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Article

Different Approaches Towards the Understanding of Socio-Environmental Conflicts in Protected Areas

Eduardo García-Frapolli ^{1,2,*}, Bárbara Ayala-Orozco ² , Malena Oliva ² and Robert J. Smith ¹ 

¹ Durrell Institute of Conservation and Ecology, School of Anthropology and Conservation, University of Kent, Marlowe Building, Canterbury CT2 7NR, UK; R.J.Smith@kent.ac.uk

² Instituto de Investigaciones en Ecosistemas y Sustentabilidad, Universidad Nacional Autónoma de México, Antigua carretera a Pátzcuaro No. 8701, Col. San José de la Huerta, Morelia CP 58190, Mexico; bayala@cieco.unam.mx (B.A.-O.); malena@cieco.unam.mx (M.O.)

* Correspondence: garcia.frapolli@gmail.com; Tel.: +52-443-322-2784

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Abstract: Conflicts are an inherent element in the establishment and management of protected areas. Even though there is ample literature about conflicts in protected areas and the field of conservation has investigated them for decades, no consensus exists about the object itself of analysis: the conflict. In this article, we describe three different approaches for understanding socio-environmental conflicts, and we illustrate them with cases from protected areas in Mexico. The principal objective of the article is to advance discussions about the importance of understanding the implications of the use of different approaches on socio-environmental conflicts, in the interest of providing elements to take better decisions about the management of the protected areas.

Keywords: conservation conflicts; human–wildlife conflicts; impairment approach; political ecology; protected areas

1. Introduction

It is increasingly recognized by conservation researchers and practitioners that conflicts are an inherent element in the establishment and management of protected areas [1,2]. Independent of the conservation model and the instruments chosen to achieve the objectives, disputes are extremely common between government actors and the local population about access and use of natural resources in protected areas—both in the interior of the areas or in their zones of influence. These disputes also occur, for example, when local populations perceive that their ways of life are limited by the actions of park rangers or conservation authorities [3], or within local communities when different groups confront each other over the management of resources [4]. In addition, in the current world economic model, we find the local population, civil organizations and conservation authorities fighting from the same trench against ambitious capital investment projects (mining, dam and highway construction, tourism and/or urbanization development), which threaten the health of people and the ecosystems they are trying to preserve [5]. Some conflicts have also taken on a global dimension, where actors with no direct link to the resources/species/areas in question, express strong opinions and perform advocacy [6].

For more than a century, protected areas have become the principal instrument of conservation at the global level. In the last decades, an increase in the land under protection has been notable, currently reaching more than 14% of the world's terrestrial surface [7]. In accordance with Target 11 of the Aichi Targets [8], the intention is that by 2020 17% of the terrestrial areas and continental waters, as well as 10% of the marine-coastal areas of the planet, will find themselves under some form of conservation management. If the signatory governments commit to fulfilling these objectives, in the next years we

will see many new protected areas created. Simply to show the scale of the challenge that countries have undertaken, in the last year the Mexican government proclaimed more than 210 million km² of marine reserve with the Mexican Caribbean Biosphere Reserve and the Revillagigedo Archipelago National Park. These new areas, as well as the existing ones, will not be exempt from multiple socio-environmental conflicts.

The discourse and most general analysis about socio-environmental conflicts in protected areas establish that this conservation model is a natural generator of conflicts because its essence is to separate part of the territory for nature. Deciding what, how, and where to put conservation into practice has confronted conservation institutions, governmental or not, with the local population and many times with the business sector [9,10]. Nevertheless, even though the literature about conflicts in protected areas is very extensive [11,12] and the conservation field has decades of experience investigating conflicts, it is interesting to observe that no consensus exists about “the object of analysis itself: the conflict” [13] (p. 3). For example, “conflicts” are often mistaken for “problems,” although many problems, like the proliferation of invasive marine algae, cannot represent a conflict situation [13]. Conflicts are a characteristic of human society and develop in many forms [14]. Usually, it is argued that conflicts arise because the people or institutions have differences or incompatibilities between their interests, values, power, perceptions and objectives about something in particular [11]. Nevertheless, although conflicts are based on differences, not all differences automatically become conflicts [15].

In this paper, we try to settle the discussion about the importance of understanding socio-environmental conflicts in the interest of contributing elements for making better decisions concerning the management of protected areas. It is widely known that the existence of strong socio-environmental conflicts impedes the management of protected areas and thus the fulfillment of their objectives [11]. Nevertheless, our experience as practitioners and scholars of conservation has led us to realize that although we all directly or indirectly work with socio-environmental conflicts in protected areas, there is no shared understanding of how the conflicts are understood, who participates in them and what could be the strategies for managing them. In our review of the literature about conflicts in protected areas or conflicts with a natural component, we describe in the following section three of the main approaches for the understanding of socio-environmental conflicts, to later illustrate them with cases in protected areas of Mexico. Depending on the approach that we draw from, our interest is to show how the management implications could be very different.

2. Different Approaches towards the Understanding of Socio-Environmental Conflicts

The literature about conflicts in the social sciences field is extremely rich. Without delving too deeply, many studies have centered around conflicts (intrapersonal, interpersonal, interorganizational or intergroup) [15] and others in analyzing conflict situations (war and peace, work and management, stakeholders, racial and ideological issues, among others) [16]. In addition, many others center on conflict management, as to resolve it, if it is believed the conflict can be resolved [16], or to generate agreements, if it is believed that conflicts cannot be resolved but that compromises between those involved are sought [17,18]. In all these cases, the conflict as such is the object of study. These works search to understand what is the nature of the conflict, the context of the definition of conflicts, the situations, causes and levels of the conflict, as well as the escalation and the possible forms of reconciliation [14,19]. Nevertheless, for those of us who are in the interface of natural sciences and social sciences, the study of conflicts usually arrives in an indirect way because the object of study normally is not the conflict, but a species or an ecosystem, a policy instrument (i.e., protected areas) or the management of a natural resource.

In this section, we describe three different approaches emerged from interdisciplinary sciences (i.e., conservation biology, human ecology, environmental anthropology, political ecology) to delve into the analysis of socio-environmental conflicts. These approaches do not necessarily originate in the context of protected areas, but they definitely apply to the particular reality of this conservation instrument.

2.1. Human–Wildlife Conflicts: The Traditional Approach

What we call in this paper the traditional approach is what the literature defines as “human–wildlife conflicts”. According to Conover [20], these conflicts are defined as those that occur when the action of a human being has an adverse effect on wildlife and vice versa. There are many examples of this type of conflict. On one hand, there are studies about the predation of livestock by large carnivores [21–23]. In these works, the attitudes, actions and economic losses of the local inhabitants are investigated when their livestock is affected by large carnivores such as leopards, mountain lions, etc. In addition, studies regarding the negative effect on crop harvest are common [24], as well as studies about how the rise in urbanization and the reduction of habitat increase the encounters between humans and wildlife [25,26].

It is important to realize that this traditional approach for understanding the conflicts has its origin in the natural sciences, particularly conservation biology, which obviously has important conceptual implications. Without entering very deeply into the discussion, because it is not this article’s objective, probably the most important conceptual implication drawn from conservation biology is that the concepts of “biodiversity” and “conservation” are in principle positive or good, and thus, it is imperative to do something to improve them. In fact, it is a “mission”, according to Meine et al. [27]. What can be observed from the research about conflicts between “humans and wildlife” is that the approach is made through very concrete case studies; in other words, they are based on particular experiences, and from there the understanding of conflict is built. Another important aspect is that besides trying to understand the ecological factors related to these conflicts, these studies directly or tangentially venture into the human dimension. The most common are the studies of human perceptions [28,29] or those that quantify economic losses [30,31]. Many of these studies are also based on showing how important the problem is, with the expectation that people can be convinced that a species is not a problem because the actual damage caused is minimal. Understanding from where these studies emerge, it is understandable that the large majority lack a social theory from which the conflict’s structure is defined. Moreover, this research frequently even lacks concrete definition of how they are interpreting what is the conflict and how to tackle it. What has happened in recent years is that much research has incorporated theory and concepts from management or business administration for the sake of contributing to “conflict resolution” [32]. Combined with the search for more efficient models for the use of scarce resources for conservation, probably the reason that many studies are introducing these terms is that they are made by natural sciences academics who are not immersed in the conservation field, whether working for nongovernmental organizations (NGOs) or working with them. Therefore, it has gone from describing a conflict to generating management tools to take decisions [33], but always using a scientific scope, because from this perspective, conservation must be based on scientific evidence and impartial data [34].

In protected areas, these conflicts are common and add another ingredient to the confrontation between people and wildlife. Many local residents, as Dickman [35] and Skogen et al. [36] have noted, feel antipathy towards the targeted wild species because, in addition to the negative effect on their livelihoods by the damage caused, they feel that the conservation of these species is given in a domain of inequality and power imbalance imposed by the more powerful urban elite.

2.2. Conflicts between People about Wildlife or Other Aspects of Biodiversity: The Impairment Approach

Although many studies are still based on this human–wildlife approach, over the last years, new approaches for the understanding of these conflicts have been developed. The main argument behind the modification of this focus is that what we understand as conflicts related to wildlife or to biodiversity are in reality conflicts between people about wildlife or other aspects of biodiversity [37,38]. According to this updated approach, conflicts arise when the interests of two or more parties compete for some specific aspect of biodiversity and when at least one of the parties perceives that its interests have been sacrificed at the expense of the interests of the other party [37]. Under this perspective, the conflicts are always between at least two actors (human beings or institutions).

In this context, the interpretation of the conflict changes radically. No longer does it treat people versus wildlife, now conflicts are between people for some specific aspect of nature. This signifies that we should not understand the “human–wildlife conflicts” as such, because there is no human counterpart. White and colleagues [37] called these “biodiversity conflicts”. Redpath and collaborators [12,39], building from this understanding, work with the concept of “conflicts of conservation”. Conservation conflicts are those that occur when people or institutions clash for the differences regarding conservation objectives and when one of these parties asserts, or at least perceives, that their interests have been sacrificed at the expense of the interests of the other party.

According to Glasl [15], the existence of disagreements between people and/or institutions does not automatically translate into the existence of a conflict. Of course, the differences between people are the foundation or the heart of the base conflicts [40], but a conflict will only exist because of the existence of differences in the perceptions, emotions or interests, one of the parties feels “impeded or diminished” by the behavior of the other party. This approach has been called the “impairment approach” [15]. Differences in perceptions and interests are the source of conflict or the deterioration of the relationships between people, but they should not be confused with the real situation of conflict [41]. According to De Pourcq et al. [2], conceptualizing the conflicts from the existence of “differences” distracts the attention from the fact that differences exist in many situations that are not conflictive. In almost all social encounters, it is inevitable that differences exist between people, but not in all social encounters are there conflicts.

According to the proponents of the “impairment model” [15] and its users [2,41,42], one of the advantages of understanding conflicts from this perspective is that what defines the existence or not of a conflict is the action or behavior of an actor that diminishes or harms the other actor. In other words, attention must be placed on the behavior of the actor (A) that makes actor (B) feel impeded, diminished or harmed (see Figure 1). In this sense, it is important not to confuse the factors and/or conditions that lead them to “impairment” with the real conflict or with the real experience of feeling impeded. These factors or conditions are the source of conflict, and separating them is the mark of difference between the traditional approach described in the previous subsection and the “impairment approach”. Yet, it seems that under this perspective there is no specific natural context in which conflicts arise. If a species symbolizes a problem, how will stakeholders feel if the management response does not involve tackling the direct issue?

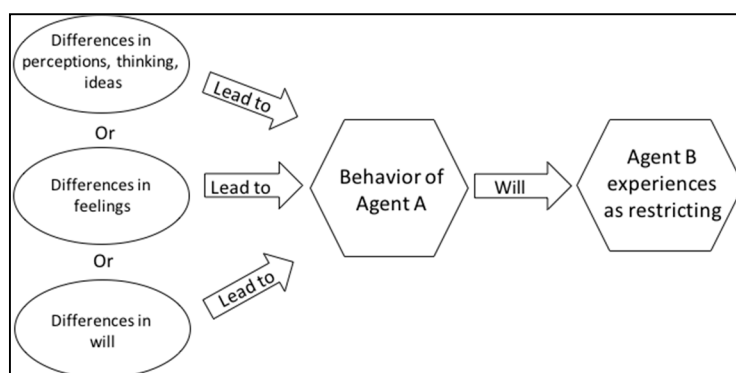


Figure 1. Defining elements of a social conflict (modified from Glasl [15]).

As in the case of “human–wildlife conflicts,” during the last years an attempt to generate useful tools for the management of conflicts and decision-making has been made. Redpath et al. [12], besides providing a conceptual framework for the understanding of conservation conflicts, proposed a guide with two stages for studying conservation conflicts: (a) mapping, and (b) conflict management. In the first stage, trying to map the conflict is undertaken from the identification of social variables (i.e., identifying the actors involved and their positions to recognize the social impact of the conflict) and

ecological variables (i.e., ecological impact), as well as the sociopolitical context of the conflict. The second stage, concentrated on conflict management, is centered in the processes of searching for and generating solutions. In this way, the guide for mapping and conflict management permits in an interdisciplinary way directing the study of practical problems to the search for solutions. In this process to management (i.e., a search for solutions), the generated knowledge is linked with the actions required to attend to the conflicts [43].

2.3. *A Different Framing Towards Socio-Environmental Conflicts: The View from Political Ecology*

Political ecology poses a different framing of the understanding of socio-environmental conflicts. In accordance with the characteristics of the conflicts, some authors call them socio-environmental conflicts (sensu Le Billon [44]), others ecological distribution conflicts (sensu Martínez-Alier [45]) and others conservation conflicts (sensu Adams [34]). Nevertheless, in this section we continue dealing with the term socio-environmental conflicts to maintain a terminological coherence.

Although not only one view exists for understanding socio-environmental conflicts from political ecology, according to Escobar [46] socio-environmental conflicts are a historical struggle for the forests, for biodiversity, food, water, rivers and seas, which include interpretations of how to preserve them [47]. According to Le Billon [44] (p. 598), “political ecology is about politics, and about recognizing the political character of environmental and resource issues”. But also, political ecology is about recognizing the power that actors have at the moment of deciding what, how, and where to conserve. The difference between the political ecology approach and the previously described approaches in this section is that political ecology explores the politicization of nature through conflicts, instead of naturalizing the conflicts through environmental analysis [44] (p. 598).

According to Escobar [48], when trying to understand the struggles for forests or biodiversity, immediately two important aspects are made evident. The first is that, most of the time, the struggles involve the rich or powerful against poor people or people without power within regions, countries and at the multinational level. The second aspect is that the struggles imply some type of mobilization regarding the defense of the local cultures and nature. This way of understanding socio-environmental conflicts is what Guha & Martínez-Alier [49] call the “environmentalism of the poor”.

Escobar [46] (p. 7) poses that it is useful to think of socio-environmental conflicts from three areas of transformation or of conquest: the economic, the ecological and the cultural. He explains what occurs at present in many biodiverse regions is the transformation of diverse local economies, in part oriented to self-production and subsistence, to economies propelled by the market. This implies changing complex ecosystems into modern interpretations of nature (often plantations), and it also implies changing local cultures, based on the place, into cultures that have to resemble more the dominant modern culture, with its individualistic and productive ethos and its orientation towards the market.

Within the framework of political ecology, socio-environmental conflicts arise under the umbrella of specific economic and sociopolitical structures [50–52]. Political ecology rejects the hypothesis that with greater environmental scarcity or lack of resources there is an increase in conflicts. According to Benjaminsen & Bryceson [53], the current principal tendencies of conservation are the modern form of what Karl Marx defined as primitive accumulation, which included the commodification and privatization of the land, the conversion of communal property into private property and the suppression of rights over communal assets. Depriving the people of the land and its resources, either by the decree of a protected area or by land grabbing, and steering them to the current of privatization for the accumulation of capital, is what Harvey [54] has called accumulation by dispossession. From this perspective, the noncapitalist spaces and resources are opened for accumulation through the combination of formulas like “protected areas and tourism” or “conservation through payments for environmental services”. As Li [55] indicate, it is the places and the resources the ones that are being valued, but not the people and their culture, which are those that in reality have been driving and co-evolving with their environment.

Under this perspective, political ecology presents a different glimpse in understanding the conflicts between people about wildlife or other aspects of biodiversity. It is done recognizing that all human decisions, and therefore also conservation, are inherently political [34], in which the relations between actors happen in a realm of power [56], and that this power, at least currently, occurs in the framework of a global neoliberal economy that aims to generate surpluses [57]. Political ecology does not propose specific tools or techniques for the study and resolution of socio-environmental conflicts, but it poses that the political dimension of the conflicts must be explored, forming questions, such as: What uses of nature should be permitted? Which ones should be prevented through laws, rules and, even in some cases, through economic incentives? How much freedom of action protects conservation and who limits it? Who wins and who loses in whichever conservation decision? [34].

3. Analysis of Socio-Environmental Conflicts in Protected Areas of Mexico

The objective of this section is to illustrate how socio-environmental conflicts are analyzed in terms of the different approaches described in the previous section. Our interest is not to indicate an approach as better or worse for understanding and addressing the socio-environmental conflicts. Simply, we want to point out that in terms of the epistemological viewpoint with which we analyze the conflicts, the questions that we form and the actions that come from them have very different effects when undertaking conservation.

We chose three cases with which the authors are very familiar through various research we have carried out. The three cases are located in the Yucatan Peninsula, one of the richest biocultural regions of Mexico. As Smardon & Faust [58] have noted, the Yucatan Peninsula is one of the most interesting regions to study, given that it is well-documented how the Mayan civilization has used its resources for more than 3000 years. As well, there is a broad history of almost five centuries of colonial and national government practices that have affected the local communities, and because of broad scientific studies that have documented contemporary Yucatec Mayan culture, as well as its ecosystems and biodiversity. Considering this reality, in the present section we describe some socio-environmental conflicts from the human-wildlife outlook, from the impairment approach and then from a political ecology perspective.

3.1. Human-Jaguar Conflicts in the Calakmul Region

Many of large carnivores are threatened by conflicts that arise between these predators and the human communities with whom they compete for space and food [59]. The jaguar (*Panthera onca*) is considered the largest predator of the Neotropics and a species of great ecological importance [60]. Nevertheless, it is estimated that its population is decreasing in almost all of its distribution range because of the destruction and fragmentation of its habitat, isolating these animals to smaller spaces in which they inevitably encounter human populations [61]. In Mexico, it is estimated that in the last 40 years jaguar habitat has been reduced by 60%. This must be not only because of the loss and fragmentation of its habitat, but also the expansion of human settlements and agricultural development, which have increased poaching [62,63]. In particular, conflict from the predation of livestock has become one of the main threats to the jaguar's survival and one of the urgent issues to address to ensure its conservation in the country [63].

The Mayan forest region in the Yucatan Peninsula accommodates the largest jaguar population of Mesoamerica [64,65]. This intact forest is in a good state of conservation and still sufficiently large to maintain viable jaguar populations and their prey for what has been considered of paramount importance for the conservation of the species [62,65]. In particular, the Calakmul Biosphere Reserve (CBR), located in the southeast of the state of Campeche, comprises the largest protected tropical forest of Mexico. With an expanse of 723,000 ha [66], the CBR constitutes one of most important zones for the jaguars. This reserve, together with the protected area of Bala'an K'aax and the state reserves of Balam Kin and Balam Ku, comprise the Calakmul region that protects an area of tropical forest of more than 1,300,000 ha, with an estimated population of 900 jaguars [62]. Nevertheless, Calakmul has not

been exempt from the impact of human activities and the accelerated transformations of the landscape, giving rise to conflicts between the jaguar and the local inhabitants.

In the last years, the development of farming in the region has caused a reduction of the jaguar's habitat and has led to an increase in attacks on domestic livestock by jaguars and other carnivores [67]. This situation has also resulted in an increase in the hunting of jaguars by local people who depend on the raising of cows and sheep. The economic damage that jaguars cause is one of the main reasons of poaching. It has been estimated that the economic losses by wild predators in Calakmul and the Lacandona forest can reach \$18,533 USD (161 households/year) and that cows and sheep constitute the most common domestic prey of jaguars and pumas [68].

Given the threatening situation in which the jaguar finds itself in the region, various actors have been given the task of designing conservation strategies to mitigate the conflict. For more than two decades, academics from the Institute of Ecology of the National Autonomous University of Mexico, together with NGOs like Unidos para la Conservación, Ecosafaris, Agrupación Sierra Madre, Amigos de Calakmul, EcoCiencia, have generated scientific information [62,64] about the status of the jaguar populations and its habitat requirements, with the final purpose of identifying priority zones for maintaining the connectivity of populations of this feline [69]. Similarly, they have generated potential distribution maps of the jaguars' habitat and the areas of human–jaguar conflict to identify the sites most susceptible to the conflict and to direct efforts to mitigating the attacks on livestock [67].

From the scientific information that has been generated, the different actors linked to jaguar conservation have designed different strategies and instruments specifically for conservation. For example, the National Commission of Natural Protected Areas (CONANP), together with academics and NGOs developed the “Program of Action for the Conservation of the Jaguar Species (*Panthera onca*)” [70]. In this, they establish the principal guidelines, actions, strategies, and goals for the short, medium and long-term, as well as scientific indicators that are applied to generate actions that achieve the recovery of the species and its habitat. In addition, as part of the conservation strategies, schemes have been designed for the payment of environmental services focused on jaguar habitat conservation. An insurance fund for livestock protection in Mexico has been established, which is designed to compensate for the livestock lost to predator attacks. This fund also provides advice to those affected to reduce future attacks. In the same way, diverse programs of environmental education and of local media coverage about the importance of the jaguar have been developed, as well as activities directed to the inhabitants for improving livestock management practices and reducing poaching, among other actions [62,63].

The human–jaguar conflicts are without a doubt one of the greatest threats facing the species in the Calakmul region, and although various initiatives exist for mitigating the threats to this species in danger of extinction, it is clear that there is still much to do. Using the framework of conservation biology has been useful in terms of identifying which conflicts should be a priority and/or where to focus resources to best mitigate the problem. However, we have to be cautious about being too optimistic because, while technical solutions are key, they often make naïve assumptions about the way they can be implemented and about the agenda funders have.

3.2. *Mayan Subsistence Hunting in Los Petenes Biosphere Reserve: A Different Wildlife Use Interest?*

The Los Petenes Biosphere Reserve (LPBR) is one of the five terrestrial biospheres reserves located in the state of Campeche, in the Yucatan Peninsula. Created in 1999, without any interior human population, this reserve shelters the unique ecosystem of petenes, constituted of islands of arboreal vegetation immersed in a matrix of lower vegetation (e.g., grassland). There in the petenes, numerous species find shelter, water and food. Many of these species have been traditionally hunted by the local people for many years. The Yucatec Mayan communities (N = 20), although they are outside the boundary of the LPBR, maintain a strong interaction with the protected area, evident in the use of the natural resources [71].

Since pre-Hispanic times, the Yucatec Mayan population has practiced subsistence hunting, with one of the main target species being the white-tailed deer (*Odocoileus virginianus*) [72]. In addition to game being one of the main sources of animal protein for the Yucatec Mayan [73], in the communities neighboring the LPBR this activity enjoys a deep-rooted sociocultural history, maintaining its relevance to this day [72,74].

In its governing management instrument [71], the LPBR permits subsistence hunting in its buffer zone, consistent with the viewpoint of these protected areas to ensure the well-being of the local populations. In spite of this, the authorities in charge of the area conduct a *de facto* prohibition of this practice, spreading the message of the hunting ban between the communities and running patrol activities according to such a prohibition. Such a way of acting, according to the authorities, is founded on the precautionary principle, as there is a lack of precise information on the status of the game population. This restriction has generated a conflict with the communities located in the influence zone of the LPBR, because local people perceive that their livelihoods are being undermined.

In spite of this apparent contraposition of interests between the actors (i.e., subsistence use versus conservation), by digging into the perspectives of parties we found that those responsible for the LPBR's management and the local communities both share the interest in preserving the exploited species. In the case of the LPBR, by prohibiting hunting the authorities are looking to preserve the ecological balance of the protected area. In the case of the communities, the households are looking to ensure the availability of the wildlife resource for the future, thus being able to continue practicing subsistence hunting. In fact, locals mentioned they perceived recent reduction in potential prey at present.

What can clearly be observed is there is a difference in the way agents approach the conflict. While the environmental authorities think the way to reduce the pressure on wildlife is to limit hunting, the local residents state the need to continue performing the activity to sustain their families, the same activity that has maintained them for at least three generations [72,74]. What has generated the conflict between the local population and the LPBR is not the difference in the perceptions, but the *de facto* prohibition of hunting in the LPBR. According to the approach in Figure 1, searching to fulfill their conservation objectives, the authorities of the LPBR and the environmental authorities (Agent A in Figure 2), with their prohibitions for whatever form of hunting, have created a perception of undermining the subsistence interests of the local actors-users of the wildlife resource (Agent B in Figure 2). Under this logic, local populations are impaired in two different ways. On one side is an impairment of access restriction on use or extraction of natural resources, because the LPBR authorities have performed actions that inhibit people's access to a particular resource. At the same time, the local residents are facing impairment for noncompliance by LPBR administration with previous agreements or existing rules. In other words, they feel an imposition due to the fact that the potential for hunting in the buffer zone is considered in the management plan. These feelings of imposition are the triggers of the conflict.

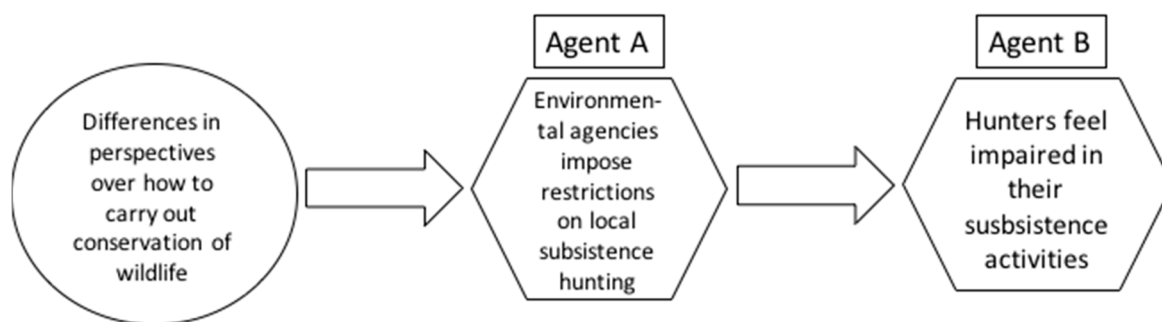


Figure 2. The case of using wildlife for subsistence purposes in the area of the Los Petenes Biosphere Reserve in view of the “impairment approach”.

Exploring if concrete proposals have emerged for managing the conflict, we found the LPBR authorities have not implemented direct actions related to the subsistence use of wildlife. Conversely, they have promoted the development of alternative productive activities in the communities (i.e., making of handicrafts, ecotourism) so as to compensate the losses derived from the restrictions imposed by the reserve. Even though the local communities can view the search for alternative productive activities as something positive, in reality they do not consider that this action is aimed at resolving the conflict about hunting; in fact, it deepens the conflict. When CONANP establishes what activities can compensate for the local population's loss of the means of subsistence, it is again imposing its interpretation of what is suitable for the communities. It is imposing its own perspective regarding the communities' well-being, disregarding the sociocultural roots of the traditional activities. This type of management action, which does not directly address the conflict, in addition to not resolving it, can cause the conflict to deepen and re-emerge with more strength [75].

To our understanding, focusing on the impacts of the conflict might lead to overlooking the underlying causes of the conflict or simplifying the managing strategy to resolve the conflict. It seemed that the LPBR viewed the conflict through an ecological lens, missing the social impact a *de facto* ban on subsistence hunting might have. Broadening the approach to a more comprehensive understanding of the conflict context (i.e., sociocultural roots of Mayan hunting) and implications (i.e., not attacking the real or main driver of species threat) might result in better conflict management alternatives.

3.3. Capital Accumulation in Punta Laguna: Ecotourism and Protected Areas as a Source of Socio-Environmental Conflicts

The Yucatec Mayan community of Punta Laguna is located in the borderline of the states of Yucatan and Quintana Roo, between the archeological sites of Cobá and Tulum. For more than 30 years, this community of approximately 200 inhabitants has dedicated itself to preserving part of its forest through ecotourism. As a result of the local conservation actions, in 2002 CONANP decreed the Flora and Fauna Protection Area of Otoch Ma'ax Yetel Kooch (OMYK, around 5000 km²) with the intention of preserving an important part of the mature forest and a community of spider monkeys that has been studied by primatologists for more than 30 years. As a federally protected area, OMYK is officially administered by CONANP personnel, although the management of ecotourism and the entrance to the protected area are managed by members of an ecotourism services cooperative (Najil Tucha), created by local people in 2005.

Like many other stories of conservation around the world, that of Punta Laguna is a history characterized by being a collection of struggles between actors with different levels of political and economic power, in a neoliberal conservation context (*sensu* Arsel & Büscher [57]), where the strategy that has prevailed has been the commodification of nature, the generation of surpluses and the accumulation of capital. In the struggle for the appropriation of capital in Punta Laguna, the different actors (local residents, park rangers, academics, NGO conservationists, tourist agencies, among others) have faced innumerable socio-environmental conflicts that have been previously described (see [4,76]). These conflicts have occurred between families of the same community, between the community and tourist agencies, between CONANP and the community, and currently the conflicts are taking place between the community, the NGOs and academia against the ejido (a form of land tenure based on common-pool resources resulting from the land redistribution process of the Mexican land reform).

Under the logic of neoliberal conservation, Punta Laguna has been the stage for three closely linked transformations. The first has been an economic transformation. Approximately three decades ago, Punta Laguna used to be a community that based its economy on traditional management of its natural resources, with a dual logic of self-consumption and market-oriented activities. This management strategy was developed together with low-level ecotourism activities. Motivated by external actors who favored the dominant culture of conservation, Punta Laguna became a protected area in 2002 and increased tourist activity to the detriment of agroforestry activities, the latter seen by conservation actors as a disturbing activity for the forest and its biodiversity.

The community rapidly divided in two groups. On one side were those peasants that “modernized” themselves and adhere to the premises of preserving the forest through dedicating themselves exclusively to ecotourism. This discourse has served as a banner for receiving financial resources and ecotourism training and infrastructure projects from mainstream conservation NGOs. On the other side were those peasants entrenched in the traditional agriculture, seen as backward and unproductive economic agents that pose serious threats to biodiversity.

The productive transformation came with a substantial increase of the market economy and the monetization of activities and social relationships in the community. The formula “protected area and ecotourism” interpreted as “conservation and community development”, has been an inexhaustible source of socio-environmental conflicts. For example, inside the community, the conflicts have given rise to the exclusion of those families seen as traditional rural farmers and have empowered those families seen as conservationists. We have observed that these conflicts have passed through generations, constantly repeating exclusion behaviors within the community. In addition, the exponential increase of tourists in the community have attracted an important number of tourism operators anxious to get hold of the surplus that tourist activities generate. Taking advantage of the mistrust and discontent that existed within the community, these companies managed to sign exclusivity contracts with the community, and suddenly the owners of the land and the tourist businesses became employees of one of the biggest tourism agencies in the region.

The second transformation or conquest that Punta Laguna has suffered has been ecological. By becoming a protected area, CONANP prohibited the use of fire for agroforestry activities. Those families dedicated to traditional agriculture had to make their milpas (traditional agroforestry practice) outside the protected area. Beyond establishing *de facto* good practices (i.e., ecotourism) over bad practices (i.e., milpas), this interpretation of management implicitly carries a superior appraisal of the mature forest over a forest in different successional stages. This appraisal is not surprising. By conserving through a protected area what it is being valued is a specific way to understand nature, much in line with the concept of “wilderness,” wherein the tourist-consumer, urban and with purchasing power, visits the forest as a natural space removed from human development. As West & Brockington [77] (p. 609) note, protected areas are “a way of thinking about the world, of viewing the world, and of acting on the world”.

Finally, the third conquest has been the cultural transformation. Over the years, through the different projects that have been implemented in the community, a cultural transformation has occurred. Part of the conservation objective across the protected area has been to convert farmers or primary producers into service providers. The changes in the relationship between the people and the forest have created rapid acculturation. As part of this transformation, the Mayan culture has also been commodified, by converting the ceremonies and the rituals into commercial products for the tourists. The H'men (the Yucatecan shaman in charge of ceremonies and rituals) is no longer required, now it is sufficient to be elderly and speak Yucatec Maya to receive the tourists with a meaningless welcoming ceremony. The cultural transformation also has generated conflicts within the community because the most westernized young people that have learnt different languages are those that can be tourist guides, while the adults that seem more “Mayan” and that have difficulties with languages, including Spanish, remain segregated from performing these activities.

The history of Punta Laguna is a good example of how biodiversity conservation is an inherently political action that creates winners and losers, wherein the decisions of what to preserve, how, and where are given in a scope of power between actors and in the framework of a neoliberal global economy that has transformed protected areas into commodities [78].

4. Discussion

As observed in the previous sections, diverse forms of understanding socio-environmental conflicts exist, and the way in which we address them has important implications both for management and policy recommendations. For the sake of contributing to this debate, we use a comparative table

to discuss the differences between the approaches regarding the epistemological positions and the main variables of analysis, in addition to posing how the approaches could be enriched from the different aspects that are considered when analyzing the conflicts. This way of comparing permits us to more clearly indicate where the principal differences are found and to establish bridges between the approaches, thereby contributing towards a better management of socio-environmental conflicts and thus protected areas.

In Table 1, different elements are shown that seem interesting to discuss in the light of the three cases that we analyzed in the previous section: (1) the manner in which the conflict is understood and addressed; (2) the principal outputs of analysis; and (3) the spatial and temporal scales of analysis. Some of these variables allow us to concentrate on the most profound causes (e.g., power imbalance, the political-economic system, etc.), while others help manage and mitigate the conflicts (e.g., livestock insurance fund, subsidy programs for conservation).

Table 1. Main differences between approaches towards understanding and defining socio-environmental conflicts.

Analysis Variables	Socio-Environmental Conflict Approaches		
	Human–Wildlife Conflicts	Impairment Approach	Political Ecology
Understanding and approach	Impact of wildlife toward humans and vice versa. To develop means of prevention and mitigation of the impact.	Feeling of diminishment of one actor by another. To identify difference in perceptions, feelings and desires of the parties.	Power imbalance. To recognize the context of the social, economic and political changes.
Principal products of analysis	Conservation strategies based on scientific information to lessen the threat to the species in conflict and the impacts on local livelihoods.	Promotion of the understanding of the perspective of the other actors to achieve agreements.	To construct an alternative understanding of social and environmental processes, with an orientation toward social justice and radical politics.
Spatial scale and time dimension	Local/regional scales and present temporality	Local/regional scales and present temporality	Multiplicity of spatial scales and time dimensions.

As conservation practitioners, we do not necessarily stop to think about the perspective with which we understand the conflicts in protected areas. Although it is increasingly common to recognize that not all actors see and understand in the same way, we usually assume that in our search for knowledge and hence better decision-making, our approach is adequate because we understand the central aspects of the conflict. We highlight what others do not see. For example, the case of conflict between the jaguar and residents of the Calakmul region, it is clear that the approach that is made has a strong focus on technical solutions. The premise is that scientific knowledge is required for making sound decisions: what to conserve, how to do it, and where to do it [62]. Thus, the recommendations for conservation, from this perspective, can only be based on evidence collected and analyzed with rigorous methods. In effect, we can only know with robust information if the jaguar is being preserved or not, as should have been done with the fauna being hunted in the LPBR. However, although quantitative data play a crucial role, it is often contested [79]. From a critical theory perspective, we could interpret it in another way. The decisions and actions that are taken for preserving the jaguar are scientifically based but political, and as such, are laden with interests and values that are not neutral. Defining a conflict as human–jaguar, or establishing an area as protected, or outlawing hunting in a determined place, are decisions that impose a basic set of beliefs that guide action, imposing a specific way of understanding nature and the production of knowledge, which are inseparable from social

relationships of power [80]. Thus, as Moon & Blackman [81] highlight, as practitioners of conservation it is really important that we understand and recognize the principles and assumptions encrusted in our disciplines.

From recognizing that the conflict in the LPBR involves the actions of different actors and not the species being hunted, different perceptions, feelings and desires of the parties involved in the conflict have been recognized. Similarly, the common interest of the actors in conflict has been identified to preserve the wildlife species exploited for hunting, as well as the reasons whereby the local population perceives the hunting restriction as an imposition in which priority is given to the animals over the means of subsistence. These elements open up opportunities for proposing new schemes to reconcile the interests of the actors. Thus, it is possible to bring to the table different views and engage in a dialogue between the actors involved to generate compromise solutions that increase the possibilities of creating adequate programs to mitigate the conflicts and allow for fulfilling the conservation objectives.

In this sense, it seems to us that the way in which political ecology conceives and focuses its approach on socio-environmental conflicts comes to complete the understanding, since the approach contributes the institutional background and the power relations that not only underlie the conflicts' causes, but that also circumscribe the frame in which the management actions to resolve them are developed. For example, in the case of Punta Laguna it is difficult to understand the conflicts if an explicit identification is not made of the structures of power and of how the social, economic and political changes have resulted in a situation of great inequality and power imbalance, where the decision-making about conservation are in the hands of only some actors. Although technical or conflict management solutions are not proposed as in the two previous approaches, the understanding of the underlying causes is necessary for designing ethical strategies that will result in the social and political transformation of the situation. This understanding of the underlying causes is actually crucial for effectively addressing the conflicts related to wildlife impacts on human livelihoods (and vice versa), as well as those involving the restriction on natural resources' access by protected areas.

It seems to us that where the approaches differ most is in the concrete products that are derived from their analysis. The human-wildlife and the impairment approaches, through working closely with authorities and conservation NGOs, have developed very concrete products that from their perspective permit handling or resolving socio-environmental conflicts. For example, in the case of the LPBR, from recognizing the existence of diverse perspectives, a Linkage Matrix [82] was developed with the intention of generating possible guidelines of action to diminish the conflict between the reserve and the local population. From making evident the contrast between the elements proposed by the management program and the official discourse with the elements posed by local actors, the matrix establishes a basis for possible action among the actors to detach concrete actions. The key is, to our understanding, to generate compromise solutions between all the actors that are sustained in consensus. This proposal is in tune with instruments such as the "systematic conflict management tool" of Young & collaborators [83], which presents the necessity of going further than the diagnostic or the academic understanding of the conflict, to offer concrete tools to the conservation agencies. Conversely, in the case of the political ecology approach, the concrete products are usually more related to alternative proposals for understanding the socio-environmental conflicts, although in recent years some initiatives have been developed that aim to generate data bases, web platforms, policy briefs, even joint legal actions, like those developed by the members of the Mexican National Assembly of the Environmentally Affected (<http://www.afectadosambientales.org>). These actions are aimed at joining efforts of grassroots organizations to face social, cultural, and environmental predation undertaken by the corporate global economy.

We would like to finish the discussion with a reflection on the scales of the approaches of socio-environmental conflicts. The analysis of the three cases presented in this paper was made at the local scale, allowing us to highlight the particularities of the cases, the perspectives of the actors involved, as well as their interests regarding the conflicts. This approach, as Madden & McQuinn [84] argue, facilitates the work with the most visible and immediate impacts of the conflicts and permits

working in their mitigation and prevention. Nevertheless, with this particular view it is difficult to understand the more structural causes that underlie these conflicts. In this sense, authors such as Paz [13] (p. 12) argue that socio-environmental conflicts should not be understood as a handful of isolated cases, but as a set of conflicts embedded in the corporate global power scenario that seeks to appropriate the environment, understood as scope of life and space of ecological, economic, and sociocultural survival. However, it must be recognized that the larger scale of these causes (i.e., conservation strategies through protected areas permeated by a Western vision) makes it difficult to address these conflicts. For this, other types of actions are required, such as the modification of legislation and the design of public policies with a local context. The challenge will be to combine both elements: to act for mitigating the immediate impact of the conflicts (i.e., wildlife–human conflicts and impairment approaches) as well as, in parallel, to act upon the structural causes of the conflicts (i.e., political ecology). Failure to do so will result in compromising the integrity and validity of conservation itself.

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