Soil Erosion and Social (Dis)courses in Cochabamba, Bolivia: Perceiving the Nature of Environmental Degradation*

Karl S. Zimmerer
Department of Geography, University of Wisconsin, Madison, WI 53706–1491

Abstract: Soil erosion in Cochabamba, Bolivia, has not been perceived uniformly by development institutions, peasants in their personal perspectives, and rural trade unions. Development institutions that attributed soil erosion to peasant farmers voiced the most well-known perceptions about the erosion dilemma until the mid-1980s. The personal perspectives of many peasants reinforced this view by placing blame on their own behavior. Since the 1980s, these dominant discourses have been implicitly contested by the viewpoints of numerous peasants (especially young adults) who stress links between government policies and worsening erosion. Young peasant viewpoints have been accommodated by rural trade unions. Different perceptions of soil erosion among and within the three groups were shaped by contrasting livelihood experiences and by differing efforts at shaping conservation programs and related development measures. This study demonstrates the importance to conservation-oriented development of understanding the perceptions of local inhabitants and institutions with respect to biophysical resources in general and environmental degradation in particular.

Key words: soil erosion, development, environmental perceptions, environmental degradation, soil conservation, Bolivia, peasant economy, discourse.

> The land users have not developed any awareness about the problems of soil erosion. Overgrazing and trampling by livestock, together with the removal of shrub cover for fuel in the Altiplano and the Mesothermic Valleys, are the most important causes of soil erosion. (*Environmental Profile of Bolivia*, International Institute for Development and Environment and United States Agency for International Development 1986)

> It was not like this before, the hills weren't barren nor were there many erosion gullies. Look, I'm only 27 years old but I've seen it deteriorate bit by bit . . . the soil has lost its productive force, each year it no longer produces as before. Soil from the slopes is being swept downward—leaving bare rock, subsoil, and gullies—due to the heavy rains . . . the development institutions claim that they know the solutions, but when we look at it, we recognize that we know as a result of our experience, we know how to take care of the earth. (*Interview*, Ubaldina Mejía, Aiquile, Cochabamba, 14 October 1991)[1]

> The peasants will no longer tolerate . . . the exploitation of our natural resources by the oligarchy and the imperialists. (*Resolutions of the Third Congress*, ["The Sole Trade Union Federation of the Peasant Workers of Cochabamba"], Cochabamba, 1986)

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Views of Environmental Hazards and Development

A consequence of deteriorating environments, hazards present a threat to people worldwide and to their prospects for development (Mathews 1989; World Commission on Environment and Development 1987). Alarming accounts of hazards frequently evoke the commonness of human concern about deterioration. Yet a growing body of studies suggests differences in people's views of the nature of environmental deterioration and its relation to development (Denevan 1973; Hecht and Cockburn 1990; Schmink and Wood 1992; White 1966). From water pollution in Boulder, Colorado, to deforestation in the Brazilian Amazon, the causes of environmental deterioration tend to be perceived differently. In many cases, distinct groups of people and institutions have drawn on contrasting perceptions of cause as they attempt to shape policies and programs dealing with the environmental impacts of development. Yet the importance of perceptual (emic-type) differences among social groups and development institutions has not been addressed in the growing corpus of work concerned with environment-development issues.[2]

The present study examines diverse perceptions of the causes of soil erosion among inhabitants and institutions in Cochabamba, Bolivia. According to recent accounts, soil erosion in the Cochabamba "heartland" and several other highland regions of Bolivia constitutes a destructive environmental hazard that degrades farm and grazing lands and increases flooding, desertification, and dust storms (Eckholm 1976; LeBaron et al. 1979; Terrazas 1974; Presencia 1990). Estimates indicate that 64 percent, or 790 square kilometers, of the land surface in Cochabamba is at least moderately eroded, and approximations of annual soil erosion vary between 50 and 150 tons per hectare, well above rates of soil formation (CORDECO 1980; Zimmerer 1991). These figures signal an erosion dilemma that exceeds even the severe national situation: a recent report released by the Bolivian Ministry of Peasant Agriculture and Ranching (MACA), and published in two major newspapers, estimates that between 35 and 41 percent of the country currently displays moderate or extreme soil erosion (Los Tiempos 1991; Presencia 1990). For many inhabitants and institutions in Cochabamba, soil erosion has become an issue of substantial alarm.

Articulated perceptions (discourses) of the causes of soil erosion assessed here include three groups of inhabitants and institutions in Cochabamba: government institutions and nongovernmental organizations (NGOs), peasants in their personal perspectives, and rural trade unions. Each group has expressed concern about the recent erosion dilemma, its impacts and possible solutions. The articulated perceptions typical of each group are represented in conversational accounts made in 1991 and in published and unpublished documents. These were assembled in field research undertaken in July 1990 and between February and December 1991. The present study, except where indicated, is based on personal notes and observations, including conversations.[3]

The research topic addressed in this study resembles the "perception of natural hazards" tradition in human geography (Burton, Kates, and White 1978; Kates and Burton 1986; White 1974), but integrates major reformulations by building on three criticisms posed in previous critiques of the "perception of natural hazards" tradition and by advancing two additional perspectives. In terms of previous reformulations: (1) As distinct from the "naturalness of hazards," the creation,

[2] This oversight is frequently associated with the furnishing of cohesive explanations of cause and effect in environmental degradation. I examine cause-and-effect relations in Cochabamba soil erosion in a separate study (Zimmerer 1993).

[3] The present tense is used to refer to conditions existing during 1991.

or at least the worsening, of many hazards is anthropogenic (Emel and Peet 1989), with soil erosion clearly fitting the latter characterization. (2) Whereas traditional research did not consider in depth the historical, social, or political contexts of hazards (Whyte 1986; see critiques by Hewitt 1983; Watts 1983, 1985), the present study emphasizes the contextual character of soil erosion and constructs the problem within a regional spatial scale (the Cochabamba region) and a historical time frame (primarily since 1970, with minor references to periods as early as the sixteenth century).[4] (3) Near-exclusive focus on individuals in traditional research often diverts attention from social forces conditioning hazardous situations and the hazard-related behavior of people (Watts 1983, 1985). The present study redresses this underemphasis by delimiting groups, each with a characteristic viewpoint on the causes of soil erosion, shaped by social and political economic forces related to development.

In addition, the present study proposes two additional bases for the consideration of environmental hazards. First, it focuses attention on the personal views of soil erosion expressed by local inhabitants during informal conversations, thereby departing significantly from the "perceptions of natural hazards" tradition. The traditional approach examined artifacts of perception, at first focusing on textual and graphic depictions by scientists, scholars, explorers, writers, and artists. As the approach concentrated on present-day problems, standardized questionnaires, in some cases similar to psychological testing instruments, were adopted. Applied to contemporary settings during a six-year research effort in 24 countries, the investigators relied on such methods as sentence completion tests and choice questionnaires (White 1974). Ensuing criticisms showed those methodologies to be ethnocentric, narrowly scientific, obsessed with normal-type behavior, and geared toward technocratic management (Emel and Peet 1989; Hewitt 1983; Waddell 1977; Watts 1983; Whyte 1986). Efforts at representing views of local peoples subsequently diminished in the "perceptions of natural hazards" tradition.

In the present study, personal views on the causes of soil erosion in Cochabamba were gained through open-ended conversation with local inhabitants. This approach partly enabled Cochabamba peasants "to speak for themselves," a rhetorical strategy referred to as giving "voices to the voiceless" (Gugelberger and Kearney 1991; Yúdice 1991).[5] By representing numerous "little voices" speaking about environmental deterioration, this study reworks the methodological and epistemological foundations of earlier studies that attributed roles only to relevant "great actors and subjects" (the nation-state, leaders of political parties, government officials), a casting of social life and history that has remained almost unchallenged until recently.[6] The

[4] Long time frames are important in understanding not only the views of governments and rulers but also contemporary issues involving peasant and indigenous peoples in developing countries (Stern 1987; Wolf 1982).

[5] The expression "voices to the voiceless" is itself misleading, because frequently the "voiceless" marshall social power and articulate their concerns. Although their voices are admittedly weak and their social power restricted, peasants and other dominated people are rarely dominated with such completeness that they are "voiceless." Recognizing this, I refer here to "little voices."

[6] The view of soil erosion that emerged in the United States during the late 1930s and the 1940s following the Dust Bowl has wielded considerable influence in Cochabamba institutions working on soil conservation. The Cochabamba library of the Ministry of Peasant Agriculture and Ranching, for instance, contains only one publication focused on soil erosion: "Facts about Wind Erosion and Dust Storms on the Great Plains," written by the United States Department of Agriculture (1955, Leaflet Number 394) and published in Spanish by the United States Agency for

present study, in contrast, sought perceptions on erosion causes articulated in conversation and during open-ended interviews in the local language (Quechua) with the "little voices" of 34 inhabitants. Taped and transcribed with their consent, our 30 to 90 minute dialogues furnished a basis for understanding personal perspectives.

The second conceptual basis proposed in this study concerns the relation between articulated perceptions of soil erosion and social power steering development in Cochabamba. It, too, departs from the traditional approach toward "perceptions of natural hazards." Discourses on the causes of erosion are seen here not as mere reflections of experience, culture, and development history in the region, but instead are recognized as constitutive of past and present power relations. Articulated perceptions of soil erosion, elucidated through the theoretical perspective of Giddens (1979), figure into even broader concerns. Contention, resistance, and accommodation evident in these viewpoints have been situated by the three groups within wide-ranging beliefs about development, modernization, and conservation and, no less importantly, about the related roles of the peasantry, the state, and development agencies (including nongovernmental organizations). As well as contrasting viewpoints between the three groups, viewpoints on erosion within each group have rarely coalesced in unvarying or harmonious accord.

The main focus of this study lies in similarities and differences among and within the major explanations of soil erosion expressed in Cochabamba since 1970. During this period, similar viewpoints expounded by distinct groups have been crucial in justifying conservation policies related to development programs. The first noteworthy similarity matched the majority of development institutions and many peasants in their personal perspectives, with both groups attributing the causes of soil erosion exclusively to peasant behavior. A similar emphasis, although implicit, probably lay behind the absence of the erosion dilemma among issues addressed by rural trade unions prior to the mid-1980s. This widely shared explanation was at first uncontested. Yet it eventually confronted a second, and quite distinct, group of viewpoints on the causes of soil erosion emerging among younger peasants. Forming personal perspectives under distinct environmental, social, and political circumstances, many young peasants sought to identify the political and economic conditions of worsened soil erosion and rural underdevelopment. Young peasants extended their personal discourses on the causes of soil erosion into the broad-based social movement represented by revitalized rural trade unions. Unlike earlier positions, recent trade-union explanations of the erosion dilemma have considered the extra-regional political economy together with concerns based on local concepts of space and time.

Explanations for Erosion in Cochabamba

The long-term history of soil erosion in Cochabamba resembles that of other highland regions in present-day Bolivia.[7] Cov-

International Development in 1974. With respect to hearing "little voices," it is notable that the widely read and differing accounts of Hugh Bennet (1947), James Malin (1936), Paul Sears (1935), and Donald Worster (1979) concur in the paucity or absence of attention to views expressed by either local inhabitants or groups such as Farmers' Clubs.

[7] Cochabamba Department consists primarily of uplifted Paleozoic sedimentary rock, which forms a highly dissected upland with elevations between 250 and 4,200 meters above sea level and which is characterized by steep slopes and entrenched valleys. Most agriculture and livestock raising in Cochabamba takes place at elevations between 2,500 and 3,800 meters above sea level, where annual precipitation varies between 450 and 800 millimeters. Vegetation consists primarily

ering 38 percent of the national territory, highland landscapes were centers of political power and population prior to invasion and conquest in the fourteenth century by the Altiplano-based Aymara. Subsequently Cochabamba became an agricultural heartland for the Cuzco-based Inca, who organized more than 14,000 agricultural workers on state farms producing economic surpluses (Wachtel 1982). Although the number of agriculturalists in Cochabamba decreased with the onset of Spanish rule, colonial policy of the Spaniards nonetheless pressured inhabitants to provision agricultural goods and laborers in general and for crown mining centers such as Potosí in particular. The same economic orientation persisted following political independence of Bolivia in 1825. While peasant agriculturalists in Cochabamba were able to gain land at the expense of large landlords in the late nineteenth and twentieth centuries, intensified production caused environmental deterioration (Larson 1988). As early as the 1920s, observers noted the unwelcome spread of deforested and eroded expanses where once there had been productive range and agricultural land.

Yet aggravated soil erosion in Cochabamba did not draw the attention of government officials responsible for policy on rural land use until the mid-twentieth century because of several factors. For one, Bolivia and other Latin American states differed from Asia and Africa insofar as the colonial government had not established agencies for soil conservation (Blaikie 1985). Moreover, once independent in 1825, the Bolivian state was weak and chronically unstable. Beginning in the mid-twentieth century, governments in Bolivia permitted international assistance in agricultural planning and development, provided particularly by the United States, which sought to influence Bolivian political and economic policy. Involved directly with Bolivian agriculture at least as early as 1943, the United States Department of Agriculture chose Cochabamba sites for several projects aimed at modernization (USDA 1962). The agricultural projects implemented by the USDA and other United States agencies through the mid-1960s addressed neither soil erosion nor conservation.

The development institutions of the Bolivian government also paid little attention to worsening soil erosion. Although the national Agrarian Reform Law of 1953 listed natural resource conservation among six fundamental objectives, this legal statute did not guarantee action. In fact, a review of the reform law 15 years later concluded that the government devoted little attention to environmental conservation and allocated even less fiscal support (Heath 1969). The apparent failure of the decree on environmental conservation accords with the emphasis of reform policies that overall favored commercial agriculture on the relatively flat, fertile, and well-watered alluvial soils of the lowlands (Gill 1987; Urioste 1984). Nearly 300,000 inhabitants of the highlands received land titles through the 1953 agrarian reform statute, but they gained few other benefits. Most development incentives benefited large-scale agriculture in Santa Cruz, where large farmers and ranchers, granted 60 percent of the land adjudicated in the agrarian reform, expanded crop and livestock production severalfold under the added impetus of unprecedented credit and price policies.[8] Highland agriculture, on the other hand, received little stimulus, and even policies and projects designated for agricultural development in the highlands tended mostly to benefit large land holders cultivating irrigated bottomland tracts (UMSS 1963).

of shrub-steppe savannas and thorn-scrub woodlands (Montes de Oca 1989).

[8] Farmer and rancher groups in Santa Cruz, such as the Federations of Cattlemen (*Federaciones de Ganaderos*) and the Agriculture and Livestock Bureaus (*Camaras Agropecuarias*), effectively pressed the Bolivian government for benefits; as the center of economic and political power in the country shifted increasingly toward Santa Cruz these groups gained more influence in government policy.

Beginning in the 1960s, a number of academic researchers and scholarly observers have given considerable attention to soil erosion in Bolivia. Geographer David Preston, carrying out field work during 1966 and 1967 on a multiagency project, found invigorated gully incisions due to accelerating soil loss (Preston 1969). Subsequent research organized through the U. S. Agency for International Development (U.S. AID) decried damaging erosion throughout much of the next decade (Grover 1974; LeBaron et al. 1979). Many Bolivians learned of the erosion dilemma through a popular and insightful book entitled *Bolivia: The Despoiled Country* (Terrazas 1974). Similar warnings were sounded with the publication of *The Wasted Country: The Ecological Crisis in Bolivia* (Baptista 1977), while a large international audience was introduced to the Bolivian soil erosion crisis in *Losing Ground* (Eckholm 1976). By the mid-1970s, soil erosion in Bolivia had indeed been widely publicized at home and abroad.

As awareness grew in the region during the 1970s and 1980s, three prominent perspectives on the erosion situation could be identified: those of governmental and nongovernmental institutions; those of peasants in their personal perspectives; and those of rural trade unions.

Development Institutions: Blaming the Peasants

The development institutions of the Bolivian government did little to support soil conservation despite the accumulating accounts of catastrophic erosion in Cochabamba and other highland regions. None of several governments ruling during the 1970s and 1980s established a national policy or program on soil conservation, a source of consternation for various consultants contracted by the United States (IIDE and U.S. AID 1986). When agencies in the national government did assess soil erosion, they blamed the perceived backwardness of peasant farmers and herders. A report on "Renewable Natural Resources" by the Ministry of Peasant Agriculture and Ranching, for instance, claimed that the primary cause of soil erosion could be found in a failure of land users to employ modern techniques (MACA 1977). Such reports asserted that the transfer of proper tools and techniques to ill-equipped and erosion-inducing peasants would stem erosion. Market signals and articulation of the peasant economy with agricultural businesses, it was thought, would induce the necessary innovations and transfer modern technologies (Adams 1980).

But capacity of the peasant sector in Cochabamba to generate market demand for modern technologies declined steadily during the 1980s, and agribusiness integration remained restricted to small areas within the overall peasant economy (Weil 1983). National economic restructuring implemented since August 1985, in accord with a neoliberal model recommended by the International Monetary Fund and the World Bank, dashed remaining hopes that market-induced technological change would aid in the reduction of soil erosion. With sectoral, social, and spatial inequalities engendered by new economic policies, highland production exerted little demand on input markets.[9] Countering the prior paucity of government interest in erosion, some state agencies called for assistance programs to aid in the transfer of modern agricultural tools and techniques for conservation purposes. In a 1987 "National Meeting on Natural Renewable Resources," governmental institutions, to-

[9] Neoliberal restructuring favored expanded commercial agriculture, oriented toward export markets in the Santa Cruz lowlands, at the expense of combined production for subsistence and markets by highland peasants. Faced with increasingly disadvantageous conditions, highland peasants were forced to "squeeze" production yet further through intensifying land use on their mountainous fields and rangeland, environments considered at least moderately susceptible to water erosion (Cochrane 1973; de Morales 1990).

gether with representatives of major international aid agencies, recommended establishment of a national soil conservation program (MACA 1987). Yet even as these national agencies expressed urgent need for conservation measures, such programs lay beyond government finances, and arguably outside its overall will, in the restructured economy.[10]

As the financial and administrative capacity of the Bolivian state weakened, soil conservation devolved almost entirely on international aid agencies and nongovernmental organizations. Beginning in the 1970s, these institutions advocated the provision of technical assistance to peasant producers. U.S. AID, for instance, sponsored various studies of soil erosion and conservation in peasant communities within larger projects aimed at "modernizing" Bolivian agriculture (LeBaron et al. 1979; Wennergren and Whittaker 1975).[11] The Swiss Technical Corporation supported a range of soil conservation programs, most notably in the form of small-scale forestry projects. By the late 1980s, over 300 NGOs had initiated assistance programs in Bolivia and more than 80 clustered in Cochabamba, where many sponsored studies and small projects designed to abate erosion.

Causes of soil erosion identified by other development institutions—primarily international aid agencies and most NGOs—coincided, for the most part, with recent assessments by Bolivian government institutions described above. Peasant ignorance was assumed in numerous reports by international aid agencies and NGOs, such as the "Environmental Profile of Bolivia," where the authors allege that "land users were not at all aware of the soil erosion problem" (IIDE and U.S. AID 1986, 99). Other reports supported by U.S AID averred that worsened erosion originated in the "cultural backwardness" of rural inhabitants (LeBaron et al. 1979; Wennergren and Whittaker 1975). In a similar indictment of peasant ignorance, the director of the Center for Forestry Development (CDF) in Cochabamba held that "men cause soil erosion where they do not know better" (Estrada 1991). Arising from this cultural unawareness, erosion-inducing techniques and technologies employed in land use were seen as the major problems (de Morales 1990, 52; Estrada 1991; IIDE and U.S. AID 1986; MACA 1977).[12]

Designs of numerous soil conservation projects in Cochabamba have been based on assumptions of the inappropriate techniques and underlying ignorance of peasant farmers (e.g., IIDE and U.S. AID 1986).[13] Educational pamphlets and seminars intended for peasant farmers are

[10] Following Decree 21060, the Bolivian state abdicated most responsibility for rural development in the highlands. For example, technical assistance for an estimated 500,000 highland peasants was assigned to a staff of 100 extension agents during the late 1980s (Pérez Crespo 1991).

[11] In Cochabamba, U.S. AID funded a parastatal bureaucracy, the Program for Alternative Regional Development (PDAR, later changed to PDR), which by the mid-1980s had become the major U.S.-funded institution involved in study of soil erosion and implementation of conservation measures.

[12] Although specific techniques mentioned in their lists differed, these reports concur by not considering inappropriate land use techniques in relation to conditions other than presumed peasant ignorance and, in some accounts, population growth. Peasant ignorance and overpopulation formed foundations for an international perspective on Latin American soil erosion, influenced by the widely disseminated work of William Vogt, chief of the Conservation Section of the Pan American Union, who wrote books on Venezuela, El Salvador, and Costa Rica during the 1940s and the 1950s (e.g., Vogt 1946).

[13] It is notable that while most government institutions and international aid agencies continue to consider ill-suited practices the result of backwardness and lack of modern customs, a contrasting claim is increasingly heard: environmentally damaging land use practices are the result of cultural degradation, in effect too much modernity rather than too little (Eckholm 1976; van den Berg 1991).

common in these projects. Because the ignorance of farmers is assumed, the conservation projects frequently prescribe highly publicized solutions without assessing present practices or their rationales. Life circumstances that shape land use practices and alterations in them are largely ignored.

The Peasants: Diverging Perspectives

Cochabamba peasants also put the blame for soil erosion on themselves. But their viewpoints are distinct from those of development institutions in two ways: (1) many Cochabamba peasants reveal a partial understanding of soil erosion, utilizing a complex lexicon from the local language (Quechua) to discuss diverse erosional landforms, and relating erosion to soil types and agricultural and grazing practices; and (2) they invoke the supernatural world of religious beliefs and customs in the causation of soil erosion. In both regards, a distinguishing characteristic of peasant perceptions of soil erosion is the vivid sense of prolonged historical time and local space.

Historical illustration of these characteristics is found in judicial depositions dealing with peasant efforts to defend rights to land, water, and forest resources. Numerous records filed during the nineteenth century, currently housed in the Municipal Archive of Cochabamba, indicate that the distinct temporal and spatial aspects of contemporary perspectives on erosion were frequently expressed. For example, in 1832 Isidoro Ayllita, a local authority in the Cochabamba countryside (the Cacique of Colcapirgua), defended his rights to irrigate with waters of the river Collpa (AMC 1832). Ayllita justified his right on the basis of traditional use: "we have possessed these waters of the Collpa since time immemorial . . . and we have used them continuously . . . since the creation of the world" (AMC 1832, 2). Similar to concepts expressed by many present-day environmentalists, Ayllita argued that sustained use over time evidenced his propriety. By referring to various local places, he rendered a highly personal and familiar knowledge of the resource.

A personalized and long-term view of resources continues to infuse conversational accounts offered by Cochabamba peasants. In our discussions, most attributed erosion to the increased frequency and intensity of torrential downpours, referred to as "crazy rains" (*loco paras*).[14] This may seem to blame nature, but the ultimate responsibility for "crazy rains" was in fact seen as personal. Neglect of ritual obligations toward the main non-Christian deity—the climate-controlling "Earth Mother"—brought on recent worsening of "crazy rains." As 35-year-old Leocardia said:

> When I was a child my parents made offerings to the "Earth Mother" [*Pachamama*]. They cooked special foods that they buried in the soil along with maize beer [*aqha*]. They did all this so that they would be looked on favorably by her. But today these practices aren't common although we still make offerings on Carnival and on Saint John's Day and when we start to plant. But it's less than before; perhaps for this reason she's angry with us and maybe that's why there are so many "crazy rains" [*loco paras*]. (Leocardia González, Tiraque, Cochabamba, 2 March 1991)

Personalized reciprocity is envisioned as the basis for obligations to the "Earth Mother." This customary reciprocity appears to form the basis of a peasant conservation ethic, according to indigenist anthropologists in Cochabamba (Rocha 1990; van den Berg 1991).[15] Yet, while soil

[14] In attributing anthropogenic soil erosion first to nature, Cochabamba peasants resemble other farmers. Great Plains farmers thought the extremeness of natural drought was responsible for the "Dust Bowl" (Worster 1979). Because Worster did not examine the perceptions of local inhabitants, his study does not elucidate how Great Plains farmers explained the onset of extreme drought. In the Ecuadorian Andes, soil erosion is viewed by peasants as the "will of God" (Staedel 1989).

[15] The anthropologist-priest van den Berg, for instance, writes that, in the peasants' eyes,

erosion is often attributed to ritual neglect, this transgression is not the sole origin of divine wrath and subsequent erosion. Transgressions in the realm of social reciprocity are considered by some Cochabamba peasants as provoking the wrath of the earth deity, the heightened onset of "crazy rains," and ensuing soil erosion. According to this causal sequence, erosion originates in the breakdown of customary social rights and obligations. When discussing the perceived origins of worsened erosion, numerous persons conveyed the image of a social universe undermined by disrespect, animosity, inequality, and violence:

> Relations are no longer good among people. (Victor Flores, Tiraque, Cochabamba, 10 July 1991)

> There's no respect among us anymore. (Casimiro Vargas, Tarata, Cochabamba, 15 June 1991)

> There are many fights and massacres. (Eliodora Marcos, Tiraque, 2 November 1991)

> Not all people are the same today, there is a great deal of bad feeling. (Ninfa Salazar, Tarata, October 1991)

Despite acknowledged asymmetry and regular violations, the ideology of reciprocity infuses social life in the Cochabamba countryside. Reciprocal-type social relations were once thought by ethnographic observers in Andean regions to ensure social equality among families and communities (Mishkin 1946). In recent decades observers have recognized that reciprocity ideals often veil social domination. Orlove (1974), for instance, demonstrated how social reciprocity masked growing differentiation of groups defined by wealth and gender; many studies have followed suit in noting how reciprocity covers widening rifts along these two social axes (Mallon 1983; Weismantel 1988).

Age is a third distinction dividing many Andean peoples with increased salience. In Cochabamba, the elderly and young adults tend to differ in amount of schooling and character of work experience, with discourses on soil erosion following this rift in a subtle but crucial shift.[16] Elderly peasants are most likely to voice the explanations of soil erosion outlined above. Many elderly peasants say that young people in their communities have incited divine wrath: "some people rebel against their parents," "parents are being killed," "children do not respect us." Seventy-two-year-old Manuel described the generational rift in this way:

> It's all "crazy rains" now, there weren't many before. All I can say with regard to this is that the world must be exhausted. Moreover, God is mad because we people are not equals whereas before, as I told you, it wasn't that way. We respected one another but today children do not respect us as they should. I only think these things when I am alone, and I do not tell even my children about them, it's only in my heart that I think about them. (Manuel Fernández, Tarata, Cochabamba, 10 December 1991)

Numerous young peasants in Cochabamba, on the other hand, explain soil erosion less in terms of the wrath of the earth deity and more in terms of direct human causes. They commonly blame

"The earth produces according to how one handles her. If she is treated well, there's production. If she's treated poorly, there won't be production due to natural disasters" (van den Berg 1991, 74).

[16] The present assessment of age-based differences in explanations of erosion causes does not imply that these are the only differences heard among Cochabamba peasants. A notable viewpoint not examined in the study links soil erosion to the millenarian vision of an impending apocalypse (see Stern 1987 on the historical importance of millenarianism among Andean peoples). One Cochabamba peasant expressed this apocalyptic interpretation as follows: "It also appears that we are at the time of the end of the world and the judgement day and for this reason God is angry with humans and hence the 'crazy rains.'"

their elders, those from whom the young peasants have inherited degraded fields and pasture. More schooled, more likely to speak Spanish as well as Quechua, and more experienced in off-farm work, young peasants express skepticism about the earth deity, although few deny her existence outright. Conversational accounts of two 23-year-olds, a man and a woman, illustrate this generational shift:

> It's true that "crazy rains" have increased, the thunder too is greater than before. They have increased the problem of erosion, but the problem of erosion is due also to the fact that the ground is "naked." It no longer has grass or trees. These were depleted by our parents and the others [elders]. (Casimiro Vargas, Tarata, Cochabamba, 15 June 1991)

> Due to erosion the fields that we [young adults] inherit are infertile; seeing this state some of us migrate to the Chapare. Furthermore, there's not much land left, and all of it is pure rock or at least rocky. There aren't good agricultural lands available for inheritance or partitioning. Look up there, for example, it's bedrock, along with some other rock-filled fields. It looks as though the rain or perhaps the wind has removed the soil. (Ninfa Salazar, Tarata, Cochabamba, 11 October 1991)

During the 1980s, the discontent of young Cochabamba peasants about economic, political, and environmental dilemmas brought increased involvement in rural trade unions (*sindicatos*).[17] An increasingly common perspective on soil erosion formed as several rural trade unions initiated critiques combining local perspectives with consideration of related national and international issues. By the decade's end, young peasant voices mingled with and eventually added to prior explanations on environment and development in the trade union tradition.

Rural Trade Unions

Rural trade unions first emerged in Bolivia following national defeat in the Chaco War (1932–35), as the governing power of the republic's elite weakened. Throughout the mid-1980s, trade unions, which belonged initially to the Confederation of Bolivian Workers (COB), did not formulate positions on soil erosion—or on other rural environmental dilemmas, for that matter.[18] Even as leadership in the COB shifted in 1977 from mining centers to the city-countryside under the growing rural social movement known as *katarismo*, which in 1979 founded the first national trade union for peasants ("The Sole Trade Union Confederation for the Peasant Workers of Bolivia"), there was no immediate expression of concern about the erosion dilemma (Albó 1987).[19]

[17] The unions, sometimes referred to as peasant unions, fit into a nationwide hierarchy. A number of individual unions (each typically equivalent to one peasant community) in the political-administrative territory of the canton comprise a "subcenter." Subcenters within a political province join to form a "center," which in turn combine to make up a department-level federation (Healy 1989).

[18] The trade unions did, nonetheless, formulate incisive criticisms and social analyses of water pollution in mining centers.

[19] Rural trade unions were initially allied with the major urban-based workers' union, the miner-led COB. They later transferred support to the populist National Revolutionary Movement (MNR) party, which implemented the national agrarian reform of 1953. The MNR and subsequent governments during the 1950s and 1960s manipulated rural trade unions through unconcealed clientelism. The MNR created a special Ministry of Peasant Affairs when it came to power in 1952 so that the government could control the rural trade unions (Albó 1987, 383). Ties between the peasant unions and the ruling party were most tight-knit under the so-called Military-Peasant Alliance (*Pacto Militar-Campesino*), forged by military governments in the 1960s. Alliance between the rural trade unions and the COB was reestablished in the 1970s. The *katarismo* movement—named for the indigenous peasant insurgent Tómas Katari, who led Altiplano peasants in the 1781 siege of La Paz—revitalized historical and ideological traditions in the effort to achieve revindications based on both ethnicity and class. Although *katarismo* centered geographically on La Paz and the northern Altiplano, rural trade unions in much of Bolivia surged with mass-based political

The absence of soil erosion in the voices of rural trade unions was conspicuous following *katarismo's* rise to power in 1979. That absence, I contend, did not result from mere coincidence nor simple oversight, for the trade union movement had considerably advanced its critique of other environmental problems and identified the causes of these problems (e.g., water pollution and lowland deforestation). Several deteriorating environmental resources, for instance, were detailed in resolutions at national and regional meetings of rural trade unions and other union groups throughout the 1980s (COB 1985; Calla, Pinelo, and Urioste 1989; CSUTCB 1989; FSUTCC 1986). The notable absence of erosion concurred with the epistemology implicit in the trade union analysis of environmental problems.[20] Economic and political domination by transnational corporations and imperialist powers caused problems such as water pollution in the mining centers and large-scale deforestation. The causes of soil erosion, on the other hand, were not obviously extralocal. Instead, for most trade union members, the causes of this problem originated in local settings and among local inhabitants

The two common explanations of soil erosion—personal perspectives that fingered ritual neglect and the expert-type discourse of government and nongovernmental institutions that blamed peasants—reinforced omission from sindicalist discourse. This dilemma nonetheless slid into the articulated concerns of rural trade unions as many young adult peasants not only assumed leadership posts during the late 1970s and the 1980s but also stressed land use practices as the cause of worsened erosion. Even so, many 20- and 30-year-olds did not pin responsibility solely on the previous generation. Rather, they saw that elderly land users faced unfavorable circumstances resulting from economic policies affecting the peasant agricultural sector. Such explanations broadened as many young peasants expanded their leadership role in local trade unions. In certain Cochabamba areas—most notably Campero Province—they became union leaders during rejuvenation of the movement in the late 1970s. Later, the Campero unions were distinguished as forging new and distinct explanations about the soil erosion situation.

Campero leaders have begun to merge local interpretations of soil erosion with consideration of related national and international issues. Several speak about the contradiction between concern for the rural environment proclaimed by development institutions of the Bolivian government and international agencies on the one hand, and government policies on agricultural prices and credit that pressure peasants to intensify land use on the other.[21] One leader in Campero gave the following assessment: "the national government maintains a contradictory position ['thinks two times']; on one hand, they want we [peasants] to conserve the environment but on the other hand they pressure us to exploit the environment because we keep having to produce more

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participation (also known as "popular" or "grassroots").

[20] Official assessments of environmental deterioration by Bolivian trade unions during the 1980s emphasized a critique of global capitalism, economic dependency, and imperialism that coincided with the nationalist and frequently populist position advanced by both military and civilian governments since 1952. The 1984 Confederation of Bolivian Workers meeting, for instance, discussed the "Defense of Natural Resources" under the rubric "Against Imperialist Oppression and Dependency" (COB 1985).

[21] The concerns of peasant trade unions about government policy on agricultural prices and credit were formulated extensively at the national and regional levels under *katarismo* impetus beginning in the late 1970s (Albó 1987; CSUTCB 1984; Flores 1984). Explanations of how these national policies relate to environmental deterioration, however, have been expressed primarily by grassroots leaders in such settings as the Campero trade unions.

to earn a livelihood." The success of soil conservation projects, he continued, depends on favorable policies for peasant farm production.

Extended frameworks of time and personalized views of space have distinguished the personal character of explanations about soil erosion expressed by Campero trade union leaders.[22] Such vantage points on the temporal and spatial qualities of resources descended indirectly from judicial discourses used for generations in order to defend peasant resource rights. Their recent reappearance did not, however, represent simple reassertion of long-standing tradition. Rather, extended time periods and personalized spaces merged with cultural and class concerns highlighted by *katarismo* during the late 1970s and the early 1980s. Reflecting these concerns, one leader in Campero linked local environmental deterioration to the quincentennial of the Spanish invasion:

> Throughout the last 500 years we peasants have been stepped on by the wealthy, the mestizos, and the Spaniards; the trees and animals similarly have been abused and are being extinguished, and thus we share much suffering along with the environment. (Victor Flores, Aiquile, Cochabamba, 30 March 1991)

The qualities of extended time and personalized space, expressed in accounts of soil erosion, have been used by Campero union leaders when advocating local-scale assessments of conservation and development projects. Campero peasants have used these criteria in discussions with a local nongovernmental organization to argue for the design and implementation of intermediate-scale technologies (e.g., small dams for irrigation), which would permit the continuation of existing use patterns. They also have used the criteria of extended time and personalized space to support the importance of local knowledge in conservation planning. The applicability of local terrace techniques for soil conservation, for instance, has been incorporated into conservation-development projects in Campero funded by the governments of Italy and the Netherlands.[23]

Explanations of soil erosion in Campero unions have drawn strands from previously separate perspectives. As young peasants became active members and leaders of reinvigorated rural unions, they were influenced by historical struggles for resource rights and the *katarismo* movement, two perspectives imbued with long time frames and personalized concepts of space, outlooks previously overlooked or at least underemphasized in the trade union tradition. At the same time, perceptions of the causes of soil erosion among young peasants occurred within the context of worsening erosion, which offered sharp and daily reminders of the dilemma. It is noteworthy also that trade union viewpoints on soil erosion and conservation continue to undergo discussion and reformulation.

Discussion: Soil Erosion and the Shifting Terrain of Environmental Hazards and Development

Distinct explanations of soil erosion in Cochabamba have supported differing plans for conservation. Social, technical, political, and economic features that worsen erosion have become targets for transformation. Government and international aid agencies, together with many nongovern-

[22] In this respect, together with their broad base of popular support and participation, Campero unions resemble other social movements in Latin America (Slater 1985).

[23] The validity of local knowledge employed by peasant land users in Aiquile has been affirmed by local experience with a number of unsuccessful development projects. According to Campero resident Ubaldina Mejía, "the development institutions claim that they know the solutions, but when we look at it, we recognize that we known as a result of our experience, we know how to take care of the earth."

mental organizations representing soil erosion as due to the inadequacies of peasant agriculture and livestock-raising, have justified soil conservation programs limited to technical assistance. In contrast, the recent explanations of soil erosion expressed by rural trade unions and their mainly young leaders have combined assessment of local and extralocal conditions. These explanations have led them to address the effects on soil conservation of government economic policies. This crucial use of explanations about soil erosion has received little attention, however, in either Bolivia or other Andean countries.

Differing explanations of soil erosion also reflect past development. In Cochabamba, two major features of this past ("sedimented") development were: (1) extremely uneven economic growth, in which numerous peasants "cornered" by economic stagnation inhabited degrading rural environments, providing unsettling evidence of human impacts to young peasants; and (2) government policies that reinforced this uneven development and environmental degradation, including disinterest in peasants and other marginal social sectors that led to the prominent roles of international aid agencies, nongovernmental institutions, and popular social movements (such as the rural trade unions in Cochabamba during the 1980s). Rather than comprising a unique historical-geographic conjuncture, the above environmental and social circumstances are at least moderately common in developing countries (de Janvry, Sadoulet, and Young 1989; Slater 1985; Storper 1991). Their commonness makes it likely that peasants, nongovernmental organizations, and social movements will frequently form major voices on problems of environmental hazards and their solutions.

A useful comparison exists between the soil erosion situation in Cochabamba and the Brazilian Amazon, where various social groups differ in their perceptions of deforestation causes (Hecht and Cockburn 1990; Schmink and Wood 1992). That the Cochabamba groups most concerned about erosion have concurred since at least 1980 that deteriorating soil resources undermine rural development contrasts clear-cut distinctions between "conservationists" and "exploiters" (such as livestock ranchers) in the Amazonian forest. The less-striking difference of attitudes characteristic of the Cochabamba erosion problem will likely distinguish other environmental hazards as their deleterious effects on development potential are acknowledged by a widening range of social, economic, and political groups.[24] Rather than clear-cut binary opposition, differing interpretations of environmental hazards, which may appear nonconflictual, are likely to characterize the views of such groups.

Explanations of soil erosion in Cochabamba have not mirrored regional political and economic interests in a simple fashion. Various viewpoints have displayed resemblances or differed in complex ways—both within and among the three most concerned groups—as groups and subgroups borrowed ideas and accommodated differences, while others relied on explicit contestation. International aid agencies and, perhaps especially, nongovernmental organizations have evidenced an unmistakable plurality of perspectives within the dominant view. Certain NGOs, for instance, have voiced pro-peasant views on soil erosion that include regional political-economic issues, thus extending beyond the counsel of

[24] Another feature evidenced in Cochabamba that warrants comparative study concerns links between environmental deterioration in the countryside, rural development in general, and urban-based industrialization. Because rural trade unions in Cochabamba have continued to ally with their urban-based counterparts, development and environment issues in the city and countryside remain linked in the perspectives of each group. Development specialists have underscored similar links, indicating various economic ties between rural development—a focus of planning during the 1980s—with the urban-based development of industry (Pérez Crespo 1991; Storper 1991).

technical assistance (e.g., AGRUCO; see Rist and San Martín 1991).[25]

"Little voices" articulated by Cochabamba peasants demonstrate that local knowledge of soil erosion is extensive and that it complements peasant expertise about such biophysical features as climate, crops, and plants and animals in general (Hatch 1984; Zimmerer n.d.). The local knowledge of soil erosion (an aspect of Indigenous Technical Knowledge) has become a common referent in the empowerment efforts of rural trade unions as they seek to democratize the process of development and, more specifically, the implementation of development projects. Evoking the validity and importance of their technical knowledge, unions such as those in Cochabamba's Campero province have sought to tailor conservation-related development projects to local settings. This extensive knowledge of soil erosion did not, however, prefigure a uniform or immutable view of its causes and significance by peasant inhabitants. Differing perceptions between generational cohorts highlight variation among the peasant "little voices," with this variation guiding noteworthy contrasts in the commonplace explanations of soil erosion and in the efforts of conservation-with-development projects.

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[25] In general, the working agreements between NGOs and trade unions have been based on shared end objectives, such as resource conservation, rather than broad concerns about local democracy, social justice, and equality. In Campero, the lack of local democracy in design and implementation of projects by a variety of NGOs has been a regular source of discontent among inhabitants.

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