8-1 Civil Society Strategy to Fight Soil Degradation in Peru

By:

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This case study could not have been written without the contribution of Heifer Project International (HPI) Bajo Piura soil improvement project members who participated in a rapid appraisal of project impacts co-led by the author, along with Luis Gómez Abramonte and José Namoc Rodriguez, lead HPI Peruvian staff members, who implemented the Bajo Piura project.

Executive Summary

Soil degradation, a process that reduces the potential of land to support animal and plant production, has become one of the most pressing problems for farmers worldwide (Scherr 1999). Based on the opinions of 250 international experts, the United Nations Global Land Assessment of Degradation concluded as early as 1992 that degradation had caused a 38 percent loss in global agricultural land since the 1940s (Oldeman et al. 1992). This soil loss, at a rate of 5 to 10 million hectares per year, has multiple causes, including nutrient and vegetative depletion, agrochemical pollution, deforestation, and soil erosion due to severe floods, wind, and steep hillside farming (Scherr and Yadav 1996).

Despite dire forecasts, Dregne and Chou (1992) estimated that reduced soil quality would not threaten the balance of international food supply in the near decades. What warrants close scrutiny, however, is the regional impact of these changes, particularly in hot spots where degradation may be reversible only through costly on-farm investments or engineering strategies, if at all (Scherr and Yadav 1996). Drylands alone are 70 percent degraded, affecting nearly 2 billion people (FAO 2002). Regionally, Latin America has the highest proportion of degraded agricultural land in the world, followed by Africa (Scherr and Yadav 1996).

Peru's north coast, the focus of this case study, is threatened most by salinization, a process that can cause irreversible desert-like conditions (UNEP 1992). With salinization now affecting up to 40 percent of cropland on the north coast (Collado 2001), the situation could have national repercussions. Although the coastal valleys make up only 3.8 percent of Peruvian agricultural land, including pasture and forest, they yield 50 percent of Peru's gross agricultural product (Vera 2006). Despite a history of intensive agriculture on the north coast that extends back to 200 C.E. (Nordt et al. 2004), it appears that recent changes—irrigation practices, rice-focused production, and limited opportunities to invest in or build the capacity for soil conservation—have exacerbated the susceptibility of soil in the region to salinization.

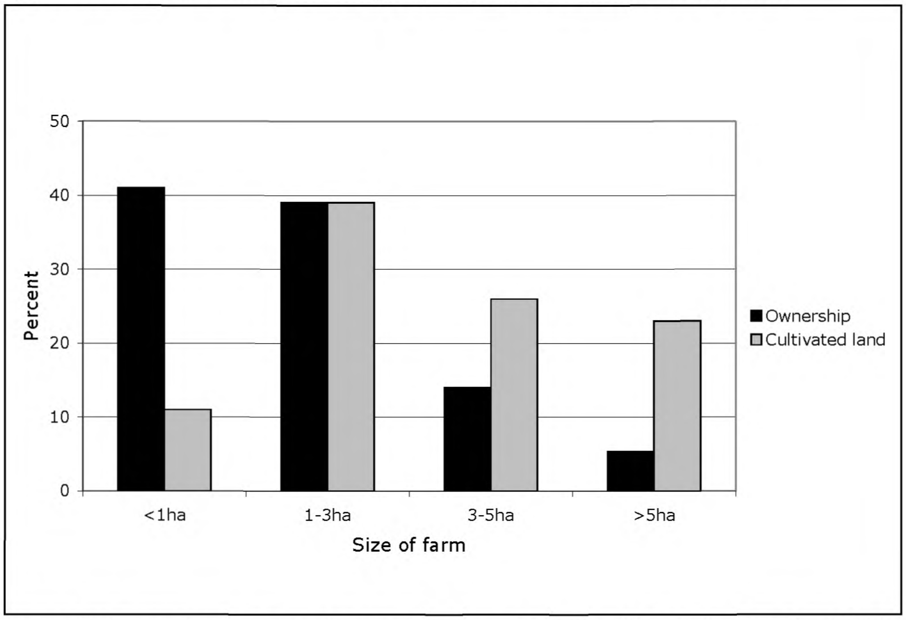
The Food and Agriculture Organization of the United Nations (FAO), World Bank, and United Nations all agree that soil conditions may improve most through community initiatives that increase productivity sustainably while improving the economies of poor households dependent on agriculture (Dixon et al. 2001; UNCCD 2005). One program implemented in the Peruvian coastal department of Piura by the nongovernmental organization (NGO) Heifer Project International (HPI) appears to have had success. HPI's key strategies focused on participatory planning and management with leaders of local irrigation commissions, training in eco-agriculture practices, and rotating funds for small-scale livestock and seeds for alternative crops. After three years, the project expanded from 20 households to 689, and farmers reported reduced salinization, lower input costs, and increased production and income. Despite HPI's apparent success, some development theorists question whether local impacts like this can last or how valuable they are to broader systems without scaling up.

Considering the wider policy environment presented here, your assignment is to determine the next steps you would take if you were directing HPI in Peru. Who would you target, how, and why? Should HPI continue working exclusively with farmers, or should your organization try to partner with or influence other civil society actors, policy makers, agrochemical companies, or credit agencies? Ultimately, where is your comparative advantage as an institution, and what are the risks of attempting to target certain actions and ignoring others?

Background

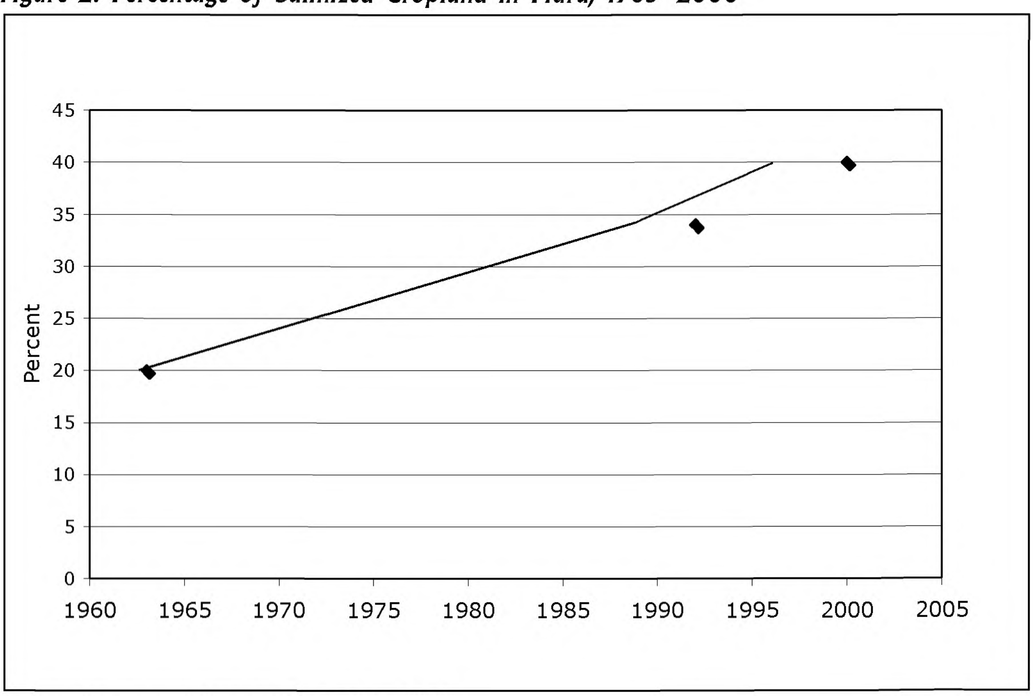
Primary agricultural production amounts to 8.5 percent of Peru's gross domestic product (CIA 2007), but more than 37 percent of the population is employed in the agricultural sector (ECLAC 2005). The most recent agricultural census in 1994 showed that more than 60 percent of the country's 1.8 million farms were smaller than five hectares and of poor quality (INEI 1994). Antolin Huáscar, president of the National Agrarian Confederation, and Hernando De Soto, president of the Institute for Liberty and Democracy, claim that of the 8 million farmers and rural laborers in Peru, concentrated along the north coast, only 1 million own their land and have access to financing (Salazar 2006; Fernandez-Morera 1999; Figure 1). As the following policy analysis illustrates, it is these small-scale farmers who are most affected and least able to reverse rapid salinization. Salinization rose from affecting 20 percent of Piura cropland in 1963 to 40 percent in 2000 (Figure 2). Although ownership rights are unclear, 95 percent of Piura farms are less than five hectares.

Figure 1: Farm Size and Percentage of Cultivated Land in Piura, 1997



Source: Padrones de usuarios de las Comisiones de Regantes 1997, cited in Boucher 2002, 23

Figure 2: Percentage of Salinized Cropland in Piura, 1963–2000



Source: Dregne and Chou 1992; Collado 2001

Policy Analysis

Among the factors that appear linked to increasing rates of salinization in Piura are modern irrigation infrastructure and management systems, a focus on water-intensive rice production in the past 30 years, and several factors—costly agrochemical inputs, limited access to credit, and a poorly coordinated institutional environment—that have reduced the capacity of small-scale farmers to invest in soil conservation practices.

Necessary but Problematic Irrigation Systems

The extreme desert conditions along Peru's north coast have required effective irrigation and drainage systems for controlling water variability and overcoming the tendency of soils to salinize for centuries (Nordt et al. 2004). Yearly rainfall in this region averages 23.2 millimeters, and sometimes as little as 12 millimeters over a period of several years (Nordt et al. 2004; Siversten and Lundberg 1996). Combined with high temperatures, the sandy, mineral soil experiences high evapotranspiration rates that draw moisture up from the water table and deposit salts on the surface. If managed effectively, irrigation can promote effective leaching of minerals. Poor drainage systems, however, allow clay particles to accumulate, eventually leading to waterlogging and the buildup of toxic chemicals and salts.

In their case study of irrigation systems along the north coast, Siversten and Lundberg (1996)[1] found that pre-Inca, earthen canals are still used in some areas to channel runoff from the Andes, but this traditional system changed during the 1950s when the central government began promoting commercialized, intensive agriculture. Modern irrigation systems with reservoirs and new concrete canals improved the speed, amount, and timing of water many coastal farmers received, but over time it also increased the tendency of soils to salinize (Figure 2). Whereas previous irrigation systems relied on the flow of rivers and runoff and thereby distributed nutrients and minerals to fields as a way of maintaining soil fertility, now nutrients and minerals become trapped in the basins of dams. The concrete canals prevent seepage, which was critical for keeping the water table low and the process of salt accumulation slow. Finally, many of these new systems are poorly constructed and require regular maintenance of drainage systems, critical for preventing waterlogging.

Siversten and Lundberg (1996) also concluded that the irrigation system they studied in the bordering department of Lambayeque did not benefit all farmers equally. Access to effective maintenance and to sufficient and predictable amounts of water was often dependent on political influence or higher payments. Each sub-department in the north coast has a local irrigation commission, or Comisión de Regantes, responsible for coordinating upkeep and deciding the timing, amount, and cost of water distribution. Sub-departments in Lambayeque with more political influence, and often larger landowners, were able to secure state investment for new concrete canals and drainage systems. This investment in the mid-1980s allowed some municipalities in the region to reduce salinization problems over nine years and to transport larger amounts of water, increasing their production of rice. Neighboring municipalities with older irrigation canals, smaller landholdings, and poor drainage systems, on the other hand, experienced gradually worsening soil conditions. Additionally, when water is scarce from June to December, some farmers, particularly large landowners, obtain more than their share by buying at higher prices or illegally siphoning upstream. Farmers with capital can also install pumps or windmills to draw groundwater or build small reservoirs to collect rainfall or water released through the irrigation system.

An Emphasis on Rice Production

In Piura, irrigation systems may be less to blame for current soil problems than the amount of water-intensive rice produced. During the 1990s, Piura farmers began planting more rice than any other crop, and by 2004 the department was the second-largest producer in Peru (Boucher 2002).

[1] Some caution is required regarding the conclusions Siversten and Lundberg (1996) draw, because they provide little description of their methodology. They draw on an extensive literature review, use national statistical databases, and describe comparisons of "distinct" villages and case studies of three farmers, not selected randomly, who represented three sizes of farms (1, 7, and 60 hectares).

High national rice prices during the 1990s motivated much of this production, as did the Ministry of Agriculture's subsidies for rice cultivation in the north coast (Vinatea 2005). Between 1994 and 2004, after indigenous chicken meat, paddy rice competed with potato production as the most important agricultural commodity produced in Peru (ranked by value) (FAO 2004). Rice also outpaced most crops in the total land area dedicated to its cultivation. In 1990 cotton, corn, and rice were planted in nearly equal amounts (between 140,000 and 190,000 hectares), but by 2003 cotton had fallen to less than 70,000 hectares and corn and rice had increased to 260,000 and 320,000 hectares, respectively (Notte 2004).

For some small-scale farmers, however, rice production appears to be leading them into a difficult trap. The situation is described in a case study in Siversten and Lundberg (1996) and in an HPI-Peru report based on five years of work with more than 600 Piura farmers whose farms averaged 1.7 hectares (Abramonte and Rodriguez 2005b). National policies and a lack of markets for crops other than rice make it difficult for farmers to diversify along the north coast. Sometimes their choice is made when water from neighboring farms inundates their fields. Yet if they cannot control when this water arrives or invest in or maintain effective drainage systems, fields can become waterlogged and salinized. Rice production also requires large amounts of water to cover rice seedlings, increasing costs; the volume of water required is even greater if a farmer cannot afford to have his or her field leveled to ensure that all areas are adequately covered. Even if rice production can be sustained at first, the effects of frequent droughts and fluctuating international prices (Mori 2006) gradually reduce the profit margin. As one HPI project farmer says, it may not make sense for small-scale Piura farmers to maintain a dependence on rice production:

> Here, we (HPI project members in Piura) have to work hard with trainings to develop a culture that doesn't plant rice on the coast because the cost of water is high. We cannot continue insisting or count on an infrastructure that is so costly with large dams, canals, and drains to continue cultivating rice, a crop that in the long-term is not profitable for producers. The training must begin in school, to create an awareness that we must begin planting alternative crops (Abramonte and Rodriguez 2005b, 41).

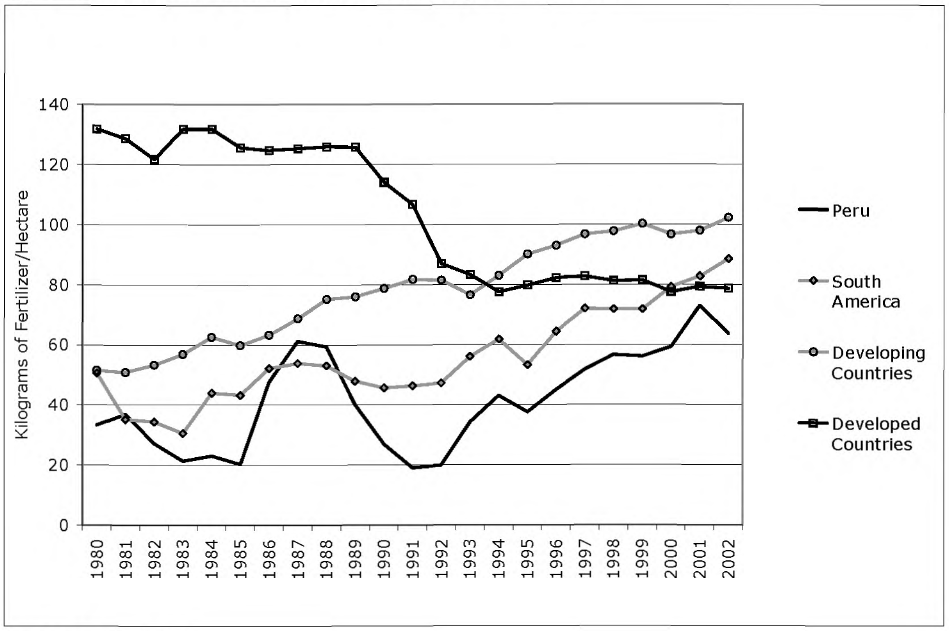
An Agrochemical Culture

As the profits from key crops like rice fall for small-scale farmers, another common practice that keeps production costs high in Piura—agrochemical use—is further diminishing poor farmers' ability acquire the necessary capital at the start of each season to make long-term investments in their farms. Along with irrigation, farmers in Piura have always needed high levels of nitrogen inputs. Nordt et al. (2004), for instance, found that pre-Inca cotton farmers along the coast left leguminous *algarrobo* trees standing among fields for leaf litter fertilizer as well as adding inputs of seabird guano, llama dung, and fish heads.

Although there are few data about agrochemical use specific to Piura, Figure 3 illustrates how chemical use across Peru has steadily increased since 1980, as it has in South America and developing countries generally. With agriculture concentrated along Peru's north coast, it is safe to assume that this increase is disproportionately concentrated in departments like Piura. HPI staff report that, before the farmers they worked with adopted eco-agriculture approaches, agrochemicals constituted 30 to 40 percent of their production costs. Few were using low-cost methods to build soil nutrients, such as nitrogen-fixing trees, manure, compost, or crop residue (Abramonte and Rodriguez 2005b). In a 2005 rapid appraisal of HPI's impacts[2] co-led by the author and 2 HPI field staff, nearly all 30 farmers and 5 irrigation commission leaders interviewed discussed the marketing and cultural pressure they felt to use chemical fertilizers and pesticides. A "mentality" that agrochemicals were necessary for productive farming had developed. As one farmer described,

[2] Fieldwork for two days took place in six of the seven project communities. It involved interviews with 24 individuals from 10 project households and one focus group with 11 project members (including 5 irrigation commission leaders, who were the local HPI project leaders). The focus group was open to all project members, while households were selected by HPI staff to represent the communities involved and those they felt were most and least successful project members.

Figure 3: Mineral Fertilizer Use Intensity, 1980–2002



Source: FAO 2006

"[Neighbors] used to say I was a *cochino* [filthy person] because I put down manure" (Medio Bajo Piura Heifer Project Farmer 2005). Faced with salinization or other soil degradation, small-scale farmers may feel forced to increase fertilizer inputs. Disregarding the possibility that farmers may be increasing the alkalinity of the soil through excessive fertilizer use, such high inputs further undercut short-term profits and their ability to make investments for long-term soil improvement.

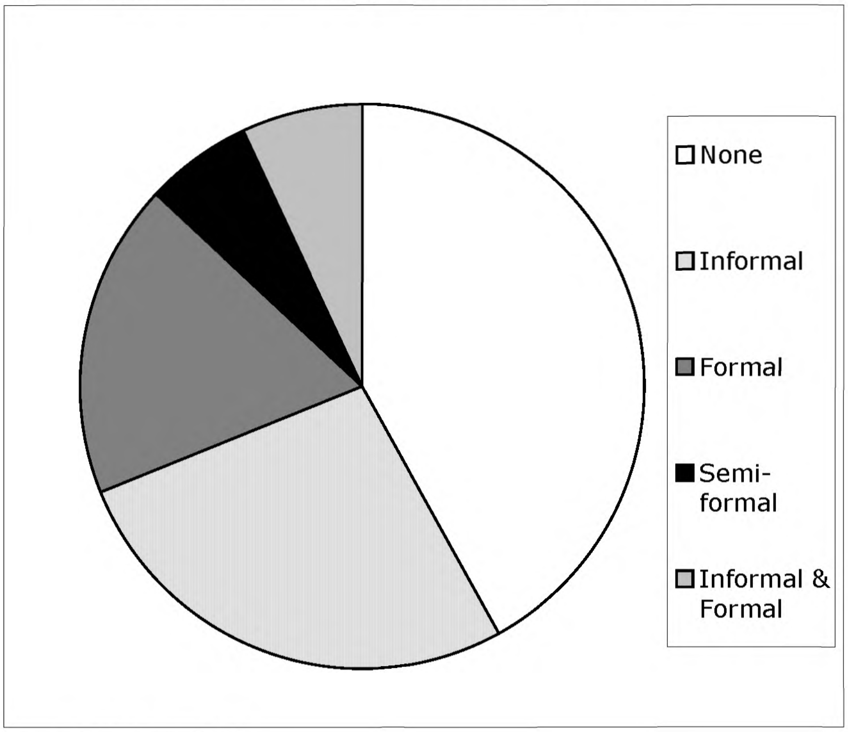
Conservation-Discouraging Credit Policies

Access to loans could help farmers make the investments necessary to improve their soils, increase their production, and reduce their risk over the long term. The Inter-American Development Bank (IADB) describes how credit policies in the Andes instead discriminate against resource-poor farmers and in so doing, discourage long-term soil management (IADB 2001). Because of the obstacles they confront, small-scale farmers often choose not to take out loans or feel they have no access to credit agencies; a survey of 500 farmers in Piura by the University of California at Davis found that 42 percent of them had no loans in 2003[3] (Figure 4; Guirkinger 2005). For those who do have loans with high interest rates, repaying them, rather than making productive investments, often becomes a short-term priority. Arslan (2003) predicts that both of these situations can cause a spiral effect, where the natural resource base can deteriorate more rapidly, ultimately making it difficult for farmers to make investments and increasing their susceptibility to shock.

When farmers do seek out loans, smallholders often cannot get access to formal credit with low interest rates because they lack the necessary collateral (Boucher 2002). The UC Davis survey, for instance, found that only 18 percent of Piura farmers in 2003 had formal loans, and many who did were large landowners (Guirkinger 2005). As Arsalan (2003) describes, the assets poor farmers do have are typically informal and cannot be used for collateral, whereas those who do have enough collateral may fear losing their primary productive asset. Even if farmers can obtain formal loans, if

[3] Six percent of farmers had "semi-formal" loans offered by NGOs and targeted government programs. These are described more in the "Policy Options" section.

Figure 4: Types of Loans Held by Farmers in Piura, Peru, 2003



Source: Guirkinger 2005

they default, they face higher interest rates and are denied additional formal loans until their debt is paid (Guirkinger 2005). In this situation they are often forced to acquire a loan from the informal sector to help pay off their original formal loan. The IADB (2001) also describes how financial crises reduce what few resources poor farmers might have, further lowering their ability to turn to the formal financial sector for help. Unfortunately, this scenario has been true for many vulnerable farmers as crop prices have fallen owing to macroeconomic factors across Latin America and Peru, forcing them to acquire whatever loans they can to pay off existing debts (Guirkinger 2005).

Whether farmers take out informal loans out of choice or necessity, local lenders are often more accessible and pose fewer risks for small-scale farmers in the short term. In the 2003 study, 27 percent of Piura farmers had only informal loans and 7 percent a combination of formal and informal loans (Guirkinger 2005). Informal lenders offer a form of insurance not provided by the formal sector: additional financing even as a farmer is trying to repay a previous debt. Informal loans are also virtually collateral-free, and going to your local moneylender has fewer transaction costs (the time to secure a loan, travel costs, and procedural costs). These lenders do, however, charge interest rates up to twice as high as those of formal lenders (Boucher 2002). Local farmers also described another drawback: in return for an informal loan, farmers are sometimes forced to sell their harvest to the moneylender at a cost below the market value (Abramonte and Rodriguez 2005b).

A Changing Institutional Climate

Changing any of the previous policies depends largely on the type of institutional support and coordination that surrounds farmers. During the 1990s the Peruvian government instituted two major plans that had the potential to help farmers in departments like Piura improve their livelihoods: it decentralized the Ministry of Agriculture, and it undertook a national action plan to fight desertification. The result has instead appeared to create more disarray and what Llambi and Lindemann (2001, 3) describe as a "notorious vacuum in the institutional apparatus of the country."

The process of decentralization began affecting Peruvian agriculture in 1992 with the Organic Law of the Ministry of Agriculture. This law parceled out the Ministry of Agriculture's support services and regulatory functions to local municipal governments. Although rural municipalities in Peru are often more involved in local agriculture and can be held accountable more easily by local communities, the administrative process of decentralization was not accompanied by sufficient capacity building or funds to optimize the effects it might have had. In their assessment of Peru's decentralization process, Llambi and Lindemann (2001) point out that municipal governments often do not know the national laws, lack administrative capacity to raise funds and design or monitor investment projects, and do not have the knowledge to negotiate with other public agencies or private firms. Most important, local governments often have little information about the larger political and economic environment to help them develop long-term development strategies. According to Lindemann and Llambi (2001, 3), this has resulted in "management through projects" with no coherent long-term plans. As they describe it, a "project approach to sectoral policy creates . . . an overabundance of ad hoc institutions with a short life span. Moreover, these generally locally-based or subsectorally-oriented projects are not designed to address the structural causes of rural poverty."

Just as municipalities were facing this new institutional setting, in 1996 Peru joined the United Nations Convention to Combat Desertification (UNCCD) with its ambitious national action plan to fight desertification (referred to as PAN-Peru). Piura first appeared to be one of the most organized departments with its "Piura 2010" plan (Guevara 1999). This plan was intended to heighten communication and collaboration around issues of natural resource management across public agencies, universities, unions, NGOs, and businesses. Local institutions, including the National University of Piura, the Peruvian Center for Social Studies (CEPES), the Agrarian University of Molina, and the Center for the Study and Promotion of Rural Information (CIPCA), were to monitor environmental issues in the area. The media was also involved, with *The Green Crusade* newsletter launched by the newspaper *El Tiempo* and the "Cutivalu" radio show that discussed environmental and agriculture issues facing the area.

Despite this earlier coordination and other Piura-based initiatives sparked by NGOs, municipalities, and communities, these efforts were not part of integrated regional or national policy (Guevara 1999). PAN-Peru did not in fact become the "central reference" to guide these institutions and projects (Valderrama 2001), and the regional association that formed to develop Piura 2010 no longer functioned by 2002 (INRENA 2002). As Guevara observed in 1999, the coordinating bodies that did exist in Piura were relatively isolated and restricted to the academic community or other limited circles and not utilized in a coordinated way by the business sector, communities, or municipal government. The committees or commissions that did involve these multiple stakeholders were typically short-lived and established to take action on immediate, not long-term, structural problems.

Policy Options

For a country like Peru, where less than 3 percent of the total land area is arable (ECLAC 2005), slowing or reversing the current rate of land degradation within its most valuable agricultural region is critical for protecting the nation's future economic growth and food supply. For the vast majority of poor farmers along the coast who rely on agriculture as their principal livelihood, it is a question of how quickly, affordably, and sustainably their soil quality can be improved. A number of policy options exist to address the multiple factors discussed, but it is unclear which of these issues is the most critical, who should address them, and by what means.

The Heifer Project International Approach

The FAO, World Bank, and United Nations all agree that combating soil degradation may work best through community-based initiatives (Dixon et al. 2001; UNCCD 2005). HPI's Piura soil improvement program, mentioned previously, appears to bear out this idea: it has led to sustainable increases in yields and improvements in the socioeconomic conditions of households dependent on crop production.[4]

Working out of the lower Piura region, referred to as Bajo Piura, the HPI-Peru office started in 2001 with 20 smallholders considered *locos,* the crazy men in their communities. These were smallholders willing to take a risk, innovate, and become showpieces capable of convincing neighbors that their efforts would be successful. Through participatory planning sessions, HPI considered with farmers what factors would motivate them to make long-term changes to their system of production in ways that would minimize risks to their yields or income levels in the short term. Using ecological agriculture practices, the long-term goal was to recoup highly salinized land, reduce input costs, increase profits, and improve food security.

Over a period of three years, the first phase focused on improving soil fertility by replacing costly agrochemical inputs with substitutes like manure, vermiculture, crop residue, mulch, and bird guano. The second phase focused on diversifying farm production without competing with other crops. This phase included planting locally adapted fruit trees (mango, lime, and tamarind) or nitrogen-fixing leguminous plants along paths, borders, or other open field space. Many households also received a small starter herd of sheep, to which they fed readily available crop residues and from which they received manure for fertilizer, meat to supplement family nutrition, and a "living bank"—an asset they can sell in case of emergencies.

The goal for the final stage was sustainable agroecological production. To ensure these efforts would last in the long term, HPI staff worked to build the capacity of local irrigation commissions to carry on similar agroecology initiatives by involving leaders in the design, implementation, monitoring, and evaluation of the project in their communities. The local commissions chose 25 community members to become trained as agroecology promoters to offer training and support to project members. Five community members were also trained as informal veterinarians to provide (at a substantially reduced cost) vaccination campaigns and basic veterinary skills to livestock owners (both project members and nonmembers). In HPI's tradition, families each contributed to a "Passing on the Gift" rotating fund to provide additional families with sheep, vegetable seeds and fruit trees, basic equipment (such as plastic barrels for making organic fertilizer), and funds to replenish veterinary kits. Workshops and farmer-to-farmer exchanges focused on homemade insecticides, compost fertilizer, other agroecology practices, leadership building, and gender-focused personal and family empowerment.

By 2004 the HPI-Peru office reported expanding from 20 participants and 3 irrigation commissions to 689 households and 7 irrigation commissions (Abramonte and Rodriguez 2005b). More than 300 households had expanded into livestock production (primarily for self-consumption), and all were incorporating some aspect of agroecology (such as using manure compost, tilling crop residue into the soil rather than burning it, or using homemade organic insecticides) or diversifying their production. Irrigation commissions were expanding their work plans beyond issues of water management to hold additional training in agroecology and leadership. Project members also spoke of efforts to push the larger Piura irrigation board to coordinate with state institutions to support policies favoring agroecology development in rural zones.

Although no systematic quantitative data were gathered, during the rapid appraisal conducted in 2005, all 35 project members interviewed discussed the input costs they saved using fewer agrochemicals; the salinized land area they had recovered; the increased production they had experienced (often double the amount, which the evaluation team observed by comparing fields that were salinized, recovered, or nonproject); and the higher income they had gained from these practices. The majority also talked of a critical change they and their neighbors had experienced in their mentality, or approach to farming. By the end of the project, all saw manure and mulch as valuable forms of fertilizer and had replaced at least a portion of their previous agrochemical use with these substances and other low-cost, homemade insecticides and fertilizers. They all had fewer fields

[4] Descriptions of this HPI project come from the Heifer-Peru 2005 report (Abramonte and Rodriguez 2005b) and the 2005 rapid appraisal co-led by the author, described in footnote 2.

devoted to monocrops of rice, cotton, or corn. They were eager to plant more locally adapted fruits and vegetables and were more aware of the importance and means of building soil quality through eco-agriculture methods.

Additional Policy Options

Despite HPI's apparent success, some development theorists question how long local impacts like this will last and how valuable they are to broader systems if they do not scale up. A project involving 689 households may be large by NGO standards, but its reach is small in a department that encompasses a rural population of more than 1 million (Brinkhoff 2007). HPI may be yet another ad hoc institution that cannot have an impact on the structural causes of poverty and broad-based natural resource problems. Llambi and Lindemann (2001), for instance, suggest that locally based projects like HPI's need to collaborate with national economic strategies and sectoral policies. Although it appears that there are many research institutions, state agencies, private sector agencies, international organizations, and local NGOs involved with similar natural resource management efforts in Piura, HPI only discusses their involvement with the local irrigation commissions and never deals with them directly.

HPI-Peru staff, for instance, fail to discuss how affordable, less discriminatory credit might benefit the poor farmers. Boucher (2002, 1) describes how liberalization and free markets create a context where "the ability of institutions to overcome the obstacles to providing affordable credit to small farmers will play a key role in determining which farmers will be able to participate and which will be forced to exit the sector through land rental or sale." Some government programs and NGOs in Piura already offer "semi-formal" subsidized credit with low interest rates and flexible collateral requirements, but currently they make up a small percentage of the value of all loans in the area, and access is restricted to targeted government programs or communities where these few NGOs work (Guirkinger 2005).

HPI also appears to have overlooked (or may not have the capacity to influence) the markets these small-scale farmers can access. Several farmers interviewed during the rapid appraisal hoped to find markets for their organic fruits and vegetables, but reported having few prospects for reaching regional or national markets. At least two hoping to export internationally described the practical need for a critical mass of neighboring farmers to also make the shift to these alternative crops (Scriven et al. 2005).

Like many NGOs, HPI has not yet considered engaging the private sector. In a similar situation in Rangpur, Bangladesh, excessive and inappropriate use of fertilizers was increasing the alkalinity of the soil, reducing soil productivity, and increasing farmers' expenses. Katalyst, a project implemented by Swisscontact and GTZ International Services and supported by the U.K. Department for International Development (DFID), other major donors, and the Ministry of Commerce, supported the creation of a private business focused on soil testing for vegetable production. Preliminary results appeared to show that farmers who paid for this service had reduced use of chemical fertilizers, greater use of organic composting, and improved soil health (Katalyst-Bangladesh 2004).

This case study raises the critical question of what role the central government should play in projects like HPI's. The government already appears to be taking on a share of what HPI was trying to do. Reacting both to problems of salinization and to lower rice prices, in February 2006 the Peruvian Ministry of Agriculture announced a "Plan to Convert Rice Cultivations" on up to 10,000 hectares (Mori 2006). Farmers are being promised financial and technical assistance in deciding which crops would be most appropriate and most lucrative on the international market, including artichokes, paprika, peppers, citrus, or mangos. Although the ministry's plan to help farmers diversify has potential, it does not discuss the pacing of implementation, which farmers will be targeted, and how they intend to ensure farmer livelihoods during the transition. It also fails to consider parallel strategies for improving soil quality or for addressing the strong culture of agrochemical use, an input cost that may continue to rise even as farmers invest in higher-value crops.

Assignment

What steps should Heifer Project International take next to ensure that small-scale farmers in Piura improve their livelihoods and maintain soil improvements? Like many NGOs, the Heifer-Peru office has little empirical evidence upon which to base its decision at the completion of this project. Staff have farmer testimonials, informal reports, one external rapid appraisal, and personal experience. Yet time is of the essence as the region as a whole continues to experience rapid soil degradation. Market trends, national policies, or agromarketing could potentially reverse the apparent gains HPI farmers have made. Based on the HPI impact reports and the wider policy environment presented here, consider what direction you would take if you were directing the HPI-Peru office.

Who would you target, how, and why? Should HPI continue working exclusively with farmers, or should your organization try to partner with or influence other civil society actors, policy makers, agrochemical companies, or credit agencies? Could your staff, for instance, have a larger impact if you influenced the government to adopt more holistic strategies and provide more equitable support for irrigation and drainage infrastructure? Should part of this effort include building the capacity of marginalized irrigation commissions and farmers groups to advocate to local or national government for their needs? Would it be possible, and how would farmers fare, if you attempted to influence policies for alternative markets, state extension policies, or credit practices? Ultimately, where is your comparative advantage as an institution, and what are the risks of attempting to target certain actions or of ignoring others?

Additional Reading

Abramonte, L., and J. Rodriguez. 2005a. *Strategies for promoting ecological agriculture: Bajo Piura Valley 2001–2004.* Final HPI report by Heifer-Peru field staff. Lima, Peru. [Note: This is the condensed, English version of Abramonte and Rodriguez (2005b), still under HPI review as of August 2006, but made available for the purpose of this case study.]

Guevara, J. T. 1999. *Desertification in Piura (Peru).* La Molina, Peru: Research Center for Arid Zones of the Universidad Nacional Agraria. http://library.fes.de/pdf-files/iez/00974/wueste3.pdf.

Scherr, S. 1999. *Soil degradation: A threat to developing-country food security by 2020?* 2020 Discussion Paper 27. Washington, DC: International Food Policy Research Institute. http://www.ifpri.org/2020/dp/dp27.pdf.

References

Abramonte, L. G., and J. N. Rodriguez. 2005b. *Manejo agroecologico en el valle del Bajo Piura: Sistematización de una experiencia.* Lima, Peru: Heifer-Peru.

Arslan, A. 2003. *Financial market liberalization and its effects on risk and natural resources in Peru.* Proposal submitted to the Social Science Research Council and Risk 2003 Summer Grant. Davis, CA: University of California, Davis.

Boucher, S. 2002. *State contraction and credit market development in rural Peru.* Davis, CA: University of California.

Brinkhoff, T. 2007. City population: Peru. Oldenberg, Germany. http://www.citypopulation.de/Peru.html.

CIA (Central Intelligence Agency). 2007. *World Factbook.* Washington, DC. https://www.cia.gov/library/publications/the-world-factbook/geos/pe.html#People.

Collado, A. D. 2001. *Consultation on desertification in South America: Regional relevant information parallel to the UNCCD (United Nations Secretariat of the Convention to Combat Desertification).*Villa Mercedes, Argentina: World Conservation Union South American Regional Office and Estación Experimental Agropecuaria San Luis Instituto Nacional de Tecnologia Agropecuario (INTA).

Dixon, J., A. Gulliver, and D. Gibbon. 2001. *Farming systems and poverty: Improving farmer's livelihoods in a changing world.* Rome and Washington, DC: Food and Agriculture Organization of the United Nations and World Bank.

Dregne, H. E., and N.-T. Chou. 1992. Global desertification dimensions and costs. In H. E. Dregne, ed., *Degradation and restoration of arid lands.* Lubbock: Texas Tech University.

ECLAC (Economic Commission for Latin America and the Caribbean). 2005. *Statistical yearbook for Latin America and the Caribbean.* Rome: United Nations. http://www.eclac.org/cgi-bin/getProd.asp?xml=/publicaciones/xml/1/26531/P26531.xml&xsl=/deype/tpl-i/p9f.xsl&base=/tpl-i/top-bottom.xsl.

FAO (Food and Agriculture Organization of the United Nations). 2002. *Dryland degradation: A people problem.* Rome. http://www.fao.org/NEWS/2002/020205-e.htm.

———. 2004. *Statistical yearbook.* Rome. http://www.fao.org/es/ess/yearbook/default.asp.

———. 2006. FAOSTAT. Rome. http://faostat.fao.org/default.aspx (February 10, 2007).

Fernandez-Morera, D. 1999. Hernando De Soto interview. *Reason Online*, November 30. http://www.reason.com/news/show/32213.html.

Guevara, J. T. 1999. *Desertification in Piura (Peru).* La Molina, Peru: Research Center for Arid Zones of the Universidad Nacional Agraria. http://library.fes.de/pdf-files/iez/00974/wueste3.pdf.

Guirkinger, C. 2005. *Risk and the persistence of informal credit in rural Peru.* Davis, CA: University of California, Davis.

IADB (Inter-American Development Bank). 2001. *Regional policy dialogue on environment: Executive profile of environmental management Andean region.* Bogota, Colombia: Andean Center for Economics in the Environment.

INEI (Instituto Nacional de Estadística e Información, Peru). 1994. *III Censo nacional agropecuario 1994.* Lima, Peru. http://www.inei.gob.pe/.

INRENA (Instituto Nacional de Recursos Naturales). 2002. *Informe nacional para la implementación de la Convención de las Naciones Unidas de Lucha Contra la Desertificatión (UNCCD), 2000–2002.* Lima, Peru.

Katalyst-Bangladesh. 2004. *Intervention report V3: Promoting private soil testing June 2004–December 2004.* Dhaka: Bangladesh. http://www.katalystbd.com/admin/downloads/20060504025917.pdf.

Llambi, L., and T. Lindemann. 2001. *State reforms and the decentralization of the agricultural and rural public sector: Lessons from the Latin American experience.* Rome: Food and Agriculture Organization of the United Nations. http://www.fao.org/sd/2001/IN0502a3_en.htm.

Medio Bajo Piura Heifer Project Farmer. 2005. Personal interview by the author, Puyuntala, Peru, June 24, 2005.

Mori, R. 2006. *Planean reconvertir 10 mil has. de arroz por otros cultivos.* Summary of an article from *El Peruano* listed on the website CEPES (Centro Peruano De Estudios Sociales) Portal Rural. http://www.cepes.org.pe.

Nordt, L., F. Hayashida, T. Hallmark, and C. Crawford. 2004. Late prehistoric soil fertility, irrigation management, and agricultural production in northwest coastal Peru. *Geoarchaeology: An International Journal* 19 (1): 21–46.

Notte, G. 2004. *Cotton and products update.* Report number PE4011. Washington, DC: U.S. Department of Agriculture, Foreign Agriculture Service, Global Agriculture Information Network.

Oldeman, L. R., R. T. A. Hakkeling, and W. G. Sombroek. 1992. World map of the status of human-induced soil degradation: A brief explanatory note. Wageningen, the Netherlands, and Geneva: International Soil Reference and Information Centre and United Nations Environment Programme.

Salazar, M. 2006. Peru: Agro-export program sounds better than it looks. Article #47232. New York: Inter Press Service News Agency.

Scherr, S. 1999. *Soil degradation: A threat to developing-country food security by 2020?* 2020 Discussion Paper 27. Washington, DC: International Food Policy Research Institute. http://www.ifpri.org/2020/dp/dp27.pdf.

Scherr, S. J., and S. Yadav. 1996. *Land degradation in the developing world: Implications for food, agriculture, and the environment to 2020.* 2020 Discussion Paper 14. Washington, DC: International Food Policy Research Institute.

Scriven, M., T. Chianca, A. Gullickson, C. Coryn, A. Hite, N. Persaud, D. Schroter, B. Youker, and L. Hoey. 2005. *An evaluation of a sample of HPI projects in south central USA and Peru.* A report to Heifer Project International submitted by the Evaluation Center, Western Michigan University. http://www.heifer.org/site/c.edJRKQNiFiG/b.1433283/.

Siversten, A., and A. Lundberg. 1996. Farming practices and environmental problems in an arid landscape: A case study from the region of Lambayeque, Peru. *Goegrafiska Annaler, Series B, Human Geography* 78 (3): 147–161.

UNCCD (United Nations Convention to Combat Desertification). 2005. *The bottom-up approach.* Rome. http://www.unccd.int/ngo/menu.php.

UNEP (United Nations Environment Programme). 1992. Managing fragile ecosystems: Combating desertification and drought. Chapter 12 in *Agenda 21.* Report of the United Nations Conference on Environment and Development. Rio de Janairo, Brazil.

Valderrama, M. 2001. *The tower of Babel: NGOs, foreign aid, and development.* Ottawa: Canadian Council for International Cooperation.

Vera, R. R. 2006. *Country pasture/forage resource profiles: Peru.* Rome : Food and Agriculture Organization of the United Nations. http://www.fao.org/ag/AGP/AGPC/doc/Counprof/Peru/Peru.htm.

Vinatea, C. 2005. *¡Ministro, más arroz!* Summary of an article from *El Comercio* listed on the website CEPES (Centro Peruano De Estudios Sociales) Portal Rural. http://www.cepes.org.pe.