

CHALLENGES AND OPPORTUNITIES OF HUMAN CONFLICT AND ENVIRONMENTAL TRANSFORMATION

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ABSTRACT.— This article critically analyzes the relationships among resource scarcity, conflict, and the transformation of the environment, positing several conceptual tools that provide a nuanced explanation for environmental transformation through human conflict and which overcome some of the limitations of the existing literature of political conflict. After proposing the idea of nonlinear cycles of violent degradation and demonstrating empirically how this has transformed landscapes and societies in the Ecuadorian highlands, the article examines the sociopolitical processes that occur at each of the nodes of the cycle. Specifically, it argues that the political incentives for cooperative environmental management can build confidence and be instrumental in the de-escalation of violence related to natural resource conflicts. When cooperative environmental management and dispute resolution fails, it is frequently the result of a gap between the short-term political incentives for decision makers to intervene and craft institutional solutions and the long-term pay-offs of these institutional measures for their constituents. The article argues that the destructive cycle is not deterministic, and that at each of the nodes of the cycle, opportunities exist to reach a stage of constructive negotiation, either by building on technical cooperation, mobilizing external allies and pressure agents, or by equalizing the gap in political time windows through conflict escalation so that decision makers find it in their interest to engage and help manage the conflict and mitigate global change.

Key words: environmental conflict, violence de-escalation, political incentives, Ecuador, Andes Mountains

RESUMEN.— Este artículo analiza críticamente las relaciones entre la escasez de recursos naturales, los conflictos, y la transformación del medio ambiente. Propone varias herramientas conceptuales que ofrecen una explicación detallada de la transformación

ambiental por medio de los conflictos humanos y que superan algunas limitaciones de la literatura sobre los conflictos políticos. Después de proponer la idea de ciclos no-lineales de degradación violenta, y demostrar empíricamente cómo se han transformado los paisajes y sociedades de la Sierra ecuatoriana, el artículo examina los procesos sociopolíticos que ocurren en cada uno de los nodos del ciclo. Específicamente, sostiene que los incentivos políticos para el manejo cooperativo del medio ambiente pueden aumentar la confianza y pueden contribuir decisivamente a la disminución de la violencia que está relacionada a conflictos de recursos naturales. Cuando el manejo cooperativo del medio ambiente y la resolución de disputas fracasan, frecuentemente resulta un desequilibrio entre los incentivos políticos de corto plazo para intervenir con la creación de soluciones institucionales, y los beneficios de largo plazo que vienen de las medidas institucionales para su electorado. Este artículo sostiene que el ciclo destructivo no es determinista, y que en cada nodo del ciclo, existen oportunidades para lograr una negociación constructiva. Esta negociación puede resultar de cooperación técnica, de la movilización de aliados externos y agentes de presión, o de cambiar el desequilibrio en incentivos políticos por medio de un aumento del conflicto para hacer que los líderes políticos tengan interés en involucrarse para ayudar a manejar el conflicto y disminuir el impacto del cambio global.

Palabras claves: conflictos ambientales, disminución de violencia, incentivos políticos, Ecuador, montañas Andinas

1. Introduction

The Andean landscape is constantly shifting and being shaped by powerful forces, including water erosion in the chill, humid *páramo*; solar radiation from the direct rays of the equatorial sun; and seismic activity from the many volcanoes, to name a few of the natural change agents driving landscape transformation. The pace of this transformation is increased significantly, however, as a result of human agency, with the effects of farming, cattle-grazing, deforestation, industrial emissions, and even tourism all contributing to a rapid acceleration in the change, and frequently the degradation, of tropical Andean landscapes. Social interaction, and especially violent human conflict, has often wide-reaching effects on the environment, which is transformed not only through naturally-occurring processes but also through intentional and unintentional human action.

This paper argues that environmental transformation and degradation that occurs in conjunction with human conflict is frequently the consequence of a gap in time windows for political action; insufficient institutional infrastructure to overcome collective action problems; and a failure to engage meaningfully in negotiation, and that these phenomena are exacerbated by widespread poverty and socioeconomic inequalities. I unpack the concept of cycles of violent degradation, demonstrating that natural resource scarcity, environmental degradation, and violence are interconnected into a

destructive cycle, rather than being traced in a linear, causal relationship in accordance with conventional wisdom and the popular press. Finally, I explore the nuances that occur at the nodes of the cycle, in which opportunities for joint environmental cooperation and even the pressure of escalated conflict combined with intervention from external actors can lead to constructive negotiation. By exploring the case of the conflict over foreign mining operations in Ecuador, I provide empirical support for a framework of environmental conflict management that represents an expansion of previous work by others. If there is to be an intelligent conversation about how human conflict can be mitigated and its negative effects on environmental transformation reduced, conceptual tools like those proposed here are needed in order to think more clearly about the nature of the problem.

Many scholars have noted the interrelated processes that link together the degradation of natural resources and environmental systems on the one hand with conflict and violence on the other hand (see HOMER-DIXON, 1991; HAUGE & ELLINGSEN, 1998; GLEDITSCH, 1998). Much of the political science literature on this subject focuses on how environmental scarcity exacerbates existing risk factors like poverty and political instability in order to fuel low-level conflict (HOMER-DIXON, 1999). Geographers, ecologists, and policymakers have also recognized and studied the relationships between human social interaction and the environment, although they have tended to focus more on how human agency in general shapes environmental change. L.S. HAMILTON has argued that mountains in particular can serve as key sites both for violence and conflict (due largely to their remoteness and lack of control by political agents) as well as potential spaces for conflict resolution efforts arising from transnational shared environmental conservation efforts (HAMILTON, 2006).

2. The Destructive Cycle of Conflict and Environmental Transformation

In theorizing the relationship between conflict and environmental change, we can think about a destructive cycle rather than a linear relationship between environmental scarcity and conflict. See Figure 1 as a visual representation of this cycle.

The scarcity of natural resources can be taken as a starting point¹. Because there are not enough of most natural resources freely available for everyone

¹ Framing the analysis in terms of natural resources inevitably focuses only on environmental issues in relation to human extractive needs, rather than on the intrinsic value of the environmental or on the complex interdependence of ecosystems in which changes can transform the relationship, and even the very existence,

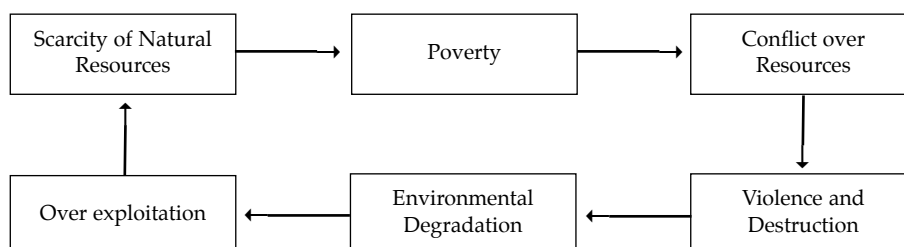


Figure 1. Destructive Cycle of Conflict and Environmental Transformation.

to take as much as they want, some procedure for extracting and distributing those resources must exist. This often involves territorial/ownership claims, with prices in essence licensing these ownership claims on the use of the resource as well as paying for the effort of extracting and delivering the resource. Since the control of scarce resources is unequally distributed, with the rich and politically powerful controlling a larger share than the poor, poverty emerges. Those who are disenfranchised by the social system, disadvantaged by individual characteristics that make them less productive, or exploited by those in positions of power find themselves unable to use nature's gifts for survival or economic self-improvement. Especially in areas that are economically dependent on agriculture, poverty can become a key mediating factor between environmental change (for example, when drought affects crop production) and the likelihood that the affected population will engage in conflict and/or violence (DE SOYSA & GLEDITSCH, 1999). CARPIO & MENESES argue, "Para entender los conflictos ambientales, es necesario saber que, los síntomas de degradación y contaminación de los recursos naturales, vistas desde la visión socio-ambiental, evidencian el deterioro ambiental que disminuye la productividad de los ecosistemas, y que aumentan la pobreza y la exclusión social. En otras palabras...la pobreza es la peor forma de contaminación." (2006: 31).

Poverty, and especially unequal distributions of poverty exacerbated by a sudden relative change in income, or sudden loss of livelihood, often leads to conflict in which the new have-nots resist this loss by attempting to reclaim those resources or control over that territory to which they believe they have

of many species, even if this does not immediately reduce or increase the number of resources available to be extracted by humans. This is an important consideration and a valid potential criticism, but since I am focusing on human conflict, the variables need to be compatible and comparable, so it makes sense to frame environmental factors in terms of natural resources that affect or are available to humans.

a legitimate claim or which was formerly controlled by them. Widespread poverty itself is not necessarily a persuasive causal explanation for violence, as many of the poorest areas of the world remain poor over time, but they are not the areas most characterized by violence. LEIF OLSSON argues, "While poverty may be a near-endemic condition in certain societies, loss of livelihood marks a rapid transition from a previous stable condition of relative welfare into a condition of poverty or destitution. It is the rapid process of change resulting in a sudden fall into poverty, more than the endemic condition of poverty, which creates the potential for livelihood conflicts." (OLSSON, 2001: 3).

Such a sudden change in livelihood could come as a result of the contamination of a watershed on which a population depends for fishing, farming, tourism, and drinking water, as occurred in Papallacta, Ecuador in 2003 (SCIORTINO *et al.*, 2007; PUGH & SARMIENTO, 2004). The loss of livelihood could also come as a result of the burning of vegetation in the high grassland *paramo*, resulting in a diminished capacity to absorb and filter moisture, causing a water shortage that severely intensifies the intracommunity competition over the distribution of water for drinking and agriculture, as occurred in the communities around Lago San Pablo in northern Ecuador (CABASCANGO, 2007). One of the best examples of this loss of livelihood resulting in conflict is the incursion of petroleum companies into traditional indigenous territories, where colonists, equipment, and oil spills significantly diminish the population's livelihood. As a result, conflict emerges, and in the case of the Cofán indigenous group in northeast Ecuador, the population may escalate to violence. This group, after repeated attempts at a negotiated solution, burned down the oil well and equipment of the petroleum company that had established drilling operations in their territory (BORMAN, 2007).

As the conflict and violence that results from resource competition and loss of livelihood escalates, there is a significant likelihood that this human conflict can have disastrous side effects in terms of environmental degradation. In the case of the Cofán, the conflict over the oil well escalated to the point of burning the equipment, which would have released toxic fumes, and the fire could easily have spread, burning parts of the surrounding forest. A further illustration of resource conflict and violence having negative environmental effects is the violence waged in Colombia on multinational corporations by the ELN (Ejército de Liberación Nacional), which claims a Marxist agenda to free the poor of the oppressive poverty caused by the exploitation of foreign companies stealing the scarce resources that make up the national patrimony of the country. The most common

manifestation of this conflict, however, is through explosive attacks and sabotage on petroleum infrastructure, which leads to oil spills, wasted fossil fuel resources, and degradation in the surrounding ecosystems as a result of the attacks (PUGH, 2003). Given the delicate balance and complex interdependent networks that characterize mountain ecosystems, this type of massive disruption is likely to have far-reaching, long term effects both on the system and on the capacity of humans to benefit from available natural resources. As these empirical examples show, environmental disasters and competition for natural resources can result in escalated conflict and violence, which exacerbates the destructive cycle.

It should be noted that there are other possible outcomes from the escalation of conflict, such as greater urgency and pressure to negotiate, which will be explored later in this paper in the context of a framework for environmental conflict management. Alternatively, unilateral actions by the more powerful actor or by external agents might include cooptation of opponents, corruption, repression, or complete withdrawal. The Lake Papallacta water contamination case mentioned above illustrates all of these factors, as the affected community was offered a one-time minimal settlement that they could either accept or take on the company in court, an unrealistic option for economically disadvantaged campesinos. Local leaders were co-opted and convinced to agree to the settlement, and despite complaints from the population that very little of the settlement money was used to benefit the community, residents felt hopeless that they could do anything about it (SCIORTINO, *et al.*, 2007; PUGH & SARMIENTO, 2004). ESPERANZA MARTINEZ argues that this type of unilateral solution through co-optation is a frequent strategy of many businesses involved in environmental conflict (MARTINEZ, 2006).

As conflict-ravaged environmental degradation transforms the mountain landscape, the remaining accessible natural resources are utilized more intensively, putting even greater strain on the system. A lake that has been contaminated by lead from surplus weaponry or by petroleum spilled in a violent conflict means that everyone must draw drinking and irrigation water from the remaining rivers and streams nearby, which in turn become even more scarce as a result of this more intensive over exploitation. This brings the cycle full scale back to its starting point of resource scarcity. As this explanation makes apparent, environmental degradation, natural resource scarcity, and violent conflict are not linked into a linear causal relationship; rather, they form mutually reinforcing components of a destructive cycle which threatens the integrity of ecosystems and landscapes as well as the peace and prosperity of human populations.

3. The Time Window Gap as Explanation for the Persistence of the Cycle

Given the dangers of this destructive cycle, and the fact that this insight has not gone unrecognized in the literature, why is it that human societies acting from rational self-interest do not craft cooperative policies to avoid this suboptimal outcome? The familiar answer to this is that the paradox presents a collective action problem in which no one person has enough incentive to bear the costs of stopping the cycle, even when the combination of everyone doing nothing creates an outcome that is much worse for everyone. All affected parties would much rather free ride on the protective efforts of others while enjoying the environmental benefits that result (OLSON, 1965; LIEBRAND, MESSICK, & WILKE, 1992; HARDIN, 1968). This is not all of the answer, however, because the traditional solution to collective action problems is to build institutions that raise the cost of defection and increase particular benefits for cooperation. These institutions, such as government regulation, permitting, and clubs, however, often fail to materialize, or if they exist, fail to successfully bring about cooperative and coordinated conflict resolution and conservation efforts that would overcome free riding and break the destructive cycle described above.

One of the major reasons why societies, and especially decision makers, fail to create sustainable institutional solutions to collective action problems that allow environmental transformation and degradation to occur as a result of conflict is what I call the 'time-window gap'. At key points in the destructive cycle, political leaders could intervene in a way that would alter the trajectory of the cycle. In particular, the environmental degradation, overexploitation, and poverty stages are three points in which long-term investments of political will, such as protection of endangered species, permits, and enforcement to prevent overuse of resources, could be decisive in reversing the perils of the collective action problem known as the 'tragedy of the commons' (HARDIN 1968).

The fact remains, however, that this political will is required from decision makers who owe their livelihood to staying in power, which is accomplished in regular political cycles, usually corresponding with elections every few years. This means that the political leader is under pressure to produce direct benefits for his/her constituents in a fairly short time frame and has very little incentive to worry about, or spend political capital to achieve, diffuse benefits that will not be direct or apparent for some time, such as protecting the balance of interdependent mountain ecosystems. Demands for political approval of projects that are lucrative in the short term, like unrestricted fishing, logging, and construction of electric power dams, promise

immediate, direct benefits to particular constituents who will be better off and have a high incentive to support the political leader. The incentives for the political leader to prevent actions with such harmful effects, on the other hand, are diffuse benefits that raise the quality of life for everyone, not particular beneficiaries, and which may not be apparent for some time. This gap between the short time window of the decision maker's political need to provide direct economic benefits within a short period of time and the longer time window required for the policy changes to produce enough collective benefits to be noticed and to disrupt the trajectory of the destructive cycle helps to explain the unfortunate persistence of the cycle in societies around the world. Ironically, the escalation of conflict to violence can sometimes have the counterintuitive effect of equalizing the time gap window and motivating the politician to intervene or facilitate a dialogue, because the risk of doing nothing in the face of crisis may be greater than the risk of disappointing constituents seeking particularistic economic benefits. This phenomenon will be explored later in this paper through the example of the Canadian mining industry in Ecuador.

4. Escaping the Cycle through Negotiation, Dialogue, and Technical Cooperation

Despite the difficulties presented both by the destructive cycle and the sociopolitical realities that contribute to its perpetuation through the gap in political time windows, a more complex view of environmental conflict reveals that efforts to escape or transform the cycle can and sometimes do succeed. The cycle described in Figure 1 indicates the way that interrelated phenomena of scarce resources, poverty, violence, and environmental degradation interact, exacerbating each other's effects in an ongoing fashion. At each of the nodes of the cycle, however, there are opportunities for agency in which engagement or intervention by political entrepreneurs or organized mobilization by affected parties in alliance with external allies could change the trajectory of the conflict into an opportunity for positive change. When competition over resources, loss of livelihood, or other factors results in environmental conflict, KEN CONCA notes that exacerbation of violence and environmental degradation is not the only, or even the most likely, outcome. Rather, he argues that the shared problem represented by environmental damage can be an opportunity to engage in joint problem solving, shared technical consultation, and the production of unified conservation programs that transform conflict through technical cooperation (CONCA, 2002).

In addition to the possibility of joint technical cooperation to resolve environmental challenges (and their associated conflicts), it is also important to note that conflict over environmental resources does not necessarily produce a violent outcome. Figure 2 lays out a framework for understanding how environmental conflict management works, including the actors involved and the factors shaping their decision-making process and options.

Frequently, when an action is taken by an actor ('conflict generator') that could adversely affect the environment or intrude on another party's ability to benefit from natural resources, the affected party responds using a menu of possible actions, including political demands, mobilization of allies, pressure for third-party intervention, or violent resistance, to name a few (GUÍA, 1998)². The interaction between the generating party and the affected parties may also be shaped by ethical concerns, the self-image of the parties as presented to the public, and/or the history between the two (FONTAINE, 2003). Based on the response of the affected parties, and the degree to which it forces the generator to pay attention and respond, the conflict proceeds into a negotiation phase in which both sides seek to come to a mutually acceptable agreement. This may succeed, but if it does not, the conflict may escalate, possibly leading to violence and/or environmental degradation as described in Figure 1. In this case, the cycle might continue to spiral, or the escalation could lead directly back to negotiations. All of this takes place in the context of pressure from external actors, including government, activists, interest groups, and corporations, as well as the sociopolitical context that shapes the opportunities and constraints on available options.

The conflict between foreign mining companies such as the Canadian Ascendant Copper Corporation and the largely indigenous communities of Íntag and Cotacachi, Ecuador provides empirical support for how this model works in practice. Opposition to the mining operations of Ascendant in Íntag began to escalate, with local actors arguing that they were getting an unfair share of the benefits from the extraction of Ecuador's patrimony, that foreign mining was an unsustainable enterprise that would strip their region of natural resources, and that the operation was disrupting the rich biodiversity of the area. As local actors, including activist cooperatives, sectors of local government, and other inhabitants resisted the mining operations through political demands to expel the company, protests, and communication campaigns, the conflict began to escalate. Little successful negotiation occurred, so opponents of the mining appealed to the Ministry of Energy and

² This framework expands upon valuable insights proposed and detailed in GUÍA 1998 by the Observatorio Latinoamericano para Conflictos Ambientales. See that work for a more practical step-by-step manual for managing environmental conflict in Latin America.

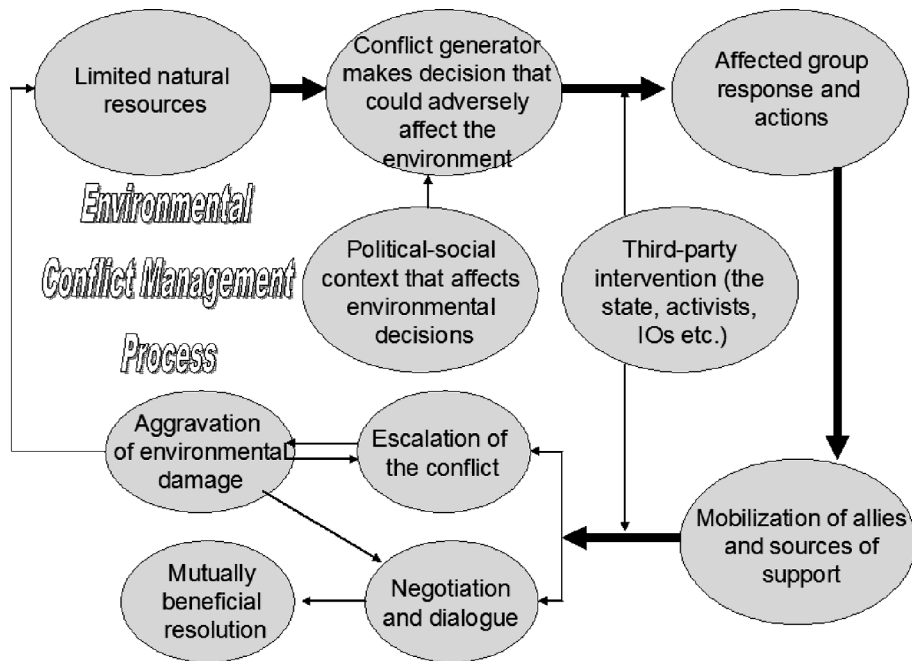


Figure 2. Process of Environmental Conflict Management.

other external agents, staged protests, and according to news reports, they ultimately resorted to burning a miners' work camp and kidnapping several mining employees hostage with demands that the company leave (DECOIN, 2005; MINERÍA, 2006). The mining company also appealed to the government, police, and military to stem the illegal and violent activity, and in the context of an unfavorable sociopolitical context and negative public perception, the Mayor of Cotacachi claimed that Ascendant had mobilized private security forces, which escalated the violence further through forced detentions, use of tear gas on residents, and other security measures (TITUAÑA, 2006). In the face of the escalating conflict, the time window gap between environmental benefits and political opportunities was equalized by the desire to stop the violence, and Minister of Energy Alberto Acosta called for a national-level dialogue to mediate the conflict between mining companies and local populations and to deliberate on future plans (MINISTRO, 2007). Subsequently, the negotiation was incorporated into the national Constituent Assembly deliberations, an excellent example of

escalation combined with third-party pressure returning an environmental conflict to the negotiation stage of the framework.

Conclusions

As this analysis shows, the connections between human conflict and environmental transformation are numerous and interdependent. Rather than a linear relationship in which violence causes environmental degradation or environmental scarcity fuels violent conflict, I have argued that these two phenomena are linked in a destructive cycle which has proven very difficult for many societies to overcome. In addition to environmental degradation and violence, poverty and loss of livelihood play a key intermediary role in the cycle that connects these components. In order to understand why these destructive cycles have been so difficult to transform into positive cooperation, I have proposed that one explanation lies in the gaps between the time window available for policies to offer direct constituent benefits in order to be relevant to political leaders seeking to stay in power (short time window) and the time window in which the diffuse benefits of environmental cooperation and protection are likely to become manifest for the policy maker's constituents (long time window). Finally, I have argued that the destructive cycle is not deterministic, and that at each of the nodes of the cycle, opportunities exist to reach a stage of constructive negotiation, either by building on technical cooperation, mobilizing external allies and pressure agents, or by equalizing the gap in political time windows through conflict escalation so that decision makers find it in their interest to engage and help manage the conflict. Future research and policy analysis can build upon these insights to develop more detailed ideas about how to deal with the interrelated problems of violent conflict and environmental degradation and to engineer strong institutional mechanisms that overcome the challenge of the time window gap and alter incentive structures for political leaders, preferably without having to escalate to violence.

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