oneself was no longer necessary, as they would reap the benefits of the common resource regardless of their own behavior (Wabnitz, 2009). The strategy for this group evolves then to be one of defection, or competition over the common-pool resource.

After a long period of droughts, it seemed like the natural solution to invest in the Senegal River and to build projects such as the dams to ensure the resource’s potential was maximized. The land around the river and its resources became a precious commodity because of these technological and financial investments, as well as it being the last area of arable land, so there was a scramble between groups as to whom would have access to it (Diallo, 1993). Interestingly then, the conflict was not so much about competition over a scarce resource, but rather competition to ensure ownership and access to the land that had become increasingly valuable. Some of the literature in the field disputes whether conflict is more likely to happen in times of scarcity or of it is in fact abundance that is the catalyst for conflict. Interestingly, as seen in this case, the link between abundance and conflict has found more support among scholars than that claiming that scarcity can lead to conflict (Annika, Lauster, & Wodni, 2011). In this case, conflict reached its height not in the period when the country was suffering from scarcity due to the drought, but rather at a moment were money and resources were abundant.
10.2.1. Interdependency and reciprocity

Farmers and herders had found a way to cooperate over the commons by showing restraint over their use of the commons. They restrained themselves because they had found a system of assuring one another that they would not end up in a social dilemma as they both would restrain rather than compete. They were assured of the how the other would act because of the interdependency that existed between the users. They knew that through acts of reciprocity, such as allowing a group to graze the fields in exchange for manuring the soil, they established a need for one another that secured the survival of both communities. Furthermore, by living together in the same area, the different groups had gotten to know each other and through repetitive exchanges had learnt to trust one another, thus creating a relation of mutual dependence (Human Rights Watch/Africa, 1994).

This system was broken down with the establishing of private tenure over the land as the landowner could now set up a fence around the field, restricting the movement of those around him and having the right to exclude those who wishes. This new arrangement placed by the government made reciprocal acts hard to carry out and even unnecessary, as one group was clearly being taken care and favored by the government over the other through the implementation of discriminatory regulations (Diallo, 1993). Interdependency was lost then and it is this loss in interdependency that made the choice of competing more appealing, as the group of users being backed up by the government no longer depended on having reciprocal exchanges with the black populations to ensure they would survive in the harsh climate. There were no longer enough conditional cooperators left to play the game, making it more logical to become Olsen’s rational egoist and compete over the resources of the common.

10.3. Decision-making Arrangements in Mauritania

The institutional arrangement that had allowed farmers and herders, blacks and whites to work for years was replaced with an arrangement based on the idea of exclusion and individuality. It had the exact opposite effect of encouraging interdependence. Although the previous arrangement had not been an open-access one, private tenure rights made it possible for the owner to make sure no one trespassed his land. The previous users were completely excluded
from the decision-making process and a weak monitoring system meant rules could easily be ignored (Salmone, 1998). Rather than create points of connection for the users the government systematically sought to get rid of a group and encouraged divisions and a sense of “otherness” between the groups.

For the different groups living in Mauritania, movement was a way of life. Being able to move and take advantage of the resources in another place assured the group could thrive in a semi-arid variable climate. The users of the resources designed an institutional system that allowed for this necessary movement, at the same time that it created rules of usage with an accompanying enforcement system (Salmone, 1998). They had in other words found a way to together play an Assurance Game. This arrangement gave access to other groups when necessary while it both ensured the land-owning group would not be taken advantage of and that the resource would not be overused (Wabnitz, 2009). The Mauritanian government changed all this when it imposed privatized tenure, assuring that other users would not be able to use the resource and thereby severely infringing in the ability of groups to migrate. Although still in essence a commons, the public was blocked from having access to it. By changing the institutional arrangement, the government inadvertently also changed the rules of the game, making free riding at the expense of another group more appealing.

10.3.1. Locally Devised Rules and Second-Order Arrangements

What is worst, the users themselves did not create the new arrangement, but it was a system imposed on them by the government (Salmone, 1998). This is also a crucial component mentioned by Ostrom in designing a resource regime – the users need to design their rules and they themselves must limit the amount, time and technology of harvesting the resource. The users were deprived of creating their own rule system so there was no unanimity when the rules were changed, which is another one of Ostrom’s principles. According to Ostrom, one of the worst possible outcomes comes when rules that are externally implemented are combined with a weak monitoring and sanctioning system (Ostrom, 2005). If reciprocity encouraged the users to play an Assurance game, it was fears of making religious trespasses and an understanding that it was necessary for survival that made sure users complied with the rules. If disputes broke out, a
system of arbitration was set up in which the users themselves could settle their disputes. The government instituted new rules externally, but what is worse, as these rules were not founded in religion or on reciprocity for survival, it became easy for users to violate them. Furthermore, as it was the state itself that was committing the infraction, there was no third party the people could turn to when their rights were being trampled (Salmone, 1998).

10.3.2. External Arrangements

It was not just that the institutional arrangements did not match the reality of the common-pool resource and the people living there, or the aid and investments that led to competition. What lies at the root of these factors is a loss of equity that was exemplified by the discriminatory laws established by the state to assure one group would be favored over the other (Diallo, 1993). These asymmetries caused a dissatisfaction with the users as they saw they were receiving less from the common resource although they are investing more than others. According to Oakerson (1992), the presence of inequity can also be linked to an erosion of reciprocity. The blacks who had lived in the land inherited by their ancestors, perceived the laws favoring Arabs as corrupt and an abuse of international law. It had been specified in all international treaties since the time of independence, that indigenous patterns of ownership and cultivation in the valley could not be interfered by any country in the creation of international borders (Diallo, 1993).

Technology is many times within the climate change discourse presented as a solution to climate change by increasing resiliency (Burrows & Kinney, 2016). In the light of climate change and the need to better prepare for water shortages, some development agencies are calling for the construction of more dams in West Africa (Economic Community of West African States, 2006). The Mauritania case shows that if several local factors are not considered, such as power-sharing structures, land issues and ethnic problems, technology has the potential to exacerbate already present problems and create conflict. Not only did the drought cause changes in migration, the installment of the dam itself, built to mitigate problems of water shortages, also caused changes in migration (Diallo, 1993). It was this movement closer towards the river, because of the newfound value, that helped exacerbate the conflict, rather than the drought itself.
10.4. Physical and Technical attributes of the Senegal River Valley

In terms of exclusion, user’s access to the common-pool resource became limited not because of changes to the resource itself, but rather because of the regulations imposed on the government that excluded those that did not have the means to labor the land, that is to say the black farmers who were not the recipients of the investments. This group was expelled from its own land and denied any further access to it (Salmone, 1998). Furthermore, the system of privatization made the exclusion of others much easier and likely than under the controlled access system previously in place, meaning that groups could no longer move freely from one grazing area to another or access water wells (Human Rights Watch/Africa, 1994).

It would seem then that in terms of indivisibility, the way the common-pool resource was divided after the government instituted private land tenure did not suit the needs of all users. Only one group benefited from the common at the expense of the other (Salmone, 1998). Access was crucial for all groups to thrive under changing climate conditions, and denying this access meant the users survival was in jeopardy. This also meant the collapse of the system of rules and norms that was previously in place, as these were no longer needed. Interestingly, the way the Senegal River itself was divided to form a border between two countries also added fuel to the conflict, allowing it to become an international affair. This will be discussed in more detail shortly.

11. Mismatch between institutional world and traits of the common-pool resource

Following Oakerson’s framework, we could conclude the following. The privatization of land together with discriminatory regulations were a mismatch to the common-pool resource’s need for movement and flexible borders, as well as the new technological changes that made the common-pool resource more valuable. This mismatch led to a decrease in interdependency that made it more appealing to choose the strategy of competition rather than restrain, which in turn led to the actions between the users to become increasingly conflictive. These results are presented in Figure 3 below.
The Mauritanian Conflict and Oakerson’s Framework for the Commons

Flexible borders
Need for movement due to climate

Abolishment of traditional tenure
and nomad rights replaced with private tenure
Discriminatory and racial laws

Competition
(Decrease in interdependence)
Conflicitive actions

Oakerson (1992) believes that having a mismatch between the institutional world and the physical attributes leads to subpar outcomes, which seems to be confirmed by the Mauritanian case. Life in the Senegal River was dependent on one crucial thing – transhumant movement. Climate in the area is volatile, even under normal conditions and for survival to be guaranteed migration is crucial. However, if migration is to work there needs to be a clear system of rules for the users of the common-pool resource. This system can only work if there is reciprocity between the groups and an interdependence that helps to assure that other users will comply with the rules (Parker, 1991). By setting up a system of land tenure based on private property, the Mauritanian government negatively affected the institutional arrangements in two ways – it didn’t allow for free movement and by instituting legislation that sought to favor one group of users of the others it decreased interdependence. These decisions encouraged competition over the common-pool resource, thereby contributing to the outbreak of conflict.

11.2. Flexible borders

It could be argued that where it not for the nature if how societal life was built around the river, the conflict would never have been an international one. Mauritania found itself at the brink of war with Senegal because farmers in the area were accustomed to move freely from one side of the river to the other, with little regard to the fact that they were crossing over to another country.
The problem is not so much that the users themselves did not know what the borders were. The problem is rather that others than the users had decided to draw an imaginary line and create a border, without any recognition to what really constituted a border to the people who lived there. Life went on as usual on the river banks the day the Senegal River was decided to form a border between two separate countries. Societal life was not based on nationality, but rather on ethnic belonging. This meant that when the conflict spread to other parts of the country it carried with it a racial rather than national element. The conflict was able to intensify because it was unclear who the enemy or the perpetrator was, and so it became easy for people to choose to retaliate against who best suited them, in this case the black populations of Mauritania and Senegal (Human Rights Watch/Africa, 1994).

One of the main design principles for institutional arrangements to succeed according to Ostrom has to be clear boundaries. Conflict was able to arise in the Mauritania case because the national boundary that was created did not match that of the common-pool resource. It was not strange for Mauritanian farmers to find themselves on the Senegalese side of the river because that is what they had been doing all their lives. The user’s borders may not always coincide then with the borders chosen by outsiders. This can become a problem if climate is to become more variable, as those places in the world most vulnerable to climate change also happen to be those places whose borders have been drawn for them by outsiders, with little regard to ideas of ethnicity, religion or what works best for the people actually living there. Colonies then are at particular risk, whom unlike Europe, have not had the chance to dictate their own borders and create their own identity within them (Parker, 1991). The question going forward then, especially when creating regulations that govern commons, is whether to reinforce the boundaries set by the nation-state, or believe in a more permeable and flexible definition of a border.

11.4. The Pastoral Code

Interestingly, it seems Mauritania learnt from its previous violent experience and by enacting the Code Pastoral in 2000 shifted away from exclusive ownership rights and once again recognized the traditional common property arrangements established by nomads. Aiming at decreasing violence between herders and farmers, it established the pastoral system need for mobility,
making illegal the appropriation of pastoral resources. Arbitration is once again the main way to settle disputes, with the use of external courts as a last resort. There are some innovative features to the law, such as the hybrid concept of land tenure rights that are neither fully exclusive nor fully common. As there is an understanding, that locality plays a key role, different regulation principals can be used on the same issue depending where they happen within the nation (Wabnitz, 2009).

Mauritania has been hit with several drought periods since the one that is the focus of this paper, experiencing particularly little rain in 2017 (Tabary, 2018). It would be of great interest to analyze what effects the Code Pastoral has had in mitigating the effects of droughts and mass displacement since the law was put in effect in 2004. This would help to further understand if the assertions made in this paper hold up, and if indeed a proper institutional arrangement can help mitigate the effects of climate change and migration, decreasing the risk for conflict.

12. The State’s function in overseeing the commons

In following Ostrom’s line of thought, a bottoms-up system of arrangement to govern the commons is probably best suited, particularly in times of crisis such as climate changes and mass migration. However, this does not mean that the state has no role to play in governing the commons. The state can play a major role by first ensuring that the right institutional arrangements are in place that match the needs of the users and the physical attributes of the common-pool resource. In the case of Mauritania, this meant not encouraging a system of private land tenure. Ostrom has done extensive work on whether commons should be privatized (1990), and although the case of Mauritania shows that she could be right in her assertions, this is only one case in which that particular arrangement did not work as it constricted the need for movement and had a latent issue over the flexibility of its borders. Care must be given to not extend the conclusions of this case to apply generally to all commons. Rather, this study shows that states must be careful in choosing the appropriate arrangement for the particular common-pool resource.
Secondly, the state can also help in ensuring that interdependency is fostered between users. Interdependence is crucial to maintain a system that fosters cooperation over commons (Runge, 1992). In the Mauritanian case, it could be believed that a contributing factor to the conflict was the perverted structure of choice due to the incentives given to some to compete. The loss of trust and reciprocity made it more likely to carry out conflictive rather than cooperative acts. To avoid conflict it is in the state’s interest to ensure that when institutional arrangements are created, that these help to encourage interdependence between a common’s users.

Another problem with a top down approach is that it also interferes with the user’s ability to define their own rules. These rules have been designed by possessing a deep understanding of the lay of the land and the variability of climate, a knowledge that cannot be matched by the government. However, it is not enough for the users to create their own rules. Having a self-designed system will not guarantee cooperation without the backing up of the state, providing legitimacy and support, by for example, giving access to its court system when arbitration fails to settle disputes between users.

In most cases, we want to believe that it is ultimately the function of the state to protect its citizens from the effects of climate change and mass migration, and we would be right in believing so in most cases. However, this may not necessarily be the case in situations such as the Mauritanian one where you have discriminatory laws and weak state institutions, a problem being faced in much of the developing world. This is where the international system becomes crucial, stepping in to mitigate problems over commons when the state proves too weak or corrupt to do so itself. Sadly, in the case of Mauritania the opposite proved true. The international system helped to legitimize the discriminatory agenda of the Mauritanian government by pushing for the privatization of the land. This gave cover for the government to pass laws that favored one group and only helped to justify its actions during the conflict, coming close to apartheid-like behavior.
13. Conclusion

Former US President Obama asserted that the unrest in Syria could be attributed to the intense period of drought experienced prior to the outbreak of conflict (Selby, Dahi, Fröhlich, & Hume, 2017). As discussed here, the link between climate change, movement and conflict does exist, but only if other factors are present as well. What offers hope for the future in spite of weather that is more erratic and a warmer climate is that these events do not exist in a vacuum. Climate change in itself does not cause conflict; migration by itself does not have to carry with it the threat of violence. For years, groups that have been confronting climate variabilities have created institutions that have ensured their survival through cooperation. As long as these institutions are allowed to remain and are strengthened, as long as governments fulfill their functions and do not infringe on the rights of users, there is hope that those who are hit the hardest with climate changes will still find ways forward.

The case of Mauritania shows us that the state can play a crucial role in ensuring that the institutional arrangements match the traits of the common-pool resource as well as ensuring the interdependence of its users, helping them foster reciprocity. A bottoms-up approach is necessary, with the creation of institutions that correspond to the norms and needs of the users, that allows for flexibility and gives people the power and room to self-regulate. Issues of the flexibility of borders also need to be discussed by states and their populations. At the same time, if the user’s own rules are to be effective the state needs to give them legitimacy and ensure it can step in to support users when the need arises. A good example of this being that of the Pastoral Code in Mauritania. The international system also needs to be involved, as the issues dealt with in this study are matters too complex to be solved by one actor. However, when doing so it must be cautious not to infringe on user’s rights and to try to take into account the needs of all those involved. If embracing the future means accepting and dealing with drastic changes in climate, states serve themselves best by fostering the institutions that allow people to cooperate over common resources that create interdependency and instances of reciprocity.
14. References


