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Water Access, Food Sovereignty and Peru's Water Regime

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Abstract

Peru's water regime is the product of 20 years of negotiations involving the state and non-state actors, the World Bank and the InterAmerican Development Bank. The 2009 water law and the institutions which have been designed to implement it are informed by IWRM discourse. While on the surface, it appears to be a rejection of the neoliberal water privatization project, its principal beneficiaries are the agro-export and energy sectors. Using case materials from the conflictive Rio Santa and Rio Ica watersheds, this paper asks what the new water regime means for food sovereignty, in particular for the power of highland campesinos, small- to mid-scale coastal farmers, and artisanal fishers to supply domestic markets.

Introduction

Although noted in the literature, little attention has been devoted to water management policies and practices can undermine or bolster food sovereignty. Conversely, the political ecology literature treats the cultural meanings of water and its importance to place and addresses such problems as contamination, virtual water exports, water maldistribution in urban and rural contexts, and land grabs as water grabs, but rarely makes the connection between water regimes and food regimes.

As Patel (2009) argues, the definition of food sovereignty is elastic and at times contradictory. For purposes of this argument, I adopt with reservations the Nyéléni declaration (2007) definition of food sovereignty as both the right to sustainably produced healthy and culturally appropriate food produced and the right of peoples to define their own food and agriculture systems. In Peru, not all culturally appropriate food is sustainably produced, and dietary preferences may not always favor indigenous cultivars. Conversely, not all sustainably produced food would be defined by its consumers as culturally appropriate. For this reason, it may be more useful to think in terms of food production for local and regional markets. I will use the terms *food producers* and *food production* as shorthand references to activities that more or less fit the declaration's definition.

Challenges to food sovereignty are apparent in Peru at all points in the food system. However, this paper focuses on water-related limitations on the ability to produce food for domestic consumers. These limitations have been largely imposed by what Tanaka (2013) calls a "technocracy" comprised of state and non-state actors whose policies and actions are generally intended to satisfy the rapidly growing water needs of the corporate agro-export and energy sectors and to facilitate mining operations. Those whose access to clean water is compromised as a result include indigenous and campesino communities, small-and medium scale commercial farmers, the aquaculture industry, and in-shore fisheries.

Water and Food Production

By delivering water to farm fields and pastures at critical times in the agricultural calendar and by ensuring access to relatively clean water, water governance institutions can encourage the production of culturally appropriate and nutritious food crops. Relatively clean lake, river, and in-shore coastal waters also sustain local fisheries and livestock production. But water management technologies and institutions act as constraints to food sovereignty to the extent that they favor unsustainable water management practices and when they deprive food producers of water needed for irrigation.

Sustainable water use

If we accept the Nyéléni declaration definition of food sovereignty, we need to ask what constitutes sustainable and culturally appropriate water use. Engineers who focus on efficiency think of water as a stretchable membrane, and believe it a moral imperative to stretch the membrane as far as possible by moving water from places where it is abundant to those where it is scarce and by encouraging the adoption of technologies that deliver optimal amounts of water to the root zones of whatever plants are cultivated. To do otherwise is seen as wasting water. Economists treat water as an economic good rather than a human right.¹ They focus on scarcity (Swyngedouw 2006), and emphasize the importance of moving water to where it will be used most profitably. These two perspectives combine to what Peruvian observers see as a technocratic paradigm--a paradigm that fosters expansion of the agricultural frontier, and with it expansion of demand for irrigation water. The technocratic paradigm underlies integrated water resource management (IWRM) discourse as defined by the 1992 Dublin Principles, although this discourse does include language on participation and on the ecosystemic value of water.

In contrast, from an agroecological perspective, appropriate water use means first and foremost conserving water by practicing rainfed agriculture wherever possible, using irrigation water as needed to extend the growing season, but in ways that minimize soil erosion. Crop selection should be geared to water availability, rather than the reverse. The use of agrochemicals should be minimized to prevent water pollution. Industrial and mining discharges into waters used for irrigation and domestic consumption should be tightly regulated. Lastly, and this is of considerable cultural importance in the Andes, the complex relationships between water, place that shape local waterscapes should be respected. While integrated water resource management (IWRM) discourse plays lip service to these agroecological considerations, the engineering perspective appears to be dominant in the international project to “modernize” water governance.

¹ Conca

Water governance

With the bureaucratic transition in water governance, the technocratic paradigm becomes dominant, even in places where there exist robust and culturally appropriate local water regimes and management practices. Policies based on the notion that water is primarily an economic good can have a detrimental effect on food production. Several scholars argue that commoditization of water and the creation of transferrable property rights facilitate diversion of water—real and virtual—to its most profitable rather than its most essential uses (see, e.g., Barlow and Clarke 2004, Swyngedouw 2006; Petrella 2001). While commoditization has been problematic, as in the case of the Chilean water reform (Budds 2013), water deprivation or exclusion from access need not require full commoditization. As Sosa and Zwarteveen (2012:372) note, water transfers may result from “long-winding, fuzzy and opaque processes of negotiation and sometimes struggle on a playing field that is far from level.” Bues and Theesfeld (2012) reiterate this point in their study of the capture of community-managed irrigation water by international and national horticultural farms in Ethiopia. They argue that changes in water governance rules rather than overt commoditization resulted in “water grabbing.” In the worst case, water can be taken away from agricultural communities either as a punitive measure (as in Palestinian communities) or diverted to other uses in an exercise of eminent domain.

A second feature of water regimes with important implications for food sovereignty is their role in supporting and guiding the direction of water transfer projects which render some places highly productive, at least in the short run, while depriving others of customary access. Big water storage, transfer, and irrigation projects have helped concentrate irrigated land in the hands of agribusiness firms (Smaller and Mann 2009). Water transfer projects—notably those related to power generation and navigation—are also used to supply some economic sectors at the expense of others. These projects also reshape land and waterscapes—often in ways that are prejudicial to existing farming systems and to other ecosystems that supply food to local populations, and they often entail technological changes in water allocation and distribution that constrain the ability to produce food in culturally appropriate ways.

Aquifer mining is an indirect and highly privatized form of water transfer. Those who can afford to install deep tubewells and to pay for the power needed to pump water in copious quantities as water levels drop can effectively deny water to resource-poor farmers. As a corollary, water is transferred from food crops for local markets to high-value commodities.

Closely related to water commoditization and transfer are questions related to access, allocation and voice. An emphasis on efficiency often strengthens the position of technical elites—notably irrigation engineers and economists—in water governance arenas (Ingram et al. 2008; Ore and Rap 2009). These elites rarely grasp the agronomic, ecological and societal

consequences of their decisions. Also, as Ingram notes, where efficiency is the overriding concern, questions of equity are often glossed over if not ignored. Lastly, the selective exclusion of problematic water uses like aquifer mining and water pollution from government oversight severely compromises water access for food production.

Food Production and Water Governance in Peru

This appears to be the case in Peru, despite the nation's growing gastronomical prominence and global interest in its indigenous cultivars.² Peruvian food preferences reflect the country's ethnic and geographic complexity as well as a history of irrigated agriculture and inter-regional exchange of agricultural products that precedes the Columbian encounter by centuries. Despite growing food nationalism, the ability of the Peruvian food system to provide nutritious, culturally appropriate and sustainably produced food for its residents seems problematic at best. To understand this paradox, we need to ask who is producing culturally appropriate foods for local and regional (subnational) markets and what kinds of pressures they face.

The Producers

Van der Ploeg (2009) identifies three different, if not always distinct modes of agriculture--peasant, entrepreneurial, and large-scale corporate. These modes are differently distributed among Peru's three basic geographical regions--the well-watered Amazon drainage (selva and ceja de selva), the moist to dry Sierra and altiplano, and the arid coast. Although we find agribusiness enterprises and small-holdings in the selva, food production has been largely concentrated in the Sierra and on the coast. "Peasant" producers or campesinos predominate in the Sierra. The general pattern is crop production at elevations below 3000 m. and livestock above, although we are beginning to see more crop production at high altitudes as a result of pressure on land, climate change or both. We also see campesino production in coastal valleys at the edges of what were once haciendas and later cooperatives.

Both campesino cultivators and medium sized commercial farms produce--sometimes sustainably and sometimes not--for local and regional markets. This is less true of large-scale corporate enterprises, which are far more prevalent on the coast. While rainfed cultivation happens in the Sierra, irrigation at some points in the growing season is essential for much of

² Each year the La Mistura food fair in Lima draws hundreds of thousands of visitors--rich, poor, old and young, immigrant and indigenous--to admire and sample local charqui, quinoa, canihua, aguaymanto, oca, ollucos, and cheeses as well as the offerings of street food vendors and newly discovered little roadside restaurants. That said, concentration at the retail end is taking place even in this environment. Like many other Latin American countries, Peru has seen the entry and increasing prominence of transnational food retailing chains. In 2007, the homegrown Wong chain was sold to a Chilean firm, provoking outrage on the part of Peruvian consumers. Supermercados Peruano was Chilean, but was bought by Ahold.

campesino production. It is fair to say that food production in all but the northernmost regions of the coast depends entirely on irrigation or water harvesting.³

The tendency among Peru's technocratic elite has been to either denigrate campesino cultivators as unscientific and retrograde. In contrast, some NGOs and some academics venerate them as paragons of sustainability. The former position has been dominant within the Ministry of Agriculture (MINAG) and the irrigation bureaucracy for over a century; it persists in the assistentialist discourse of the World Bank and aid agencies.⁴ Altieri and Toledo (2011: 589) tend toward the latter position, drawing a sharp dichotomy between small scale, integrated farming systems and industrial agriculture. They argue first that traditional small-scale agriculture contributes to biodiversity, and second that "Such agricultural systems not only have fed much of the world population for centuries and continue to feed people in many parts of the planet, especially in developing countries, but also hold many of the potential answers to the production and natural resource conservation challenges affecting today's rural landscapes." They contrast the richness and complexity of small-scale production with a vulnerable industrial agriculture model suffering from "low ecological diversity" and a "narrow genetic base."

However, this dichotomy is less sharp than it appears, and particular agroenterprises lie at different points on a continuum between completely integrated agroecosystems and the vast, water and energy-consuming monocultures that we think of as defining capitalist, corporate agriculture. As van der Ploeg (2009) observes, many peasants are engaged in market-oriented production, a tendency encouraged by Peru's Sierra Exportador program. At the same time, widespread terrace abandonment and depopulation both suggest the increasingly precarious position of campesino agriculture.⁵ There are several reasons for this. First, many campesinos lack direct access the different ecological zones required for integrated agropastoralism.⁶ Households may use occupational diversity as a substitute for the exploitation of a range of microenvironments; this means that they have less time to spend on tasks related to food production. Second, as young men seek employment in transport and construction and children go on to secondary school and college, the labor supply in campesino families is

³ Other water delivery systems, like raised bed cultivation in the Lake Titicaca basin and cultivo en hoyas (sinking fields to levels where plant root zones can access the aquifer) on the coast, were once common but have largely given way to surface and pump irrigation.

⁴ See, e.g., the 2010 World Development Report, which states that with climate change, "traditional agricultural and water management practices are no longer useful. This is already the case in the Cordillera Blanca in Peru, where farmers are facing such rapid changes that their traditional practices are failing. The government and scientists are starting to work with them to find new solutions." (p 137)

⁵ Denevan (1986) estimated that 62 percent of terraces in the Colca Valley have been abandoned, and over 90 percent at higher elevations. See also Inbar and Llerena (2000) who attribute soil erosion to outmigration.

⁶ Anthropologist John Murra (1972) introduced the terms verticality and archipelago to refer to such patterns of land and resource access in Andean societies. It is also central to Brush's early work (1977).

shrinking. Third, more and more families are abandoning outlying hamlets (aldeas) and moving into towns to be closer to schools, health care, the soccer field and internet cafes. This means that time once spent in the fields or up on the puna with animals is spent in town or in transit. While Sierra cultivators have always (or at least since the Inca period) had to leave their fields for work in distant places, this tendency too seems to be accelerating with migration to nearby cities, Lima and abroad. As a result, on the whole, it may well be that campesino cultivation is becoming both less labor- and knowledge-intensive.⁷

Despite these societal changes, campesino cultivators in the Sierra continue to make significant contributions to agrobiodiversity (see, e.g., Brush 2004), and they supply basic crops to urban and local markets. For example, in 1990 more than 80 percent of the nation's potatoes were produced by small farmers. More than 90 percent of Peruvian potatoes were produced at altitudes between 2,500 and 4000 meters (CIP 2013: 2). Similarly, Peru's 60,000 quinoa producers are mainly small cultivators in the Sierra (FAO 2011). That said, commercial farmers in the lower, more fertile valleys of the Sierra and on the coast also contribute to Peruvian food sovereignty, even though they tend to cultivate "improved" rather than traditional varieties and to use chemical inputs. They produce a variety of crops, many of which--like yuca, arracacha, papaya, avocados, mangos, rice, and maize (choclo)--are key elements in Peruvian diets. It may well be, although I have no hard data here, that as financial pressures increase some entrepreneurial farmers will reduce their use of agrochemicals and make increasing use of family labor.

Lastly, and importantly fishers contribute important elements to the Peruvian diet. The health of inland and in-shore fisheries depends on water quality and to the amount of fresh water flowing into salt marshes and estuaries. Conversations with fishing industry representatives in Chimbote suggested an intimate relationship between watershed governance and the health of the industry, but this is beyond the scope of this paper.

Campesino cultivators and small commercial (what van der Ploeg calls entrepreneurial farmers) face myriad pressures, some of which were alluded to above. One is the deeply ingrained cultural bias against Sierra communities and their farming systems, a bias reinforced by and justifying the tendency of state and private sector alike to concentrate investment in the coastal agriculture.¹ Disinvestment in the Sierra dates at least to the 1940s when highland hacendados shipped their colonos out to work either in urban areas or in coastal cultivation. It

⁷ Brush (2004:113) notes that the release of "improved" potato varieties beginning in the 1950s contributed to a loss of potato diversity. In San Marcos (Cajamarca) in the 1980s, I saw efforts by MINAG officials and USAID consultants to expand cultivation of "improved" potato varieties at the expense of other cultivars like prickly pear cactus and harvested native plants, including several tree species, despite the fact that the internal market for these varieties was very limited.

was aggravated in the period following the agrarian reform, when highland hacendados stripped their properties of their moveable assets, leaving their campesino successors to make do without. The anti-campesino, anti-sierra bias remains pervasive. For example, the 2008 World Development Report (p. 59) claims that rural poverty is “most responsive to growth” on the coast and least responsive in the Sierra. They attribute the difference to Andean isolation and distance from markets which encourages subsistence cultivation. And in 2011, a Ministry of Economy and Finance bulletin contrasted the coast, which it defined as developed and densely populated, but dry, with massive irrigation infrastructure and the institutional capacity for IWRM, and the sierra, which was seen as having abundant water resources, but little infrastructure, a poor population and weak institutions.

The bias against the campesino communities and the Sierra more broadly is reinforced by and reinforces state policies and institutions that continue to favor extractive industries, agribusiness enterprises, and food exporters. A series of measures in the 1980s and 1990s, including laws and executive decrees enabling privatization and titling of lands in agrarian reform cooperatives, a law authorizing corporations to own land, and another declaring all uncultivated coastal land to be property of the state paved the way for the growth of export-oriented agribusiness at the expense of domestic food production.

The Fujimori presidency completed the undoing of the agrarian reform that had begun during the second Belaunde presidency. The big coastal state-run sugar cooperatives of the north coast were subdivided among the socios and reconsolidated in the hands of large private agribusiness firms. As Mayer (2009) notes, the neoliberal Fujimori administration was more interested in the creation of wealth than in its distribution.

Despite a retreat from the blatant neoliberalism of the Fujimori era, the Toledo, García and Humala administrations continued to favor mining and land concentration for export agriculture and biofuels production. This tendency was particularly pronounced during the second administration of President Alan García who consistently asserted the government’s right to reallocate natural resources. García made his preference for export-led development clear in two famous op-ed pieces on “El Perro del Hortelano” (2007; 2008), which lambasted campesino communities for their unwillingness to either develop their own natural resources or to get out of the way and let others do so. As president, Garcia promoted policies intended to facilitate a Free Trade Agreement with the United States. One proposed law would have allowed foreign investors to buy community lands on the premise that “community land is idle land, because the owner has neither the training nor the economic resources, which means it is owned merely in name”(Alan García, quoted in Salazar 2008). Another (DL994) gave the state authority to sell uncultivated land to individuals for investment in irrigation infrastructure (Burneo 2011). Lastly, Garcia’s *Sierra Exportadora* program encouraged commercial growers in

the highlands to shift from food crops for local consumption to export production (Oré et al 2009).⁸

So the question is whether Peru's water regime is making a separate and significant contribution to changes in the ability of Peruvians to produce and consume culturally appropriate crops for domestic consumption. If so, is this due simply to sectoral, jurisdictional or upstream-downstream competition among unequal players, or do the policies, institutions and laws governing access to water favor some water uses over others? What kinds of waterscape transformations do these policies encourage? To address these questions, I look at the evolution of national water politics at the national level and then at policy implementation in two watersheds and its implications for food production.

Modernizing Water Governance

While state control over irrigation management in Peru predates the colonial encounter, when looking at the implications of water governance for food sovereignty, it makes sense to start with the 1969 water law enacted by the Velasco government as part of its broader agrarian reform and modernization project. The agrarian reform, as Mayer (2010) reminds us, was about abolishing feudalism and introducing capitalist agriculture in the sierra and about expropriating capital and socializing production on the coast. In both cases, meant integration and Peruvianization—nationalizing foreign-owned agribusiness enterprises like the Grace sugar plantations and bringing isolated campesino communities into direct contact with state development agents. The water law was an integral to this effort.

The 1969 water law made all of Peru's surface and groundwater state property (Boelens 2006; Oré and Rap 2009). It was intended to make distribution rational, efficient, and equitable, but failed to live up to its intentions. The stated goal was to prevent water capture by large landowners and to promote its redistribution to small holders, but in practice this often proved difficult. What did happen is that the state, in an effort to integrate indigenous and campesino communities, increasingly made its own presence felt in the management of highland irrigation systems.⁹ This meant new water user associations, new rules for water management, and new definitions of water rights, but the attempt to impose an engineering vision on community irrigation never succeeded entirely.

⁸ Agroexports guaranteed duty-free entry into the US under the terms of the 2009 TLC include asparagus, paprika, grapes, lentils and beans, grapes, mangos, clementines and ethanol (http://www.peruembassy-uk.com/Embassy2006/Files_html/SiteIngles/Newsletters2009/Newsletter1/TLC%20Peru-USA.html.) China is also a major trading partner, but I could find no data on agroexports to China.

⁹ See, e.g., Gelles 1990,1993; Lynch 1988; Lynch et al., 1986; Oré 1989, 2005; Trawick 2003

State irrigation programs, before, during and after the demolition of the agrarian reform prioritized investment in coastal irrigation. That said, as part of its effort to integrate serranos, the Velasco government did support low-cost micro-irrigation efforts in the Sierra. While flawed in many respects, over the years, the 1969 law created porous interfaces that at least to some extent could be manipulated by sierra irrigators.¹⁰ After Velasco, agrarian policy shifted rightward, but both the military government of Morales Bermudez and the Acción Popular government of Fernando Belaunde Terry that succeeded it continued to use small and medium-scale water projects in the Sierra as vehicles for building political support. Also in the 1980s, in keeping with World Bank, InterAmerican Development Bank (IDB) and donor (notably USAID and the GTZ) interest in small and medium-scale irrigation, the Peruvian government oversaw the expansion and rehabilitation of small and medium-scale systems in what were then the departments of Cajamarca and Cuzco. While the agronomic recommendations that went with these programs may have been less than sustainable, the goal of the projects was to improve water access for domestic food producers.

But by the late 1980s, support for small-scale irrigation in the Sierra appeared to be waning. With militarization of the sierra during in the late 1980s and 1990s, the emphasis shifted from buying votes to enhancing security. Moreover, structural adjustment under Fujimori meant radical disinvestment in social programs and food production coupled with enthusiastic promotion of mining and agroexports. Within the irrigation bureaucracy, the new emphasis was on turnover of older canal systems —shifting financial responsibility for the maintenance of now aging systems to the water users and on stimulating private sector agribusiness investment through the development of irrigation infrastructure (Oré and Rap 2009).

Fujimori also drafted legislation that would have privatized water and created tradable water rights, but irrigators vehemently opposed the changes, and the bill was scrapped when Fujimori left office in 2000 (Slaughter-Holben 1999). Concerted opposition to privatization made it impossible for Fujimori to achieve a full-blown water reform, but several changes in water governance did take place. One was his encouragement of agribusiness expansion on coastal

¹⁰ Boehlens (2009:328) argues that serranos struggled within the law for greater autonomy and recognition of their water rights. In so doing, they often adopted the rules and constructs handed to them by the state. The encounters produced by these struggles allowed the state to “subtly include and domesticate the water use communities according to bureaucratic or market needs.” As Trawick (2003b) notes, the 1969 water law created new base level organizations or water user associations with whom a government-appointed administrator would consult as he designed a cultivation and irrigation plan. The opacity of the planning process raised in importance encounters between a state appointed water distributor and water users. It fell upon overworked distributors engaged in face-to-face contacts with irrigators at the ditch to ensure equitable if not efficient water delivery. Gelles (2000) and I (1988) independently found instances of institutional layering in Sierra irrigation; where state institutions were superimposed on preexisting irrigation systems organizations, the former continued to exist in some form or other.

desert lands. In addition, in order to reassure international investors in mining and energy, he promoted sector-based water policies and dispersed authority for water governance among competing government agencies with differing degrees of power. So, the powerful Ministry of Energy and Mining (MEM) rather than the Ministry of Public Health was in charge of environmental impact assessment for new mining projects. His policies not only devolved responsibility for irrigation operation and maintenance to water users, they transferred authority for huge irrigation schemes (or special projects) to the regions. It could also be argued that the seeds of water conflict in the Río Santa and Ica watersheds that erupted after his departure in 2000 were sown by his broader development policies that favored mining and agroexport growth.

In summary, throughout the past century, government irrigation investment was concentrated on the coast, but we see a shift from increasing intervention and slightly more investment in Sierra irrigation from 1968 to the mid 1980s to overt neglect of Sierra agriculture and renewed enthusiasm and support for private agribusiness enterprises beginning in the 1990s. A key difference between the pre-reform and neoliberal periods, however, was a new willingness to compromise the interests of small and medium-scale commercial farmers on the coast who were by and large irrigating their crops from older canal systems.

The Water Modernization Project

With its return to democracy in 2000, Peru began a renewed effort at water reform with loans and guidance from the InterAmerican Development Bank (IDB) and the World Bank. The Water Resources Management Modernization Project, now in its second phase, was firmly grounded in the Integrated Water Resource (IRWM) paradigm. The stated purposes of the reform were to integrate all aspects of water governance under the aegis of a single authority,¹¹ to develop a national expert-managed water information system, to inculcate a “new water culture” in policy makers, civil servants, children, and the public, and to devolve responsibility for water governance to the watershed level. The three major institutional innovations of the water regime that resulted from this effort were (1) passage in 2009 of the first new water law since 1969, (2) the creation of a new national water authority (ANA) in the same year, and (3) an on-going program to establish watershed governance councils (CRHCs) comprised of state and non-state actors.

¹¹ Prior to ANA’s creation, authority for water governance was dispersed among eight ministries—Agriculture (MINAG); Defense; Economy and Finance (MEF); the Ministry of Energy and Mines (MEM); Housing, Construction and Sanitation; Health; Production; and Environment (MINAM)—12 ministerial level departments and 17 agencies (Oré 2009).

The new water law (Ley No 29338) defined the structure for new institutional hierarchy, set rules for and prioritized water uses, and outlined water rights. The law does recognize the preexisting water rights and water governance responsibilities of indigenous and campesino communities, although this recognition can be narrowly construed, and the rights are not antecedent to, but rather granted by the state. The law represents a retreat from a strong neoliberal position, and although irrigators fear that it will be used to justify water privatization, to date, outright privatization and creation of water markets has not happened. Simplification of water rights is more likely. If the emergent water regime creates a unified legal framework, it would, as Boelens (2009) argues, reduce the array of possible water sharing and undermine the ability of food producers to collectively manage water.

ANA remains a problematic agency. The banks hoped to create a water authority independent of and able to supervise the water-related activities of the line agencies, but the García government located the new agency within the Ministry of Agriculture, where is subordinated to agribusiness interests. Its functions are wide-ranging, but it is dominated by irrigation engineers who see their mission as building works (Oré and Rap 2009). The absence of crop scientists from ANA's staff means that the agency lacks the ability to evaluate the implications of agronomic behaviors for water demand. ANA also lacks staff capacity to work on water quality and in 2012 was outsourcing public health responsibilities to the Ministry of Public Health. It was also delegating to MEM the authority to conduct environmental impact assessments of mine operations, although this responsibility passed to the Ministry of the Environment in 2013. Finally, while the water law calls for the reservation of river flow for ecosystemic functions, ANA has no instruments for ecosystem protection. Social and equity issues were not even on the table. In sum, while the agency was able to amass large quantities of hydrologic data, it lacked the capacity to translate this information into environmentally sound, let alone equitable water management practices.

ANA sits at the apex of three separate hierarchies of water institutions. One is comprised of the AAAs or Administrative Water Authorities for Peru's 14 water districts and the ALAs or Local Water Administrators. The second, a relic of the 1969 law, is the hierarchy of irrigator associations which extends down to committees at canal level. Although formally part of the water governance system, the intent appears to be erosion of their power and authority, and with it the power of food producers within the water bureaucracy.

The institution intended to replace the hierarchy of irrigator associations is the CRHC which is supposed to (1) bring together state and civil society actors to make a management plan that conforms to the National Policy for the Administration of Water Resources and (2) decide on water use priorities. In the context of Peru's water regime, the watershed is an elastic unit, which coincides with neither jurisdictional (regional) nor natural hydrologic boundaries. This

elasticity makes it easier to justify water transfers cross hydrological boundaries. While immensely helpful to coastal agribusiness, this elasticity has not been used to include sierra food producers whose livelihoods are affected by what goes on in the watershed.

CRHC formation is a task assigned to the regional government, but its composition is mandated by the water law (p.76-77). In principle the CRHC would be an inclusive space where representatives of all water users would come together, not all would be equally represented. Large-scale systems or special projects are over-represented vis-à-vis the older state-recognized irrigator associations. Unrecognized irrigator associations would have no opportunities for representation at the watershed level. All the widely scattered campesino communities in a watershed would share a single representative, as would all non-agricultural water users, including domestic water systems, mining and energy production, as well as fishing and aquaculture. Natural ecosystems are not represented. It is also clear that irrigators would have more power than other water users, and that the special projects would be in a stronger position than the single representative of myriad small systems. Lastly, water resources engineers would constitute a significant fraction of the representatives, reinforcing ANA's technocratic bias.

Watershed, Waterscapes and Food Sovereignty

The watershed may or may not be a useful unit of water governance. It is however, a unit large enough to reveal the relationship between water regimes and waterscapes and among diverse user groups. The two watersheds discussed below are somewhat similar. Both lie in the Pacific drainage, and both encompass more than one region. The dominance of the agroexport sector is clear, and a history of water competition strains relations among water users. Conflict is growing more acute with expansion of demand. Both watersheds were chosen by the World Bank and the IDB as pilot CRHC efforts.

The Río Santa Watershed

The Rio Santa flows from the high puna into the Callejón de Huaylas, a highland agricultural valley, and toward the Pacific coast, where it forms the boundary between the regions of Ancash and La Libertad. Water stress in the valley is intensifying, and numerous conflicts have erupted over the past decade. These conflicts have jurisdictional, sectoral and upstream-downstream dimensions. The continuing ability to produce food and respect for existing community and/or municipal water rights lie at their core. Enterprises in the mining, energy, and export-agriculture sectors have claimed water rights, tacitly and quasi-legally in the case of the mining industry (which sees itself and is seen by the state as a minor water user despite its serious impacts on water quality) and the hydropower industry; formal in the case of agribusiness enterprises in the large coastal irrigated areas. These favored industries compete

for water and land with domestic food and livestock production and with a growing aquaculture industry in the Sierra.

In the high Andes (above 3,300 m), most water disputes are mine-related. Mine royalties are narrowly targeted and their environmental impacts diffuse. Extraction and road building bring arsenic and heavy metals to the surface and into the Santa, and leaching from old mine tailings continues unabated, polluting the Santa and making some of its tributaries too toxic for irrigation or domestic use. Road building and the movement of heavy equipment through the spongy terrain of the high meadows (*puna*) is reducing the water storage capacity of the land and may contribute to absolute scarcity down the road. Mining is also blamed for stream acidification and reduction of vegetative cover on *puna* lands used for pasture and, increasingly, for potato, oca, and ollucu cultivation (Silverio 2008).¹² MEM officials who were charged with monitoring pollution until this year, are reluctant to impose sanctions that would affect the financial performance of the sector (Poveda et al. 2005).

In December 2010, MEM's decision to grant a permit for mineral exploration on the shores of Lake Conococha, the Santa's headwaters provoked a massive protest organized by Catac, a *puna* livestock-producing community. Participants in the protest included other comunidades, commercial farmers, urban water users, students, clergy, and defenders of the Huascarán National Park. Protesters blocked the main highway from Lima to Huaraz for three days and marched in the region's cities calling for cancellation of the license to pollute. In response, in January 2011, responding to coalition demands, ANA declared that mining exploration and other industrial activities would not proceed in the wetland near the lakeshore. In the first instance the Conococha conflict was about competing and incompatible uses of land and water. It was also about the right of campesino communities to control land and water use within their boundaries.

The Callejón de Huaylas, the middle reach of the watershed, which despite urbanization, outmigration, and land abandonment, remains a reservoir of agrobiodiversity. Campesino cultivation predominates on the steep slopes of the cordilleras, while commercial agriculture takes place on the valley floor. Competition between irrigators, domestic water users and the energy sector is intense.

Illustrative is a dispute over rights to Laguna Parón, a glacial lake high in the Cordillera Blanca. In 2008, Cruz de Mayo, a campesino community, blocked access to the lake to protest water withdrawals made a Duke Energy subsidiary authorized to manage the Cañon del Pato hydroelectric plant. The plant supplies power to the region and to the national grid. Demand

¹² Sosa and Zwarteen (2012) characterize these activities as a form of "water grabbing."

for electricity has expanded rapidly due in no small part to mining and national electrification policies (Leavell 2008). The company claimed the right to control releases partly on its purported property rights to the lake and on its technical expertise (Fraser 2010; Carey 2008). But Duke's releases were incompatible with the irrigation needs of communities with long-standing rights to lake water (Aiello 2009). Water would at the wrong time of day, and its flow, too rapid for irrigation, caused soil erosion.¹³

The blockade lasted 18 months as officials from Caraz and surrounding communities petitioned the government for redress. After months of negotiation, ANA announced that the lake was "the property of all Peruvians" and that communities with preexisting rights to lake water would control releases for agriculture, drinking water and hydropower on the condition that Duke be allowed to lower the lake level should it become dangerously high. The agreement fell apart in 2011 when a Constitutional Court ruled in favor of Duke's right to the lake (Carey et al. 2012). The Parón conflict was about access to water for food production and domestic use. It was also about rights claims based on two fundamentally different views of how, for what, and by whom water should be governed. Rights claims based on a faith in expert management were pitted against claims based on "traditional" community rights based in local knowledge and underlain by a sense of place-based equity.

In its lower reaches, the Río Santa forms the boundary between the regions of Ancash and La Libertad, and a substantial fraction of the watershed lies within the latter's boundaries. Here regional competition is aggravated by the presence of two large coastal irrigation and water transfer systems—Chinecas in Ancash and CHAVIMOCHIC, Alan García's pet project in La Libertad. These compete for the Santa's waters. Both diversion projects mean less and dirtier water for downstream small and medium-sized farms and for in-shore fisheries.

Still under construction, CHAVIMOCHIC transfers water into four smaller watersheds for irrigation, power generation and water for the city of Trujillo (Oré et al. 2009; Kus 1987). The CHAVIMOCHIC command area grew by 44,000 ha. between 1994 and 2006. Of these newly opened lands, 37,780 ha. were concentrated in the hands of 11 agribusiness enterprises (Burneo 2011). Some 23 percent of the total was bought by Camposol, the largest asparagus exporter in the world. The project, now in Phase III of development, vastly increases demand for Rio Santa water at a time when supply is likely to become more variable if not more limited due to climate change. Chinecas, an older scheme, less than half the size of CHAVIMOCHIC, seems somewhat less dominated by huge agroexport enterprises. Until recently, its infrastructure was in poor shape, but the scheme is now undergoing a major expansion.

¹³ The small city of Caraz also depended upon the lake for its domestic water supply, but during dry periods, Duke's releases left insufficient water to meet urban needs.

Both projects have reduced the supply available to older and smaller irrigation canals on the river delta canals that serve small and medium-scale commercial farmers who grow some crops for the export, but produce largely for local urban consumption. In the upper parts of the delta, the main crop is corn. Lower down we see cotton and fruit. Rice, beets, carrots and garlic are grown in the lower delta. And so, those food producers whose access to clean water is most immediately threatened by what is euphemistically called “expansion of the agricultural frontier” are not so much campesino communities as commercial producers. Their farms may not be models of agroecosystemic sustainability, but they do contribute dietary staples to the local urban food supply.

As these cases indicate, competition in the Santa watershed is still largely local, although serious upstream-downstream imbalances exist. The upper basin accounts for 40 percent of the watershed’s irrigated area and 70 percent of its irrigators, while the coast accounts for some 70 percent of irrigated area (about 135,000 ha) and 30 percent of irrigators in the watershed (Hendriks 2008; Burneo 2011). This imbalance will become more marked when CHAVIMOCHIC and Chincas are completed. CHAVIMOCHIC landowners are entitled to a fixed yearly allocation of 10,000 m³/ha. (Chanduví 2006). In contrast, highland irrigators’ water rights are defined in terms of access to a canal’s total flow for a fixed time period, so the latter get less water during droughts. Fear that climate change will limit their access to water, in 2008, Peru’s Association of Exporters demanded that the government guarantee their access to sufficient water to prevent anticipated losses (La República 2008). If this demand were met, water would likely be taken away from highland food producers and urban residents. But, to date, that highland irrigators have experienced reductions in water supply as a result of transfers to the special projects. The mines and Duke are more serious concerns. A more immediate source of tension is the role that highland irrigators are being asked to play in conserving water for use downstream. They are being asked to plant trees rather than crops and to install expensive water-saving irrigation technologies. In response local irrigation officials and community leaders argue that if coastal enterprises want more water, they need to pay highland cultivators to adopt conservation measures—whether hi-tech irrigation systems or reforestation. This would not solve the problem of food production.

Lastly, as we saw in the case of the Parón conflict, water rights are a significant source of tension for campesino communities. Although the water law (Chapter 3, Art.64) recognizes their right to use water flowing through or sitting on their lands in accordance with their “usos y costumbres,” and ALA officials in the watershed are arguing for a very narrow interpretation of this right.

In sum, water demand for power generation and agroexports has been growing as a result of the government policies of the past 25 years, while policies that have favored growth of mining

have rendered water unfit for irrigation or human and animal consumption. Because they use sophisticated irrigation technologies, agribusinesses are portrayed as modern and water conserving even though they are responsible for the export of virtual water needed for food production on the coast. In contrast, food production in the upper reaches of the Santa has been seen as not as a contributor to food sovereignty, but as an obstacle to mineral exploration and energy development.

The question is whether a CRHC could effectively manage conflict in the watershed and with what implications for food producers. Excessive demand for water on the coast feeds a perception of water scarcity—a perception, nourished by regional and national government authorities, that will grow more acute with expansion of the irrigated area on either side of the river. A CRHC dominated by engineers is not likely to tip the balance in favor of food producers. Upstream, where mining is the focal point of contention, conflict management will require that ANA play an active role in regulating mine waste contamination, but the agency lacks the capacity to do so. There also seemed to be a sense in the upper reaches of the watershed that the president of the region took care only about irrigators on the coast. Whether true or not, this perception fueled mistrust of regional government and its ability to make a positive contribution to water management.

The Ica- Alto Pampas Watershed

Like the Santa watershed, the Ica-Alto Pampas watershed crosses regional boundaries.¹⁴ However, whereas regional competition in the Santa watershed happens on the coast, the Ica watershed is defined to encompass both the largely coastal region of Ica and the impoverished Sierra region of Huancavelica. Like the Santa, the Ica basin has seen a remarkable expansion of coastal export agriculture and with it the concentration of land in new latifundia. In this case, however, agroexport expansion took place on lands irrigated by groundwater. In the Ica watershed, as Damonte et al. (2013) note, river water is deemed to be dirtier and less reliable, and hence less valuable than groundwater from the Ica-Villacurí aquifer. It is abundant during the wet season, and crop calendars have to be adjusted accordingly. Water stored in reservoirs is somewhat cleaner, and it is available for most of the year, but its flow is still variable. As a result, while small and medium-scale cultivators rely directly on river water diversion or on canals fed by upstream reservoirs, agribusiness enterprises are concentrated on the arid coast, where they are depleting the nation's largest coastal aquifer.

¹⁴ Except as noted, the Ica watershed discussion relies heavily on the as yet unpublished research of Gerardo Damonte, Eduardo Pacheco, Claudia Grados, Maria Teresa Oré, Diego Geng, Ismael Muñoz, Susana Navas and Maria del Carmen Milla, Patricia Urteaga, Iris Dominguez, and Armando Guevara Gil, but I take full responsibility for any resulting misinterpretations of their work.

Agro-export production has been around for a long time in Ica, but in the 1950s the lower watershed's principal products were cotton, grapes and food for domestic consumption. Cotton crashed in the 1960s, and with the agrarian reform, food production on small plots became more important. In the 1990s, the Fujimori government made state lands in the desert overlying the aquifer available for purchase. Whereas in the Santa watershed, expansion of the agricultural frontier entailed heavy state infrastructure investments in two regions, irrigation development on the newly opened lands in Ica was financed by private investment in the absence of effective government regulation.

Agribusiness enterprises producing asparagus, and to a lesser extent, table grapes and paprika, expanded rapidly through the first decade of this century (Muñoz et al. 2013). The agroexport boom made it profitable for these enterprises to sink more and deeper tubewells. As aquifer depletion proceeded, more expensive technologies were needed to access water and to deliver it parsimoniously to crop root zones. This resulted in the exclusion of small cultivators from access to the aquifer. The agroexport enterprises, on the other hand, could effectively purchase water by renting or buying the land of small cultivators, who are now growing less food for domestic markets and, increasingly, selling their labor to the agroexport firms. In sum, what we appear to be seeing in the lower reaches of the watershed is water grabbing, largely at the expense of domestic food production. Aggressive groundwater extraction has also reduced access to water for Ica's small and medium cultivators dependent upon surface water irrigation.

As depletion of the Ica-Villacurí aquifer makes tube-well irrigation increasingly costly, growers are looking to Huancavelica as a water source. Like other Sierra regions, Huancavelica is climatically diverse. Its altitude ranges from 1900 to 5000 meters, and its major economic activities are herding, which is concentrated in high-altitude wet pastures, and campesino cultivation for subsistence and local markets. There is some mining in the region, and, due to state investment, the region is now the third largest producer of llamas and alpacas in Peru; its alpaca fiber is sold on international markets (Urteaga 2013). Some parts of the region are arid or semi-arid, and there is a paucity of hydrologic data on the region. Nonetheless, as Ica agribusiness firms seek greater water security, the region is increasingly being defined as water-abundant, despite the fact that in some areas agriculture is entirely rainfed and even drinking water is scarce. A myth common in Ica is that Huancavelica communities do not use water efficiently and that they don't really need it because the land is too cold for cultivation and because most of the region's population has migrated to Ica. This perception nourishes plans for new reservoir building projects in Huancavelica to supply the water needs of Ica. Huancavelicanos are mistrustful of proposed water transfer projects, in no small part because of a disastrous prior experience.

The organizational landscape of the watershed is also designed to favor the agroexport sector (Oré and Geng, 2013). Authority for forming the CRHC for the watershed has been given to the Ica regional government. Irrigation authorities, who by a large share have a technocratic bias, find it easier to understand the arguments made by the water user association representing aquifer miners than those made by the representatives of Ica's two canal associations, much less those made by the unrecognized user groups representing campesino cultivators in Huancavelica (Guevara Gil 2013).

In sum, in the Ica watershed, the value of water determines the value of the land, and, in turn, land values determine crop choice and ownership. Small and medium scale food producers in Ica are facing diminished water supplies as the Ica-Villacurí aquifer is depleted, while campesino cultivators in Huancavelica fear being pawns in the water transfer game. As Urteaga (2013; p. 104) puts it, "At the end the porosity of the state vis-a-vis powerful productive forces in Ica made it unresponsive to local upstream water claims." But in response to what Huancavelicanos see as state intransigence, they continue to block efforts to transfer the region's waters to producers in Ica.

Conclusion

At the end of the day, Peruvian water policy and its implementation appears to be a contributing, if not the primary factor in the erosion of domestic food sovereignty. Even though full water privatization is not yet occurring, state policies intended to boost exports coupled with the growing power of technocrats inside and outside of the state and a long-standing culture that defines the Sierra and campesino cultivation as retrograde have combined to further reduce the control of domestic food producers over water access, allocation, and quality.

The redesign of Peru's water regime to centralize water governance in ANA is further cementing the power of irrigation engineers with their emphasis on works and marginalizing public health, agronomy and environmental concerns. The new and nascent CRHCs are heavily weighted in favor of the technocracy. Campesino communities and small and medium sized irrigation systems enjoy formal representation on the councils, but this amounts to passive inclusion. Finally, IWRM discourse with its lofty calls for inclusion, subsidiarity, and ecosystem protection, has provided cover for state policies prejudicial to domestic food producers.

The Ica and Río Santa cases show how water allocation policies favor land concentration in the hands of agroexporters. In the Ica watershed, exports of virtual water in the form of asparagus and table grapes is producing scarcities in the region of Ica and feeding new demands for water transfers from Huancavelica. Ica has become a poster child for the position that land grabs are

in fact water grabs. In the Santa valley, vast expansion of the agricultural frontier through diversion into the CHAVIMOCHIC and Chinecas irrigation schemes, appears to have its most pronounced effect on small and medium-scale commercial farmers producing food for local urban markets. At the same time, at least in the Santa watershed, campesino cultivators and herders in the Sierra are facing a decline in water quality, a decline due in no small measure to the proliferation of mining activity at very high elevations. In sum, what is threatened in these watersheds is not simply small-scale campesino production, but commercial farms that supply dietary staples for domestic markets.

Those of us who are studying water governance both at the national and watershed levels are concerned about its implications for domestic food production, but we have little more than anecdotal information to rely on. It is not clear whether changes in water access are causal factors in shifts from domestic food to agroexport production, or whether these shifts are responsible for changes in water governance and access. Nor do we know who is producing what “culturally appropriate” foods for whom? This lack of clarity implies an ambitious research agenda. First, we need to ask what are the relative contributions of campesino cultivation and small-and mid-scale commercial production to Peruvian food sovereignty. Second, do those who are making major contributions to Peruvian food sovereignty have access sufficient water and sufficiently clean water at the right points in the growing season and delivered in ways that do not exacerbate soil erosion? If not, is this due to absolute scarcity or to water transfers to more powerful users? Lastly, while we have begun ask about the voice of domestic food producers in water governance, we have a lot more work to do here as well.

This is an ambitious research agenda, and it may not be doable. Problematic as they are, using watersheds as units of analysis could be the best way to proceed. IWRM discourse privileges the watershed, but more interestingly, a focus on the watershed--however defined--draws attention to how food production is affected when waterscapes are reshaped both through water transfers from one place to another and from one sector to another. A watershed focus may also make it somewhat easier to delineate the power relationships that govern decisions regarding these transfers.

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FOOD SOVEREIGNTY: A CRITICAL DIALOGUE INTERNATIONAL CONFERENCE PAPER SERIES

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A fundamentally contested concept, food sovereignty has — as a political project and campaign, an alternative, a social movement, and an analytical framework — barged into global agrarian discourse over the last two decades. Since then, it has inspired and mobilized diverse publics: workers, scholars and public intellectuals, farmers and peasant movements, NGOs and human rights activists in the North and global South. The term has become a challenging subject for social science research, and has been interpreted and reinterpreted in a variety of ways by various groups and individuals. Indeed, it is a concept that is broadly defined as the right of peoples to democratically control or determine the shape of their food system, and to produce sufficient and healthy food in culturally appropriate and ecologically sustainable ways in and near their territory. As such it spans issues such as food politics, agroecology, land reform, biofuels, genetically modified organisms (GMOs), urban gardening, the patenting of life forms, labor migration, the feeding of volatile cities, ecological sustainability, and subsistence rights.

Sponsored by the [Program in Agrarian Studies at Yale University](#) and the [Journal of Peasant Studies](#), and co-organized by [Food First](#), [Initiatives in Critical Agrarian Studies \(ICAS\)](#) and the [International Institute of Social Studies \(ISS\)](#) in The Hague, as well as the Amsterdam-based [Transnational Institute \(TNI\)](#), the conference “Food Sovereignty: A Critical Dialogue” will be held at Yale University on September 14–15, 2013. The event will bring together leading scholars and political activists who are advocates of and sympathetic to the idea of food sovereignty, as well as those who are skeptical to the concept of food sovereignty to foster a critical and productive dialogue on the issue. The purpose of the meeting is to examine what food sovereignty might mean, how it might be variously construed, and what policies (e.g. of land use, commodity policy, and food subsidies) it implies. Moreover, such a dialogue aims at exploring whether the subject of food sovereignty has an “intellectual future” in critical agrarian studies and, if so, on what terms.

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