

ECOLOGICAL ENGAGEMENT IN TRIBAL COMMUNITIES
IN THE CONTEXT OF COMMON-POOL RESOURCES

by

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DEDICATION

This work is dedicated to those who care about Mother Nature, who respect the Earth as a collective wealth and who do not put their personal interests before those of others.

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LIST OF ABBREVIATIONS

Abbreviation	Description
CLT	- Collective Land Titles
CPR	- Common-Pool Resources
CR	- Common Resources
ELC	- Economic Land Concessions
FAO	- Food and Agriculture Organization of the United Nations
ICCA	- Indigenous Community Conserved Areas
IPCC	- Intergovernmental Panel on Climate Change
MLMUPC	- Ministry of Land Management, Urban Planning and Construction
NEE	- Non-Equilibrium Ecosystems
NTFP	- Non-Timber Forest Production Organization
OHCHR	- Office of The High Commissioner for Human Rights

I: INTRODUCTION

Nature is not unfeeling matter; it is full of invisible forces with their own intelligence and deep knowing. We need to re-acknowledge the existence of the spiritual world within creation if we are even to begin the real work of bringing the world back into balance. Only then can we regain the wisdom of the shamans who understood how to communicate and work together with the spirit world.

(Vaughan-Lee, 2013)

We are beginning to play with ideas of ecology, and although we immediately trivialize these ideas through commerce or politics, there at least continues to be an impulse in humans to unify and thereby sanctify the total natural world, of which we are a part (Bateson, 1979).

Every day, thousands of environmental campaigns, movements, and actions rise worldwide to raise awareness in people and policymakers to save the planet, combat climate change, improve consumption models and make the earth a better place to live for human beings and other species. Every action warns people of the tragedy of climate change, destruction, drought, deforestation, flood and other natural disasters.

Nevertheless, few of these movements believe in the human connectivity to nature and humans' role in shaping and reshaping the natural environment through their modes of living. As Llewellyn Vaughan-Lee notes in *The Call of the Earth* (2013), "all [these impacts] contributes to the first manmade mass extinction of species that the planet has suffered, caused by industrialization and people's addiction to a materialistic lifestyle. And we are all responsible: simply by traveling by car or plane, we actively participate in an ecologically destructive culture."

Another example is the fact that greenhouse gases are causing global warming to have increased by 31% since preindustrial times. Carbon dioxide and other gases trap heat in the atmosphere, causing global temperatures to rise. Although carbon dioxide has natural sources, such as volcanic eruptions, human activities have caused its quantity to increase from 280 parts per million (ppm) before the development of industry to over 400 ppm

today. Other greenhouse gases include methane and nitrous oxide—also produced by human activities—which have contributed to a 0.6°C increase in the global air-surface temperature in recent decades. The Intergovernmental Panel on Climate Change (IPCC), which includes over 1,300 scientists from the United States and other countries, forecasts a temperature rise of 2.5 to 10°F over the next century (other sources predict an increase of 0.5 to 8.6°F by 2100). Particulate matter from vehicles, factories, fires and eruptions cool the atmosphere, but researchers at the National Center for Atmospheric Research nevertheless predict a 90% chance that human activities will cause a 1.7 to 4.9°C increase in global temperatures by 2100 (Green, 2017).

As Carson (2015) cites in *Silent Spring*, “the history of life on Earth is an interaction between living things and their surroundings.” She believes that “To a large extent, the physical form and the habits of the earth's vegetation and its animal life have been molded by the environment. Considering the whole span of earthly time, the opposite effect, in which life modifies its surroundings, has been relatively slight. Only within the moment of time represented by the present century has one species—man—acquired the significant power to alter the nature of his world. During the past quarter-century, this power has not only increased to one of disturbing magnitude, but it has changed in character. The most alarming of all man's assaults upon the environment is the contamination of air, earth, rivers, and sea with dangerous and even lethal materials. This pollution is for the most part irrecoverable; the chain of evil it initiates not only in the world that must support life but in living tissues is for the most part irreversible.”

While for indigenous peoples the world is a sacred, interconnected living whole that cares for us and for which we, in turn, need to care—Mother Earth—for Western culture it has become an object of exploitation.

For hundreds and thousands of years, indigenous and tribal communities have protected and conserved natural resources and common pools in an excellent manner. Equipped with long-established indigenous knowledge, the traditional owners of these resources steadily and sustainably participated in rescuing their ecosystem, which is now being mistreated by aggressive development systems.

They continue to improve their traditional knowledge, generation after generation, and know what to ask from Mother Earth and what to give her in return. “They learned this knowledge from their ancestors. In this way, knowledge is passed on from one generation to the next. They know how to protect their resources sustainably, so their children benefit from them, because of their and their ancestors’ engagement in ecology.

The amount of knowledge that people acquire about nature differs with their level of connectivity and engagement with nature. Those who live in river banks, on top of mountains or on a boat at sea know how to communicate with nature. They clearly understand that their lives and livelihoods depend on Mother Nature and choose to live a life in harmony with her. As this knowledge evolved, human beings sought alternative ways of living, which were more destructive for the planet: land degradation and deterioration is rooted in alternative ways of living such as conventional and industrial agriculture, and industrialization.

Objectives of this study

This research aims to discuss ecological engagement in the context of common-pool resources (CPR), from different perspectives: Hardin’s tragedy of common resources and Ostrom’s doctrine on governing CPR. In this study, I analyze factors involving both theories.

I examine the tragedy of the commons from different perspectives and re-introduce an alternative paradigm introduced by Elinor Ostrom to reject the theory of the commons. The principles mentioned in this alternative paradigm demonstrate the role of indigenous knowledge in the conservation of natural resources and the strengthening of their engagement and participation in nature. I present several examples of Indigenous Community Conserved Areas (ICCAs) in Iran and Italy to exemplify Elinor Ostrom’s principles and determine which factors play a role in community resilience.

My goal is to understand these tribal communities’ level of engagement and participation in ecology and their management of common resources, as well as to identify which factors are not considering in theories of managing common pool resources initiated by Hardin and Ostrom. I attempt to find out to what extent communities participate in their environment and which factors attach or detach them from nature.

In chapter one, I define the relevant concepts and terminologies, and in chapter two I discuss the tragedy of the commons. Chapters three and four are dedicated to examining Ostrom's doctrine on governing the commons and to introducing the methodology of this study, respectively. In chapter five, I analyze and discuss my findings through a critical review, followed by a conclusion in chapter six.

II: DEFINITIONS AND CONCEPTS

Tell me the story of the river and the valley and the streams and woodlands and wetlands, of shellfish and finfish. A story of where we are and how we got here and the characters and roles that we play. Tell me a story, a story that will be my story as well as the story of everyone and everything about me, the story that brings us together in a valley community, a story that brings together the human community with every living being in the valley, a story that brings us together under the arc of the great blue sky in the day and the starry heavens at night...

—Thomas berry, *The Dream of the Earth* 1998

The first requirement was to understand the definitions of the terms used in this study: where they come from and what is meant by “ecological,” “ecological engagement” and “the commons” when discussing “engaged ecology” and CPR. To better understand and analyze the meanings of these terms, I discuss the concept of ecological engagement in the CPR context through a natural-resource management approach. This demarcation helped me to evade addressing further aspects of the issue that might affect the topic beyond the time-frame and resources available for this study.

In modern literature, the German zoologist Ernst Haeckel coined the term *ecology* perhaps for the first time in 1866 when he wrote that “By ecology we mean the body of knowledge concerning the economy of nature—the investigation of the total relations of the animal both to its inorganic and to its organic; including above all, its friendly and inimical relations with those animals and plants with which it comes directly or indirectly into contact—in a word, ecology is the study of all those complex interrelationships referred to by Darwin as the conditions of the struggle for existence.”

One century later, Udome’s *Ecology: the link between the natural and social science* (1972) defines ecology as a term which is derived from the Greek root “oikos,” meaning “house,” combined with the root “logy,” meaning “the science of” or “the study of.” According to this definition, ecology is the study of the earth’s “households,” including the plants, animals, microorganisms, and people that live together as interdependent components. Because ecology is concerned not only with organisms but also with energy flows and material cycles on the lands, in the oceans, in the air, and in fresh waters,

Eugene believes that ecology can be viewed as “the study of the structure and function of nature.” It is understood that humankind is part of nature. Following this line of logic, other references also similarly define the science of ecology. Berkes (2005) believes the science of ecology occupies a unique position. Although much of ecology continues to be practiced as a conventional reductionist science, the more holistic approaches to ecology provide a new vision of the earth as an ecosystem of interconnected relationships in which human beings form part of the web of life.

According to the fact that a confirmed definition of the science of ecology exists ecology is not a new science. Human beings knew about ecology since ancient times, and strong sets of indigenous knowledge exist that are produced and reproduced by indigenous and local communities every day.

Ecology and engagement

The MacMillan dictionary defines engagement as the feeling of being involved in an activity, whereby it is synonymous with involvement, participation, and intervention. According to this definition, the ecological engagement (of humankind) means (people’s) participation in knowledge about the relation of living organisms to one another and their physical surroundings. Fabian (2015) notes that “We need an ‘Engaged Ecology’ that moves beyond concepts and energy-saving tips to actual deep practice—a way of being, thinking, and acting, that restores our relationship with our communities and the Earth. We need shared values.” She proceeds to note that “an Engaged Ecology is a set of values and instructions derived from Nature that can guide us back to harmony and restore our fundamental relationship with the Earth.” Fabian sets seven principles for an engaged ecology (*Table 1*), each of which invites people to consider, interpret and adapt these practices according to one’s situation, capacities and communities’ needs (*ibid*).

According to Lopes (*personal communication, 2016*), engaged ecology is a new/ancient/indigenous paradigm that seeks to understand and harmonize our relationship with the natural world by removing perceptual boundaries between humans and nature. He starts with the assumption that our inner world (memories, feelings, dreams) and outer world (rivers, trees, rocks, buildings) are intimately interconnected and

that engaged ecology is primarily concerned with the transformation of our hearts and minds to reawaken our sacred connection with the web of life that brought us forth.

Table 1: Fabian’s principles for an engaged ecology

	Principles	Practices
1	Nature’s brilliant design is all-pervasive	Cultivating awareness of nature
2	Nature adapts and self-regulates	Being opening to learning and change
3	Nature expresses innate potential	Developing empathy for all forms of life
4	Nature regenerates and nurtures new life	Cherishing and nurturing the young
5	Nature is efficient	Limiting consumption and waste
6	Nature functions cooperatively	Thriving as a community
7	Nature is a system of systems	Participating as citizens of the earth

Like Fabian, Lopes defines a series of principles and practices for engaged ecology (*Table 2*).

But unlike Fabian, Lopes insists more on the mutual connection between nature and communities. According to him, “Engaged Ecology will play an essential role in helping us to understand and cope with the daunting realities of the 21st century.”

Table 2: Lopes’ principles for an engaged ecology

	Principles	Practices
1	We are all connected	Coming to our senses
2	Truth is found in Nature	Cultivating awareness of nature
3	Everything flows	Being open to change
4	Community matters	Learning through community
5	Caring for the Earth	Developing empathy

Ecology and indigenous knowledge

All populations of different species living and interacting within an ecosystem are referred to collectively as a community, which Berkes (2005) describes as a world that increasingly looks like a single society: a “global village.” However, he believes that the shrinking cultural diversity of human society contributes to a detachment from ones’ environment and undermines a flourishing relationship to nature.

The above describes a highly paradoxical relationship, as illustrated by the following example: On the one hand, one study (Orr, 2017) shows that British people are becoming increasingly detached from wildlife, the countryside and nature. According to this study, seven out of ten people in the Jordans Cereals survey admitted they felt they were losing touch with the natural world, while one third said they did not know enough about the subject to teach their own children. One in three people could not identify an oak tree. According to Orr (2017), people simply cannot and will not rally round to save something they are not aware of.

On the other hand, according to Barceló (2017), the planet is the largest theme in terms of research output, highlighting how central the environment is to sustainability. More recent data reveals that in 2015 alone, nearly 37,000 scholarly papers were published on this theme globally, representing nearly half (46%) of the total sustainability science output in that year. He believes that people play a vital role in protecting nature, but that some of the problems we have caused can only be solved by harnessing nature.

According to Olson (2014), in this vast implication of humans and environments, our health, economies and happiness all depend in some way on how we interact with our environments. We share this Earth and its resources through varying forms of stewardship. And we also have indigenous communities, equipped with valuable knowledge, who have long struggled to maintain their dignity in a rapidly changing world. For some indigenous peoples, that means retaining aspects of their cultural heritage. For others, it means creating ideological and physical spaces in modern societies through processes of assimilation and differentiation.

Traditional peoples chose to be hunters or gatherers to compete with other populations to survive and settle on planet Earth. In this interconnected environment, some populations

fed from other populations to survive. They were hikers and campers and continuously sought knowledge to develop better ways of life. In a progressive process, they became equipped with sound knowledge of the flora and fauna of the land in which they lived. For example, Brody (1976) reports that the Inuit have 40 different names for snow, each identifying a specific form or condition of snow or ice. Also, according to different sources, Bedouin (Arab nomads) have 61 terms for different types, breeds, ages, shapes, sizes, region and variations of camel, and of course words relating to the business of raising camels in general (Musil, 1926).

Traditional peoples are deeply engaged with their natural environment, which they govern and protect independently. Their territory is part of their livelihoods, identity and culture, and they have an extensive and inclusive knowledge about the local web of life. The knowledge that we call indigenous and traditionally ecological is according to Berkes (2005) as old as ancient hunter-gatherer cultures. Through this valuable knowledge that evolved and was transferred from heart to heart, these peoples could protect themselves and their resources for generations.

A good example of this engagement with the local ecology is the connectivity and participation of indigenous communities in CPRs (i.e., their territories and natural, spiritual, socio-cultural and economic resources).

Varieties of ecological engagement

The biological history of human evolution has a direct relation to ecological engagement. For example, the quality and level of people's engagement in ecology decreased or changed from primitive peoples to hunter-gatherers, nomads, farmers and modern civilians.

Hunter-gatherers are psychophysically anchored to their lands. They have hunted in the land and can identify the names and behaviors of hundreds of flora and fauna species, weather phenomena, earth phenomena and so forth. So today, when we walk the land and bed down on it, we are living in the most primitive, elemental way known to our species and returning to a way of life that is intrinsic to human experience. We are shedding the burden of millennia of civilization. (Copeland & Copeland, 2011).

But it is more lifestyle than time and space which causes these changes. For instance, although nomadic lifestyles continue to be practiced in many forms within indigenous communities and numerous groups of farmers, fishermen, rangers and researchers practicing deeply engaged forms of ecology, there are other groups of people living in the middle of megacities who have minimal access or connection to nature.

Common Pool Resources (CPR)

In legal literature, commons or *res commune* is defined as “things common to all; that is, those things which are used and enjoyed by everyone . . . but can never be exclusively acquired as a whole” (Black Dictionary of Law, 1990). It is important to note that this legal definition applies to the resource system—forestry ecosystems, marine and coastal ecosystems, irrigation systems, grazing lands, oceans and watersheds which are used and enjoyed by everyone—but not to the units from that resource system such as woods, fisheries and water, all of which are rivalrous (Araral, 2013). The CPRs in this study refer to natural resources such as rangelands, groundwater, mountains, forests and so forth.

III: THE TRAGEDY OF THE COMMONS

(The dark side of ecological engagement)

In 1968, a paper appeared in the journal *Science* outlining a macroeconomic concept referring to the problem of the common use of environmental resources (Dacko 2015). Its author, Garrett Hardin (1968), states that the natural human desire to maximize individual economic benefit led to the overexploitation of environmental resources, to the detriment of the whole of society.

Hardin's description of the tragedy is as follows:

“Picture a pasture open to all. It is to be expected that each herdsman will try to keep as many cattle as possible on the commons. Such an arrangement may work reasonably satisfactorily for centuries because tribal wars, poaching, and disease keep the numbers of both man and beast well below the carrying capacity of the land. Finally, however, comes the day of reckoning, that is, the day when the long-desired goal of social stability becomes a reality. At this point, the inherent logic of the commons remorselessly generates tragedy. As a rational being, each herdsman seeks to maximize his gain. Explicitly or implicitly, more or less consciously, he asks, “What is the utility to me of adding one more animal to my herd?”

He also states that “this utility has one negative and one positive component. The positive component is a function of the increment of one animal. Since the herdsman receives all the proceeds from the sale of the additional animal, the positive utility is [obvious]. The negative component is a function of the additional overgrazing created by one more animal. Since, however, the effects of overgrazing are shared by all the herdsmen, the negative utility for any decision-making herdsman is only a fraction [of the burden] . . . The rational herdsman concludes [from this] that the only sensible course for him to pursue is to add another animal to his herd. And another, and another . . . But this is the conclusion reached by each rational herdsman sharing commons. Therein is the tragedy. Each man is locked into a system that compels him to increase his herd without limit, in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his

own best interest in a society that believes in the freedom of the commons. Freedom in commons brings ruin to all” (ibid.).

Hardin's main concern is overpopulation, whereby he uses the example of commonly used grazing lands. According to Hardin, the land could provide adequately if the number of herders grazing cattle on it was kept in check through natural population-control mechanisms such as war and disease (Rouse, 2013).

Regarding the grazing of cattle, Hardin notes that the commons became completely depleted, although this was not in the interest of the local community. It is not only in farming that ecological and social problems appeared as consequences of individually rational economic activity: Hardin's concept found confirmation in overexploited water supplies, depleted fisheries, cleared forests, illegal rubbish dumps, and rivers degraded by sewage.

Ponce (2011) names the absence of regulation as a tragedy of CPRs. He states that while CPRs are shared properties and nobody officially owns any part of it, some users would prefer a bigger and better share, and benefit from it without any limitation, because of which the commons is depleted and eventually ruined. He subsequently argues that at the root of the tragedy lies the unrestrained self-interest of certain individuals, reasoning that if the commons are eventually used up, whoever effects the greatest use stands to benefit the most. Under these circumstances, the benefit-cost ratio is astronomical: while the benefits accrue solely to the user, the costs are spread among all others sharing the commons.

According to Ponce, to understand the importance of Hardin's tragedy, we must examine how nature works. Most natural resources are held in common, i.e., are shared by many. For instance, as he indicates, the air (our atmosphere) is the quintessential commons: no group or country can claim exclusive ownership of it. Diffusion acts to equalize all constituents, such that the causes of some actions are the effects of others. No better example comes to mind than that of global warming. The excessive pumping of carbon dioxide into the atmosphere by certain countries results in the melting of glaciers elsewhere on the planet. Another example of a typical commons is groundwater. Nobody owns groundwater; it is technically up for grabs. However, individual pumping of too

much groundwater can result in its depletion, not to mention of other related effects or losses, such as land subsidence and salt-water intrusion. Again, diffusion acts to spread the effect of the individual's use among all. Eventually, depletion by a few means depletion for all.

Unlike groundwater, surface water is subject to appropriation, as is the practice in the United States. Therefore, one may think that surface water is not commons. However, the real issue is subtler than it appears. Surface water carries solids in the form of suspended sediments and dissolved salts, and acts as the means of carrying these solids from sources in the mountains to sinks in the oceans (for peripheral continental basins). Every iota of consumptive use of water (for instance, for irrigation) encroaches upon the right of nature to export these solids, particularly the salts, to the ocean. This “right” is seen as commons; i.e., by definition, a resource that can be used by many and abused by a few. Taking most or all the runoff and converting it into evaporation and evapotranspiration (as is usually the case in highly developed basins) wastes the commons' right to export the salts, resulting in the eventual ruin of the land. Again, omnipresent diffusion takes its toll. The salts are diffused locally and end up polluting the local and sub-regional surface and groundwater, laying waste to neighboring ecosystems. Thus, while surface water *quantity* may not be commons in practice, surface water *quality* clearly is (Ponce 2011).

Dacko (2015) connects Hardin's theory with the idea of sustainable development. He says that “The problem brought up by Hardin is very important from the perspective of the idea of sustainable development. After all, the relationships in which the pillars, or subsystems (ecological, social and economic ones), of sustainable development remain should be harmonious enough to enable simultaneous maximization of their objectives.” He believes the social, economic and ecological subsystems should not exclude one another. However, according to him, the tragedy of the commons is a classic example of a situation in which the economic subsystem conflicts with the ecological and social subsystems. As Hardin indicates, this phenomenon occurs in various spheres of human activity and cannot be overcome by technical means alone.

It is in the vital interest of society to better understand and control the mechanism that leads to exceeding the environment's regeneration capacities and leads its users to incur

losses instead of benefits. This issue is examined by a systemic approach to management which identifies the universal pattern of system behavior referred to as the archetype of the tragedy of the commons. Thus, the phenomenon is systemic in origin, and we can learn more about its development in time (or even neutralize it) by means of the method of system dynamics. Hardin believes a system affected by the tragedy of the commons functions in a way that diverges from the idea of sustainable development. It contradicts not only the postulate of intergenerational justice (through the overexploitation of environmental resources, which can even lead to an irretrievable loss), but also intra-generational justice (through the actions of some users of the environment causing inconveniences that afflict the whole of society). Therefore, we cannot ignore the symptoms of the tragedy of the commons while attempting to implement local ideas of sustainable development.

The tragedy of the commons and protected areas

Hardin's ideas are fundamental in understanding current debates on park management. In order to present the risks of overexploiting environmental resources, Hardin uses the example of a pasture in which the absence of a collective ruling system leads to a tragedy, i.e., the ruin of the commons (Wozniak & Buchs, 2013).

“To strengthen his point, Hardin presents the example of national parks in the United States: The National Parks present another instance of the working out of the tragedy of the commons. At present, they are open to all, without limit. The parks themselves are limited in extent—there is only one Yosemite Valley—whereas population seems to grow without limit. The values that visitors seek in the parks are steadily eroded. Plainly, we must soon cease to treat the parks as commons or they will be of no value to anyone. What shall we do? We have several options. We might sell them off as private property. We might keep them as public property but allocate the right to enter them. The allocation might be because of wealth, using an auction system. It might be based on merit, as defined by some agreed-upon standards. It might be by lottery. Or it might be on a first-come, first-served basis, administered to long queues. These, I think, are all the reasonable possibilities. They are all objectionable. But we must choose—or acquiesce in the destruction of the commons we call our National Parks” (Hardin, 1968).

As Hardin recognizes, the tragedy of the commons is less likely to occur where property rights are well-defined and secure, as each owner has ample incentive to act as a steward, thereby caring for the underlying resource and preventing its overuse, both for him/herself and for others who may value it (McArdle, 2012).

According to McArdle (2012), pursuing the identification and expansion of property rights in ecological resource management is difficult, but the potential benefits are substantial. What we are learning is that more sustainable practices tend to result where property-based institutions can be adapted to ecological resources.

The importance of property rights for environmental conservation is not a new idea. It lies at the core of the early American conservation movement. After all, it was the institution of property rights that enabled the first Audubon Society to create private reserves to protect birds from hunters who sought to collect their feathers for women's hats. It was the institution of property rights that enabled Rosalie Edge to transform Hawk Mountain from a hunting ground into a bird sanctuary. It is the institution of property rights that allows land trusts large and small, from the American Prairie Foundation to the Western Reserve Land Conservancy, to protect precious places. –Another organization that uses this model is the Nature Conservancy. The necessity today is to continue moving beyond property in land and adopt property institutions within a wider array of ecological resources so that they have the chance to succeed in those areas where mutual coercion, mutually agreed upon has failed (ibid).

IV: TRADITIONAL ECOLOGICAL KNOWLEDGE AS AN ALTERNATIVE PARADIGM

Elinor Ostrom shared the Nobel Prize in Economics in 2009 for her lifetime of scholarly work investigating how communities succeed or fail at managing common pool (finite) resources such as grazing land, forests and irrigation waters. According to Araral (2013), she has at least three major and interrelated legacies to environmental governance: (1) as a critique of Hardin, (2) for establishing an international research agenda to identify the determinants of collective action in the commons and (3) for establishing the Bloomington School of institutional analysis, otherwise known as the Ostrom Workshop. Since Hardin argued for the tragedy of the commons, privatization or state control has been proposed as a solution to it. However, in addition to other criticisms, Ostrom opposes such an idea and opens the possibility of the sustainable management of CPRs through local peoples' autonomous institutions. Ostrom's achievement effectively answers popular theories about the tragedy of the commons, which has been interpreted to mean that private property is the only means of protecting finite resources from ruin or depletion. She has documented in many places around the world how communities devise ways to govern the commons to assure their survival for their needs and future generations. (Walljasper, 2011).

A classic example of this is her study in a Swiss village where farmers tend private plots for crops but share a communal meadow to graze their cows. While this would appear to be a perfect model to prove the tragedy-of-the-commons theory, Ostrom discovered that there were no problems with overgrazing. This is due to a common agreement among villagers stating that one can graze more cows on the meadow than one can care for over the winter: a rule that dates to 1517. Ostrom documented similar examples of "governing the commons" in Kenya, Guatemala, Nepal, Turkey and Los Angeles.

According to Sanjayan (2009), although [Hardin's] premise influenced the conservation movement, Ostrom's work has shown that the "tragedy of the commons" does not always have to happen. Ostrom has devoted her career to demonstrating how a fundamental premise upon which most modern conservation strategies are built—the "tragedy of the commons"—is at times false.

Elinor Ostrom's work challenges traditional assumptions around CPRs. Indeed, her work is based fundamentally on a rejection of Hardin's famous parable of the tragedy of the commons, as set out in her most well-known work, *Governing the Commons: The Evolution of Institutions for Collective Action* (1990), in which she demonstrates that communities can successfully manage commons even in the absence of private property rights and a strong regulatory authority. In analyzing CPRs from around the world, Ostrom concludes that "informal institutions with certain characteristics . . . can successfully manage common pool resources even in the absence of a formal system of private property rights". In doing so, Ostrom offers important insights into a wide range of contemporary issues, from deforestation to carbon emissions, and suggests that neither government regulation nor market-based solutions necessarily represent the direction forward.

Her research proposes that communities can and will impose substantial costs to themselves to sustainably manage a common resource if (a) the expected benefits of managing a resource are greater than the cost of investing in the rules to govern those benefits, (b) loss of short-term economic gains are offset and (c) the potential of cheating is eliminated (Sanjayan, 2009).

Furthermore, Ostrom's work suggests there is another way forward. Not only does she showcase that CPR users can work together to reverse environmental degradation and sustainably govern their commons; she also provides a potential framework for doing so. Her decades of research reveal that all successful cases of commons self-governance have in common eight principles (Chow & Weeden, 2012) for how commons can be governed sustainably and equitably in a community.

There are many of examples of self-governed common resources worldwide, some of which are registered as Indigenous Community Conserved Areas (ICCAs) in the ICCA consortium registry and others which have yet to do so. This form of conservation by local communities, as Ostrom states, is a sustainable method for protecting natural resources for themselves and future generations.

The global coverage of ICCAs has been estimated to be comparable to that of governments' protected areas, namely about 13% of the planet's terrestrial surface.

Globally, 400–800 million hectares of forest are owned or administered by communities. More land and resources are under community control in other ecosystems. By no means are all areas under community control effectively conserved (i.e., can be considered as ICCAs). In this chapter, I introduce the ICCA consortium as a telling example of Ostrom’s self-governed common pool.

Table 3: Ostrom’s governing principles

Principles	
One	The CPR has clearly-defined boundaries (effective exclusion of external unentitled parties)
Two	There is congruence between the resource environment and its governance structure or rules
Three	Decisions are made through collective-choice arrangements that allow most resource appropriators to participate
Four	Rules are enforced through effective monitoring by monitors who are part of or accountable to the appropriators
Five	Violations are punished with graduated sanctions
Six	Conflicts and issues are addressed with low-cost and easy-to-access conflict resolution mechanisms
Seven	Higher-level authorities recognize the right of the resource appropriators to self-govern
Eight	In the case of larger CPRs: rules are organized and enforced through multiple layers of nested enterprises

In another study, Constanza (2014) emphasizes the governance categories clustered by Borrini-Feyerabend et al. (2002, 2010):

A. Governance led by government. State agencies are the principal recipients of authority, responsibility and accountability. The level of government may vary, and the state may or may not have the legal obligations to consult management decisions.

B. Shared governance, where formal authority, responsibility and accountability still rest principally in one agency but there is substantial collaboration among two different agencies that recognize each other as legitimate to share the decision-making process.

C. Private governance. Authority, responsibility and accountability rest primarily in corporations, private owners or are delegated by the legal owner to one or more organizations.

D. Governance by indigenous peoples and local communities where these groups or their representatives hold the principal authority, responsibility and accountability of the areas and resources they have usually inhabited and co-evolved with. It is the customs around the area that define its conservation-management objective (categories I to VI, see Fig. 2.1). (I explain this type of governance later in this thesis).

The principles mentioned in Ostrom's doctrine show the role of indigenous knowledge in the conservation of natural resources and the strengthening of their engagement and participation in nature. I present two examples of ICCAs in Iran (*Box1*), and Italy (*Box2*) to exemplify Ostrom's principles. To do so, I introduce two communities of different socio-cultural and geographical settings to determine which factors play a role in community resilience.

Governing the commons and ICCAs as a form of ecological engagement

Pretty (2002) estimates that humans lived close to the land as hunter-gatherers for 350,000 generations. He proposes that a sense of belonging, place and feeling embedded within the broader natural world characterizes these cultures. Only since the industrialization and urbanization of the Enlightenment have we moved away from being in close contact with nature. The influential ecologist Leopold (1949) writes that "We abuse land because we regard it as a commodity belonging to us. When we see land as a commodity to which we belong, we may begin to use it with love and respect."

Ecopsychologists (cf. Roszak et al., 1995; Roszak, 2001; Fisher, 2002) have echoed Leopold's statement in stating that feeling a sense of belonging to the broader natural community may be a prerequisite for increasing environmental protection (Mayer & Frantz, 2004).

Mayer and Frantz (2004) present a scale designed to measure individuals' experiential sense of oneness with the natural world and examine previous approaches to measuring humans' fundamental relationship with the natural world: the basic core of individuals' belief systems, the foundational truths about self, the physical world and social reality.

Indigenous and Community Conserved Areas is the name adopted since the beginning of the millennium to describe the natural sites, resources and species' habitats conserved in a voluntary, common and self-directed way by indigenous peoples and local communities throughout the world. This conservation practice—profoundly intertwined with local strategies for livelihoods, the spiritual and material values of local cultures, and many local attempts to secure land and resource rights—is the oldest on earth. Paradoxically, it is also the least understood and officially recognized, and it is in extreme jeopardy today under a variety of external and internal threats (e.g., extractive industries, land grabbing, privatization of natural resources, loss of local languages, knowledge, skills, institutions, values and so forth).

A close association is often found between a specific indigenous people or local community and a specific territory, area or body of natural resources. When such an association is combined with effective local governance and conservation of nature, we speak of “ICCAs”. For many people and communities that relationship is far richer than can be expressed in words. It is a bond of livelihood, energy and health. It is a source of identity and culture, autonomy, and freedom. It is the connecting tie among generations, preserving memories from the past and connecting them to the desired future. It is the ground on which communities learn, identify values and develop self-rules. For many it is also a connection between visible and invisible realities, and material and spiritual wealth. With territory and nature come life, dignity and self-determination as peoples.

In the last decades, ICCAs have become known and recognized as essential features for the conservation of nature that have come under attack by a variety of economic and political forces on the planet. They include cases of continuation, revival or modification of traditional practices, some of which are of ancient origin, as well as new initiatives, such as restoration of ecosystems and innovative uses of resources taken up by indigenous peoples and local communities in the face of new threats or opportunities.

Significance of ICCAs (*adopted from ICCA consortium website*)

- Indigenous and Community Conserved Areas help to conserve critical ecosystems and threatened species, to maintain essential ecosystem functions (e.g., water security), and to provide corridors and linkages for animal and gene movement, including that between two or more officially protected areas.
- Indigenous and Community Conserved Areas are the basis of cultural and economic livelihoods for millions of people, securing resources (energy, food, water, fodder) and income.
- Indigenous and Community Conserved Areas are part of indigenous peoples' and local communities' resistance to destructive 'development,' such as rainforests threatened by mining, dams and logging industries, ecologically sensitive high-altitude ecosystems threatened by tourism, over-exploitation of marine resources by industrial fishing and so forth.
- Indigenous and Community Conserved Areas are based on rules and institutions "tailored to the context," (bio-cultural diversity), skilled at adaptive management and capable of flexible, culture-related responses.
- They are built on sophisticated collective ecological knowledge and capacities, including sustainable use of wild resources and maintenance of agrobiodiversity, which have stood the test of time. They are typically designed to maintain crucial livelihood resources for times of stress and need, such as during severe climate events, war and natural disasters.

They offer lessons in systems of conservation that integrate customary and statutory laws.

Example of managing common resources by the indigenous community in absence of the tragedy

Box 1- An ICCA initiative from Baluchistan, Iran

Kishkor-Koohchir, Baluchistan, Iran

Baluchistan is located in non-equilibrium ecosystem with semi-arid climate in south Asia, a transboundary province between Iran and Pakistan. Due to unpredictable rainfall and drought seasons, both rural communities and tribal nomads are equipped with various watershed conservation mechanisms that help them to carefully manage their water trajectory through a complex system of qanats (horizontal tunnels), hootak (pools) and degars (wells). For example, the Kishkor-Koohchir, a Baluchi tribal community, are practicing one of these mechanisms for sustainable use of their pasture and maintain their territory resources. Before every horizontal migration, men called goolah, travel to the newly growing pastures and analyze the pasture capacity for the number of animals which are supposed to graze in specific period of time and also the best area for the livestock to graze. They share this information with tribal elderlies and leaders who then determine about the number of animals to enter the pasture.

Kishkor-Koohchir (*Table 3*) and Ampezzo Valley (*Table 4*) are good examples of self-governing through local institutions that Ostrom argued and described through eight principles (*Table 3*). This tribal community clearly defined boundaries for their territory (principle 1), have governance structure for managing their resources (principle 2), decide collaboratively (principles 3&8), have strong monitoring and evaluation system (principles 4&7), have mechanism for punishment and penalty for those who violate local rules (principle 5), have conflict resolution system (principle 6).

The Ampezzo Valley, Italy

The Regole of the Ampezzo Valley, an institution with a recorded history of nearly 1,000 years, still manages today the common property resources its members established centuries ago, when the Regolieri created a high-altitude pasture and started the sustainable production of timber in one of most spectacular areas of the Alpine Dolomites (Italy). Through time, the inhabitants of the valley maintained their land rights and sustained their own livelihoods thanks to their internal unity and skills as diplomats, ensuring agreements with all the dominant powers of the day, from the Venetian Republic at the time of Marco Polo, to the Emperors of the Austrian-Asburgic dynasty and many others. In 1918, at the end of the First World War, the property of the Regole was annexed by the Italian state. Again, because of the personal skills of the Regolieri and because of the importance and visibility of the landscape they managed to conserve, the Regole maintained its autonomous status and its collective ownership of 16,000 hectares of land. But they were to achieve more. Their institution is now formally in charge of governing the Parco Naturale delle Dolomiti d'Ampezzo a regional protected area established partially on the Regole's land (4,700 hectares) and partially on land belonging to the Italian state. The formal recognition of the governance of a protected area by a community institution required modifications to the national and regional legislation. The Regole achieved that, obtained a tax-free status and now also receive funds and subsidies from the Veneto regional government, the Italian state and even the European Union. Noticeably they obtained all this despite some eyebrow-raising characteristics, including that their inherited membership rights and

Box 2- Continued

responsibilities are passed-on nearly solely along a male descendant line (to their merit, they recently had a woman as President!). Indeed, their ICCA is very important, it forms the core of one of the only two natural World Heritage Sites recognized in Italy, and their example is an inspiration for other ICCA-related communities, in Italy and elsewhere.

V: METHODOLOGY

The research paradigm

The concept of ecological engagement is about the connection between humans and nature. This study aims to discuss the theories related to the management of the commons by man-made structures or institutions. Hence, human elements and entities, in the form of indigenous communities, institutions, and public and private sectors are considered. I adopt constructivism as the research paradigm to analyze various perspectives towards managing CPRs. In a constructive study using qualitative methods, I attempt to interpret the reality I observed from reassessing different points of view. In this study, I collected information within a natural setting of Qashqai tribe. The main sources of information and data about the Qashghaie tribe (Iran) are the results of relevant studies and my own observations in the field. The study is pursued through a constructive research method.

Crnkovic's (2009) cites in her paper that "the key idea of Constructivist Research (or the Constructivist knowledge production), is the construction [of a knowledge], based on the existing knowledge, with possibly adding a few missing links that are needed to support the structure." According to her, "the construction proceeds through design thinking that makes a projection into the future envisaged solution (theory, artifact) and fills conceptual and other knowledge gaps by purposefully tailored building blocks to support the whole construction."

The constructive research method aims to solve practical problems with the support of an academic theoretical basis, by pursuing the following (Lehtiranta et al., 2018):

1. Selecting a practically relevant problem; the problem discussed in this study is the shortcomings in managing common resources.
2. Obtaining a comprehensive understanding of the study area; in chapters two and three, I discuss the concept of common pool resources (CPRs) through two authoritative paradigms, both of which I analyze from various perspectives.
3. Designing one or more applicable solutions to the problem; chapters two and three also contain case studies and practices that form applicable solutions to the problem presented by Ostrom and Hardin.

4. Demonstrating the solution's feasibility; chapters five and six contain critiques and assessments of Ostrom and Hardin's theories by scholars who found gaps in both theories. I also discuss the issue from the perspective that received less attention from researchers, namely a participatory engagement in managing the commons. By introducing two examples, I attempt to demonstrate that this collaborative approach in managing the commons is disallowed by Hardin and Ostrom, followed by a discussion of their critiques toward such an approach.
5. Linking the results back to the theory and demonstrating their practical contribution; in the final chapter, I connect the result of my study to the theories on which this paper is based: the tragedy of the commons and governing the commons. I also explain the impact of these theories in developing more reliable approaches to managing and governing the commons.
6. Examining the generalizability of the results; the collaborative approach that is introduced at the end of this study is a solid form of sustainable natural-resource management that is applicable in any area of study and in various geographical settings.

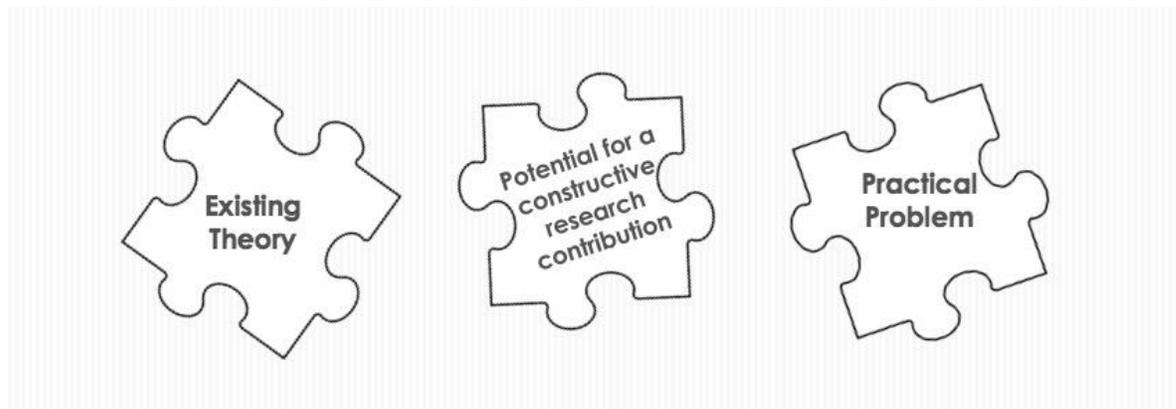


Figure 1. Potential for a constructive research contribution (Lehtiranta et al., 2018)

My position as a researcher

I have been an environmental practitioner for over 15 years and sought for communities' engagement and participation to protect nature, as well as to establish sustainable livelihoods through community-based and participatory approaches. To achieve these goals, I worked with the closest stewards of natural resources: indigenous and tribal communities residing in various geographical settings that are fully engaged in ecology,

all of which located in non-equilibrium ecosystems (NEE) in the Middle East, and South and South-East Asia. An NEE can be defined as a situation in which competitive exclusion is prevented in an ecological community due to disturbances affecting what would be stable communities through vectors such as predation, disease or other population disruptors. These factors in turn put ecological communities in an unstable condition in which uniformity is no longer present, creating a non-equilibrium state (Babeermann, 2016). In these ecosystems, the communities I became acquainted with were able to collaboratively manage and protect their common resources despite extreme weather and climate change, and non-equilibrium ecosystems' destructive impacts for hundreds and thousands of years, before aggressive development and careless policies violated their rights of access and control over their resources. In recent decades, we are observing rapid land degradation and deterioration both in private properties and institutional governance. Two outstanding doctrines related to the CPRs that I reviewed and analyzed in this study are the considerable legacies of Ostrom and Hardin in environmental governance, particularly in the commons literature (Arral, 2014): 1) The tragedy of the commons by Hardin and 2) Governing the commons by Ostrom. I am going to challenge these theories based on my observed CPR's through two examples.

From a critical review perspective, I analyze the methodological descriptions of two published case-study reports. Both cases were selected from the ICCA consortium and compiled based on qualitative data by collaborating with local and international experts.

- **Case selection.** In this qualitative study, I exemplify through several cases how indigenous knowledge can play a vital role in conservation and sustainable natural-resource management. I looked for situations in which CPRs were fully managed and conserved by communities and indigenous people, as well as private common properties that deteriorated due to external factors such as inadequate socio-environmental, political and ecological policy, and practices such as land grabbing and aggressive urban development.

The first two case studies are examples of ICCAs showing the ability of traditional communities in managing resources based on their indigenous knowledge. In both cases, namely **Kishkor-Koohchir**, Baluchistan and **Ampezzo Valley**, Italy, communities could manage their CPRs (water and pasture) for hundreds of years.

In the third case study, I discuss how external factors affected the common resources and resulted in land degradation, while considering the eight principles of Ostrom and the solutions that Hardin recommends in his theory.

The fourth case study is a brief review of small landowners and farmers in rural Cambodia who could properly manage their commons before land grabbing came to prevail.

By introducing the other two case studies, from Qashqai tribe and rural Cambodia, I attempt to show why the existing theories of Hardin and Ostrom do not offer a reliable solution for managing the commons. Neither privatization, nationalization nor self-governing is the answer to managing the commons. This is because the communities in the case studies in Iran and Cambodia lost their deep connection with Mother Nature, while considering principles and practices recommended by both theories.

- **Researcher and case-study interaction.** The case studies from Iran, Italy and Cambodia were selected because they form part of my field experience, except for Italy. These field practices presented me with a unique opportunity to observe communities' interactions with nature. From my two-year work in rural Baluchistan, I learned about traditional water conservation methods in arid and semi-arid ecosystems with NEEs. After three years of work with Qashqai nomads and accompanying them in their seasonal migrations, I learned about community-based rangeland management in common properties. Finally, my three-month field stay in rural Cambodia provided me with an exceptional opportunity to understand the importance of natural resources for the survival of communities living in extreme poverty conditions.

By including an example from Italy, I attempt to convey the message that not necessarily poor communities in developing countries benefit from indigenous knowledge. This source of knowledge is still a strong and reliable asset for communities participating in natural-resource management.

- **Theoretical framework.** In this research, I review two prominent theories related to managing natural resources: the tragedy of the commons by Hardin and governing the commons by Ostrom. A research paradigm is “the set of common beliefs and agreements shared between scientists about how problems should be understood and addressed” (Kuhn, 1962).

To better understand these outlooks, I conducted a critical review after extracting the crucial elements of each theory in order to analyze two case-study reports based on elements I found and my understanding of the topic. This structure helped me to describe missing factors affecting CPRs.

These case studies show that neither privatization nor indigenous knowledge is sufficient to protect and conserve natural resources. This is because there are numerous factors that threaten the Earth and CPRs, some of which are totally unpredictable or inevitable.

To understand the definitions and terminologies of this study, I adopted an interdisciplinary approach. As a result, my search covers a variety of disciplines, including ecology, philosophy, environment, agriculture, anthropology, economy and sociology.

In accordance with the multidisciplinary nature of the topic, every case study was approached from a unique perspective.

To find more resources I had to expand my research to other topics and theories. As a result, I used the following keywords: community engagement, common resources, natural resources, indigenous knowledge, ecology and society, community conserved areas, governance, land deterioration and resilience.

Method

- I defined two groups of elements based on Hardin and Ostrom's theories. I developed the theoretical framework based on Hardin and Ostrom's fundamental principles, which I combined with my observations in the field. My goal was to bring to the fore unsighted situations that probably neither of these authors considered in their works.

I benefited from a combination of mixed methods. The first part of the study was formed through archival research and data collected from scholarly journals, online sources, books, published reports and papers, and grounded theories (Corbin & Strauss, 2007).

- This study is a critical reflection on the result of reviewing the elements. After critically analyzing the topic, I argue why more studies are needed in this field. At the end of the thesis, I recommend a more integrated approach for managing CPRs in a sustainable way.

VI: RESULTS AND DISCUSSION

Nothing truly valuable can be achieved except by the unselfish cooperation of many individuals.

— *Albert Einstein, 1940*

The considerable legacy of Hardin and Ostrom has been reviewed and critiqued from different angles by other researchers, some of whom support the idea and some of whom provide fundamental critique. In this part of my study, I present a summary of related discussions from different sources, after which I add my observations and understanding of these theories based on two case studies from Iranian pastoral nomads and Cambodian farmers.

The tragedy of the commons' critics

Hardin's argument was widely accepted by economists and free-market enthusiasts, as well as several sociologists and environmentalists, and the seemingly obvious solution to the dilemma was privatization: the enclosure of the commons. However, this solution is not obvious. Hardin introduces some confusion on the notion of common goods (Wozniak & Buchs, 2013). Wozniak and Buchs address four different types of goods: (i) *private goods*, which can be considered as rival goods from the use of which an individual can be excluded; (ii) conversely, *pure public goods*, which are non-rival and non-excludable (i.e., national defense). In between these extremes are *impure public goods*, which are partially non-rival and/or partially excludable, such as (iii) *common goods*, defined as rival and non-excludable goods (i.e., a common forest or fishing resource) and (iv) "*club goods*." (Buchanan, 1965) defined as non-rival and possibly excludable goods due to potential congestion issues (i.e., a public swimming pool or a highway) (*figure 2*).

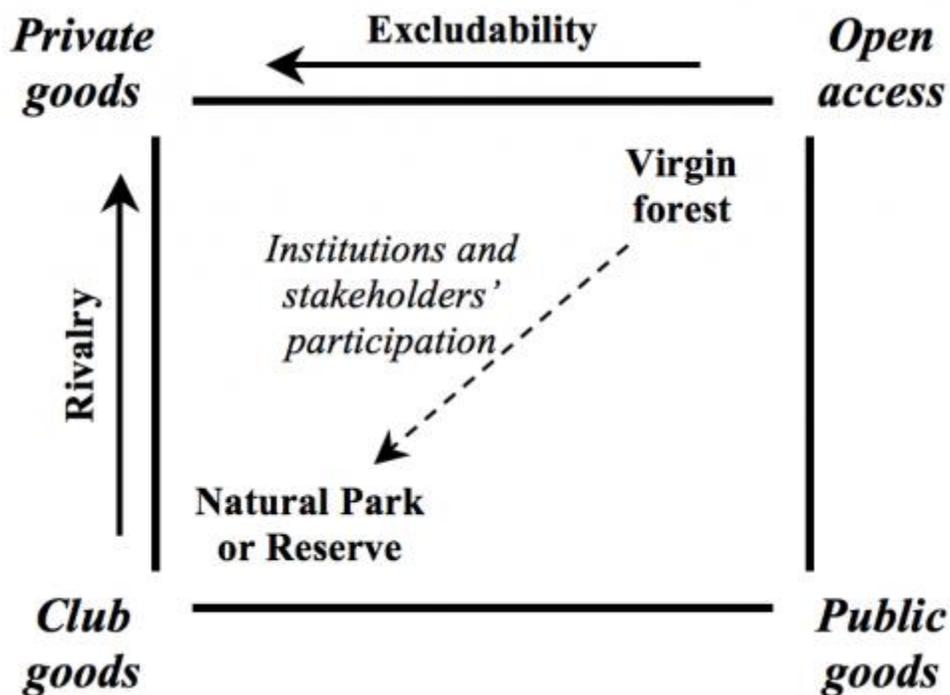


Figure 2. A typology of goods: rivalry and excludability (Buchanan, 1965)

According to Villiers (2012), “Hardin’s theory was the purest poppycock and widely adopted only because it seemed to convey the essence of free market competition and it presents a truly corporatist view.” As he notes, Hardin’s main error was to adopt a key proposition of the free market proposed by Adam Smith, stating that people are rational beings who always act in their own best interests, and to assume that those interests automatically involve the multiplication of personal assets. But what Hardin described was not rational behavior; it was the purest selfishness, Villiers believes. And therein lies, after all, a crucial difference. Rational beings faced with a dilemma of the commons would be able to calculate long-term prospects and conclude, quite rationally, that some sort of short-term limit, arrived at through negotiation, would be in their own interests. In other words, in the context of a limited commons, cooperation is a more rational decision than independence. Hardin derives his views from biology— he was not an economist— and preferred a hardline version of Darwinism called, unsurprisingly, survival of the fittest. But “fit” was interpreted narrowly and stripped of its social context. Hardin simply assumes that when people come together without rules, violence or conflict ensues. He had no knowledge of the equally Darwinist view that natural selection could just as easily select for mutual cooperation as for continual family warfare, a view that has been

gaining credence among biological evolutionists in the past few decades. He takes no account, therefore, of the human ability to develop rules for accessing and using common resources. He subsequently exemplifies his argument with fishermen who have been banded together by their locations to set sustainable catch quotas and supports his arguments with a few more practices from Jonathan Rowe's *State of the Worlds* (2008), such as the rice paddies of the Philippines, the Swiss Alpine pasturelands, the Maine lobster fishery, the Pacific haddock fishery and many other places. According to Villiers, the case could even be made that if settled communities remain intact, the commons flourishes. The community merely needs to be enabled to protect it.

In his article "The Myth of The Tragedy of the Commons," Angus (2008) critiques the tragedy of the commons as a paper that is more often cited than read because in his opinion it fell far short of science. He argued that Hardin ignored the reality of self-regulation by the communities involved, which was described years earlier in Friedrich Engels' account of the "mark," (Cox 1985) the form taken by commons-based communities in parts of pre-capitalist Germany:

- "The use of arable and meadowlands was under the supervision and direction of the community."
- "Just as the share of each member in so much of the mark as was distributed was of equal size, so was his share also in the use of the 'common mark.' The nature of this use was determined by the members of the community."
- "At fixed times and, if necessary, more frequently, they met in the open air to discuss the affairs of the mark and to sit in judgment upon breaches of regulations and disputes concerning the mark."

In "No Tragedy of The Commons," Cox (2008) emphasizes that "this communal management of shared resources is not a tragedy of the commons but rather a triumph: for hundreds of years—and perhaps thousands, although written records do not exist to prove the longer era—land was managed successfully by communities."

Hardin assumes that peasant farmers are unable to change their behavior in the face of certain disaster. But in the real world, small farmers, fishers and others have created their own institutions and rules for preserving resources and ensuring that the commons

community survived through good years and bad (Angus, 2008). As Angus notes, Hardin does not describe the behavior of herdsmen in pre-capitalist farming communities, but rather that of capitalists operating in a capitalist economy. The universal human nature that he claims will always destroy common resources is the profit-driven “grow or die” behavior of corporations (ibid).

Pearl (2015) believes the concept of the tragedy of the commons is well known but does not adequately capture the gravity of harm caused by the mismanagement of certain CPRs. According to him, not all commons are created equal; some are more important than others. If the common pasture where cows graze is overused and rendered barren, the community shifts to a vegan diet. But if the groundwater aquifer used to grow soybeans and other foods is exhausted and no water remains for extraction, then individuals, families and entire communities perish. Present commons scholarship is unable to differentiate between varying levels of importance among commons resources. He subsequently corrects the problem by introducing the model of the vital commons: a type of CPR that is both vital to human existence and supports a massive population. The earth’s atmosphere and groundwater aquifers are two important examples of vital commons. Overuse of either creates a tragedy, but it appears as an apocalypse. The traditional response to the tragic overuse of a commons is the creation of private property. Using this technique with vital commons, however, makes things far worse and only expedites the coming catastrophe. Informal norms or principles of private ordering are also completely ineffective at sustaining the long-term health of a vital commons. Instead, the only answer to the tragedy of the vital commons is the wholesale removal of property rights to this essential and depleted resource.

Although, Hardin's concept found confirmation in overexploited water supplies, depleted fisheries, cleared forests, illegal rubbish dumps and rivers degraded by sewage. But in a review of this theory, Ponce (2011) names the absence of regulation as a tragedy of CPRs.

Among other critiques, analyzing the commons within a capitalist context and underestimating communities’ ability to define rules and regulations, as well as defining the commons from an economic outlook bring the reliability of the tragedy of the commons under question. Ostrom discusses many of these critiques in her governing of

the commons doctrine. However, decades later, her theory became more controversial through other critiques and researchers who reviewed and analyzed her theory, as discussed in the following section.

The governing of the commons' critics

Ostrom is justified in her critique of the suggested solution to the tragedy of the commons but a rethinking is needed of her critique of private property rights and markets (Araral, 2013). Based on the institutional approach to the study of self-organization and self-governance in CPR situations developed by Ostrom, her investigation sought a theoretical explanation of phenomena.

In *Tragedy of the Partnership: A Critique of Elinor Ostrom*, Block and Jankovic (2016) claim that Ostrom does not properly distinguish between a commons and partnership arrangements, because of the following:

- “First, she seems to conceptually misunderstand the very notion of private property rights and therefore . . . partnership or condominium, with an allegedly new form of “governance” that is neither under government control nor that of free-market participants.” The authors argue that Ostrom discusses various forms of private partnerships rather than commons.

- Second, this error is based on and reinforced and amplified by the further mistake of assuming that any viable system of commercial self-regulation or enforcement of private property rights is based on government force and imposed on individuals from without. The authors, however, believe many legal and economic frameworks regulating market activities emerge spontaneously in the market system and with voluntary cooperation.”

As they argue, the reason for the confusion between the commons and private property in Ostrom’s work is that she believes private property is possible only if government protects and enforces it. They show by using various historical examples that Ostrom’s assumption is wrong and hence that the central tenet of her model of the commons fails.

In *Community-Based Natural Resource Management*, Cox et al. (2010) identify three primary criticisms directed at the [Ostrom] design principles as a whole:

1. Some of the publications argue that the design principles are incomplete and need to be included in a full account of successful community-based natural-resource management.

2. It is not clear if the design principles can be applied to a wide range of cases beyond those that were used to develop them. Several authors (Pomeroy et al., 2001; Young, 2002; Berkes, 2005, 2006) question the applicability of the principles to cases larger in scale than those from which Ostrom (1990) derived them.

3. The final point criticizes what the authors conceive as the design-principle approach itself. Several researchers argue for a more constructionist or historically, socially and environmentally embedded perspective that departs from viewing actors as rational decision makers and communities of users as coherent wholes without internal conflict or heterogeneity (Mosse, 1997; Leach et al., 1999; Klooster, 2000).

In their study, Cox et al. (2010) reformulate principles one, two and four, and propose that principles three, five, six, seven and eight remain as they are. They divide each of the first two principles into two components for their analysis.

Key elements in Hardin and Ostrom's metaphors

Hardin and Ostrom discuss two sides of ecological engagement. If we consider the ecological engagement as a spectrum, Hardin's tragedy of the common, privately owned resources as the best solution for protecting the commons stands on one side, while Ostrom's governing the commons, focusing on community-based conservation as a solution to prevent the tragedy, stands on the other. However, numerous factors are involved in governing CPRs. Moreover, CPR is an interdisciplinary issue and there is not one cure-all for all its problems and challenges. (*figure 3*)

In Hardin's metaphor, the main trait of the commons is that exclusion from the resource system is relatively difficult compared to the local commons (Aararal, 2013). Hardin simply assumes that when people came together without rules, violence or conflict ensued. He therefore takes no account of the human ability to develop rules for accessing and using common resources (Villiers, 2012), perhaps because he ignored the reality of self-regulation by the communities (Angus, 2008)

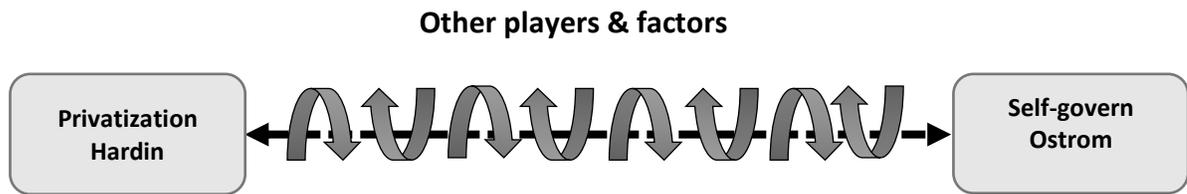


Figure 3. The ecological engagement in managing the CPR spectrum from Hardin and Ostrom's perspectives

Figure 3 shows the engagement of other players and factors on a spectrum of ecological engagement in managing CPRs, as presented by Ostrom and Hardin, neither of which can define a multi-stakeholder approach through their metaphors. On the left side of the spectrum, Hardin seems to exclude tribal and indigenous communities from his solution to the tragedy of the commons. None of his reasonable possibilities (Hardin, 1968), which include selling off CPRs as private property or keeping them as public property, consider involving the ecological engagement of indigenous communities in managing the commons as a sustainable method for protecting resources. He also fails to recognize other influential factors as a threat to the commons. Even highly protected areas that are owned by the public or private sector may end in tragedy in the case of wars, conflicts, corrupted governments, and natural disasters such as water crises, to name but a few. This is especially true in situations in which all these disastrous factors are related to population growth and lack of vital resources such as water. Hardin does not consider ways to govern the commons to ensure its survival for the needs of future generations, as Ostrom argues in her doctrine.

Ostrom, in contrast to Hardin's disregard for the indigenous community, was one of the early scholars to introduce collective action as a solution for the sustainable management of CPRs through local people's autonomous institutions (Ostrom, 1990). This argument sounds logical until realizing that she also excludes some of the players from her solution, because she argues that communities can successfully manage the commons even in the absence of private property rights and a strong regulatory authority. This solution may have worked before the third millennium, when tribal communities were free from regulatory authorities and lived in transboundary territories with plenty of natural resources. In other words, Ostrom's idea of collective action is applicable only within a tribal community, in which neither the public nor the private sector, nor other

stakeholders are engaged in managing the commons. Moreover, in the interconnectedness of contemporary life, the entire world is a single entity.

In many societies, private reserves are an investment for powerful and rich individuals, so there is no guarantee for how long common resources will be shielded from the tragedy. It seems as if Hardin introduced the tragedy of the commons for an American society or as a concept adoptable for communities with powerful and lawful socio-economic and political situations.

Neither Hardin nor Ostrom consider political systems, especially in communities in conflict or suffering from unstable policy performances. For example, Hardin recognizes that where property rights are well-defined and secure, the tragedy of the commons is less likely as each owner has ample incentive to act as a steward. And Ostrom (1990) demonstrates that communities can successfully manage commons even in the absence of private property rights and a strong regulatory authority. But there is no definite answer for either approach, as a day land-use change has now become one of the most important ecological issues at the global level, in addition to other risks such as climate change, soil deterioration and land cover changes (Bajocco et al., 2012). To shed light on this argument, I introduce two situations in which land use change affected CPRs:

In the first example (*Box 3*), the Qashqai tribe had considered almost all Ostrom's principles and could sustainably protect their common resources for hundreds of years, despite the many ups and downs caused by nature and climate change impacts. However, they could not resist new governmental policies and other decisions that resulted in the nationalization and privatization of their CPRs. It is obvious that neither Ostrom nor Hardin's mechanisms could help this community to sustainably protect their resources.

Qashqai Territories in Iran (*Borrini, G., Jarieh, H. 2007*)

The Qashqai tribe, composed of Turks, Lurs, Kurds, Arabs, Persians, and Gypsies, traditionally practiced a mixed economy of nomadic pastoralism (sheep and goats, with camels used as transport), cultivation (grains), and weaving. Their long seasonal migrations of 350 miles between lowland winter and highland summer pastures in the southern Zagros Mountains took them by Shiraz, southern Iran's major city and a market for Qashqai produce. Beck (1984)

Most of the tribes have an agreed migration route through which they pass twice a year: in the spring and in the autumn. The landscape over which these tribes migrate is held and managed under a typical common property regime. The allocation of land follows the customary laws and each unit of the tribe knows the territory over which it has the right of grazing. They take great care to ensure that the rangelands are healthy. Men take care of larger animals that can move over large distances without water, while women take female and lactating animals grazing closer by. Women are also in charge of milking the animals twice a day and processing the milk into butter, yoghurt, and many other products. Children, too, are a productive part of the system. Managing the common property resources is the responsibility of the Councils of Elders, usually through a sophisticated and complex process. Barring unusual events and disasters, the system assured the sustainable use of pasture for centuries, maintaining the ecosystem in a state of dynamic equilibrium.

Land reform; nationalization and privatization

In the 1920s and 1930s, however, the new governmental policies brought drastic and disastrous changes. The landscape of the Qashqai nomads is scattered with the

Box 3: Continued

reminders of this very unfortunate epoch. The powerful rural police managed to keep them effectively under the siege of forced decentralization.

During the 1940s the nomadic pastoralists felt a relative lessening of the iron rule over them, which unfortunately was soon to be re-established. The Qashqai took full advantage of the temporary situation, as the government in Tehran was weak and ineffective: they simply took to their migration routes again! They collected the surviving sheep, goats, donkeys, horses and camels and started again to take care of their rangelands and flocks of livestock. They managed rather well until 1953, when a well-known USA-UK-backed coup d'état ousted the nationalist. Throughout their history, the Qashqai have shown to be defenders of the land.

An important event took place in these years and were extremely harmful to the lifestyles and livelihoods of the Qashqai nomads was the nationalization of all-natural resources in Iran. According to these laws, forced through the handpicked parliament, all rangelands, which amounted to ninety percent of all usable land in the country and which had been treated and managed under a common property regime throughout history, became henceforth state property. Instead of dealing with rangelands as a collective responsibility and privilege, individuals had to apply for short term licenses for grazing and all customary rights and laws were ignored. This action was tantamount to removing the base of survival for the nomadic tribes of Iran. As a matter of fact, even other national policies were designed without any consideration for the needs and capacities of pastoral societies and had a powerful weakening effect on them. One of the immediate consequences was that the integrity of the rangeland ecosystems, which they had so carefully maintained through time, began to erode.

Box 3: Continued

After 1979, under the new Islamic regime, issues of natural resources, continued the alienation of the nomadic tribes through the endorsement of the practice of rangeland ownership by the state.

The government finally realized something to this effect in the 1990s, but even then, decided to privatize rangeland management rather than return it to its original rightful owners. Rangelands were and still are given away by FARO for everything— from military bases and oil refineries to urban development and speculative operators.

The non-equilibrium ecosystem conditions that characterize most of Asian arid regions had not yet been understood by the relevant establishment of the country. Alien concepts of carrying capacity were applied, including for a major government project called “Livestock and Rangeland Equilibrium,” imposed all over the country. The main purpose of this project was to reduce livestock on rangelands, and to eliminate many of the pastoral producers, obliging the nomads to settle permanently. The decentralization of nomads, in fact, became the focus of the Organization for Pastoralists Affairs (OPA), which had originally been created in the office of the Prime Minister to support nomadic pastoralism. Another post-revolutionary institution, called “Rural and Pastoral Service Centers,” was later reduced to rural service centers only, and its job degenerated mainly into writing extravagant prescriptions for pesticides.

After nationalization and land reform in 1950s and 1960s, the rangeland capacity decreased while the number of livestock remained the same or increased. This situation put additional pressure on rangeland capacity and resulted in land degradation, soil erosion and groundwater depletion. As a result, “of the total land area in the country, approximately 75 million hectares (ha) are exposed to water erosion, 20 million ha to wind erosion, and the remaining five million to other types of chemical and physical

degradation” (FAO 2015). Figure 4 shows the changes in Qashqai’s territory affected by state law and other external factors such as land-use changes that transformed their natural resources into factories, military stations, townships, and other construction projects.

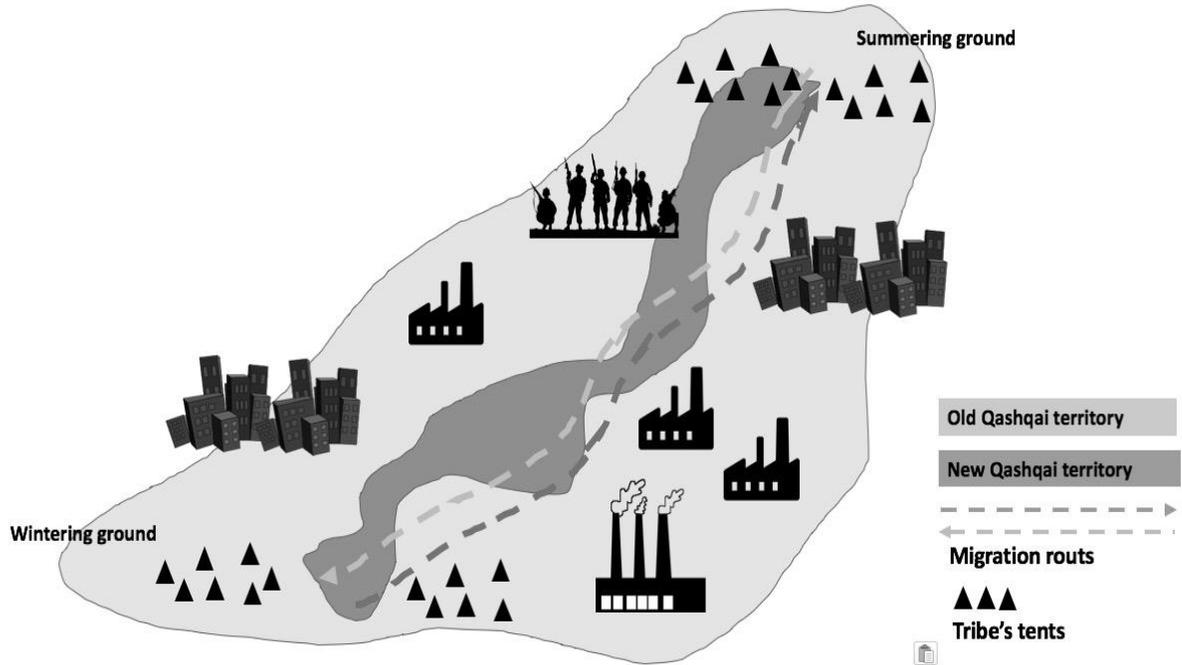


Figure 4. Qashqai tribe territory affected by external pressures

Land Grabbing in rural Cambodia (*Pen & Chea 2015*)

Cambodia, as an emerging market among other least developed countries, moreover risks developing an international reputation as a country of insecure investment opportunities, both in the land sector and in general. The current climate of development is characterized by low transparency levels, uneven access to information, inadequate consultation practices and non-inclusive participation methods – a situation that is unsustainable and likely to hamper economic growth in the future (OHCHR, 2012).

Indigenous communities in Cambodia are remarkably dependent on agriculture and forest areas for their livelihoods and for the survival of their cultural identity, which is among others expressed in the traditional slogan: “land is life, the forest is a market” (NTFP, 2000). Beyond this, land issues gain an even greater importance as the land itself has spiritual significance, which often articulates itself in situations where indigenous peoples’ access to land or forests is being hampered. While there is a general belief that spirits reside throughout the landscape, each community has several spirit forests that are considered particularly powerful. It is believed that misfortune can result from not treating these areas with respect, which has given rise to several “taboo” systems governing the activities undertaken in spirit forests (NTFP, 2000). Such rules often control the exploitation of natural resources, the cutting of vegetation as well as hunting and fishing activities. Spirit forests also serve as important components of an indigenous community’s cultural and religious life. Each year, in countries such as Cambodia, millions of hectares of land are illegally taken from the people who live on it, often through violence and intimidation, to make way for mining, timber or agricultural plantations. The institutions who should provide justice to the victims of land grabbing

Box 4: Continued

are often the very groups driving the problem – national governments and their elites who frame land seizures as an unfortunate but inevitable step on the path to economic development, and quash any resistance.

It provides evidence that since 2000, 770,000 people have been adversely affected by land grabbing, many of them already forcibly displaced from their homes, with 20,000 new victims in the first three months of 2014 alone. In the capital Phnom Penh, ten per cent of the population has been directly affected.

Since 2000, the equivalent of more than 70% of Cambodia's arable land has been leased out – a significant proportion in a country where nearly eight out of ten people depend on land and natural resources for their livelihoods. The complaint asks the International Criminal Court to consider them as symptoms of aggressive state policy, the impacts of which transcend the boundaries of human rights abuses and domestic crimes, and contain all of the legal elements that constitute crimes against humanity.

Land deals are often conducted in secret, so available figures are likely to be a gross underestimate. But we know that over the last decade as much as 49 million hectares – an area just smaller than the size of Spain – has changed hands or is under negotiation.

Many governments and companies peddle the myth that large-scale agriculture is necessary to feed the world. But this argument ignores the fact that small-scale farmers still produce more than 80% of the food consumed in Asia and Sub-Saharan Africa.

And they do this without routinely resorting to violence, persecution or evictions. Far from furthering development, taking land away from ordinary citizens undercuts it, representing one of the biggest threats to poverty alleviation.

Surprisingly, large-scale land investments are still relatively ungoverned internationally. Since 2012, the US, Europe and Hong Kong have all introduced binding requirements

Box 4: Continued

for oil, gas and mining companies to publicly report on payments they make to governments. Meanwhile, Europe, the US and Australia have also introduced laws to prevent the import of illegal timber. No binding international regulations exist, however, to stop agribusiness companies from illegally acquiring, clearing or managing land.

If the Cambodian government is held to account for these crimes, other governments and the companies involved will have to heed the warning and recognize that land grabbing is too big a price to pay for doing business.

Samuth Krom in Pre-Collective Land Titling vs Private Title and ELCs

Samuth Krom village is one of seven Tumpoun indigenous communities in Seda commune, Lumphat district, Ratanakiri province. All communities, especially the Samuth Krom- community have recently experienced the new challenge of land grabbing through Economic Land Concessions (ELCs). There are three ELCs located in the area, affecting more than 50 families and their land. The community applied for a Collective Land Title in 2008, shortly after the arrival of the ELCs. Two steps towards the granting of Collective Land Titles have been achieved: self-identification and determination such as certified by the MRD, and getting a legal entity certified by the MoI. Recently, the application for interim protective measures has been sent to Ministry of Land Management, Urban Planning and Construction (MLMUPC).

The community has received far-reaching threats since it applied for Collective Land Titles (CLT) and the protection of their natural resources. A land dispute began in February 2012 with Jing Zhong Ri Cambodia Co. Ltd when the company's workers

Box 4: Continued

started clearing community land without consultation with the community.

Later, in October 2012, a team of youth volunteers established under Directive no. 01 arrived and started to explain the private title concept to the community. They then started to register private land of individual community members, using intimidation and misinformation.

During the process of private titling by the student volunteers, the team rejected to measure the land and territory that overlapped with the ELC map, while the community demanded that the occupied land and reserved land be demarcated. is ELC and two other ELCs have thereby violated the indigenous peoples' rights, the 2001 Land Law, the 2009 Sub-Decree on Procedure of Indigenous Land Registration and the interim protective measure. The ELCs did not consult with the indigenous community.

The village chief and community members have claimed that Directive no. 01 had a negative impact on community land, livelihood and traditional culture. On the other hand, there were eight families that applied for a private land title under this directive. They are now rejecting the title in order to participate, with the rest of their community, in the application for CLT.

This shows the lack of supporting instruments and political willingness to address the problem, probably as the importance of indigenous communities cannot compare with the relevance of ELCs. There are numerous indigenous villages facing the same challenge.

In another example, it is observable that rural Cambodia is also victimized by destructive common rights policies, despite their close connection with nature and specifically their spiritual beliefs about their land, which make them totally connected and engaged with it as part of their hearts and souls.

The final outcomes of these two practices, among thousands of others, provide certainty that new models for the sustainable development of CPRs are needed. A model that enables all players and stakeholders to have equal access to the commons and collaboratively set rules and regulations to have better control over resources. In this way, corporate and state power can benefit from the traditional knowledge of small-scale beneficiaries and small-scale owners can benefit from collaborative management to sustain their livelihoods and stay connected with Mother Nature. In the following chapter, I briefly discuss the concept of collaborative management from different perspectives and in various contexts.

VII: CONCLUSION AND RECOMMENDATION

In the examples presented in chapter 5—the Qashqai's tribes (*Box 3*) and land grabbing in rural Cambodia (*Box 4*)—various factors affecting CPR management become evident. In her eight principles for the sustainable management of CPRs, Ostrom does not consider influential factors, such as national common rights systems or privatization of the commons, as potential threats. Even though these principles apply in every community-conserved area, numerous factors limit communities' ability to protect their natural resources. These factors that can shape or reshape the quality of the common pool are usually not manageable and could destroy the natural resources.

On the other hand, Hardin's theory of the tragedy of the commons underestimates indigenous communities' role in protecting natural resources. Privatization has driven indigenous communities to sell their sources of livelihood and move to cities, thereby forcing urbanization and leading to a more serious tragedy of common resources in neighboring areas or other locales. It seems that neither Hardin nor Ostrom consider natural and artificial risks in sustaining common resources.

Collaborative management: An integrated approach towards managing common resources

Borrini and Jaireth (2007) argue in *Sharing Power* that there are two main challenges in managing natural resources. One is to respond appropriately to the ecological characteristics of a given environment and the other is to respond to the social characteristics of the same environment. They recommend contemporary collaborative solutions to resource management challenges and define concepts and terms used to understand and describe collaboration in managing natural resources: “The sharing of power and responsibility between government and local resource users” (Berkes, George, & Preston, 1991). The collaborative management of protected areas later is defined as “A situation in which some or all of the relevant stakeholders are involved in a substantial way in management activities. Specifically, in a collaborative management process the agency with jurisdiction over natural resources develops a partnership with other relevant stakeholders (primarily including residents and resource users) which specifies and

guarantees the respective management functions, rights and responsibilities.” (Borrini-Feyerabend, 1996)

This collaborative-management model (*Figure 5*) can bring all stakeholders together and pave the way for a sustainable management of the commons while spreading social justice among human beings who continue to be ecologically engaged.

As mentioned above, the collaborative-management model is an inclusive approach that engages all stakeholders toward a sustainable governance of the commons. In this model, the commons belong to the Earth and not to the people, a sector, a state or a community. The commons are a heritage for the next generations and for the wilderness. An alternative solution for managing the commons is to share interests, power, and dignity through a collaborative-management paradigm.

All living entities on the planet are engaged in ecology and may be negatively or positively affected by nature. This engagement can be respectful or disrespectful, but the equivalence can be reached by engaging all stakeholders in protecting the commons, committing to a sustainable use of resources, and protecting life on the planet.

In *Figure 6*, defines the quality of ecological engagement, ranging from disrespect to respect. According to this definition, disrespect refers to every human activity that harms the ecosystem and causes land degradation, deforestation, and other destructive actions caused by urban development, industrialization, and aggressive development. For example, in the Qashqai tribe and land-grabbing examples (*Boxes 3 & 4*), underlying the evidences that resulted in land degradation, was a disrespectful attitude toward the value of natural resources, which ended in a tragedy of the commons for that region. Moreover, neither of these policies and practices considers the sustainable protection of those resources.

In contrast, respect refers to every activity that demonstrates care for nature and prevents or decelerates destructive impacts on Earth. For instance, the Baluchi tribes and Ampezzo Valley in Italy (*Boxes 1 & 2*) adopting traditional mechanisms, attempt to protect their resources in a successfully sustainable managing system. But even these respectful practices could not last due to external factors that affected their control of and access to their resources.

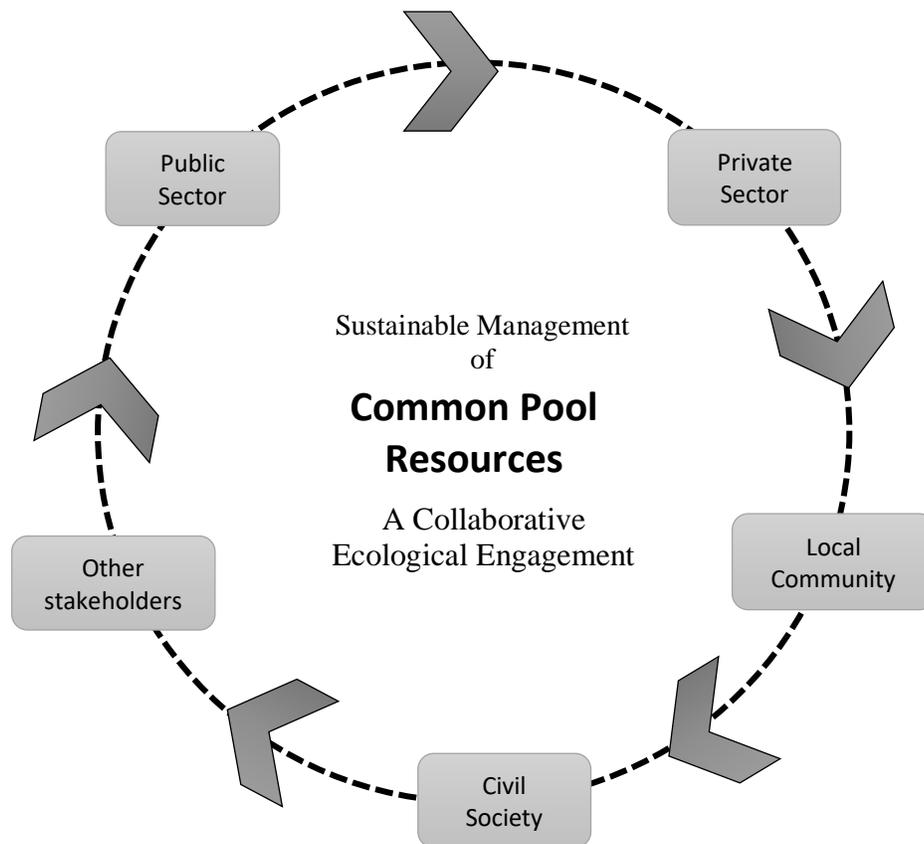


Figure 5. A collaborative management model for managing the commons

The collaborative-management model can help them sustain their conservation initiatives. In this model, people and institutions with a sense of ownership toward a common object of interest attempt to govern the commons through a collective managing strategy. They may have individual reasons connecting them to the commons, be it their livelihood, belief, wellness, peace, security, power, and so forth. This is where sustainable, heartfelt, and reviving ecological engagement happens. But the collaborative management approach is usually associated with challenges and limitations and can easily be violated or misconducted whenever all stakeholders are not fully aware of the consequence of shared benefits or potential threats and conflicts. Collaborative management approach is possible in a situation in which all stakeholders come together and discuss their potential needs and interests as well as potential risks and limitation that might violate their rights in many forms.

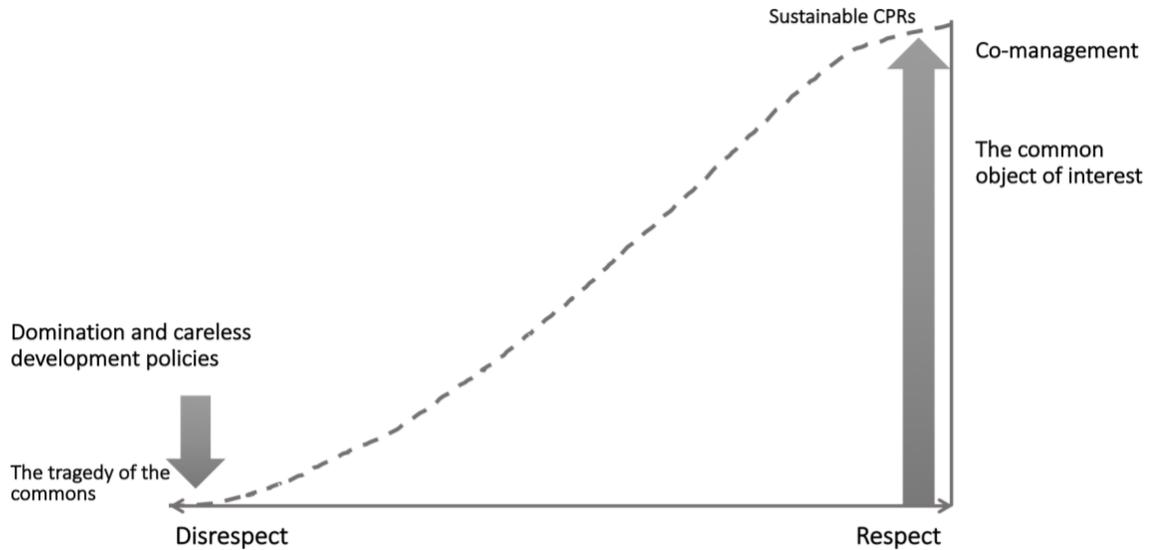


Figure 6. Level of ecological engagement

As an active and neutral mediator, nonprofits and civil society organizations can play a vital role in making coalition among stakeholders toward achieving a sustainable development paradigm. Natural resources are as diverse as cultures and communities as well as geographical settings, and there is not a one-fit for all solutions for sustainable management of common pool resources. This collaboration required a bottom-up approach that encourages the grassroots to be engaged in decision-making processes, while at the same time modify top-down policies and practices in favor of sustainable livelihoods based on common pool resources. Amalgamation of indigenous knowledge, up-to-date information and rules and regulations is the foundation of the collaborative management model.

Thus, interdisciplinary research tools are needed to make an inter-sectoral coalition in which every shareholder voices, including public and private sector, academia, tribal communities and other parties, could be heard and counted. They will not necessarily have equal shares, yet they can build consensus according to the socio-economic, environmental and political situation that rules the resources they have shared.

This deliberative participation cannot be achieved unless the collective benefits are met and the next generations' rights are taken into account. ■

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