

# A Community Tragedy: The Unmanaged Water Commons in Southern Somalia

---

Adan Omar Hashi



## I. Introduction

Water is the most crucial resource for virtually all aspects of human existence. Humans are overwhelmingly dependent on it for economic development, environmental survival, food security, and societal well-being. In 1998, the United Nations identified that scarcity of fresh-water is one of the biggest problems facing humanity. According to UNESCO, by 2050, two billion people will suffer from water scarcity.<sup>1</sup> In Somalia, water insufficiency has already reached an alarming point: less than 35% of the Somali people have access to clean water and for rural communities the number spirals to almost zero. Because of the water scarcity, conflicts are becoming more frequent in southern Somalia. Traditionally, such conflicts were socially defined and acceptable ways of negotiating were implemented. However, many people in Somalia, and more commonly in the southern regions, have lately

turned a blind eye to the traditionally based system, and mechanisms of force have become the social norm.

The term “commons” can be traced back to the Justinian code of 530 AD, issued by the Roman emperor Justinian, which recognized resources, such as the air, sea, and running water, as “*res communes omnium*” (things held in common). Such resources belong to everyone and therefore cannot be owned by the private sector or the state. In 1215, the English King John signed the Magna Carta and in 1217, the Charter of the Forest. Both documents defined, for the first time, what is called the commons.<sup>2</sup> Studies of the commons emerged in the 1970s. The commons are a collective inheritance; they are not just resources, but also the rich source of relationships between ordinary people and communities that work together on shared purposes.

In the academic world, scholars have introduced different concepts that explain the problems of the commons and proposed solutions that can be used to solve these problems. Hardin’s 1968 concept of “the tragedy of the commons” asserts that the core reasons behind the problems of the commons are purely internal and that the solution is through privatization and centralization. In contrast, in 1990, Ostrom observed that many commons throughout the world pool resources. He argues that since a number of them are governed by common property regimes, privatization would not be the solution to the problems.

The focus of this brief article is to comment on the causes of conflict over the commonly owned water resources in southern Somalia. The aim is not to present a new approach, but rather to dissect and better comprehend the conceptual and contextual debates surrounding the topic and assess their relevance in the southern Somalia case. The first section reviews the internal factors and conflicts over common-pool resources. The second section deals with the external issues and their influence over the problems of the commons. The third part proposes methods that might help contain such conflicts and better manage the communally owned water resources.

## II. Inter-Group Conflicts over Common-Pool Resources

The common-pool resource concept, which refers to a communally owned resource, has nowadays been more generally acknowledged than in the past. Bromley contributes to the common-pool literature by defining the common property regime, which enables the owner of the resources to exclude non-owners from using the resources, while at the

same time giving co-owners rights and responsibilities with respect to resource use rates.<sup>3</sup> Causes of problems in the use, governance, and sustainability of a commons can be said to be human behaviors that often lead to social dilemmas, like competition for use, freeloading, and overharvesting.<sup>4</sup>

According to Ostrom in 2005, a common-pool resource has two elements: excludability, which is associated with the difficulty of excluding users from appropriating a benefit from the resource; and subtractability, as a user appropriating benefits would reduce the availability of the resource units to other beneficiaries.<sup>5</sup> Bodies of water, such as rivers and groundwater, are typical examples of common-pool resources. Prohibiting water users from withdrawing water is very difficult. Because a user's withdrawal of the resource limits the chances of usage by others, an externality problem arises.<sup>6</sup>

Southern Somalia has in the past two decades experienced intense conflict over common-pool resources. Although the prime cause of such conflicts could be due to the changing climate, there are also other elements, like social and political aspects, which are also important. Conventional solutions to the problems of the commons normally involve centralization or privatization of the resources. Hardin's use of the tragedy of the commons concept has proved to be a useful starting point for figuring out how the commons have come to the brink of environmental collapse. According to Hardin, commoners face a number of problems created not by malicious outside forces, but rather by their innocent individualistic behavior. In the case of Somalia, Hardin's solution of centralized regulation and management, as well as full private ownership of common-pool resources, is actually the cause of the tragedy. The conventional theory failed to predict when government ownership would perform appropriately and how privatization would improve outcomes. Ostrom, who conducted much empirical research of common property systems in many different parts of the world, has challenged Hardin's concept. He argues that Hardin confused it with open access, where no rules exist to limit entry and use. Ostrom introduced eight design principles that can be used to examine whether commoners are managing the common-pool resource effectively.<sup>7</sup> The article will call upon Ostrom's design of durable cooperative institutions, organized by commoners. The design principles are as follows:

1. Defined boundaries
2. Governing resources

3. Collective-choice arrangements
4. Monitoring mechanisms
5. Graduated sanctions
6. Conflict resolutions
7. Minimal recognition of rights to organize
8. Nested enterprises

The first design principle, clearly defined boundaries, requires cogent definition of not just the physical boundaries of the resource, but also precision on the type of groups that have rights over the use of the resources.<sup>8</sup> Physical boundaries on resources in southern Somalia are often not clearly delimited because resource users come from different parts of the country and are not limited to just the resident group. In addition, there is overlapping use of the same resource by different social and kin-based ethnic groups.

In Somalia, the *Xeer* traditional legal system was used to manage the common-pool resources.<sup>9</sup> Herders with their cattle and camels moved long distances in search of grazing land and water. Preventing migrating pastoralists from using the communally owned resources was difficult. However, this was not considered to be a problem as long as the newcomers did not claim ownership and as long as they gained permission.<sup>10</sup> Yet because there are no clear and unambiguous rules about the use of water, haphazard conflicts are becoming more common. Such conflicts occur between pastoral communities, and between pastoral and local agriculturalist communities.<sup>11</sup> Because of poorly defined boundaries in southern Somalia, the commoners are considered to be less successful in using the design principles approach.

The second principle governing resource use requires that the contribution of labor, money, and materials suits the local situation. *Qaaraan*, which serves as a social safety net, were collected from every member of the clan or resource user, and workforces were mobilized to better maintain the resource.<sup>12</sup> In some parts of southern Somalia, like Lower Shabelle, new users of a *war*, an unlined dug-out dam usually two to three meters deep, are required to take out buckets of mud before being permitted to utilize it. This is because the bigger the *war*, the more water it can accommodate during the rainy season. Lately, however, people have been more determined to capture benefits from the commons than to fulfil their duties.<sup>13</sup>

The third principle, collective-choice arrangements, gives those with the right to participate power in modifying the rules.<sup>14</sup> *Shir* is an infor-

mal meeting of all the affected groups. It is where they discuss their opinions and concerns and is the specific stipulation of *Xeer*.<sup>15</sup> In southern Somalia, *Xeer* is not universalistic. Although there are rules that are common to all Somali clans, like the payment of *Diya*, *Xeer* is specific to the relationship between any two kin-groups. Different rules exist for different communities, like agriculturalists and pastoralists.

Monitoring is the fourth design principle and helps control the common-pool resource appropriation. Despite the rules and user participation in the decision-making process, there is often the temptation to cheat. Monitoring ensures the cheater will be observed and held accountable.<sup>16</sup> In southern Somalia, the communally owned water resources are often poorly monitored.

The graduated sanctions design principle deals with the punishment of violators. In southern Somalia, like other regions, an individual is insured under the law against his or her liabilities by next of kin, and victims are often given *Diya*.<sup>17</sup>

Conflict resolution mechanisms exist because even when commoners design and modify rules together, different interpretations may occur. Therefore, before disagreement threatens the functioning system, there is a need for low cost and readily accessible arenas in which to mediate and reach resolution among the users.<sup>18</sup>

Somalis have long used *Xeer*, which is an unwritten social contract, to resolve conflicts. New systems of *Xeer* rules were continuously developed to address unforeseen problems. The aggrieved group might favor negotiation under the auspices of a *Guurti* or an *Ergo*, which is a group of mediators that is often established to mediate between both groups without becoming personally involved in the disputed subject matter. If both parties fail to reach an agreement, a jury known as *Xeerbeegti* could be established to reach a solution, and both parties are expected to embrace the verdict.<sup>19</sup>

To achieve *Xeer*, both parties must be happy with the *Ergo* or *Xeerbeegti* members. Negotiation is also expected to take place in a neutral venue. Each clan, sub-kin, or sub-sub-relatives select a cohort known as *Nabadoono* (sub-kin elders) that represents the kin group when dealing with others. The *Nabadoono's* main task involves the management and supervision of the daily business matters of the kin group.<sup>20</sup> These elders often deal with conflicts among various identities or negotiations with other groups. However today, *Xeer* is poorly managed. Because of the introduction of sophisticated weapons of war, conflicts now often take days, if not weeks and months, to settle.

The last two design principles, minimal recognition of rights to organize and nested enterprises, do not exist in southern Somalia. Both principles require external government authorities giving rights to the common-pool regimes, which the overthrown government denied. For large systems the design principles are organized into multiple layers of nested enterprises.<sup>21</sup>

### III. Beyond the Internal Conflict over the Common Pool of Resources

In addition to these eight principles in the case of southern Somalia, one more issue needs to be examined: the external factors. Both Hardin and Ostrom missed considering the external elements and their influence over the problems of the commons. This is a major shortcoming.

Hardin states that the problems of the commons are purely internal. He proposes privatization, which consequently proposes a neo-liberal Washington consensus ideology of the free market, and centralization, which in the case of Somalia is the actual cause of the tragedy. The core reasons why there has been a lack of governance over the common-pool resources include a disorganizing colonial intervention, a later attempt at nationalization of the commons compounded by the violent overthrow of Siyad Barre's government, and a desire to reduce the positive influence of the country's kin-group tradition.<sup>22</sup>

Throughout the colonial period, Somalia was divided into two separate parts: the Italian region in the southern areas and the British in the northern territory. The Italians appointed chiefs for each kin-group to better manage their administrations.<sup>23</sup> Because of the introduction of this system, competition among kin-groups became frequent and elders started competing for political appointment as a chief. The colonialists used this policy to weaken the integrity of the communal tradition and decision-making, which was crucial to governance and forestalling the onset of conflict.<sup>24</sup> Moreover, the Italians introduced discriminatory laws that undermined the *Xeer* and further degraded the status of Somalis.<sup>25</sup>

During the decades of the Cold War, most African countries sided with either the communist or the capitalist ideology. With the military takeover, Somalia threw in its lot with the statist ideology and introduced a new framework, different from the traditionally based one, known as the *Hantiwadag*. It essentially means the common ownership of assets. It is a literal approximation of "scientific socialism."<sup>26</sup>

By October 21, 1970, General Siyad Barre had proclaimed the embrace of “scientific socialism” and ordained that all resources would be nationalized. He believed that by using this new model of organizing material life, the nation of nomads could be turned into a modern socialist state in which communities would become free of the liabilities of sectarian identities and move on to become citizens aligned with the new ideology of the state. From there, the state would offer more effective types of governance, leadership, greater security, and welfare.<sup>27</sup> The main ideological objective of the government was to modernize, if not replace altogether, the *Xeer* and kinship systems, which had laid out the link between the individual and group in Somalia for centuries.

There were two problems with this new model. First, the introduced model did not fit with Somali concepts. Here, kinship systems and Islamic conviction ran deep and therefore could not be easily supplanted. In fact, despite the governmental insistence on the elimination of the kin-based system and mentality, people still used the term “MOD” when referring to Barre’s government. It stands for Mariixaan (Barre’s kin community), Ogaadeen (Barre’s mother’s group), and Dhulbahantej (the community that Barre’s son-in-law hailed from).<sup>28</sup> For many observers, these three kin-groups were the backbone of the government’s inner circle. Due to the onerous implications of the imposed statist policies, combined with the free-for-all (*Hantiwadag*) that replaced the commons regime, commoners insisted on regaining their *Xeer* system. This is the reason for the murderous chaos that now bedevils the country.

The new generations that grew up under the collapsed regime had little knowledge of the traditions that were deployed by their ancestors. As a result of this void, merchants of war emerged. These groups use tactics of divide-and-rule among the elders to achieve their own malignant interests. Because of disintegration and distrust within the main kin relationships everywhere, smaller sub-kin started to identify their own leaders, which increased tensions between clans and sub-clans. Traditionally, elders have used their powers to maintain peace and co-existence within the community and to resolve local problems. However, after the collapse of the state, elders started to mobilize their own kin groups to fight with “others,” and siding with their kin even if they were the aggressors.<sup>29</sup>

According to Dietz and colleagues, as history records, commoners go through a process of comedy and tragedy during upheavals. The

point is that issues relating to the problems of the commons do not necessarily lead to tragedy, but can also lead to drama with a happy ending.<sup>30</sup> Before the colonial period, elders and their congeries had, to some degree, successfully managed to maintain the effectiveness of the common-pool resources by using the customary law, but have failed to do so recently.<sup>31</sup> Southern Somalia has not experienced Ostrom's drama of the commons model, but rather an endless series of breakdowns. As stated by Caffentzis, there is no logical reason why communities that have successfully been managing common-pool resources for generations (like water in southern Somalia before the colonial period) to suddenly falter even though they have, at times, managed to solve the coordination problems.<sup>32</sup> Ostrom's perspective fails to include within the eight design principles external factors that can be the causes of conflagration. In Somalia, the external factors of colonialism, "scientific socialism," and civil war weakened the functionality of *Xeer* and common-pool assets.

#### **IV. Managing Tragedies**

There is no blueprint solution to the water problems in southern Somalia. However, understanding links between external and internal is crucially important. These reflections recommend further research on an external-internal approach that combines the eight design principles with external factors, such as the civil war, so as to achieve a more effective and collective management system.

Based on the preliminary explorations, the Rowland-Ostrom Framework, which provides two-step solutions to resource management problems, is relevant to this particular outlined problem. The first step of the framework deals with the identification of the problem that threatens both the resource and the users. This examination identifies the water crisis in southern Somalia as a state of acute urgency. The most difficult issue with the first point is for the commoners of the common-pool resources to acknowledge that a crisis situation exists. After such a recognition, commoners could work toward reaching an agreement so as to better sustain the resource for their mutual benefit.<sup>33</sup> There is little doubt, then, that the water crisis in southern Somalia is interconnected with droughts, civil war, and the lack of effective management.

With respect to the supervision of common-pool resources, resident users often possess inadequate scientific knowledge to com-

plement their own indigenous knowledge. Reliable information on water conditions and the effects of water use patterns are important for the long-term management of common-pool resources.<sup>34</sup> The current government can help local users by conducting environmental assessments of water use patterns and identifying areas that are being degraded or at risk, while also providing training to the local communities in improved management techniques. The current government has an important role to play in resolving disputes, reconciling the different user groups, monitoring the implementation of resource use agreements by providing a legal framework worked out by different local groups, providing technical and management support for local communities, and carrying out environmental assessments. Considering these various issues, it can be clearly said that the state has a continuing and facilitative role to play in the management of common-pool resources.<sup>35</sup>

The second step of the Rowland-Ostrom Framework requires transitioning from the existing water management system to a protocol using a common-pool resource system, which follows from Ostrom's eight principles. Once a common-pool resource management system is in place, water disputes can be prevented more successfully.<sup>36</sup> In order to address southern Somalia's unprecedented water crisis, Somalia desperately needs to find long-lasting solutions to the ongoing political conflict. Without dealing with the external factors, which both Hardin and Ostrom failed to acknowledge, an effective water management system cannot be implemented. The argument is that in the case of southern Somalia, both external and internal factors are interdependent.

Apart from the government acting as a facilitator, social charters can be used as a mechanism for governing the commons. They specify the groups that have access to the resource, control over the use of the resource, and, if there are fees, how the wealth and costs are distributed among the group.<sup>37</sup> Therefore, each community creates social charters, rather than leaving all the responsibilities for the state bureaucracy. This would create common trust, which ensures the health and well-being of the communal assets for generations to come.

This assessment acknowledges that the external-internal approach is not the only way to address water use issues in southern Somalia. Though one specific approach cannot be a panacea to better manage problems over the use of water, examining the effect of a specific combination of tools is wise in order to prevent harmful consequences.

## V. Conclusion

In Somalia, water scarcity has been brewing for some time and has reached an alarming point, severely impacting the country's social, economic, political, and environmental well-being, and leading to ongoing conflicts among commoners. Traditionally, conflicts over common-pool resources were socially defined and acceptable ways of negotiating were implemented. Lately, however, people have turned a blind eye to the traditionally based system, and force has become the social norm. This is because of the colonial anti-customary-law movement and the late Barre's governmental nationalization of the communally owned range, which negated the laws devised by communities. Droughts, the growing demand for basic resources, political conflicts and civil war, and mismanagement have, combined, escalated hostilities and subsequent conflicts. While prominent scholars have long interrogated such disputes and provided good models, their studies lack an appreciation of the impact of decisive external factors that, in the case of southern Somalia, had fuelled the problems that are destroying common-pool resources. Thus, further work on this point is now necessary. As for the current authorities in Mogadishu, an attempt to minimize the destabilization of the country and *Xeer-cum-kinship* systems might prove to be worthy of serious effort. In this context, the state can act as a facilitator in the revival and monitoring of resource-use agreements reached by different local groups. Rather than the failed policy of tight centralization, commoners could now be empowered to be creative in establishing durable trust and fairness that could preempt possible disharmonies among communities. This is a drastically different future for the coming generations than the bloody mess of the past five decades.

---

### Notes

1. Kirby 2000.
2. Berry 2005.
3. Bromley 1991.
4. Hess and Ostrom 2007.
5. Ostrom 2005.
6. Ostrom et al. 1994.
7. Ostrom 1990.
8. Claire et al. 2007.
9. Axmad (Buraale) 1977.

10. Hoffman 2002.
11. Muthusi, Mahamud, Abdalle, and Gadain 2007.
12. World Bank 2005.
13. Muthusi, Mahamud, Abdalle, and Gadain 2007.
14. Ostrom 1990.
15. Hoffman 2002.
16. Ostrom 1990.
17. World Bank 2005.
18. Ostrom 1990.
19. Haowo 2009.
20. World Bank 2005.
21. Ostrom 1990.
22. Hoffman 2002.
23. Issa-Salwe 1996.
24. Ibid
25. Hoffman 2002.
26. Hassan 2009.
27. Hoffman 2002.
28. BICC 2009.
29. Amber n.d.
30. Dietz et al. 2002, quoted by Ostrom.
31. Hoffman 2002.
32. Caffentzis n.d.
33. Rowland 2005.
34. Farah 2004.
35. Rowland 2005.
36. Ibid
37. Laconte 2010.

## References

- Amber, I. "Community Peace Processes in South Central Somalia." n.d. Accessed online on 7 April 2016 at [c-r.org/our-work/accord/somalia/african-solution.php](http://c-r.org/our-work/accord/somalia/african-solution.php).
- Anarchy, A. "Dying for Water in Somalia's Drought." 2006. Accessed online on 21 April 2016 at [washingtonpost.com/wpdyn/content/article/2006/04/13/AR2006041302116.html](http://washingtonpost.com/wpdyn/content/article/2006/04/13/AR2006041302116.html).
- Anonymous. "Conflict in Somalia: Drivers and Dynamics." 2005. Accessed online on 29 April 2016 at: [siteresources.worldbank.org/INTSOMALIA/Resources/conflictinsomalia.pdf](http://siteresources.worldbank.org/INTSOMALIA/Resources/conflictinsomalia.pdf) accessed 21/11/2010.
- Axmad, Axmad Sheekh Cali (Buraale). *Xeerkii Soomaalidii Hore*. Akadeemiyaha Dhaqanka, Somalia, 1977.
- Berry, D. "The Commons as an Idea — Ideas as a Commons." 2005. Accessed online on 3 March 2016 at [freesoftwaremagazine.com/articles/commons\\_as\\_ideas](http://freesoftwaremagazine.com/articles/commons_as_ideas).

Bromley, D. W. *Environment and Economy: Property Rights and Public Policy*. Cambridge, MA: Blackwell Publishers, 1991.

Bonn International Center for Conversion (BICC). "The Scarcity of Land in Somalia Natural Resources and their Role in the Somalia Conflict." April 2009. Accessed online on 15 May 2016 at [bicc.de/uploads/pdf/publications/papers/occ\\_paper\\_03/occasional\\_paper\\_III\\_04-09.pdf](http://bicc.de/uploads/pdf/publications/papers/occ_paper_03/occasional_paper_III_04-09.pdf).

———. "Natural Resources, Environmental Degradation and Conflict: A Perspective from Peace and Conflict Research." n.d. Accessed online on 21 April 2016 at [bicc.de/tricc/background\\_paper.pdf](http://bicc.de/tricc/background_paper.pdf).

Caffentzis, G. "A Tale of Two Conferences: Globalization, the Crisis of Neoliberalism and the Question of the Commons." n.d. Accessed online on 11 April 2016 at [globaljustice-center.org/papers/caffentzis.htm](http://globaljustice-center.org/papers/caffentzis.htm).

Catholic Relief Services. "Water and Conflict." 2009. Accessed online on 13 April 2016 at [crsprogramquality.org/pubs/peacebuilding/waterconflict.pdf](http://crsprogramquality.org/pubs/peacebuilding/waterconflict.pdf).

Claire, Q. H., M. Huby, H. Kiwasila, and J. C. Lovett. "Design Principles and Common-Pool Resource Management: An Institutional Approach to Evaluating Community Management in Semi-Arid Tanzania." *Journal of Environmental Management* 84, no. 1 (2007): 100–113. Accessed online on 12 April 2016 at [cat.inist.fr/?aModele=afficheN&cpsidt=18757012](http://cat.inist.fr/?aModele=afficheN&cpsidt=18757012).

Connor, R., J. M. Faurès, J. Kuylenstierna, J. Margat, P. Steduto, D. Vallée, and W. van der Hoek. "Evolution of Water Use." 2009. Accessed online on 27 April 2016 at [unesco.org/water/wwap/wwdr/wwdr3/pdf/18\\_WWDR3\\_ch\\_7.pdf](http://unesco.org/water/wwap/wwdr/wwdr3/pdf/18_WWDR3_ch_7.pdf).

De Young, R. "Tragedy of the Commons." In *Encyclopedia of Environmental Science*, edited by D. E. Alexander and R. W. Fairbridge. Hingham, MA: Kluwer Academic Publishers, 1999.

De Young, R., and S. Kaplan. "On Averting the Tragedy of the Commons." *Environmental Management* 12, no. 3 (1988): 273–283.

Dhacdooyinka. "Odoyaal ka tirsan wax Garadka Gobolka Mudug oo ku guuleestay in ay kala qaadaan labo maliishiyo beeleed oo dhawaan ku dagaalamay duleedka magaalada gaalkacyo ee gobolka mudug." 2010. Accessed online on 23 April 2016 at [dhacdooyinka.com/2010/11/23/odayaal-ka-tirsan-wax-garadka-gobolka-mudug-oo-ku-guuleestay-in-ay-kala-qaadaan-labo-maliishiyo-beeleed-oo-dhawaan-ku-dagaalamay-duleedka-magaalada-gaalkacyo-ee-gobolka-mudug/](http://dhacdooyinka.com/2010/11/23/odayaal-ka-tirsan-wax-garadka-gobolka-mudug-oo-ku-guuleestay-in-ay-kala-qaadaan-labo-maliishiyo-beeleed-oo-dhawaan-ku-dagaalamay-duleedka-magaalada-gaalkacyo-ee-gobolka-mudug/).

Dietz, T., N. Dolsak, E. Ostrom, and P. C. Stern. "The Drama of the Commons." In *The Drama of the Commons*, edited by E. Ostrom, T. Dietz, N. Dolsak, P. C. Stern, S. Stonich, and E. Weber, 3–39. Washington, D.C.: National Academy Press, 2002.

*Encyclopedia of Earth*. "Water Profile of Somalia." 2008. Accessed online on 6 April 2016 at [eearth.org/article/Water\\_profile\\_of\\_Somalia](http://eearth.org/article/Water_profile_of_Somalia).

Farah, M., K. Nyariki, I. Ngugi, and A. Y. Guliye. 2004. "The Somali and the Camel: Ecology, Management and Economics." Accessed online on 10 March 2016 at [mbali.info/doc265.htm](http://mbali.info/doc265.htm).

Faarax-Bare, M. "Dgaal u dhaxeeya dad reer miyi ah oo ka bilowday gobolka mudug." 2010. Accessed online on 21 April 2016 at [gedonet.com/index.php?news=5091](http://gedonet.com/index.php?news=5091).

Hardin, G. "The Tragedy of the Commons." *Science* 162, no. 3859 (1968): 1243–1248.

Hassan, M. "1969 Military Coup in Somalia: Part III." 2009. Accessed online on 15 April 2016 at [warkamaanta.com/index.php?option=com\\_content&view=article&id=485:part-iii-1969-military-coup-in-somalia-by-dr-m-rashid&catid=70&Itemid=0](http://warkamaanta.com/index.php?option=com_content&view=article&id=485:part-iii-1969-military-coup-in-somalia-by-dr-m-rashid&catid=70&Itemid=0).

Hess, C., and E. Ostrom. "An Overview of the Knowledge Commons." In *Understanding Knowledge as a Commons: From Theory to Practice*, edited by C. Hess and E. Ostrom. Cambridge, MA: MIT Press, 2007. Accessed online on 21 November 2010 at [mitpress.mit.edu/books/chapters/0262083574intro1.pdf](http://mitpress.mit.edu/books/chapters/0262083574intro1.pdf).

Hoffman, S. "The Divergent Paths of Somalia and Somaliland: The Effects of Centralization on Indigenous Institutions of Self-Governance and Post-Collapse Reconciliation and State-Building." Manuscript 2002. Accessed online on 12 April 2016 at [mbali.info/doc26.htm](http://mbali.info/doc26.htm).

International Committee of the Red Cross. "Drought Assessment: Somali Region." 2006. Accessed online on 6 April 2016 at [fao.org/world/ethiopia/pdf/atf/2006/feb/ICRC\\_Drought\\_assessment.pdf](http://fao.org/world/ethiopia/pdf/atf/2006/feb/ICRC_Drought_assessment.pdf).

IRIN. "Somalia: Fight over Water, Pasture Sends Hundreds Fleeing." 2010. Accessed online on 15 April 2016 at [irinnews.org/report.aspx?ReportId=91034](http://irinnews.org/report.aspx?ReportId=91034).

Issa-Salwe, A. *The Collapse of the Somali State: The Impact of the Colonial Legacy*. London: Haan Associates Publishers, 1996.

Kirby, A. "Dawn of a Thirsty Century." 2000. Accessed online on 21 April 2016 at [news.bbc.co.uk/1/hi/sci/tech/755497.stm](http://news.bbc.co.uk/1/hi/sci/tech/755497.stm).

Laconte, E. *Life Rules: Why so Much is Going Wrong Everywhere at Once and How Life Teaches Us to Fix It*. Bloomington, IN: iUniverse.com, 2010.

Leeson, P., and C. Coyne. "Conflict-Inhibiting Norms." n.d. Accessed online on 4 April 2016 at [ccoynce.com/Conflict-Inhibiting\\_Norms.pdf](http://ccoynce.com/Conflict-Inhibiting_Norms.pdf).

Mohamed, M. "U.S. Strategic Interest in Somalia: From Cold War Era to War on Terror." 2009. Accessed online on 19 April 2016 at [somalitalkradio.com/2010/farmaajo/](http://somalitalkradio.com/2010/farmaajo/).

Monbiot, G. "The Tragedy of Enclosure." *Scientific American* (January 1994). Accessed online on 21 April 2016 at [monbiot.com/archives/1994/01/01/the-tragedy-of-enclosure/](http://monbiot.com/archives/1994/01/01/the-tragedy-of-enclosure/).

Muthusi, F. M., M. W. Mugo, and H. M. Gadain. "Water Sources Inventory for Central – South Somalia." Technical Report No W-17, FAO-SWALIM (GCP/SOM/048/EC) Project. Nairobi, Kenya, 2009. Accessed online on 6 March 2016 at [faoswalim.org/ftp/Water\\_Reports/Cleared/W-17%20Water%20Sources%20Inventory%20for%20Central%20-%20South%20Somalia.pdf](http://faoswalim.org/ftp/Water_Reports/Cleared/W-17%20Water%20Sources%20Inventory%20for%20Central%20-%20South%20Somalia.pdf).

Muthusi, F., G. Mahamud, A. Abdalle, and H. M. Gadain. "Rural Water Supply Assessment." Technical Report No-08, FAO-SWALIM. Nairobi, Kenya, 2007.

Osman, A. "Order out of Chaos: Somali Customary Law in Puntland and Somaliland." n.d. Accessed online on 15 April 2016 at [c-r.org/our-work/accord/somalia/order-chaos.php](http://c-r.org/our-work/accord/somalia/order-chaos.php).

Ostrom, E. *Governing the Commons: The Evolution of Institutions for Collective Action*. New York: Cambridge University Press, 1990.

———. *Understanding Institutional Diversity*. Princeton, NJ: Princeton University Press, 2005.

———. "A Diagnostic Approach for Going Beyond Panaceas." *Proceedings of the National Academy of Sciences* 104 (September 2007): 15181–15187.

Ostrom, E., R. Gardner, and J. Walker. *Games and Common-Pool Resources*. Ann Arbor, MI: University of Michigan Press, 1994.

Puntland Development Research Center. "Integration of Customary Law into Sharia and Secular Law." 2003. Accessed online on 21 April 2016 at [pdrcomalia.org/publication/BOOKIII.HAR.pdf](http://pdrcomalia.org/publication/BOOKIII.HAR.pdf).

———. "Restoring Order to a Lawless Society." n.d. Accessed online on 13 April 2016 at [pdrcomalia.org/publication/BOOK%20II%20Main%20Text%20Edited.pdf](http://pdrcomalia.org/publication/BOOK%20II%20Main%20Text%20Edited.pdf).

*Radio Mogadishu*. "Madaxweyne Shariif oo ka hadlay Abaaraha." 2010. Accessed online on 31 April 2016 at [radiomuqdisho.net/news/wararka/2963-madaxweyne-shariif-oo-ka-hadlay-abaaraha-dhegeyso.html](http://radiomuqdisho.net/news/wararka/2963-madaxweyne-shariif-oo-ka-hadlay-abaaraha-dhegeyso.html).

Rowland, M. "A Framework for Resolving the Transboundary Water Allocation Conflict Conundrum." National Center for Biotechnology Information. *Ground Water* 43, no. 5 (September-October 2005): 700–705.

Tamas, P. "Water Resource Scarcity and Conflict: Review of Applicable Indicators and Systems of Reference." 2001. Accessed online on 6 April 2016 at [unesdoc.unesco.org/images/0013/001333/133307e.pdf](http://unesdoc.unesco.org/images/0013/001333/133307e.pdf).

Tucker, C. "Common Property Design Principles and Development in a Honduran Community." n.d. Accessed online on 13 April 2016 at [fletcher.tufts.edu/praxis/archives/xv/Tucker.pdf](http://fletcher.tufts.edu/praxis/archives/xv/Tucker.pdf).

UNESCO. "The United Nations World Water Development Report." n.d. Accessed online on 11 April 2016 at [unesco.org/water/wwap/wwdr/index.shtml](http://unesco.org/water/wwap/wwdr/index.shtml).

*Waterwiki.net*. "Somalia – Water Management amid Recurrent Drought." n.d. Accessed online on 13 April 2016 at [waterwiki.net/index.php/Somalia\\_\\_Water\\_Management\\_amid\\_recurrent\\_drought#WHAT](http://waterwiki.net/index.php/Somalia__Water_Management_amid_recurrent_drought#WHAT).

World Bank. "Traditional Governance in Somalia: South Central Somalia." 2005. Accessed online on 2 May 2016 at [worldbank.org/etools/docs/library/153065/southcentralsomalia.pdf](http://worldbank.org/etools/docs/library/153065/southcentralsomalia.pdf).

Xaaji, Q. "Doqon haddaan doqon loogu yeerin soo iyadu isma oga?" 2010. Accessed online on 11 May 2016 at [algedo.com/2010/10/23/doqon-haddaan-doqon-loogu-yeerin-soo-iyadu-isma-oga-by-qeys-xaaji/](http://algedo.com/2010/10/23/doqon-haddaan-doqon-loogu-yeerin-soo-iyadu-isma-oga-by-qeys-xaaji/).