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# Regarding biocultural heritage: in situ political ecology of agricultural biodiversity in the Peruvian Andes

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**Abstract** This paper emerges from and aims to contribute to conversations on agricultural biodiversity loss, value, and renewal. Standard international responses to the crisis of agrobiodiversity erosion focus mostly on ex situ preservation of germplasm, with little financial and strategic support for in situ cultivation. Yet, one agrarian collective in the Peruvian Andes—the Parque de la Papa (Parque)—has repatriated a thousand native potatoes from the gene bank in Lima so as to catalyze in situ regeneration of lost agricultural biodiversity in the region. Drawing on participant action research and observation, this paper engages with the projects underway at the Parque—as well as “indigenous biocultural heritage” (IBCH), the original action-framework guiding the Parque’s work. IBCH grounds the ecology of successful crop diversity within the Andean cosmovisión, or worldview—which is included, but marginalized, in mainstream agrobiodiversity conservation policies. The IBCH concept counters apolitical renderings of agrobiodiversity erosion, arguing that this disregard of biocultural heritage perpetuates colonialist devaluations of efficacious “traditional ecological knowledge” and epistemologies. Accordingly, this paper discerns here an on-site, or in situ, political ecology of agricultural biodiversity conservation.

**Keywords** In situ agricultural biodiversity · Political ecology · *Cosmovisión* · Indigenous biocultural heritage · Peruvian Andes

## Introduction

This paper begins with the dual premise that, in general, agricultural biodiversity is critical to cultivating ecological resilience amid erratic weather patterns of global climate change, and that it holds important potential in bolstering food security amid erratic price fluctuations of neoliberal, or “global” agribusiness markets (IAASTD 2009). Upon asserting the historic—though now somewhat latent—value of agricultural biodiversity in conferring ecologic and economic resilience, I move on to investigate obstacles to its continuity and regeneration. One surprising obstacle, I argue, is that dominant agrobiodiversity conservation methods can and do disregard the social and cultural context of biodiverse agriculture in action. To illustrate, I explore a grassroots response to diminishing agrobiodiversity that is concurrently launching a compelling critique of conventional models of germplasm preservation.

More specifically, a key impediment to agrobiodiversity regeneration remains the subtle epistemological bias against place-based in situ agricultural expertise, and in particular, against the cosmological foundations of in situ agrarian expertise in agrobiodiversity hotspots, such as the Peruvian Andes. I contend that such an oversight parallels broader limitations currently confining agricultural policy and agricultural research initiatives, namely a limited role for small-scale growers committed to biodiverse cultivation. To investigate this persistent epistemological bias, a political ecology perspective is applied to the conundrum of agrobiodiversity conservation—though as I argue below, it is perhaps more apt to say that an on-site political ecology perspective is *discerned*, or identified, as already underway. Accordingly I contend that the lens of political ecology works well in clarifying the intricate dynamics at work—and at odds—in agricultural biodiversity conservation.

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This grand and general topic is addressed through a particular case study in the Peruvian Andes. After laying out the need for in situ (on-site) agrobiodiversity cultivation, I introduce an in situ agrobiodiversity conservation initiative underway in the southern Peruvian Andes at the *Parque de la Papa* (Potato Park, hereinafter: the Parque) as well as the concept those involved with the Parque use to describe and articulate their work: indigenous biocultural heritage (IBCH). IBCH contends that agrobiodiversity loss, value, and conservation are not just biophysical, but are social, cultural, economic, and political. This also comprises the central argument and premise of a lively body of scholarship that has come to be known as political ecology: a scholarly conversation grounded in the premise that environmental crises have inextricably political, economic, and social causes and consequences—and that ecological exploitation invariably involves social exploitation through political and economic inequity. IBCH extends the point by arguing that to treat agrobiodiversity as merely biological, and its erosion as primarily environmental, perpetuates a colonizing paradigm wherein the treasury of agrobiodiversity is further extricated from its in situ contexts—and in this case from the *cosmovisión*<sup>1</sup> that grounds Andean agricultural traditions.

Here, the so-called-cultural aspects of how people understand “nature” and “natural resources” are re-acknowledged as political in the very fact that they have been depoliticized by being classified as merely “cultural.” The case in point would be the systematic way alternative ecological ontologies—such as those animated by Andean indigenous *cosmovisión*—are lauded, yet subtly marginalized. Even amid pronouncements of “Farmers’ Rights,” which “recognize the enormous contribution of farmers to the diversity of crops that feed the world” (ITPGRFA 2012), farmer invocations of *cosmovisión* remain largely discounted by scientific paradigms and thus agricultural policy. This lingering disregard becomes an obstacle to effective agricultural biodiversity conservation and regeneration—and as such necessitates further investigation, (self)reflection, and dialogue. The Parque’s articulation and actualization of the concept of IBCH attempts to justify and integrate an alternative ecological ontology and epistemology into the discussion of successful agrobiodiversity. Accordingly, it can be understood as an on-site, or in situ, political ecology. This case study offers a valuable contribution to policy-makers as well as to both the growing body of scholarship and civic engagement known as “political ecology” and to agri-food studies, with its commitment to understanding agricultures—and the human values therein.

<sup>1</sup> I have left this key term in Spanish, since the English translations (cosmovision/cosmology/world vision) fail to encompass the full meaning of *cosmovisión*. Also, the Peruvian growers of the Parque with whom I spoke and worked often use the Spanish term even when speaking in Quechua.

## Political ecology of agricultural biodiversity

### Beyond apolitical cultural ecology and a-cultural political ecology

Political ecology has a long scholarly history of analyzing cultural realms, as that it emerged in part from cultural ecology—a body of research focusing on cultural acclimatization and adaptations to given environments. Anthropologists and geographers searching to understand dynamics and drivers for cultural shifts began considering the role of ecological landscapes, forces, and modes of production. In a mid-century overview of cultural ecology, Julian Steward expounded upon his idea of a “culture core” (1955)—the central aspect of “culture” pertaining to and emerging from interactions with the “natural world.” Avoiding the environmental determinism of previous analyses of human-environment influence, this concept allows for a dynamic interrelationship between “cultural” and “natural” realms, through a focus on the ongoing, processual nature of human-ecology relationships. More recently, political ecologists have described cultural ecology as “ethnographically rich ‘systems thinking’” about social adaptation to environmental contexts; here, culture “regulate[s] environmental stability much like the self-correcting properties of closed living systems” (Jones 2008, p. 687).

Carl Sauer’s ground-breaking scholarship on the morphology of historical and contemporary landscapes also drew attention to the ways humans impact their ecological context—even as they are continually adapting to the specific conditions of these contexts. Collectively, these adaptations become the cultural ecology of a people or region. The late twentieth century body of research known as political ecology built upon key aspects of cultural ecology, such as the latter’s close and sustained attention to how local people struggle to survive and think to thrive in a place. Cultural ecologists demonstrated that, far from being backwards, irrational victims, smallholders “act with sophisticated ecological motivation and understanding to produce the world around them” (Robbins 2004, p. 42).

Yet, though cultural ecology’s village-level focus attentively traced technology adoptions and soil degradation, it did not address the broader political economies at work in these micro-adaptations. Sauer himself called attention to the recent, drastic, and unprecedented impact of humans on their landscapes.<sup>2</sup> Yet, though he derided environmental

<sup>2</sup> “In the space of a century and a half—only two full lifetimes—more damage had been done to the productive capacity of the world than in all of human history preceding. The previously characteristic manner of living within the means of an area, by use of its actual ‘surplus,’ is replaced at the time by a reckless gutting of resources for quick ‘profit’...The modern world has been built on a progressive

exploitation in published papers and plenary addresses alike, cultural ecology as a whole focused on *how* landscapes changed, not *why*. In a prominent analysis of political ecology's "deep roots" in cultural ecology, Robbins notes, "[t]he crisis of explanation confronted by cultural ecology would become the fulcrum on which political ecology would be levered into prominence" (2004, p. 6). Political ecology emerges to open the "closed-loop system" of cultural-ecological assumptions, contextualizing household and community-level practices and decisions within broader political and economic pressures. Geographers celebrate this more integrative scope of analysis, even as they have wrestled with the imperative—and pitfalls—of multi-scalar perspective itself (Zimmerer and Bassett 2003, p. 288). Political ecology expands upon cultural ecology's strong intellectual foundation by attending to diverse and concurrent scales of reference at work in any human-environment interaction (Zimmerer 2007a)—and through vigilant attention to the political economy driving ecological degradation.

This vigilance often takes the form of historical-materialist frameworks, wherein the physical conditions of substandard wages, soil erosion, malnourishment, and disproportionate toxic exposure take precedence—as starting points for research and specific goals for policy intervention. This careful consideration of labor "comes quite close to articulating a materialist approach to culture," though Steward, like other cultural ecologists do not reference Marx directly (Robbins 2004, p. 40). Political ecology's historical-materialist perspectives effectively shed light on the embodied ways class differentiation manifests in actual economic and ecological exploitation. Yet, a narrowly materialist approach may overlook the supra-material realms that, according to key stakeholders—such as Peruvian growers at the Parque, actually animate and inform action—in this case: the Andean *cosmovisión*.<sup>3</sup>

Scholars have critiqued how cultural and political ecology may marginalize supra-material aspects of human-environment interactions to focus on empirically accessible and assessable socio-economic phenomenon and data like income, acreage, and caloric intake.

Rather than viewing cultural forms as derivative of, or "outside," structural entities such as "the state," or transformations in "the economy," the challenge becomes to explore how symbol and meaning give

form and content to material transformation. It is not a question of attending to either culture or power, political economy or symbolic forms, but the interrelations among them. (Moore 1996, p. 140)

More recently, Escobar has written extensively on the pivotal role of culture in politics and vice versa (Alvarez et al. 1998).

In general terms, it could be said that local models of nature constitute ensembles of meanings-uses that, while existing in larger contexts of power, can neither be reduced to modern constructions nor accounted for without some reference to local culture and grounds and boundary effects. (Escobar 2001, p. 151).

After all, disregard of cosmological scales of reference is ironic, since metaphysical, spiritual, or religious aspects of human-environment interrelations are often implied in the adjective "cultural." The "culture core" explicitly "includes such social, political, and religious patterns as are empirically determined to be closely connected with [subsistence and economic] arrangements" (Steward 1955, p. 5). In this case study, cosmological principles—invoked, debated, recalled, readapted—guide the "culture core."

Accordingly, I expressly attend to the supra-materialist drivers of conservation and political mobilization here—because these are what have been articulated. Attention to supra-materialist scales of reference hearkens back to cultural ecology's focus on "local" logic, which "requires that primary attention be paid only to relevant environmental features rather than to the web of life for its own sake. Only those features to which the local culture ascribes importance need be considered" (Steward 1955, p. 7). Political ecologists also note that, "despite the very material character of environmental struggles around the world, it is often concepts and constructions of community and nature that propel or suppress conflict" (Robbins 2004, p. 208). Political ecology scholarship highlights the dialogic, interactive, and discursive nature of "nature"—and aims to be, itself, a dialogic, interdisciplinary perspective on social-ecological matters. This study attempts to follow suit; I draw upon philosophical as well as social scientific frameworks so as to facilitate dialogue on the supra-materialist drivers of the material conditions of agricultural biodiversity renewal.

### Politicized (agri)cultural ecology

A key characteristic of current, industrialized agriculture is homogenization—wherein the vastly diverse micro-climates, economies, and agri-food systems of the world transition toward consuming standardized inputs (such as mass-produced, single-generation seeds) from giant input retailers and producing for a handful of giant food retailers.

Footnote 2 continued

using up of its real capital...The apparent paradox results that the lands of recent settlement are the worn and worn-out parts of the world, not the lands of old civilization" (Sauer 1963 [1938], p. 147–8).

<sup>3</sup> The question of how to integrate cosmological or theological perspectives with historical-materialist analyses of political economy merits further investigation, reflection, and dialogue.

This phenomenon has been chronicled by a number of scholars and has now reached public consciousness through various popular agri-food studies books and films. Concurrently, the biodiversity of agro-ecosystems, as well as the crop diversity therein, have dwindled as overall seed types and varieties become more genetically uniform (Fowler and Mooney 1990; Perfecto et al. 2009). Such dwindling diversity is alarming, but as weather patterns become more erratic, with dryer droughts, deeper floods, and more intense storms, the problem of crop uniformity becomes dire. Arguably, the need for a wide and biodiverse crop base has never been greater, even as it has never been so elusive.

Enter conservation: modern environmentalism's answer to ecological crises such as that of agricultural biodiversity erosion. Attempts at addressing and redressing the issue have followed the modernist paradigm of conservation, which frame value (in this case agricultural biodiversity) as a thing (a seed, germplasm) or a population of things (genetic resources) to be preserved as is. Large-scale efforts toward agrobiodiversity conservation focus on *ex situ*—or off-site preservation. Yet, though useful—and indeed critical—in many regards, merely *ex situ* conservation, such as CGIAR gene banks, cannot keep alive agricultural biodiversity, which is inherently dynamic, interactive, place-adapted, living, thriving, co-evolving, and transforming with changing soils, animals, insects, weather patterns, and general global climate. As the Parque and other growers and scholars from across (Tuxall and Nabhan 2001) and beyond the academic disciplines have chronicled, *ex situ* conservation can only supplement, aid, and support *in situ*—or on-site cultivation in fields, farms, and gardens.

That said, *in situ* cannot happen on command and thus presents a paradox for conservationists: many social, economic, political, and ideological forces and phenomena collude to pressure farmers to quit farming or to adopt a more industrialized, high-input, export oriented mode of agricultural production (Polanyi 1944; Berry 1978; Shiva 2000; Patel 2007). Herein lies the challenge of agrobiodiversity erosion and renewal: despite consensus on the value of and need for *in situ* cultivation (Brush 2004; Smale 2006), those at the Parque and elsewhere argue that the conservationist models perpetuate the very paradigms and policies that have curtailed local (and this global) agricultural biodiversity. The variety and variability of cultivated plants and their wild relatives are rendered as genetic resources and valued as potential capital, to be actualized, more often than not, in the process of breeding, engineering, patenting, and sale. Here, the (agri)cultural ecology of agrobiodiversity conservation begs for a multiscale, political–ecological analysis.

During and since colonialism, seeds have been sought from the far reaches of colonies and empire, collected,

deposited, categorized, and kept in centralized collections, in what Latour has called “centers of calculation” (1987). Science and technology studies (STS), feminist, and colonial studies scholars have documented how the practice and premise of bioprospecting was in fact central to colonial and imperial endeavors (Schiebinger 2004; Hokkanen 2012). Bioprospecting intensified however, after the colonial empires collapsed, as documented by Kloppenburg (1988) and Parry (2005). The vast quantities of the world's agricultural genetic resources have been stored in mega-gene banks for the past few generations for “the benefit of humanity” as international public goods (IPG).<sup>4</sup> Meanwhile the financial benefits accrued from new agricultural and pharmaceutical products using genetic material from these collections has grown—as has the number of patented gene traits extracted from these collections. The current trend in seeds—increasingly commodified, consolidated, genetically modified, “protected” by intellectual property rights—raises questions with regard to what constitutes effective and equitable agrobiodiversity conservation and even what constitutes agricultural biodiversity itself.

These philosophical questions manifest directly in a string of policies, each the product of intense negotiation and debate. Importantly, the Convention on Biological Diversity (CBD) acknowledges the critical role of traditional ecological knowledges (TEK)<sup>5</sup> in its opening statement and the much-invoked Article 8(j),<sup>6</sup> where it gives credit to the *in situ* traditional and indigenous farming systems that comprise agrobiodiversity “hot spots.” Yet, the broader global contentions regarding equitable access and benefit sharing persisted, ultimately leading to the 2001 International Treaty for Plant Genetic Resources for Food and Agriculture (Treaty), which aimed to facilitate broader

<sup>4</sup> The CGIAR declares itself to be “committed to conserving these collections for the long-term and to making the germplasm and associated information available as global public goods” (CGIAR 2012a).

<sup>5</sup> The invocation, employment, and acronym-ization of traditional ecological knowledge (as TEK) are increasingly important and complex. This paper engages the interplay of agricultural expertise and the politics of agrobiodiversity research and science, but the questions of innovation, epistemology, and intellectual property clearly need further attention.

<sup>6</sup> CBD's Article 8(j) states: “Each contracting Party shall, as far as possible and as appropriate: Subject to national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations, and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge innovations and practices.”



access to *ex situ* genetic resources and fairer sharing of their benefits.<sup>7</sup>

Amid acknowledgement of *in situ* conservation and traditional knowledge in these policies, nevertheless, economic, political, legal, and epistemological priority remains with *ex situ* conservation. The Global Crop Diversity Trust (GCDT)—the Treaty’s funding mechanism and the self-proclaimed Foundation for Food Security—focuses their efforts solely on *ex situ* modes of conservation. Potential donors are encouraged to finance the Trust, because, unlike with other daunting ecological and social crises, the “mission” of stemming global crop diversity erosion is “achievable” through “a costed, measurable plan, relying on existing institutions and simple proven technologies” already underway at Consultative Group for International Agricultural Research (CGIAR) gene banks around the world. Calling itself the “only solution” to the problem of agrobiodiversity loss, the GCDT logged a 2011 income and expenditure of US\$11.948 million, spent mostly on “securing PGRFA of global significance” so as to ensure their “long-term conservation and availability” (GCDT 2012a).<sup>8</sup>

Here, a troubling overconfidence in *ex situ* accumulation and preservation meets a neoliberalizing political economy: “availability” for what and for whom? The Trust operates under the explicit objective of conserving and availing germplasm primarily for private industry and private industry-affiliated philanthropic plant breeding researchers and industries so as to “stimulat[e] the flow of conserved genetic diversity down the ‘use pipeline’” to growers (GCDT 2012c). The inner contradictions of the “use pipeline” motif break through, though: the “production,” distribution, and adoption of new seed products contribute to the homogenization of farming, which in turn jeopardizes the flow of new genetic material to the laboratory-production line. Hence the need for a stockpile of

preserved germplasm, conserved “forever”: docile, servile, and available to plant breeders “in perpetuity” (GCDT 2012d). GCDT investment in pre-breeding—genetic trait identification and selection—maintains “the link between the conservation of diverse crop genetic resources and the modern breeding programs that produce varieties that address farmers’ ever-changing needs” (GCDT 2012e). Yet, isn’t this “link” itself an epistemic pipeline of (in)valuable knowledge and resources *from* into *ex situ*—from fields to laboratories to global markets?

The very term “conservation” lends itself to this style of intervention, wherein the solution to agrobiodiversity loss is to gather what remains and safeguard it far from harm’s way. Gene banks “save” the seeds in banks, frozen in icy vaults,<sup>9</sup> preserved away from the risky precarity of global climate change and world market dips in funding, political upheavals, revolutions, counter-revolutions, insurgencies, counter-insurgencies. Yet, what if the very conception of agricultural biodiversity as seeds to be stored away from the vicissitudes of an (ecologically, politically, economically) erratic world—tucked away, outside of the situatedness of life—what if this vision is further undermining the context within which agricultural biodiversity survives, thrives, and proliferates?

#### Public goods, private gains

CGIAR has wrestled with the growing tension between their own commitment to researching IPG and the increasing power of consolidated industry in plant breeding research and corresponding increase in highly proprietary intellectual property rights (IPR) expectations, demands, and regimes.<sup>10</sup> Across these various policy and research contexts, the ubiquitous “pipeline” terminology conveys and perpetuates a particular epistemological assumption: that growers are merely the passive recipients and potential consumers of agricultural expertise—even expertise related to agricultural biodiversity. Meanwhile, CGIAR renewed its commitment to international public goods during its comprehensive 2008 self-assessment and internal reform. Nevertheless, in its 40 year anniversary Strategy and Results Framework report, CGIAR upheld its leadership in the “success” of the Green Revolution (CGIAR 2011, p. 26), asserting, that, “biotechnological approaches... should be anticipated to eventually become the standard for

<sup>7</sup> The specific content and inner dynamics of the 1983 Undertaking and Commission on Genetic Resources for Food and Agriculture, the 1992 CBD and its lively and broadly inclusive Article 8(j) Ad Hoc Working Group on Article, 1996 Global Plant of Action, the 2001 International Treaty for Plant Genetic Resources for Food and Agriculture and subsequent Protocols, and the Multilateral System of Access and Benefit Sharing deserve their own essay, but are beyond the scope of this paper.

<sup>8</sup> These funds came from national donations (from US, UK, Australia, Norway, Sweden, Switzerland, Germany, and Ethiopia among others), with the largest single donation being from the Bill & Melinda Gates Foundation (which has donated US\$29.9 million as of February 2012—and which has a longstanding investment in Monsanto Corporation, having bought 500,000 shares worth US\$23.1 million in 2010 alone). Agribusiness provides substantial direct support, with DuPont/Pioneer Hi-bred and Syngenta each giving US\$1 million and the Grains Research & Development Corporation giving US\$5 million—among other corporate donors (GCDT 2012b).

<sup>9</sup> Such as the Svalbard “Doomsday” Seed Vault near the Arctic Circle.

<sup>10</sup> This debate prompted internal assessments and debates, as outlined in the 2006 report “CGIAR Research Strategies for IPG in a Context of IPR: Report and Recommendations Based on Three Studies,” a survey of major agribusiness corporations and research partners (Chojceki 2006), and the establishment of a Private Sector Committee’s Science and Know-How Exchange initiative.

the trade and a key component of agricultural innovation processes to help break present yield barriers” (CGIAR 2011, p. 23). Despite the spate of IPR restrictions governing them, genetically modified crops and varieties are framed here as IPG, to be consumed by poor farmers around the world as “downstream products” (CGIAR 2011, p. 25).

In a recent analysis, Nelles critiqued CGIAR’s scant research on agroecological or organic agriculture, as well as the fact that it “still maintains mostly one-way, top-down communications initiatives, including Web sites to promote its scientists and research products” (2011, p. 415). Meanwhile geographer Whatmore notes the high stakes of this tension between IPR and the commons of plant genetic resources:

IPR combine the universalizing pretensions of science and law to affect a radical break with the past, collapsing botanical becomings into the here and now of invention such that a germplasm without history is folded into a future of monopoly entitlement. (Whatmore 2002, p. 110)

Apart from the contentious issues of access and benefit sharing, there is also the contested paradigm of conservation itself. What exactly is to be conserved: the seeds themselves or the genetic traits therein? In the 2008 Visioning the Future of the CGIAR Executive Report, the “CGIAR comparative advantages” for research in “genetic improvement to push out the yield frontier” were (in order): “germplasm collection, networks, expertise, and strong IPG” (CGIAR 2008, p. 18). Here the value of in situ cultivation lies in its contribution to the repertoire of genetic traits available for agribiotechnology. To define agricultural biodiversity as genetic resources is to discursively frame the value of such biodiversity in terms of its contribution to certain kinds of future plant breeding—those that conceive of the genetic traits as intrinsically isolatable and extricable: yet, the genetic scale of reference is particular to lab-based plant breeders (McAfee 2003; Braun 2007). Moreover, policy and research have consistently advocated agribiotechnology as a means of *increasing* agrobiodiversity (CIP 2004, p. 38). The Global Plan of Action champions the use of “modern biotechnological techniques...to facilitate broadening of the genetic base of crops” (PGRFA 1996, p. 184[e]).

The ongoing debate and subsequent labyrinth of policies on the genetic resources of food and agriculture begs a few key questions: for whom is agrobiodiversity decline a problem and how? What exactly is being eroded in this “erosion”? The issue of how to conserve begs the questions why conserve as well as what exactly is being conserved.

## Biocultural heritage

### Disregarded

Here lies an interesting point of tension: the CBD, Treaty, and CGIAR all recognize the central contribution of small-scale farmers to agricultural biodiversity—indeed, how could they not? This contribution is obvious upon reflection of the situation, but it is also affirmed by a range of groups, from scholars (Nabhan 1989; Brookfield and Padoch 1994; Zimmerer 1996; Brush 2004), to the Svalbard Vault promotional video, to the 1995 Consultation on Indigenous Peoples’ Knowledge and Intellectual Property Rights in Suva, Fiji (UNDP 1995; as quoted in Posey 2001: 380):

We assert that in situ conservation by indigenous peoples is the best method to conserve and protect biological diversity and indigenous knowledge, and encourage its implementation by indigenous communities and all relevant bodies. (Clause 2.2)

Yet, what if the discourses deployed in conservation policies, such as those of GCDT and CGIAR perpetuate the paradigms that have undermined in situ cultivation—paradigms that are thus implicated in the crisis of agricultural biodiversity erosion itself?

In short: in situ cultivation poses a number of paradoxes and challenges to conventional agrobiodiversity conservation efforts, which have historically and geographically overlooked if not countered the needs, visions, and contributions of the local inhabitants of the “conserved” areas. As political ecologists have noted (Blaikie 1985), local communities have often been seen by international conservation agencies as either peripheral to the biodiversity treasury of their areas or as culprits in its erosion and obstacles to its conservation. Consequently, conservation efforts in general have come under increasing critique for disempowering local and indigenous groups, disenfranchising them from any local autonomy or sovereignty (Shiva et al. 1991; Chapin 2004; Shiva 2000; Rosset 2003; MacDonald 2010; Brockington and Duffy 2010). The case of agricultural biodiversity mitigates this conundrum to some extent because such diversity necessarily requires input and cultivation by people. Often, particularly in World Centers of Origin and Diversity—where staple crops were originally domesticated and now continue to grow alongside wild relatives—indigenous or local communities remain highly knowledgeable stewards of local ecological resources such as agricultural biodiversity (Nazarea 2005).

Nevertheless, the dominant discourse of landrace seeds as bundles of genetic resources renders them natural resources as if they “naturally” occur in their respective Centers of World Diversity, and are thus free for the taking,

or they are seen as the products of a traditional way of life that is past or passing. Meanwhile, maintaining rich crop biodiversity usually goes hand in hand with semi-subsistence or locally circulated food production, which is often characterized as antithetical to economic “development” (Yapa 1993; Shiva 2000). Amidst market volatility and climate changes, agricultural biodiversity re-emerges as critical—and yet rare. So, where, how, and why is agricultural biodiversity still thriving? What are the root causes of agrobiodiversity loss, according to these in situ growers and seed savers? What are the obstacles for effective renewal of agricultural biodiversity?

### Situated

One of the many places in the world upkeeping rich, multi-scalar agricultural biodiversity is the Parque de la Papa in the southern Peruvian highlands (see Fig. 1). This portion of the Andes—a Vavilov Center of World Origin and Diversity of a number of crops, including the potato—has maintained renowned agrobiodiversity for millennia. Instead of handicapping farming in region, the intense and varied topographic verticality has only challenged local growers to cultivate a multiplicity of crops and crop varieties—as have the extreme climate of the region and the historical and current global climate changes (from El Niño to present-day glacier meltings) (Zimmerer 1996; Gonzales 2000; Tapia 2000). Meanwhile, political geography has offered even more pressing obstacles to regional agriculture than has physical geography. Peru has a long history of colonial and colonialist land tenure systems that have displaced numerous native communities from fertile lands, forcing them into indentured labor on plantations and haciendas. Mid-twentieth century, Peru instituted one of the most extensive land tenure shifts in a region known for agrarian reforms. Since then, rural communities fled guerrilla and state violence in the 1980s, many relocating in Lima and other urban peripheries (after a generation of regional urbanization). In the 1990s, after a decade of structural adjustment impositions, President Fujimori ushered in neoliberalizing political economies that both García’s administrations extended, thereby fueling the consensus that “[e]conomic policy in Peru has long been conducted in such a way as to benefit the largely urban consumer at the expense of rural producers” (Crabtree 2002, p. 154; also see Bentley et al. 2001).<sup>11</sup>

The 2007 US-Peru Trade Promotion Agreement (TPA) moved Peruvian agriculture even further down a decidedly neoliberalized direction by eliminating tariffs on (highly



**Fig. 1** Photo (by author) of Parque, 2007

subsidized) US imports and requiring Peru to accede to the International Union for the Protection of New Plant Varieties (UPOV). This legislation further opened the market for previously released GM Revolution© potato, prompting economic and political concerns among sectors of civil society (De Wit 2006). A wide confederation of farmers’ groups and other unions launched a National Agricultural Strike on 18 February 2008 against the US-Peru TPA, which they contended would undermine local food markets, drive up input costs, and exacerbate bank seizures of *campesino* farms (Reuters 2008). Tens of thousands of farmers protested, over seven hundred were arrested, and at least four were killed by police, soon after the Peruvian government declared a state of emergency (Emery 2008)—though the uprising caught little US media attention.

More recently, Peruvian policy has both supported and undermined small-scale Andean farming heritages. On one hand, policies under García’s administration continued a long-standing ideology of Andean farming as backwards and antithetical to the goals of “modernity,” “development,” and economic and social “progress”<sup>12</sup>; for example, the US-Peru TPA built upon the 2006 “Law to Promote the Use of Modern Biotechnology in Peru.” On the other hand, this Law led to years of sustained public outcry across Andean Peru, with Parque growers at the helm. Critics decried the extensive IPR embedded within promotions of biotechnology as a threat to the region’s

<sup>11</sup> Throughout these years, the Drug War and cocaine production also (negatively) affected small-scale agriculture, but these complex subjects are beyond the scope of this paper.

<sup>12</sup> This ideology of modernity is epitomized in a quote by celebrated Peruvian novelist Vargas Llosa: “Indian peasants live in such a primitive way that communication is practically impossible...The price they must pay for integration is high—renunciation of their culture, their language; their beliefs, their traditions and customs, and the adoption of the culture of their ancient masters...Perhaps there is no realistic way to integrate our societies other than asking the Indians to pay that price...It is tragic to destroy what is still living, still a driving cultural possibility...but I am afraid we shall have to make a choice...Where there is such an economic and social gap, modernization is possible only with the sacrifice of Indian cultures” (1990, pp. 52–53, as quoted in García 2003, pp. 85–86).



biodiversity and food security/sovereignty (Toro Pérez and Madrano 2007). Peru had already established a National Regime “to protect the Collective Traditional Knowledge of Indigenous People associated with biodiversity” in 2002 (Swiderska et al. 2009, p. 2). However, though the law explicitly supports the collective nature of TEK, it still follows international IPR protocols by only covering its intellectual aspects—not the corresponding genetic resources.

In 2011, newly elected president Humala and the Peruvian Congress overwhelmingly approved a 10-year moratorium on genetically modified food, feed, fish, and seeds for agricultural purposes. The decade-long ban deploys the precautionary principle in aiming to protect Peru’s legendary agrobiodiversity and its burgeoning organic export sector. Working in, around, beyond, and through policy, indigenous modes of farming have survived centuries of colonial onslaughts and more recent neoliberalizing pressures. Small-scale Andean farming has adapted so as to persist, generation to generation, with the defining characteristic and goal of this legendary agriculture remaining its biodiversity.

#### In situated

The Parque serves as a compelling case study: a hands-on, on-site attempt to conserve agricultural biodiversity by renewing, revaluing, and respecting what those at the Parque argue is the larger *necessary* context for successful agrobiodiversity.<sup>13</sup> In 2003, six *comunidades*, or indigenous communities, merged their 10,000 hectares of land together to form an Indigenous Biocultural Heritage Area, primarily so as to repatriate hundreds of varieties of native potatoes from the CGIAR International Center for Potatoes (CIP for Spanish acronym) back to their original fields in the rural highlands of the state of Cusco (see Fig. 2).<sup>14</sup> With the financial, legal, and administrative help of an indigenous, Cusco-based NGO Association for Nature and Sustainable Development (ANDES for Spanish acronym), the Parque has also established a number of educational, ecological, and economic projects and programs so as to build a Community Registry of local traditional ecological and agricultural knowledge at the Parque and to foster agro-eco-tourism.

The Parque has also been involved in expressly political endeavors. After spearheading the successful 2007 proposal to declare the state of Cusco GM-potato free (Marris

2007), the Parque instigated the Indigenous Coalition Against Biopiracy which launched an international protest against agribusiness multinational Syngenta for their Genetic Use Restriction or “Terminator” Technology (*NewsWire Today* 2007) and then proposed the successful and unprecedented 2009 anti-biopiracy law (Portillo 2009). In 2010, Parque leaders traveled to Lima to stage a memorable public demonstration against transgenic potatoes, wherein they washed native potatoes to symbolize their commitment to protecting Andean agrobiodiversity from transgenic contamination. The move—which drew the support and participation of Lima’s mayor (IUCN 2011)—galvanized growing public opposition to genetically modified organisms. This action—alongside numerous rallies and protests in Cusco—paved the way for the November 2011 moratorium.

The Parque has also launched explicit critiques of dominant political and economic structures and policies, particularly in their Declarations, such as the one culminating a 2009 workshop with Ethiopian farmers. Though overlooked by mainstream media, the Declaration of Agrobiodiversity Conservation and Food Sovereignty serves as a powerful political document: it articulates a vision of agricultural biodiversity conservation inextricable from the indigenous biocultural heritage that engenders it. It begins by formally recognizing “the sacred and inherent rights of Pacha Mama” and continues with a thorough list of pronouncements, proposals, petitions, and calls to action—ranging from acknowledging the importance of indigenous heritage and *cosmovisión* to calling for:

...an end to all neo-liberal economic policies that promote “dumping,” subsidized agri-business, monocultures, and monopolization, commodification, and privatization of knowledge, seeds and ecosystem services and infringe upon the rights of indigenous



**Fig. 2** Photo (by author) of harvested *papas nativas*, in Parque, 2007

<sup>13</sup> I conducted research at the Parque in 2007, 2008, 2011–2012, using participatory observation, participatory action research, interviews, focus groups, and discourse analysis of related literatures.

<sup>14</sup> The Parque repatriated more than 400 native potato varieties in 2005 and another 500 in October 2010 (Suri 2005; ANDES 2012).

peoples and small farmers, particularly in relation to access to water, land and free exchange of seed. (Climate Change and Agricultural Research 2009)

The Declaration critiques international frameworks such as the Treaty and GCDT by affirming the importance and commonality of indigenous experiences and worldvisions relating to agroecology. It seeks to highlight the contributions of indigenous farming traditions and traditional knowledge in agrobiodiversity conservation (in and beyond Peru)—traditions that confer resilience to agro-food systems and the ecosystems at large amid the havoc of global climate changes.

#### Re-regarded

The Parque communities ground their social, legal, and political work in their original action-framework of Indigenous—or alternately: Collective—Biocultural Heritage. IBCH encompasses both:

...the *cultural* heritage, i.e., both the tangible and intangible including customary law, folklore, spiritual values, knowledge, innovations and practices and local livelihood and economic strategies, and the *biological* heritage, i.e., diversity of genes, varieties, species, and ecosystem provisioning and regulating, of indigenous communities which are often inextricably linked through the interaction between local peoples and nature over time and shaped by their socio-ecological context (Argumedo and Wong 2010, emphasis added).

In the applications, justifications, and subsequent publicity for their many projects,<sup>15</sup> ANDES and the Parque have articulated and expounded upon their concept of *patrimonio biocultural indígeno* or *colectivo*. The IBCH approach calls for a community-led, rights-based approach to conservation so as to ensure local indigenous peoples' self determination as well as “tenure and rights” to agricultural biodiversity, traditional knowledge, and local ecosystem goods and services in general (Parque 2012). In an internal document introducing the idea, Parque communities contend that the definitions and concepts used by international agrobiodiversity policies are “incomplete” to the extent that they do not represent all of the various aspects of biodiversity, by separating the concepts of genetic and biological resources from their foundation in traditional knowledge. Though well intended, such paradigms and policies fail to recognize the cultural and

spiritual values that necessarily undergird the historic proliferation of genetic and biological resources in Centers of Origins and Diversity, like Andean Peru. Consequently, “the protection such conventions and programs confer is slanted/biased” and thus ineffectual.<sup>16</sup>

At the heart of this discourse analysis put forth by IBCH is the assertion that traditional Andean agrobiodiversity remains inextricable from its indigenous biocultural heritage, which can only be conserved, revived, and continued through the continuity of the world-view that grounds it, namely: Andean *cosmovisión*.

#### Regarding biocultural heritage

The term *cosmovisión* serves as a Spanish approximation of the Quechua term *Pachakuti*, which has no direct translation in either Spanish or English, but is often rendered as “universe.” *Kuti* means change, revolution, revolving; so *Pachakuti* can refer to a vision of the world as intrinsically dynamic, continually revolving, rotating, turning upside down at various temporal and spatial scales. Within *Pachakuti*, the entire ecosystem—indeed the material world—is called *Pachamama*, a term used more ubiquitously in references to and invocations of *cosmovisión*. Though translated as “earth mother,” a more nuanced definition in English might be “cosmic matrix,” since *Pachamama* describes manifested reality in general: “nature” as the ultimate situation of life. *Pacha* refers to the material aspect of reality as well as to space and time, while *Mama* describes the generative, regenerative force that constantly reproduces itself anew on spatial and temporal scales.<sup>17</sup> The diminutive “mama” connotes the familiar intimacy with which humanity interacts with and depends upon the beyond-human realms.

The *cosmovisión* is agrocentric, though its agrarian principles are also ecological, social, political, economic, artistic, geographic as well as metaphysical. This ecological and social ontology manifests spatially and temporally in the ancient agrarian calendar—a cycle of “feasts for the fields” that corresponds to the agricultural chapters of the year. The year begins in the middle of the dry season, in August, with the *Pago* ceremonies. Here the Spanish word for “payment” works to encompass the complex sense of responsibility for reciprocating the bounty of nature, or *Pachamama*. After accomplishing *Pago* offerings through coca leaf ceremonies in honor of local *Apus*—or sacred mountains—the planting work and festivities commence. As in the harvest, the planting time requires collective labor. The physically demanding work of hand-planting

<sup>15</sup> These include a medicinal plant collective, a traditional textile weaving collective, agro-eco-tours and Andean cuisine restaurant, a youth video collective, as well as *papa arawiwas* (native potato guardians) to implement the repatriation.

<sup>16</sup> Translated from Spanish to English by the author.

<sup>17</sup> *Pacha*: “adj: Itself, The very. n: Place, Time, Era, Earth, World” (Hornberger and Hornberger 2008, p. 68).

enough seeds and seed potatoes to feed extended families and community networks necessitates large groups of planters, working together in an impressive orchestration of digging, tossing seeds, and applying *guano*. February brings the *Puccllay* festivals—also called *carnival*—dedicated to honoring the fertility of the rainy season. Elaborate songs, dances, and dress—each specific to the rainy time of year—accompany this holiday. The main harvests of the year occur in May, and are also heralded with social gatherings and artistic expressions specific to the season, each with cosmological context and import. In addition to following an agrarian-based solar calendar, many—often elder—indigenous Andean growers continue to align planting, harvesting, weaning, and storing with lunar cycles. Potatoes are planted during a young moon, for instance.<sup>18</sup>

The main principles governing the spatial and temporal upkeep of this social and ecological ontology are reiterated and explained in communications both informal and formal. They are now included in the Parque's digital and hard copy agro-eco-tourism literature. Among the many cosmological concepts outlined in the Parque literatures is *ayninakuy*, meaning mutual support and reciprocally balanced work, services, goods, and resources. Deceptively simple, *ayni* encompasses the central component of the intricate Andean cosmology and the foundation for social and ecological equilibrium and justice. The Spanish translation of this concept is found in the pervasive phrase *criar y dejarse criar*—to nurture (or raise) and to allow oneself to be nurtured (or raised). This key tenet of Andean agrocentric *cosmovisión* speaks of a reciprocal intimacy and interdependence exemplified in the saved seed, which is tended to and valued like an heirloom jewel for its properties of effectively tending to the growers' quality of life and health. Conscientious or "sustainable" agriculture comprises the most direct means of receiving and reciprocating the bounty of *Pachamama*. This manifests in such traditions as *pachamanca*, wherein the growers give an offering to *Pachamama* by baking freshly harvested tubers in a make-shift, underground clod oven in the *chakra* itself (see Fig. 2). Political ecologist Karl Zimmerer has written extensively on the changing landscape of diversity in the Andes, noting that, "Quechua farmers are particularly expressive in applying cultural or moral meanings to the stunningly diverse landscapes found in potato farming" (1996, p. 18), and that the "farmers felt that the spirits of crop plants held mutual rights and obligations with respect to one another" (185).

<sup>18</sup> This information was learned through participant observation, informal conversation, and formal interviews and focus groups (in 2007, 2008, and 2011–2012). See Valladolid Rivera (1998) for more information on lunar influence on agricultural activities.

Growers at the Parque continually emphasize the meticulous nurturance required for agricultural biodiversity, which itself is required for effective, sustainable agriculture. The *cosmovisión* also governs local governance, which according to customary laws takes place on the networked scale of the *ayllu*: a tight group, based in extended kinship—a micro-community within the larger *comunidad* of the village. An ancient (pre-Incan) political unit in the Andes, an *ayllu* practices self-governance and comprises a political, economic, ecological, and social decision-making body. *Ayllus* also facilitate the collective labor of *m'ita* as well as the logistics of social, agrarian festivals and religious, agrarian ceremonies (see Rangifo Vasquez 1998 for an introduction of *ayllu* and Zimmerer 2002 on its importance in Andean common field agriculture). Importantly, *ayllus* extend to beyond-human realms. ANDES director Argumedo and researcher Wong emphasize their ecological dimension:

We understand the *ayllu* as a community of individuals with the same interests and objectives linked through shared norms and principles with respect to humans, animals, rocks, spirits, mountains, lakes, rivers, pastures, food crops, wild life, etc. (2010, p. 3).

Of course, immediately upon delving into the intricate and elaborate Andean *cosmovisión*, the schisms emerge between standard scientific discourses of agrobiodiversity and their Quechua counterparts. A deep sense of interrelation and familial relation permeates traditional conceptions of and even names for agricultural crops. Maize ("*saramama*"), the various potato varieties, as well as quinoa, *qiwichi*, and other native grains are all referred to as daughters and sons of *Pachamama*.<sup>19</sup> Political ecologists have noted the "agency of nature" (Zimmerer 2007b) or "non-human agency" (Head and Atchison 2009), but entering into dialogue with the Andean *cosmovisión* would require recognizing the ecological benefits of *cocamama* (coca leaf) ceremonies in honor of local *Apus* for the sake of agricultural protection and bounty. To overcome anthropocentric biases in political ecology, "it may be necessary to examine and acknowledge how trees and animals form "alliances" and networks with human groups to establish and reinforce specific outcomes" (Robbins 2004, p. 192). So, could the principles and elements of *cosmovisión* relating to agrobiodiversity be engaged

<sup>19</sup> It should be noted that attempting to summarize or even translate elements of indigenous *cosmovisión* is delicate territory. Without the requisite grasp of Quechua, I cannot claim ethnographic expertise of this region, its people, or its worldvision, nor would it seem appropriate in this context—since the biopiracy of seeds has often been extended to the larger academic appropriation of local knowledges for export and nonreciprocal gain (as warned by Fabian 1983, Smith 1999, and Robbins 2006, among others).

respectfully and integrated into dominant understandings of sustainable agriculture? The questions of agricultural biodiversity loss, renewal and success are understood as explicitly scientific issues; can the answers themselves be biocultural?

Any honest attempt at understanding the achievement of this region regarding agricultural biodiversity, any analysis of its central components, systemic techniques, or its success must recognize and thus engage the *cosmovisión* that grounds it. Accordingly, contextualizing in situ agricultural biodiversity conservation initiatives within their respective, articulated cosmologies necessarily involves a supra-material cultural ecology perspective (called “spiritual” by Posey 1999). But due to the economic and legal repercussions of such conservation, it also demands a political ecology perspective.

### In situ political ecology of agrobiodiversity

The dream of an unworked agricultural landscape

The subject of agrobiodiversity explains and illustrates the main arguments within political ecology thought (evidenced in Zimmerer’s important body of work). Political ecology scholarship aims however not just to describe, but to halt ecological and social exploitation (Forsyth 2003). Research and teaching serve as interventions, with social justice inextricable from environmental sustainability (Jarosz 2004), and more equitable political economy (Salleh 2009). Robbins classifies the theoretical lens and canon political ecology as serving two main purposes: critiquing and offering constructive solutions. The Parque launches a political ecology of agrobiodiversity conservation that employs it both as a “hatchet” (Robbins 2004, p. 12), dismantling a falsely apolitical ecology of gene bank conservation, and as a “seed” (2004, p. 13), sowing empowering alternatives for ecologically and economically sustainable, biodiverse agriculture. The Parque’s work and words—at their most explicit—parallel a steadfast research focus of political ecologists, namely:

the way that conservation, purportedly an effort to create better conditions in the world, can frequently be a mechanism for (or more cynically a “cover” for) powerful players to actually seize control of resources and landscapes, and the flow of value that issues from these...Furthermore [even newer, more inclusive methods of conservation] typically side-step the underlying issues of political economy by focusing on institutional fixes that do not challenge critical drivers of biodiversity decline, the global market itself. (Peet et al. 2011, p. 27)

Political ecology builds off of but moves beyond “environmental politics” by upholding that the very subject of ecology is itself political, and that the very terms used to define—much less legislate, research, interact with, and use—what is called “nature” may reflect the describer more so than the described. “Nature” becomes political precisely in the ways it becomes depoliticized. Like Sauer, political ecologists map the way physical landscapes are in fact cultural landscapes.

The Parque’s concept of IBCH argues this point with regard to agrobiodiversity: the open-pollinated landraces that fill the gene bank’s coffers are as cultural—and *political*—as they are biological. The genetic traits of value within these native varieties cannot be defined as merely natural resources to be extracted, modified, and manipulated, as if they were neutral, inert commodities there for the taking. The IBCH position shares important parallels with Cronon’s thesis that:

the trouble with wilderness is that it quietly expresses and reproduces the very values its devotees seek to reject...The dream of an unworked natural landscape is very much the fantasy of people who have never themselves had to work the land to make a living...This then is the central paradox: wilderness embodies a dualistic vision in which the human is entirely outside the natural. (Cronon 1995, p. 80)

On the surface, the subject of agrobiodiversity would seem to evade this paradox since a domesticated seed by definition necessitates human involvement. And yet, agrobiodiversity conservation rhetoric operates under the “dream” that agrobiodiversity can be reduced to “genetic resources,” which, as natural resources, can be preserved most effectively through *ex situ* and *in vitro* methods. That these seeds—these genetic traits—are themselves carefully and deliberately worked, (agri)cultural landscapes in miniature is lost in this account. Yet, this dichotomous vision persists within dominant political economies, policies, and research epistemologies related to agrobiodiversity conservation.

On the other hand, drawing from feminist science and technology studies and actor-network-theory scholarship, political ecologists can help dismantle these biases, having “struggl[ed] to understand how human life is constituted by non-human objects” (Robbins and Bishop 2008, p. 751). At the Parque, potato seeds encode multi-layered dynamics of human and beyond-human relationship, interdependence, reciprocity, and responsibility: “Farmers’ perceptions of production thus involve concepts that go beyond mere economic and materialistic considerations: production is the result of interplay between human beings, their communities, and the spiritual entities that animate what the Western world calls ‘natural resources’” (Rist 2000, p. 312). Here,



agricultural biodiversity re-emerges as a deeply worked agricultural landscape. Seeds embody labor—and its fruits. Genetic traits encode the hard, collective work of sowing, growing, selecting, and saving—breeding and adapting varieties year after year, generation after generation. Production exists as social reproduction: of food, biodiversity, knowledge, and valuable germplasm. Attention to in situ agricultural biodiversity demonstrates the intricacies with which human and beyond-human realms mutually nourish and constitute each other. In this case it also calls for intellectual engagement with invocations of supra-material realms in describing this mutual constitution.

#### In situ agrobiodiversity: policy as epistemology

This is a fertile moment for expanding the terms of the conversation on conservation. After all, the efficacy of Andean agrobiodiversity cannot be denied, and its (re)generators point to *cosmovisión* as the driver and foundation for their agricultural methods and the biodiverse fruits thereof. So, it cannot be ignored in an honest—scientific—analysis of the phenomenon of crop diversity. And yet *cosmovisión* remains marginalized, included but relegated to the margins of the text, the press release, international treaties, and the budget. Nevertheless, indigenous growers, small-scale farmers, and agrarian advocates have lobbied long and hard at CBD meetings, earned key victories such as the Preamble, Article 8(j), and Treaty Introduction.<sup>20</sup> Nevertheless, the epistemological bias lingers. To a large extent, this predisposition to ex situ preservation for the use of private plant breeding reflects a distinctive and distinctively powerful political economy of agriculture and agricultural research—one that emerges from and further intensifies agribusiness concentration (Patel 2007). Yet, what are the epistemologies embedded within the political economies driving agricultural biodiversity policies?

The CGIAR research centers and gene banks include thousands of employees at work in hundreds of laboratories across dozens of countries around the world. Neither

homogenous nor monolithic, the CGIAR network encompasses diverse viewpoints and perspectives, yet remain guided by central research agendas. A World Bank assessment of CGIAR concluded that “as a whole, the crop-breeding CGIAR Centers have generated extraordinarily high returns to investment” (Gardner 2003, p. v)—to the donors; the evaluation suggested that the “global public goods idea should be more explicitly introduced into the priority-setting process. CGIAR activity should be focused on investments that, other things equal, are less likely to be undertaken by the private sector” (Gardner 2003, p. 41).

CIP has worked to mitigate the aforementioned growing strain that CGIAR’s growing partnerships with private sector research firms have caused—partnerships which demand increased IPR and so complicate CGIAR’s foundational purpose: IPG. A CIP 2010 Annual Report affirmed the research priority of supporting in situ community conservation initiatives re-introducing traditional varieties (CIP 2010, p. 11). The Report includes a two-page highlight of the Parque and the two-part “Convention for the Repatriation, Restoration, and Identification of Scientific and Traditional Practices for Food Security and Sustainable Development” between ANDES/Parque and CIP, in 2004 and 2010:

Other achievements of the agreement have included scientific validation of much of the ancestral wisdom around potato cultivation, the exchange of scientific and local knowledge, and the acknowledgement and strengthening of the traditional potato *arariwa*, or guardians, who guarantee the preservation of the crop’s biodiversity for the benefit of both present and future generations. (CIP 2010, p. 47)

Through their partnership with the Parque—alongside other (as of yet nascent) repatriation efforts across the Andes, in the *Ruta Condor* project—CIP has worked to acknowledge the value of in situ and wild crop diversity conservation. Though their alliance with the Parque is somewhat hidden in their website, the CIP visitor’s lobby in Lima boasts of these partnerships with elaborate visual displays of Parque growers welcoming repatriated native potato varieties. The repatriation is advertised in CIP tours and promotional video with images of Andean landscapes, smoothly edited footage of indigenous men and women planting, harvesting, and cooking colorful tubers. Meanwhile, the Treaty lauded their funding of the Parque as a chief success story of their first 10 years (ITPGRFA 2011).

This follows an important history of social science research at CIP that expressly aims to learn *from* and *with* local growers—not just about them. In the early 1980s, CIP-based researchers led renowned participant action research and rapid rural appraisal studies on agricultural biodiversity with Peruvian-Andean growers (Rhoades and

<sup>20</sup> In May 2007, CBD’s Ad Hoc Open Ended Working Group on Article 8(j) began publishing (online) *Pachamama: A traditional knowledge newsletter of the convention on biological diversity*. In 2009, the CBD agreed to implement key findings from the International Assessment of Agricultural Knowledge, Science, and Technology for Development (IAASTD), which concluded that small-scale, agro-ecological farming is key for economic and ecological viability as well as for social and economic equity and well-being (IAASTD 2009). In 2010, the CBD Nagoya Protocol asserted yet another valiant and more specific call for equitable access and benefit sharing of PGRFA. The CBD COP Decision VIII/16 established Akwé:Kon Voluntary Guidelines for the “conduct of cultural, environmental, and social impact assessments.” Building upon these policies, Decision X/42 instigated the Tkarihwaí:ri Code of Ethical Conduct to Ensure Respect for the Cultural and Intellectual Heritage of Indigenous and Local Communities.



Booth 1982). In a 1987 report on CIP's social science commitment, Chambers, a pioneer of the "farmer first methodological model" (1983), identified CIP's history of working closely with resource-poor farmers as its principle "comparative advantage" (CIP 1988, p. 226). The report highlighted the longstanding tension between research as a means of facilitating "pipeline" technology transfer of new products to Andean growers and research as a means of learning from growers themselves.

Even with this generation of participatory research on in situ methods of and needs for conservation, contradictions remain. The gene bank has listed "support for in situ community conservation programs and initiatives that encourage the re-introduction of traditional varieties in areas now dominated by commercial cultivars" as a key area of focus (CIP 2012), even as they carefully engage their CGIAR-based dedication to agribiotechnological research.<sup>21</sup> CIP publications acknowledge the centrality of cosmological principles in Andean agriculture (Millones 2001; Lumbreras 2001), yet frame such heritage as culturally interesting, rather than ecologically foundational or scientifically authoritative. Small-scale growers appear as targets for technology adoption and subsequent "sustainable development," rather than as valuable consultants and teachers in the global task of agricultural biodiversity regeneration. Likewise, *cosmovisión* remains on the margins, eluding legitimacy among the research biologists, the conservation policies, and US patent laws, which delegitimize the creativity and expertise of farmers breeding in situ diversity, as if the laboratory—not the *chakra*—marks the only veritable space of scientific innovation. Repatriation projects—exemplified by the CIP-ANDES/Parque Agreement—stand as crucial exceptions to this larger disregard, and hopefully, pave the way for more integrative, collaborative, and respectful partnerships with in situ agricultural biodiversity growers.

Yet even as CIP continues its work with in situ farmers, the larger CGIAR research agenda continues to relegate these growers to the margins—as mere beneficiaries and potential consumers of laboratory-based genetic engineering and production. In responding to a proposal for a "Strategic Research Theme 5: Enhancing the in situ management of agrobiodiversity management," the ISPC commentary recommended that the program not be funded: "The benefits to livelihoods, agricultural productivity, nutrition, and environmental sustainability arising from

in situ conservation are assumed by the proposal as obvious and proven when in fact there is little scientific evidence to support such claims" (CGIAR 2012b, p. 1).

The CGIAR's comparative advantage and unique role is specifically in the ex situ approaches (as also discussed in the Scoping Study). There is no discussion on alternative research suppliers and the comparative advantage that the CGIAR has for in situ conservation...Although farmers can benefit from agricultural biodiversity on farm, the level and type of diversity that is optimal for an individual farmer is unlikely to be optimal in terms of regional and global conservation and potential benefits for future generations worldwide...The long-term sustainability of such conservation strategies over generations is also an issue as the agricultural sector develops. (CGIAR 2012b, p. 3–4)

CGIAR claim recognition of and respect for in situ growers, even as its leaders have not yet prioritized in situ expertise underway in these farmer settings.

#### In situ political ecology: situating "culture"

The concept of indigenous or collective biocultural heritage admirably attempts to bridge this pervasive divide between biological descriptions of agrobiodiversity and the more ethnographic accounts of the agricultural rituals, ceremonies, and language that (re)produce such masterful agrobiodiversity. The task of integrating *cosmovisión* into scientific conversations on conservation is a political move, just as invocations of cosmological principles have animated and activated political activism throughout the Andes for centuries. Invocations of Andean cosmological principles have served as drivers of political mobilization and policy advocacy in Peru and throughout the Andes since and throughout the colonial encounter, catalyzing colonial resistance, outright rebellion, revolution, and reforms. These invocations emerge and adapt to the diverse social and political contexts, yet they retain key, definitive themes (Dwiggins 1999; Frankel 2012; Escobar 2010). The IBCH call to integrate cosmologically based ecological ontologies into agricultural biodiversity conservation policy echoes and builds upon this wider historical and regional lineage of Andean political engagement.<sup>22</sup> As

<sup>21</sup> "CIP will conduct its work on genetically engineered organisms in a participatory and transparent manner, considering the diversity of opinions and values of its partners, civil society organizations, and other stakeholders...CIP is sensitive to concerns surrounding the release of genetically engineered products in the center of origin and diversity and will always exercise extreme caution in these cases" (CIP 2008).

<sup>22</sup> Both the Bolivian and Ecuadorian constitutions now include landmark injunctions to protect the rights of *Pachamama* and to uphold the principles of *Sumaq Kawsay*, a Quechua term meaning "living well" and serving as a counter-development model deliberately grounded in Andean language and principles. These concepts—from their cosmological/biocultural origins to their social and political invocations and implications—are receiving needed further engagement (such as in Acosta and Martínez 2009; Radcliffe 2012), but are beyond the purview of this paper.

such, it stands as a deliberately *political* cultural ecology of agrobiodiversity.

Historically, the academic disciplines of human geography and anthropology researched *cosmovisión* as “culture.” The cultural turn challenged researchers to become more self-reflective about how unequal power relations are embedded in such knowledge claims of Others’ culture as well as in the very category of *lo andino*, or “Andeanness” (Starn 1994).<sup>23</sup> This epistemic and methodological challenge emerges in attempts to render the key elements of Andean agriculture in English: despite Isbell’s (1978) classic work on the emancipatory uses of indigenous Andean traditions, “ritual” nevertheless conjures images of “pre-modernity” falling into the problematic dichotomy of traditional and modern. Mignolo (2005) investigates how the powerful discourse of modernity hides but perpetuates the lingering powers of what Peruvian sociologist Quijano calls the “coloniality of power” (2007)—or the mentality of colonizing/being colonized. Invocations of *Pachamama* are not objects of ethnographic curiosity or even “cultural” ecology but rather constitute a hands-on, in situ political ecology of agrobiodiversity and its conservation.

All the while, within agrobiodiversity conservation institutions, an elite handful of viewpoints maintains positions of power and funding, while others merit a running head image on the website, an inset box in the brochures for agency donors, press, scholarly followers, corporate sponsors, or traveling tourists. These marginalized in situ experts remain included, but qualified; they rarely count as biologists, but as objects of ethnobotany (though Posey (1999), Berkes (1999), and Nazarea (2006)—among others—have worked to counter this); not as expert subjects, but as targets for expertise dissemination. Meanwhile, scholars such as Agrawal (2002) and Parry (2000) have warned against the danger of subsuming in situ expertise within discourses of science—in short: scientizing local and traditional ecological knowledges, thereby inadvertently perpetuating the hierarchy of *ex* over in situ expertise.<sup>24</sup> But, what will it take to take *cosmovisión* seriously—as a repertoire of accumulated (even revealed) ecological knowledge, valuable because of its agricultural efficacy—if nothing else: its short and long term ecological sustainability? Why *cosmovisión* merits scholarly attention, engagement, and respect has been laid out adequately by the Parque’s conception of IBCH. This

leaves the challenge of *how* such engagement could happen.<sup>25</sup>

Such a call to revalue previously devalued “local,” “traditional,” or “indigenous” agricultural knowledge immediately begs the questions of what these adjectives mean, and how this task can be undertaken without resorting to simplistic, romanticized categorizations of the noble native (Shepherd 2010). Indeed as de la Cadena (2000), García (2003, 2005), and Starn (1994), among others, have elucidated, the construct of the “indigenous Andean” identity or *lo andino* is continually (re)constructed and (re)configured in dynamic multi-scalar processes of political mobilization, social organization, and cultural articulation. Meanwhile, of course, no *one* Andean identity, experience, perspective, or voice exists. Yet, the recognition of agricultural “traditions” as dynamic, multifaceted, adaptive, heterogeneous, and resilient would seem to demand more, rather than less, engagement with invocations of “traditions.”<sup>26</sup>

Hence the central argument of IBCH: that to decontextualize the multiple crop varieties from the principles, practices, and processes that fostered them in the first place undermines the long-term viability of the biodiversity itself. It is neither ecologically sound, nor scientifically logical—nor politically just—to fail to engage this agriculture more holistically. This cultural ecology stands as ecology. That it has been qualified belies a subtle but debilitating vestige of coloniality, wherein the “modernity” of European thought and ontologies remains dichotomized against and hierarchized over indigenous worldviews and modes of thinking about and interacting with “natural”—in this case “genetic” resources. Political ecologists, Forsyth wrote in a recent special issue on the subject, “are increasingly noting how uncritical environmental science and structural policies give rise to environmental narratives and beliefs that are simplistic and frequently unhelpful to poor people” (2008, p. 763). In the same issue, Rocheleau explored two chief trends emerging

<sup>23</sup> This research faces this methodological and epistemological conundrum as well, with significantly more beyond-Anglophone literatures to engage.

<sup>24</sup> I thank an anonymous reviewer for drawing my attention to this pitfall as well as these helpful literatures.

<sup>25</sup> One important move in this direction: the CBD’s Traditional Knowledge Information Portal held an international dialogue workshop in April 2012 in Panama entitled “Knowledge for the twenty-first Century: Indigenous Knowledge, Traditional Knowledge, Science and Connecting Diverse Knowledge Systems.” The workshop culminated in the establishment of an Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), a global interface between the scientific community and policymakers that works to integrate scientific findings into international environmental policymaking related to biodiversity. IPBES asserts an explicit recognition and respect for the critical contribution of indigenous and local knowledge to conservation and sustainable use of biodiversity and ecosystems (IPBES 2012).

<sup>26</sup> In particular, it might call for more dialogic, multidisciplinary research methods, as proposed for example by in Smith 1999 and Denzin et al. 2008 account of post-structural, critical, and indigenous methodologies.

in twenty-first century political ecology: “increasing engagement with activism, situated knowledge, and social movements; and a return to ecology, science, and the embrace of complexity” (2008, p. 721). Accordingly, the articulation and actualization of indigenous/collective biocultural heritage stand as flagship in situ political ecology.

## Conclusion

In situ agricultural biodiversity hotspots are pivotal, ecologically speaking, but how are in situ growers included in the conversation on how to “conserve” agrobiodiversity? Usually as: historically important but presently peripheral; vulnerable victims of larger ecological and economic pressures; and, thus, beneficiaries of ex situ research, expertise, resources and seeds—rarely as experts in their own right.

When asked about the key to agricultural biodiversity success, as well as about root causes of its loss, most growers at the Parque invoke—directly or indirectly—the centrality of *cosmovisión*, within highland Peruvian agriculture. Parque growers have organized and mobilized to establish an Indigenous Biocultural Heritage territory so as to facilitate a repatriation of nearly a thousand native potato varieties from the CIP gene bank in Lima. In reflecting on this work, they note that the devaluation and decline of key cosmological principles goes hand in hand with erosion of agricultural biodiversity itself. This article attempts to facilitate the process of engaging this agricultural epistemology, born of an ecological ontology quite divergent with dominant conceptions of myopically ex situ germplasm conservation and its genetic “improvement.”

Many growers, activists, and scholars have noted the intricate correlation between cultural and biological diversity (Maffi 2001; Nazarea 2006; Posey 2001; Shiva et al. 1991), but according to those at the Parque, biodiversity is still separated from its cultural origins in conservation paradigms and policies. The CBD expressly lauds the importance of traditional ecological knowledge in Article 8(j), and the Treaty enshrines the self-evidence of Farmers’ Rights, but meanwhile the bulk of financial and political support for agrobiodiversity conservation (through GCDT and CGIAR) still flows to mega-gene banks, whose access and benefits many argue disproportionately favor private agri-industry research corporations from the Global North. CIP has worked to counter these trends by working with and for in situ cultivation—most explicitly and successfully through the recent repatriation project with the Parque.

Yet, the Parque seeks to counter this persistent epistemic disregard more directly through the concept of IBCH, which serves as a *political* cultural ecology of agricultural biodiversity that attends to materiality through supra-materiality. The cultural—artistic, social, cosmological—

aspects of agriculture and biodiversity are being revived and revalued—for their decolonizing potential. IBCH argues that the dominant conservationist model is born of a deliberate, colonialist appropriation—and concurrent delegitimization—of indigenous agricultural expertise. To extract the seeds from their cultural, social, cosmological contexts is to perpetuate an exploitative dynamic—embodied but hidden in discourses that dichotomize the “biological” from the “cultural.” The Parque proposes an alternative conception of the very subject of agrobiodiversity conservation in their programs and descriptions of their programs—aimed toward the local and international public in press releases, brochures, and webpage, to governments in petitions, to funders in grant proposals, and to researchers such as myself.

Carefully regarding this disregard of cosmological orientations is the first step in interacting with, listening to, and learning from previously marginalized ecological epistemologies and ontologies of nature—particularly those with a proven record of agricultural biodiversity. Political ecologists argue for moving beyond critique to advocating for alternatives. The IBCH work and words answer this call for a “compelling *counternarrative*” (Walker 2006): a new (though in this case also ancient) way to tell the story of agrobiodiversity that is policy-driven but publicly oriented; in short: a compelling in situ political ecology of agricultural biodiversity.

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