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To cite this article: Erik Gómez-Baggethun (2021): Is there a future for indigenous and local knowledge?, The Journal of Peasant Studies, DOI: [10.1080/03066150.2021.1926994](https://doi.org/10.1080/03066150.2021.1926994)

To link to this article: <https://doi.org/10.1080/03066150.2021.1926994>



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Published online: 30 Aug 2021.



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Is there a future for indigenous and local knowledge?

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ABSTRACT

By the late twentieth century, many doubted whether Indigenous and Local Knowledge (ILK) would survive the millennium, but a surge in their recognition and new insight on their resilience open new perspectives about their future. This paper examines historical drivers behind the loss of ILK and discusses possibilities for its survival and revitalization. I first examine long-term impacts of modernization and unfolding capitalism on ILK. Next, I discuss future perspectives in the light of recent developments in science, law, and politics. The paper concludes with a reflection on the role ILK ought to play in a future post-industrial society.

KEYWORDS

Traditional ecological knowledge; modernity; cultural diversity; revitalization

1. Introduction

Indigenous and Local Knowledge (ILK) are gaining growing attention in the science, policy and political agendas. Many definitions of ILK¹ exist in the literature but most of them revolve around the idea of a cumulative body of knowledge, practice and belief handed down through generations by cultural transmission (Berkes, Colding, and Folke 2000; Semali and Kincheloe 2002; Toledo 2002). A major concern in the literature is that ILK is eroding worldwide due to long-standing processes of global change affecting local, peasant, and indigenous cultures (Benz et al. 2000; Maffi 2005; Turner and Turner 2008; Toledo 2012; Reyes-García et al. 2013).

One of the most widely used markers to trace changes in indigenous and local knowledge systems is language (Maffi 2005; Diamond 2012). Toledo (2012) situates the peak of cultural and linguistic diversity some 5000 years ago, when the world has been estimated to host close to 12,000 cultures, distinguished by language and distributed across all habitats of the planet. Since then, the author argues, the history of humanity has been one of exploitation and loss of cultural diversity. The remaining living

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¹The term ILK itself is controversial and the virtues and limitations of this and other related concepts such as 'traditional ecological knowledge' and 'local traditional knowledge' have been widely discussed in the literature. While important, this semantic debate goes beyond the scope of this research. The term ILK is chosen here because of its growing use both in the literature and in prominent science-policy initiatives like IPCC and IPBES.

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languages today are down to around 7000 (<https://www.ethnologue.com/>) and The United Nations Atlas of the World's Languages in Danger estimates that, in recent times alone, more than 2000 languages have become extinct. It further estimates that more than half of the languages spoken today have fewer than 10,000 speakers, that a quarter have fewer than 1,000 speakers and that, unless there are some efforts to maintain them, over the next hundred years most of these will become extinct (Moseley 2010).

With the disappearance of unwritten languages, humanity is losing not only a cultural wealth but also a vast body of ancestral knowledge embedded in indigenous and peasant cultures. In 2019, International Year of Indigenous Languages, United Nations chief Antonio Guterres declared that half of the world's remaining languages, which are mostly indigenous, risk extinction: 'With every language that disappears the world loses a wealth of traditional knowledge' (UN 2019).

The literature on ILK has examined the complex and multifaceted factors standing behind the loss of traditional knowledge, including formal schooling (Reyes-García 2013), loss of local cultures and languages (Maffi 2005), land-use change (Kingsbury 2001; Gray et al. 2008), religious persecution and proselytism (Federici 2004), commodification of land and resources (Godoy et al. 2005; Gómez-Baggethun et al. 2010), mechanization (Brodt 2001) and, more broadly, processes of modernization (Toledo 2012) and globalization (Gómez-Baggethun 2009).

The specialized literature, however, has paid comparatively less attention to the socio-political and economic processes behind the erosion of ILK in a broader historical perspective. These processes include ontological and epistemological shifts and large-scale transformations in political and economic institutions. The core argument of this paper is that efforts to understand the loss of ILK and the options for its revitalization must look beyond direct drivers of change in knowledge systems and pay broader attention to the indirect drivers and larger historical processes underlying their erosion. With the aim of addressing this gap, this paper combines bodies of literature in anthropology, environmental history, political ecology, peasant studies, and critical theory, to provide a synthesis of key socio-political, cultural and factors behind the loss of ILK over modern and contemporary history. It further discusses perspectives for the survival and revitalization of ILK in the light of recent cultural and socio-political developments. Some historical developments reviewed in this paper are global in scope, but the bulk of the empirical material analyzed relates to Latin America, and hence the perspectives derived from the analysis fit best to this specific context. Further research would be required to evaluate the degree to which perspectives drawn from the analysis are valid also for ILK in Asia, Africa, Europe, Russia or China, where historic development of modernity followed different patterns.

2. Local and indigenous cultures meet modernity

With the advent of Modernity, loss of indigenous cultures increased vastly in speed and scale (Toledo 2012). Episodes of key importance for the fate of ILK over the course of modernity included colonization, religious persecution, and the ontological shift from an organic to a mechanical worldview brought about by scientific rationalism and the Enlightenment.

2.1. In the name of the King: colonialism and ethnocide

With the rise of nation-states and their imperialist and modernizing ambitions, tens of millions of indigenous peoples perished from disease, starvation, slave labor, and outright murder (Hinton 2002). The period of modern colonialism, situated roughly between 1500 and 1900, arguably is the most prominent episode in the history of attacks on indigenous cultures and related knowledge systems. Over this period, Western European countries like Spain, Portugal, France, the Kingdom of England, the Kingdom of Prussia, the Netherlands – and later also the United States and Japan – colonized lands in the Americas, Africa, Asia and Oceania, driving away or exterminating indigenous peoples (Totten, Parsons, and Hitchcock 2002).

Impacts of colonization included purposeful as well as unintentional destruction of indigenous peoples, dispossession of land, displacement of local populations, slavery, exploitation of cultural and natural resources, forced assimilation, genocide, and ethnocide (Nickel 1994; Delrio et al. 2010; Totten and Hitchcock 2011; Jones 2006). Some examples illustrate the scale and impact of colonization on indigenous cultures. Between 1500s and 1900s, the indigenous population in the Americas declined by more than 80%, and by as much as 98% in some areas. According to McKenna and Pratt (2015), in the two centuries spanning from 1491 to 1691, the indigenous population of the Americans had declined by 90–95%, from 145 million to around 15 million people.

2.2. In the name of Reason: mechanical philosophy and disenchantment

The rise of modernity came along with major transformations in ontology and epistemology. Two key developments deserve particular attention for the consequences of ILK: (i) the shift from an organic to a mechanical representation of the world based on scientific rationalism, and (ii) the dualist conceptual separations between soul and body and between nature and culture.

First, the scientific revolution of Early Modern Europe came along with the rise of mechanical philosophy, a scientific worldview that compares the universe to a large-scale mechanism or machine, as famously portrayed in the philosophy of Thomas Hobbes. Early mechanical philosophy was tied to rationalization and the rejection of the idea of nature as living or animated by spirits or angels (Merchant 2006). Despite the efforts of the Church, the magic and enchanted vision of the world had remained dominant among people over the middle ages. Rationalization came along with *disenchantment* (Weber 1981), a term often used to describe the process by which magic is gradually supplanted by calculation. The new mechanical philosophy was incompatible with local and traditional cosmologies, knowledge, practices, and beliefs. The animistic conception of the world conceived cosmos as a living organism, where metals, plants and other natural objects were endowed with magic properties (Foucault 1971). This cosmology, which did not distinguish between spirit and matter, was in conflict with the new scientific rationalism. In the 'Age of reason', cosmologies identified as 'irrational' were increasingly seen as forms of crime and consequently prosecuted (Federici 2004).

Second, the Cartesian theory on the separation between mind and body would have a fundamental influence in subsequent Western philosophies (Cottingham 1994). Likewise, the new separation between culture and nature was also incompatible with dominant cosmologies among local and indigenous peoples. While the ontological separation of

humans and nature is often traced back to Plato and old Greek philosophy, it is with the Enlightenment when it acquires a more complete form (Davidson-Hunt and Berkes 2003). In this period, human beings were conceptually subtracted from the natural environment and the separation between nature and culture became one of the most fundamental pillars of western philosophy and thinking. Resilience theory has pointed at the dichotomic conception of humans and nature and to techno-scientific approaches to ecosystem management that have come to replace ILK systems in many parts of the world as key drivers of ecological decline (Holling and Meffe 1996).

2.3. In the name of God: spiritual persecution and witch-hunt

In the sixteenth century, the attack on the enchanted vision of the world came to its height in Europe and beyond, and women sorceresses and healers became a key persecution target. The scientific rationalization of the world came along with high doses of violence, one of the most infamous chapters of which was the witch-hunt. This process extended over three centuries (1450–1750), resulting in an estimated 40,000–100,000 woman hanged, burnt, or tortured (Monter 1969; Midelfort 1972), many of them among indigenous peoples (Hagen 2006).

The witch-hunt was an attack on women (Federici 2018) as much as on the local and traditional knowledge they held, as it destroyed a universe of practices and beliefs considered to be incompatible with the process of modernization (Ehrenreich and English 2010). Many ‘witches’ were midwives, healers and ‘elder wise women’, holders of the ethnobotanical knowledge and memory that sustained health and reproduction control systems in local and peasant communities by administering medicinal plants and contraceptives (Midelfort 1972; Hagen 2014). With the persecution of the popular healer, women were expropriated a vast heritage of empirical knowledge related to plants and healing remedies, accumulated and transmitted through generations. This paved also the way for the gradual replacement of ILK with formal medicinal scientific knowledge.

Between 1536 (when the inquisition was introduced in the Americas) and 1543, many spiritual leaders were burnt in the name of God and ‘the struggle against the devil’ (Federici 2004). In Peru, the first large-scale attack against local belief systems (justified as a fight against diabolic forces) took place in 1560, coinciding with the insurgency of the Taki Onqoy movement, which promoted an alliance of the local gods (*huacas*) to resist colonization, and encouraged natives to retain traditional dresses and resist the clothing styles of the colonizers (Stern 1982).

In response to this movement, the Ecclesiastic Council, held in Lima in 1567, established that priests had a mandate to ‘eradicate the innumerable superstitions, ceremonies and diabolic rites of the Indians [...] arrest doctors-sorcerers and, above all, find and destroy sacred places and talismans’ related to the worship of local goods. These recommendations were reaffirmed in the Synod of Quito, 1570, where again it was stated that ‘there are famous doctors-sorcerers that [...] are custodians of the *huacas*² and speak to the Devil’ (Hemming 1970, 397).

²The *huacas* were mountains, water springs, stones and animals that embodied the spirit of the ancestors. As such, they were worshiped collectively, as natives considered them the main link to traditional land and resource management practices (Descola 1994).

Baudez and Picasso (1992) note that in the 1550s, Spaniards undertook a systematic destruction of worship items. Idols were destroyed, temples were burnt to ashes, and those who kept celebrating native rites were sentenced to death. Persecution of local beliefs was thereafter extended to Brazil, Caribe, and North America, where English colonizers justified the massacres of Indian natives by labeling them as ‘servants of the Devil’ (Williams and Adelman 1978).

Persecution of local beliefs expanded throughout the colonies in other parts of the world. For example, in the 1840s there was a wave of witch-hunts in western India (Skaria 1997).

After the Trento Council (1545–1563), the Counter-Reformation (a period of Catholic resurgence in response to the Protestant Reformation) continued attacks on popular healers, out of fear of their powers and their deep rooting in local communities. In England, a statute approved in 1604 enforced death penalty for any person ‘using spiritism or magic’ (Federici 2004). Repression notwithstanding, indigenous peoples kept rebelling against imposed religion, sometimes hiding their idols in churches to continue worshipping their gods (Ricard 2018).

Modern witch-hunts have been reported in Kenya, Nigeria and Cameroon over the 1980s and 1990s (Federici 2010), and in some parts of the world, witch-hunts have continued until our days (Schnoebelen 2009). Despite their impact on ILK and their holders, the witch hunt has so far received little attention from the literature on traditional and peasant knowledge.

3. Local and indigenous cultures meet global capitalism

The political and economic reorganizations brought about by modernity are key for understanding the disarticulation of the institutions, territorial models and lifestyles that historically sustained ILK (Gómez-Baggethun 2009). Key in this process were the French and the Industrial Revolutions – which established centralization and continued expansion of production as organizing principles of political-economic life (Naredo 2010) – and the rise of economic liberalism (Polanyi 1957).

3.1. In the name of Capital: enclosure and commodification

The rise of economic liberalism came along with a rapid expansion of the core institutions underpinning market society: private property, wage labor, and the market. As noted by Polanyi (1957), markets came eventually to absorb all fundamental elements in economic activity, turning humans (as labor) and nature (as land) into commodities that could be freely sold and bought.

These institutional changes were characterized by a concomitant decline in the institutions that historically sustained local and traditional resource management systems of the peasantry. Prominently among these institutions is common property over land and resources. By calculus or mistake, common property has been often conflated with free access systems, vulnerable to overexploitation and degradation. This view is epitomized in the ‘Tragedy of the commons’ (Hardin 1968), an important pillar of the neoliberal ideological campaign to justify privatization and commodification of land and resource systems over recent decades.

Contrary to what Hardin claimed, most common-pool resources are not subject to free access regimes. The commons are subject to complex regulatory systems, often relying on non-formal institutions and custom (Ostrom 1990). In resource systems governed through common property arrangements, right of access and use pertain to the local population, and hence, their management often relies on ILK, developed locally and transmitted across generations. While nowadays we tend to see common property as marginal and residual, particularly in Western countries, it was a dominant form of property in Europe across the middle ages, and still today constitutes important portions of land in many countries and regions around the world.

The privatization and decline of common property systems over modernity was documented in Marx's ([1867] 1887) famous account on the *enclosures*, through which peasants got deprived of access to their means of subsistence. Starting in the sixteenth-century England, the enclosures extended across Europe and the colonies along with the rise of political and economic liberalism, often meeting fierce resistance from the peasantry in the form of riots, rebellions and insurrections (Manning 1974; Charlesworth 1980; Rodrigo Mora 2008). The replacement of common property with state and private property came along with widespread commodification of land and resources (Polanyi 1957). Subsistence economies organized to produce use value re-oriented themselves towards markets and exchange value. The rule of economic productivism came along with the abandonment of many cultural practices, rural exodus, and the erosion of the social structures and relational networks that underpinned traditional peasant communities as semi-autarchic societies coupled to specific territories and ecosystems (Entrena Durán 1998).

3.2. In the name of Development: rationalization of resource systems

Erosion of indigenous cultures acquired a new and enlarged scale in the twentieth century, when the modern, industrial, capitalist, rational world expanded across the planet (Toledo 2012).

The twentieth century was also the time when growth and development became the centerpieces of economic globalization. Some authors situate the start of 'the era of development' at the launch of The Point Four Program in 1949, a technical assistance program for 'developing countries' announced by United States President Harry S. Truman in his inaugural address. By this time the countries of the world were divided between developed and underdeveloped ones, and from then onward, two-thirds of the world were made to see themselves as having fallen into the undignified condition of 'underdevelopment' (Latouche 2004). Traditional knowledge and resource systems of peasants in the 'underdeveloped' world, now labeled as archaic and unproductive, had to be modernized and rationalized in the name of development and growth.

The ideology of growth and development was articulated in the international architecture established with the Bretton Wood Agreement after World War II. The economic guidelines drawn by the World Trade Organization (previously GATT) to promote economic liberalization and free trade, and the structural adjustment programs orchestrated by the International Monetary Fund and the World Bank, have been major drivers in the transformation of local and traditional resource systems based on ILK into cash crops managed through capitalist rationalization with technical and scientific knowledge.

Key in this process was also the Green Revolution (Pearse 1974; Patel 2013) promoted over the 1960s, which forced the acceleration of production in the rural world by means of feeding agricultural and other resource systems with larger inputs of machinery, pesticides and fertilizers (with their respective requirements of water, energy and materials) sold by the developed countries to the underdeveloped ones. This agricultural transformation explicitly envisaged a package of practices to supplant traditional farming technology and turned resource systems increasingly dependent on technical and scientific knowledge, often rendering ILK obsolete.

The growing importance of agroindustry and corporate power in resource and food systems constrained the viability of many local and small-scale resource systems as they became increasingly exposed to competition in the open market, replacing peasant rationalities with economic and entrepreneurial ones. Galindo (2006) notes that the organization of agriculture and livestock systems along the principles of an industrial factory, scientifically organized for mass production, massively displaced and devalued traditional knowledge systems.

Responding to critiques of top-down, northern-dominated expert assessments of agricultural knowledge, initiatives like the IAASTD – the International Assessment of Agricultural Knowledge, Science and Technology for Development – (2003–2008) have aimed to be more inclusive and participatory in terms of incorporating local knowledge from peasants. The extent to which they have succeeded is however contested. For example, in a critical review of these initiatives, Scoones (2009, 547) has made the case that in assessments of agricultural knowledge ‘the politics of knowledge needs to be made more explicit, and negotiations around politics and values, framings and perspectives, need to be put center-stage in assessment design’.

3.3. In the name of Nature: imposed conservation regimes

If the effects of economic development on ILK may be intuitive, less so are those of its predilect antidote: nature conservation policies. Responding to urban values above those of peasant and indigenous societies, top-down conservation policies have contributed to sustain dichotomic conceptions of humans and nature, often promoting ‘pristine’ natural areas devoid of people. While these policies have played a critically important role in protecting ecological life-support systems and non-human species in the face of ecological breakdown, they have often adopted the form of new enclosures that shift conservation costs to local communities (Kelly 2011). Fairhead, Leach, and Scoones (2012) refer to this phenomenon as ‘green grabbing’ – the appropriation of land and resources for environmental ends – noting its deep and growing significance. Environmental and green agendas – the authors note – are the core drivers and goals of grabs – whether linked to biodiversity conservation, biocarbon sequestration, biofuels, ecosystem services, ecotourism or ‘offsets’ related to any of these.

The effects on ILK of top-down ‘fortress’ conservation policies imposed by States and encouraged by international governmental organizations and non-governmental ones have been particularly pernicious in inhabited places with long-standing traditions of natural resource management (Ostrom 1990; Robbins 2012). Imposed conservation regimes have often deprived peasant and indigenous communities of access to land and resources and removed the traditional practices that have shaped cultural

multifunctional landscapes over centuries of human-nature interaction (Gómez-Baggethun et al. 2013). Over recent years, conservation enclosures have gained new traction through compensations mechanisms like REDD and REDD+, through which rich countries are entitled to offset climate emissions against avoided deforestation in poor countries, entailing restrictions on access and use of forest resources by local and indigenous peoples (Svarstad and Benjaminsen 2017). Adding to other new enclosures such as those from corporate land deals (White et al. 2012), conservation enclosures have left ILK and their holders between the rock of economic development and the hard place of environmental conservation.

4. New perspectives for indigenous cultures and knowledge

By the late twentieth century, the disappearance of indigenous cultures and related knowledge systems seemed to be a matter of time (Cox 2000). In recent decades, however, new developments in culture, policy and politics have put the perspectives of ILK under new light. These developments include (i) a growing questioning of modernity's dogmas, (ii) the 'rediscovery' of ILK by science and academia as part of the solution to pressing global environmental problems, and (iii) the repositioning of peasant and indigenous movements as a political force.

4.1. Modernity and progress revisited

By the mid-twentieth century, long before 'postmodern' thinking became fashionable, the 'Frankfurt school' set out to scrutinize the notions of modernity and progress under a new and critical light. In their *Dialectic of Enlightenment*, Horkheimer and Adorno (1944) 2002 exposed a dark side of modernity, arguing that reason is a double-edge sword. Major atrocities of the twentieth century (world wars, ethnic cleaning, environmental destruction) were put in connection with the idea of progress launched in the Enlightenment (Hohendahl 2013). How can the progress of modern science, medicine and industry promise to liberate people from ignorance, disease, and brutal work, yet help create a world with fascism, genocide, and weapons of mass destruction? Rational progress, they claimed, had become irrational (Stanford Encyclopedia of Philosophy 2015).

According to Horkheimer and Adorno ([1944] 2002), the causes of genocide and others forms of large-scale violence result from a pattern of blind domination: domination of nature by human beings and the domination of some human beings by others. In a culture that pursues 'progress' no matter what the cost, any obstacle to this mission, whether human or non-human, gets exploited or destroyed. The means of destruction can be more sophisticated in the modern West than in the Middle Ages, and modern forms of exploitation may be less direct than outright slavery, but blind domination continues, with ever larger global consequences. The engine driving this domination process is an ever-expanding capitalist economy, fed by scientific research and industrial technologies.

In his *Theses on the Philosophy of History*, Benjamin ([1942] 1969) criticized the modern vision of progress as a gradual and automatic process ascending in a linear way. According to him, historical time is discontinuous, made of sudden catastrophic moments. The

dogma of progress, Benjamin argued, recognized 'only the progress in the mastery of nature, not the retrogression of society'. Against Marx's vision of revolutions as the locomotive of history, Benjamin theorized that 'perhaps revolutions are not the train ride, but the human race grabbing for the emergency brake', that is, an emergency brake to the locomotive of destructive forces triggered by progress.

In the 1970s French intellectuals associated with post-structuralist and postmodern thinking, such as Derrida, Foucault, Lyotard, and Baudrillard, developed a radical critique of modern philosophy with roots discernible in Nietzsche, Kierkegaard, and Heidegger. Foucault (1971), the most influential thinker in this line of thought, draws upon an anti-Enlightenment tradition that is critical to the ideas of reason and progress, arguing that modern forms of power and knowledge served to create new forms of domination (reviewed in Best and Kellner 1991).

Also in the 1970s, a body of literature advanced a radical ecological critique of the economy, attacking established notions of growth, development and progress. Forerunners of ecological economics such as Georgescu-Roegen, Odum, Commoner, and Daly pointed to ecologically destructive character of economic growth. Other authors, forerunners of present degrowth thinking, such as Ellul, Illich, Castoriadis, and Gorz, pushed the critique of growth even further, putting into question the notions of 'development' and 'progress' as the underpinnings of growth ideology, and of the expansionary vision and practice of modern industrial civilizations.

Post-development theory emerged in the 1980s and 1990s through the works of scholars like Sachs, Ferguson, Escobar, Esteva, Rahnema, Latouche, and Rist. Key thinkers in the post-development school have argued that the models of development promoted by Western powers and supranational organizations are often ethnocentric (Eurocentric) and based on western models of industrialization that are ecologically unsustainable and ignorant of the local, cultural and historical contexts of the peoples to which they are applied (Latouche 2009). They portray development as a tool that Western powers have deployed to increase their influence and domination over the world. Post-development theorists promote more pluralism in ideas about development (Demaria and Kothari 2017).

While some authors note that Modernity is still much alive, even within a theoretical framework of postmodernism (Bennett 2006), the growing questioning of modernity as a core driver of cultural and environmental destruction has raised a renewed interest in local and indigenous knowledge; no longer as mere folkloric curiosity, but as a potential solution to environmental problems that soon would become important items in the science and policy agendas.

Key to rethink dominant notions of modernity and to examine ILK under new light is also the large body of literature that deals with relational ontologies (Escobar 2016), epistemologies of the South, Buen vivir, and Endogenous development. Work on relational ontologies has undertaken a cultural critique of dominant, modern relationships to 'nature' through a cross-cultural philosophical engagement with Indigenous traditions of thought (Reddekop 2014). These literatures, which, often reflect academic contributions 'from the South' (Choquehuanca 2017; de Sousa Santos 2015; Escobar 2016), transcend the Eurocentric vision that has come to dominate the literature on ILK and engage in philosophical and ontological dialogs across regions and cultures (Delgado et al. 2012).

4.2. Rediscovery of indigenous knowledge in policy and academia

Long ignored or disregarded in academic and policy circles, the international status of ILK has increased drastically in recent years, and these types of knowledge are now in the spotlight of the science and policy agendas (Gómez-Baggethun, Corbera, and Reyes-García 2013; Turnhout et al. 2012).

For centuries, the attitude of formal academic science towards ILK has been one of disinterest. ILK was largely perceived as a vestige of the past, holding folkloric interest at best. It was not until the second half of the twentieth century that academics started paying attention to ILK through anthropological work by authors like Conklin (1954) and Lévi-Strauss (1962). In the 1980s, fields like ethnoecology and ethnobiology started to pay serious attention to ILK and interest has increased exponentially over the last two decades, as a growing body of literature has demonstrated the contribution of ILK to livelihood (Reyes-García et al. 2008), improved health (McDade et al. 2007), biodiversity protection (Gadgil, Berkes, and Folke 1993), sustaining nature's benefits to people (Reid et al. 2006; UNESCO 2013), and building resilience to climate and other global environmental change (Berkes and Turner 2006; Gómez-Baggethun et al. 2012).

Attention to ILK has also grown in the sustainability sciences with awareness of the limitations of sectorial disciplinary approaches to deal with environmental problems and the subsequent demand for more holistic approaches to understand human-nature interactions. Interest in ILK has also grown as research has illustrated the capacity of many traditional management systems to shape multifunctional landscapes, capable of sustaining resource systems in coexistence with high levels of biodiversity, ecological integrity, and ecosystem services. Other major international initiatives for the protection of ecosystem services and biodiversity, such as the Millennium Ecosystem Assessment (Reid et al. 2006) and The Economics of Ecosystems of Biodiversity (TEEB) (Brondizio et al. 2010), have also stressed the ecological importance of traditional knowledge.

Recognition of ILK in academia has favored in turn its recognition in policy. The United Nations' Declaration on the Rights of Indigenous Peoples and the Convention on Biological Diversity encourage national governments to recognize, protect and promote ILK in resource management and the conservation of biological diversity, i.e. UNDRIP 2007, art. 31 and CBD 1992, art. 8.

ILK is also recognized and integrated in the work of the United Nations Educational, Scientific and Cultural Organization (UNESCO 2000), the United Nations Millennium Development Goals (The Millennium Development Goals Report 2005), and the United Nations Environment Programme (UNEP 2007). ILK has also gained much attention from the Intergovernmental Panel on Climate Change (IPCC) (Ford et al. 2016) and from the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) (Tengö et al. 2017), which acknowledges local and indigenous peoples as important contributors to the governance of biodiversity from local to global levels.³

These developments in science and policy increase the likelihood that established and emerging policy recommendations will translate into the implementation of programs to sustain and restore ILK and culture. Some countries have set out to document and protect their ILK by law (Pardo de Santayana et al. 2014; Rybråten and Gómez-Baggethun 2016)

³IPBES publications on ILK are available here: <http://www.unesco.org/new/en/natural-sciences/priority-areas/links/science-policy/projects/indigenous-knowledge-within-the-framework-of-ipbes/publications>.

and others have launched programs of revitalization of indigenous cultures and languages (Becerra-Lubies, Mayo, and Fones 2019).

4.3. Indigenous and peasant movements as political force

Over recent decades, indigenous peoples and peasant communities have organized themselves internationally as a political force to defend their cultures and knowledge systems (Oguamanam 2006), but also to struggle for land rights, ownership and access to natural resources, self-determination and autonomy, food sovereignty, and the preservation of their livelihood systems against environmental degradation and incursion (Martínez-Torres and Rosset 2010, 2014).

Indigenous and peasant communities still constitute a substantial portion of the world's population. The United Nations estimates that there are 370–500 million indigenous people in the world, spread across 90 countries, representing 5,000 different cultures (UN 2019). By the first decade of the twenty-first century, there were an estimated 1.5 billion smallholders, family farmers and indigenous people on about 350 million small farms (ETC 2009). Altieri and Toledo (2011) contend that about 50% of these peasants use local agroecosystems that contribute to food security at local, regional and national levels. These numbers suggest that peasantry, a social group identified with resource management systems based on local and traditional knowledge adapted to site-specific agroecosystems (Sevilla Guzmán and González de Molina 2005), has displayed a remarkable resilience in the face of global economic and cultural change.

According to Altieri and Toledo (2011), an emerging 'agroecological revolution' is driving an epistemological, technical and social transformation in Latin America, creating changes directed at restoring local self-reliance, restoring agrobiodiversity, producing healthy food, and empowering peasant organizations. By the early twenty-first century, both indigenous and peasant communities, two social groups that many believed were bound to disappear in the face of modernization, have become important actors in socio-economic, political, and cultural transformations in e.g. South America, particularly in countries like Ecuador, Bolivia, Brazil, Mexico and Colombia (Petras and Veltmeyer 2001; Hristov 2005; Foote 2008).

Escobar (2010) notes that whereas at the level of states the transformations do not seem to venture beyond alternative forms of modernization, the discourses and strategies of some social movements suggest radical possibilities towards post-liberal, post-developmental, and post-capitalist social forms. At stake in many cultural-political mobilizations in Latin America, the author argues, is the political activation of relational ontologies, such as those of indigenous peoples and Afro-descendants, which differ from the dualist ontologies of liberal modernity. These movements struggle against the hegemony of private property and liberal market democracies, and in favor of decentralization and communal forms of organization based on indigenous practice (Escobar 1995).

An important element in these movements is the case for models of societal organization where the quality of life and the 'good living' (Buen vivir) would replace development and growth as guiding principle in political and economic life (Acosta 2009; Demaria and Kothari 2017). Another expanding movement with roots in indigenous ontologies is the movement of 'nature's rights' (Emmenegger and Tschentscher 1993), which acknowledges that nature in all its life forms has the right to exist and maintain and regenerate its vital cycles (Acosta and Martínez 2009).

4.4. Resilience and adaptability of indigenous and local knowledge

Until recently, most believed that ILK was a vestige of the past, bound to disappear with economic development, and many doubted that it would not survive the millennium (Cox 2000). Research over the last two decades, however, has found that important bodies of ILK can persist in the face of modernization (Olsson and Folke 2001; Hernández-Morcillo et al. 2014).

Furthermore, research has shown that substantial pockets of ILK also persist in developed countries in the Global North (Gómez-Baggethun et al. 2010), in particular in mountainous regions and remote areas (Oteros-Rozas et al. 2013; Hernández-Morcillo et al. 2014). Persistence of local and traditional knowledge has also been documented in cities, e.g. among migrant communities (Pieroni et al. 2007) and urban gardeners (Barthel, Folke, and Colding 2010).

The framing of ILK in academia is gradually shifting away from their conception in essentialized and static forms to their understanding as dynamic knowledge systems, often capable of adapting to new ecological and socio-economic conditions (Gómez-Baggethun and Reyes-García 2013). Research suggests that this adaptability is sometimes achieved through the accommodation of new forms of knowledge and by disregarding bits of knowledge that become obsolete or less useful for daily life (Reyes-García et al. 2014).

It has also been shown that important elements of indigenous knowledge and beliefs persist even among peoples that have been confronted with long-standing processes of acculturation. Many indigenous societies retain animistic elements and worldviews merged with the religions to which they have been converted, and these worldviews keep affecting their practices and relations with their environments (Cook and Offit 2008).

Josephson-Storm (2017) even suggests the degree to which modernity has been able to replace belief by mechanical calculation overall is largely overstated and claims that the attempts to suppress spirits, myths, or magic over modernity have failed more often than they have succeeded.

5. Looking forward

Today, ILK is often seen to persist mostly among rural and indigenous peoples located in marginal, distant and peripheral areas, often at the margins of the globalized world. Research over the last decades, however, has shown that substantial amounts of ILK are also found in urban areas (Ceuterick, Vandebroek, and Pieroni 2011), not least in the big cities of Latin America in which many indigenous people are living, e.g. Lima (Peru), Quito (Ecuador), La Paz (Bolivia), Guatemala City (Guatemala), Port Prince (Afro-descendants Haiti), and Asuncion (Paraguay).

In countries and regions where resource systems are more strongly integrated into national and international markets and policies, ILK tend to see itself sieged by the demands of capitalist productivism and the wiping forces of progress, development and growth. For example, in developed country settings ILK persists mostly in either distant and marginal areas or confined in smaller pockets or 'refugia' that are either buffered from market forces or enabled by market niches like fair trade products or organic food (Hernández-Morcillo et al. 2014).

Despite their importance and good spirit, prevailing policy initiatives aimed at protecting ILK face serious limitations. First, policy framings on the importance of ILK are primarily grounded on its instrumental value, as a tool to address global environmental challenges. Within this framing, ILK risks being reduced to something we can capture and use, such as lands, minerals and other resources, rather than recognized as a way of living and value on its own. Furthermore, to the extent ILK remains primarily valued as means to an end, its recognition will be contingent on the absence of more effective means to achieve those ends (e.g. through technological developments).

Second, policy initiatives to protect and revitalize ILK are unlikely to reverse the loss of cultural diversity as long as the political and economic structures of the industrial society remain essentially unchanged. In most likelihood, success in the regeneration of cultural diversity, including ILK, can only come about through major transformations in the present economic, political, and technological order and its ideological underpinnings. In turn, these shifts will require transformation in the ontological underpinning of modernity, evolving from the dominant dualist, anthropocentric and utilitarian worldview, towards relational ontologies, enacted and re-enacted by the people embracing ILK as centerpieces of their lifeworlds and communities.

As more and more people believe that climate and environmental breakdown cannot be tackled within the frame and logic of the existing political and economic order, the idea that we may be entering the final stage of the industrial civilization as we know it is gaining traction in some circles. This stage is marked by a lack of belief in the existing order as much as by the lack of visible alternatives. In Gramscian terms, we are living an 'interregnum', where the old is dying and the new cannot yet be born. However, an expanding myriad of social and intellectual movements, including but not limited to indigenous rights, rights of nature, post-development, degrowth, and post-capitalism, are discussing the contours of how a post-industrial civilization could look.

The contours of the post-industrial society where diverse human cultures can flourish while regenerating the planet's ecological life-support systems cannot be drawn from the molds of the existing industrial growth-based capitalist order, but neither from a return to an idealized past that never existed. In all likelihood, the new order will emerge from a synthesis of tradition and modernity. Some elements of this post-industrial society are yet to be imagined and tested. Others can be salvaged from modern culture and philosophy, including its core emancipatory elements and labor-saving technologies. Yet, others can be rescued from the vast laboratory of arrangements developed by human societies over millennia and swept away by modernity and capitalist globalization. As holders of an ancestral social memory that represents thousands of millennia-long experiments in organizing human life, traditional societies will have a critically important role to play in this societal, economic and political reconfiguration.

Acknowledgements

The author is grateful to Mariana Cantú Fernández, Tor Arve Benjaminsen and three anonymous reviewers for their comments on a previous draft of this manuscript. A preliminary version of this paper was presented at the session 'Indigenous knowledges and sustainable development', organized by Roy Krøvel and Anders Breidlid at the 2018 conference of the Political Ecology Network (POLLEN).

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This research obtained partial funding from a grant of the Norwegian University of Life Sciences' Talent development program [grant number 1850092002].

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