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Economic Development in the Andes and the Need for a More Environmentally Sustainable Model: What Can History Teach Us?

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The mountainous region of the Andes is believed to be one of the oldest cultural areas of humankind. The Spanish conquest of the Incan Empire brought about a dramatic restructuring of the Andean economy, as the economic interests of the Spanish crown centered around the exploitation of mineral resources, especially precious metals, the labor force, and the production of agricultural goods to ship to Europe. Colonialism left a double legacy in the Andes that continues to have effects today: the order and bureaucratic structure of colonial power that excluded broad segments of the population and the integration of Latin America into the colonial system, and later the world market, as a supplier of raw materials. This article demonstrates that the model of natural resource exploitation, on which the economy, agriculture, and society rely, as managed through political distribution and allocation mechanisms, is not environmentally sustainable in the long run, though attempts at change bring significant challenges. We consider ways in which the Incans' earlier production and consumption patterns could contribute to greater sustainability and help mitigate global warming by reconciling locally anchored development and autochthonous natural and human resources with national and international requirements.

Keywords: Andean society, Incan Empire, economic development, sustainability, colonialism, agroecology

La región montañosa de los Andes parece ser una de las áreas culturales más antiguas de la humanidad. La conquista española del Imperio Inca provocó una reestructuración dramática de la economía andina, ya que los intereses económicos de la corona española se centraron en la explotación de los recursos minerales, especialmente los metales preciosos, la fuerza laboral y la producción de bienes agrícolas para exportar a Europa. El colonialismo dejó un doble legado en los Andes que sigue teniendo efectos hoy: el orden y la estructura burocrática del poder que excluyó a amplios segmentos de la

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población y la integración de América Latina en el sistema colonial y posteriormente en el mercado mundial como proveedora de materias primas. Este artículo demuestra que el modelo de explotación de los recursos naturales, de la cual dependen la economía, la agricultura y la sociedad, dirigida mediante mecanismos políticos de distribución y asignación, no es ambientalmente sostenible a largo plazo, aunque los intentos de cambio plantean desafíos significativos. Consideramos las formas en que los patrones de producción y consumo anteriores de los incas podrían contribuir a una mayor sostenibilidad y ayudar a mitigar el calentamiento global al conciliar el desarrollo anclado localmente y los recursos autóctonos naturales y humanos con las demandas nacionales e internacionales.

Palabras clave: sociedad andina, Imperio incaico, desarrollo económico, sostenibilidad, colonialismo, agroecología

Introduction

This article examines the history of economic development in the mountainous region of the Andes. The first section focuses on the earliest civilization in the region, followed by sections on the rise of the Incan Empire and the period following the Spanish conquest. Taken together, this part of the article demonstrates that the arrival of the Europeans led to a dramatic restructuring of the Andean economy, with a double legacy that continues to have effects today. The first legacy was the exclusion of broad segments of the population, a drastic ethnicization of the social structure, and deep racial discrimination. The second legacy was the integration of the region into the colonial system, and later the world market, as a supplier of raw materials.

In the fourth section, we argue that this extractive model based on natural resource exploitation—imposed initially by the Europeans and continued after independence—is not environmentally sustainable. This leads to questions about what might be done to bring about a more sustainable model and to address the pressing issue of climate change. In seeking to answer these questions, we were influenced by Laurent Binet's book *Civilisations* (2021), which received significant acclaim for its efforts to reassess pre-Columbian societies. The author portrays how innovative and dynamic the Incan society was compared to European feudalism by examining the conquest. This vivid and intriguing depiction inspired us to consider what we might learn from the past about sustainability, specifically from the Incas. Thus, in the final section of the article, we point to several ways that a return to Incan practices could help us develop a sustainable economic model based on more small scale and careful use of resources, and the long-term safeguarding of local livelihoods.

Geography, Settlement, and Development of the Andean Region Prior to the Incan Empire

The Andes have a distinctive altitudinal zonation[1] characterized by the short distance between mountains and the ocean and also many different biomes.[2] The altitudinal difference and location favored the emergence of extensive biodiversity, which in turn allowed for the relatively early domestication of plants and animals. The Andean region is important in the origins of crops. For example, the domestication of the potato is attributed to the four-thousand-meter-high area of Lake Titicaca, and even today, close to four hundred different potato species can be found in the region. The Andean highlands are home to domesticated and wild camelids. The mountainous regions in the center of the Andes have an enormous wealth of precious metals and ores, especially lead, zinc, copper, iron ore, gold, and silver. The exploitation of these natural resources dates back to early advanced civilizations.

The mountainous region of the Andes is believed to be one of the oldest cultural areas of humankind (Christian 2004). The first permanent settlements in South America were established along the west Andean coast as far back as 5000 BC. These societies subsisted on agriculture, cattle raising, and fishing. Recent archaeological findings from Paleoindians in Monte Verde in southern Chile suggest that South America could have been settled more than thirty thousand years ago. This would contradict the general theory of human arrival in this part of the globe by placing the initial migration of the indigenous peoples of the Americas across the ice-covered Bering Land Bridge at around fifteen thousand years ago (Braje et al. 2017; Dillehay 2000).

Caral, found in the Supe Valley on the coast of today's Peru, is considered the first major urban center in the Americas, founded c. 5000 BC. Irrigated agriculture and marine fishing were in practice, and the city was carefully planned and organized in strict symmetry. With the introduction of ceramics beginning in 1800 BC, this culture flourished for nearly a thousand years. Caral is therefore chronologically contemporaneous with other origins of human civilization seen in Mesopotamia, Egypt, and India (Shady and Kleihege 2008). Following Caral, the Chavin culture

[1] Altitudinal (or elevational) zonation is a concept that helps explain how and why the specific combination of environmental factors, mainly altitude and temperature, can support different crops and livestock. The ecosystems at higher elevations in the Andes, for example, differ dramatically from those at lower elevations.

[2] A biome is an area classified according to the species that live in that location. Temperature range, soil type, and the amount of light and water are unique to a particular place and form the niches for specific species, allowing scientists to define the biome. However, scientists disagree on how many biomes exist. Some count six (forest, grassland, freshwater, marine, desert, and tundra), others eight (separating two types of forests and adding tropical savannah), and still others are more specific and count as many as twenty-six biomes.

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(1000–200 BC), a major pre-Inca culture,[3] cultivated corn and practiced metallurgy and became widespread throughout the Andean region (Burger 1992).

Several other regional cultures on the coast and in the highlands also produced remarkable achievements in textiles, metalworking, and ceramics. By 1000 AD, pastoral societies from the highlands dominated the Andes. They established a long-distance trade and transportation monopoly by way of an elaborate llama caravan system that linked the coast with the highlands and used trade to remedy supply deficits, especially in plant foods. Additionally, these societies produced textiles, jewelry, and pottery, practiced stonemasonry, constructed elaborate water canal systems, and invented the knotted cords registry (*quipos*), later used by the Incas for administration purposes. Around the year 1000 AD, more than 100,000 people lived in urban areas and 250,000 in the surrounding countryside in Tiahuanaco, one of the religious centers situated near Lake Titicaca. Similar statistics would not be reached by the city of Paris until five hundred years later. The first regional mining activities, primarily for jewelry production, can also be dated to this period (Patterson 1991).

Economic and Political Development Following the Rise of the Incas

Evidence shows that global climate change via cooling and droughts led to a dramatic erosion of living conditions and the decline of the early civilization described in the previous section (Roberts 2014). After a period of deterioration, primarily small-scale populations persisted, for example, in the coastal state of Chimú (1000–1400 AD). These populations were characterized by complex political and highly hierarchized social organizations which had settled in a longitudinal area of around one thousand kilometers and adapted to the new circumstances. Their crafts, agriculture, and fishing flourished again (Moseley 1992).

Then, the Inca civilization arose from the Peruvian highlands sometime in the early thirteenth century. From 1438 to 1533, the Incas incorporated a large portion of western South America, centered on the Andean Mountains, using conquest and peaceful assimilation, among other methods. The Incan Empire became the largest empire in pre-Columbian America. Its official language was Quechua. The administrative, political, and military center of the empire was in the city of Cusco.

[3] The Chavin culture was located in the Ancash Region at an elevation of 3,180 meters, 434 kilometers north of Lima and east of the Cordillera Blanca at the start of the Conchucos Valley.

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In their rise, the Incas made use of the knowledge and institutions founded during the three-thousand-year-old cultural history of the Andes, to which they considered themselves legitimate heirs. The Incas shaped and expanded traditions boldly, inventively, and repeatedly but also with brutality. Territorial incorporation and trade were their long-term political strategy to develop and intensify land cultivation, increase productivity, generate food surpluses, and obtain exotic goods. Their expansion relied on various forms of adapted agriculture and the integration of multiethnic regions into their dominion, supported by massive resettlement and other coercive measures. The most common means of expansion were co-optation and assimilation, primarily through diplomacy and marriage alliances rather than outright conquest (Bang and Bayly 2016). It is true that the subjugated peoples were obligated to render services and labor to the Incan state. Still, the state made investments and improved infrastructure and production conditions in the new territories (Acuto and Leibowicz 2020). Military force and war were not forbidden but were usually used only as a threat and last resort (Covey and Bauer 2002).

The economic basis of the Incan Empire was agriculture, which made optimal use of the Andean altitudinal zonation and linked individual environmental zones with a developed transportation infrastructure (Murra 1980). Four forms of settlement and economy can be distinguished:

1. The high Andes area was characterized by rather unproductive agriculture due to its altitude of around four thousand meters, so people tended to engage in meat and wool production via livestock raising of llamas and alpacas (Lauer 1993). The caravan transport that the Incas created functioned as a network for the high Andes pastoralists. It was an essential tool in the territorial expansion of the empire and the development of the transregional exchange and distribution system.

2. The plateau, at two to three thousand meters, was known as the Incan agricultural center, characterized mainly by its plantations of corn, potatoes, and quinoa. Since the alteration in temperature between day and night is more substantial than the alteration between seasons in the Peruvian Andes, most landscapes could be used all year, and so agriculture became a year-round occupation. Early Andean farming communities did not have draft animals or technical equipment to aid their efforts. Consequently, production was primarily based on human labor, resulting in intensive and subsistence-oriented agriculture. These forms of agricultural production were significantly enhanced by the Incas, who created essential innovations such as large terraces,[4] irrigation canals, the cultivation of new high-yielding crops such as

[4] Clark Erickson writes: "Although considerable cooperative community labor is necessary to construct well-built terraces, once constructed the fields can produce for decades with about the same labor input as a dry, rainfed field. Despite abandonment, no soil amendments, and

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corn and quinoa, and the introduction of easily preserved foods. The monocultural farming of, first and foremost, corn, began under the Incas. This highland agriculture used very complex forms of production. The working tools were versatile, and all altitudes, climates, and natural conditions of the mountainous region were used efficiently. It is assumed, for example, that in the agrarian village communities of this zone, more than twenty different plants were cultivated at the same time (Cunill 1981).

3. The irrigated oases of the western coastal zones were generally characterized by more centralized production and featured a higher degree of division of labor. Here, fishing and irrigated agriculture increased productivity, aiding the development of larger towns and craft centers, wherein some began to engage in manufacturing production.

4. The warm and humid tributaries of the Amazon, dependent upon rainfall in the Andes, located in the low eastern valleys, were also characterized by productive agriculture and fishing. While little is known about the activities of the indigenous people there, it is believed that these areas, now often referred to as "untouched nature," were once densely populated (Sales et al. 2022). However, the population had dramatically decreased before the arrival of the Europeans, leaving few clues about daily life or production and consumption habits.

Village communities called *ayllus,* which functioned prior to the rise of the Incans, were the basis of Andean agriculture. These communities were distinguished by their collective distribution of land, communal social supply, and division of labor, which was usually based on complex kinship. Social rules of cooperation prevailed and established a principle of reciprocity (*minca*), the exchange of equal amounts of work time. Strengthened by their high degree of collectivity and by forms of production adapted to their natural surroundings, the *ayllus* became robust local microcosms of Incan society at large. These communities were also allowed organizational autonomy as they were untouched by the central Incan state during territorial expansion. Their role was vital in laying the foundation of the broader economy, which continued to grow (Murra 2003).

When the agriculture and infrastructure of subjugated minorities were in early stages of development, the Incas intervened and "modernized" them until these minorities were economically able to support the empire with indentured labor. The links between different *ayllus* further served to bolster the Incan Empire. In times of crisis, the Incas provided food and goods from other regions to local communities and

lack of maintenance over the past 500 years, terrace soils maintain considerable fertility and many are still in use" (2018, 35).

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offered emergency funds. This mode of existence, relying on interconnected communities that share the yields of many ecosystems, has been aptly termed "vertical archipelagos" (Murra 1978).[5]

The overarching structure of the Incan central administrative apparatus stretched like an umbrella over the semiautonomous local social units. Urban, military, and religious centers were built up and supplied through temporary labor service (*mit'a*) performed by the subjects. The *mit'a* was a form of labor organization based on the principle of rotation, which allowed the state to access labor needed for all areas of the economy and the military. Men between the ages of twenty-five and fifty were the most frequently conscripted. Work standards were well known: dangerous work was forbidden, while rest periods and numerous holidays guaranteed the maintenance of high-quality performance. Some sources suggest that the *mit'a* was culturally understood as less of a compulsory service than a sacred offering. Since this labor was not directed to central state projects alone, the *mit'a* also serviced local communities through infrastructure construction, emergency aid, and protection (Izumi 2018). In this way, it replicated the model of the *ayllus* at the central level, which was established to a great extent on reciprocity.

Production poles (*mitimaes*) were created by the Incas through forced resettlements, which specialized in agricultural or artisanal products and guaranteed the creation of exceptionally high-quality goods (Murra 1980). Some small mining centers were also established through the state labor service, and metallurgy was comparable to the European standards of the time. However, metal was used quite differently. While the hardness, strength, and sharpness of metals were optimized in Europe, the Incans were concerned primarily with flexibility, ductility, and resilience. Europeans used metal for equipment and tools, whereas Andean Incaic societies harnessed metals to manifest wealth, power, and belonging. Filigree jewelry findings document advanced knowledge of metal alloying and processing. For utilitarian and work objects, the Incans worked with fibers as a key material, developed great creativity and precision, and produced goods that were not inferior to European standards of quality and durability (Lechtman 2007).

[5] Tristan Platt tells us that "Murra coined the metaphor of the 'vertical archipelago' to characterize the society emerging from the intermingling of colonists from different groups at the limits of their core societies' political reach, both upwards and downwards, and on both Pacific and Atlantic sides of the Cordillera. Settlers were seen as living like 'islands' in 'multi-ethnic' neighborhoods alongside other 'islands' placed there by other groups. And he saw the resettlement of populations, or *mitimaes*, by the Inca State as a transformation of the 'vertical' model, in which the ideal of maximizing each society's resource base was transcended by state economic, military, and political strategies" (2009, 36).

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Surprisingly, the Incan economic system functioned without money or markets. The allocation of resources and the demand for goods were regulated almost entirely by a centrally administered, planned economy (Baudin 1944). This economy did not lead to supply problems despite its immense expansion; instead, an abundance was generated that allowed for ample stockpiling. These stores, packed to the brim, were available to the elite and also used for the common good (LeVine 1992). Overall, most of the rural Incan population had a high material standard of living. Binet (2021) has emphasized this by contrasting the Incan peasants to the impoverished rural population and unproductive agrarian structure of European feudalism.

Based on these data and dynamics, from the fourteenth century onward, the Incan influence in the Andean region increased. From the fifteenth century forward, it resulted in expansion so extensive that it made the Incan state the largest empire in the pre-Columbian Americas for one hundred years. It is believed that the maximum north-south extension of the Incan Empire at its height reached from central Chile to southern Colombia, covering approximately four thousand square kilometers. Due to geological variations, the east-west extension was more unstable but extended to the eastern lowlands and partially to the Amazon region.[6] By the sixteenth century, the Incas ruled over two hundred and fifty local communities and 13 million people. For this reason, some of the Spanish conquistadors compared their rule to that of the ancient Roman Empire (Alconini and Covey 2018; McEwan 2008).

From the Conquest to the Present

In 1532, the Spanish conquistador Francisco Pizarro landed in Piura, Peru, and began a campaign with one hundred and sixty-eight soldiers against the enormous Incan army, eventually defeating it. Military and technical advancements, along with the use of horses, are cited as the usual reasons for this unexpected victory. However, various researchers doubt this explanation, demonstrating that the Incans were superior to the Spaniards militarily. These scholars refer to documents indicating that the local population was significantly weakened by new epidemics such as influenza, measles, and especially smallpox, which, after the arrival of the first Europeans, already had killed up to half the Incans (Dobyns 1963). The extent to which the population succumbed to European diseases is controversial. Some calculations assume that at the time of Columbus's first voyage, over 110 million people were living in the Americas and that they were, thus, more densely populated than Europe. If these figures are correct, about 90 percent of the indigenous population of the Americas had died by the seventeenth century (Kiple 1993; Lovell 1992).

[6] At its largest, the empire included the territories of modern-day Peru, what are now western Ecuador, western and south-central Bolivia, northwest Argentina, the southwesternmost tip of Colombia and a large portion of modern-day Chile.

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A dramatic restructuring of the Andean economy followed the conquest, as the economic interest of the Spanish crown was centered on the exploitation of mineral resources, especially precious metals, and the production of agricultural goods that could be shipped to Europe. Spain seized the Incan labor services in agriculture and later in mining and turned them into permanent forced labor. This action enabled the extreme exploitation of the resident population. The *encomienda* system was rapidly introduced, which entrusted the conquistadors with estates or mining rights, dispossessing the previous inhabitants. The indigenous people were, according to the religious justification for the conquest, supposed to be protected and Catholicized. However, in practice, the *encomienda* system that lasted a few generations in the Andes was nothing other than a regime of absolute exploitation (Brosseder 2018; Hemming 1970).

Additionally, a trade monopoly over the distribution of goods was introduced and, up until the eighteenth century, forced indigenous people to buy overpriced and, often for them, useless Spanish goods, all at excessive amounts of money, land, or labor. As a result of these measures, there was a sharp reduction in small-scale peasant production and a dramatic decline in the Andean highland population. The Spanish *hacienda* system prevailed in agriculture. Though large landholdings promised access to land and water, hereditary debt bondage was established via credit advances to bind the workers to the estates, establishing a form of serfdom (Wolf and Mintz 1957).

From the sixteenth century on, mining was intensely pursued. Silver production soon became one of the economic pillars of the Iberian colonial regime. In this context, the silver extraction at the Cerro Rico Mountain in Potosí, in present-day Bolivia, was key. By the beginning of the seventeenth century, Potosí had become one of the world's largest and most modern cities with 150,000 inhabitants, and more than 13,000 mainly indigenous mine workers (Lane 2019). These political-economic constellations of colonialism left a double legacy in the Andes, which continues to have an effect today.

On the one hand, the order and bureaucratic structure of the colonial power functioned mainly through personal interventions by the highest authorities and to the exclusion of broad segments of the population. A fusion of political and economic elites promoted a tendency toward authoritarianism. The elites relied on exploiting raw materials, people, and world market integration. Profits were made through exports, the monopolization of the domestic supply structure, and (financial) speculation. Labor, not labor productivity, was a significant source of value creation and received little protection or improvement. This left labor as the source of value, based on absolute exploitation, as opposed to relative exploitation (productivity and improvement of their consumption). The emergence of a competitive local

entrepreneurial class oriented toward the domestic market and focused on efficiency, productivity, and innovation was not supported. Rather, local agriculture and handicrafts were overall unproductive and insignificant for supply and markets. At the same time, the state's interest in the domestic market and internal tax revenues was low. Social cohesion and political participation were also of little functional importance.[7]

On the other hand, colonization led to a drastic ethnic division of the social structure in the Andes, which partly resembled a caste system. Spain established a vertical hierarchical social formation based on social position, power, and privilege depending on one's family origin. The top positions in politics and the economy were reserved for European whites, while Creoles (descendants of Europeans born in the colonies), indigenous and black people (mainly abducted from Africa and enslaved) occupied lower social positions in a precisely defined structure judged by their ancestry and, often, by their appearance. The performance and quality of work were determined and significantly hierarchized according to the racist structure at the heart of colonization (Fisher and O'Hara 2009).

These legacies did not end with the independence wars of the nineteenth century. Indeed, they continue to shape today's Andean world. The region's economy is still dependent on the export of agricultural and raw materials. The mountainous longitudinal areas are still preferred as cultivation regions; agriculture and haciendas prevail with their partially capitalized forms of production, which can be seen throughout the area's valleys and high basins and at the base of the Cordilleras (Denevan 2001).

With the expansion of neoliberal globalization in the 1990s, this export-oriented growth model was further deepened via privatization, capitalization, and the increased centralization of cultivated areas. Different goods found their demand in the global economy and their place on the shelves of western supermarkets, including Chilean wine, Colombian cut flowers, Ecuadoran bananas, Argentine soy, and various coca products. Large cities, originally founded by Spaniards on the coast as trade and transport centers, functioned as channels for the shipment of these goods and necessitated a mass movement of people to urban areas to this end.

Urban migration was further accelerated by significant environmental damage stemming from monocultural farming and the massive use of chemical fertilizers and pesticides, as well as the construction of new infrastructure, particularly roads that cut through farms and small communities. In these communities, poor income and

[7] For a comparative overview of the legacies of Spanish colonization, see Burchardt and Leinius 2022.

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deteriorated working conditions increased the pressure to migrate to cities. Various political attempts to support small farmers and the landless through agrarian reforms, as seen in Bolivia (1953 and 2006), Peru (1962), Ecuador (1964), and Chile (1970), were either too timid or inconsistent and did not lead to substantial structural change in their favor. In this context, it comes as no surprise that the rural Andean region is still characterized by poverty, widespread social disparities, and patterns of exclusion, implicating the colonial legacy of ethnic discrimination and the social structure in place since colonization. The elite class in the Andean region still today is comprised of whites of European descent, while most of the population living in misery are of indigenous ancestry. In particular, indigenous women in rural areas count among the most vulnerable and destitute (Cant 2018).

Since the nineteenth century, mining has become increasingly crucial for the trade balances of Andean countries concentrated on the extraction of tin (Bolivia), copper and saltpeter (Chile), iron ore (Colombia), bauxite (Venezuela), and lithium (Bolivia and Chile). There is also an increasing tendency toward a reliance on the extraction of fossil fuels, including oil (Venezuela and Ecuador), gas (Bolivia), and coal (Colombia). State-owned and transnational corporations are primarily active in these sectors. The extraction of fossil raw materials and mining guarantees large profits but leads to significant soil degradation and major alterations to local vegetation. These activities increase air and groundwater pollution and contribute to harming plants, animals, and human communities alike. The increasing environmental damage and precarious working conditions witnessed at extraction sites across the Andes have not slowed such economic activities. Instead, some experts expect that mining expansion in the Andes will gain significant momentum under the new sustainability strategies of the United States, China, and Europe (such as electromobility) (Gielen 2021).[8]

Beyond agriculture and the extraction of mineral resources, manufacturing industries continue to play a subordinate role in the Andean region and are oriented primarily toward the domestic market. The service sector, however, has expanded and grown to include a large informal (urban) economy, responsible for up to 50 percent of the working population in some countries and often under deplorable working conditions.

[8] Given the decarbonization of the world economy and the war in Ukraine, the ongoing reconfiguration of the global appetite for raw materials will likely prompt a massive rise in the demand for "green" resources, which Latin America and the Andes are well-equipped to meet. The region is the site of around one-third of global copper, bauxite, silver, coal, and oil deposits, and possesses, in total, more than a third of those minerals that leading industrial nations consider strategic economic goods for achieving the transition towards net-zero economies. It also produces a significant share of global food staples. South America is a global leader in the production of energy crops for biofuels, in the mining of lithium sought by manufacturers of batteries used in electric engines, and in the storage of CO_2 in forests (Cook 2022).

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All in all, it can be said that the Andean economic system is neither socially nor ecologically sustainable, a situation made more dire by the social and ecological ramifications of climate change.

Dangers of the Extractive Model and Need for More Sustainable Practices

The emphasis on raw materials in the Andean region, begun during European colonization, is a prime example of what is referred to as neoextractivism: the exploitation of raw materials not only as a means of economic growth but as a path toward independent development.[9] Despite severe economic overexploitation, the Andes remains a reservoir of natural resources whose importance is becoming relevant in these times of climate change. The future of this mountainous environment is closely linked to the future of global civilization. If the environmentally destructive expansion of monocultural agriculture and industrial mining continues apace, it will push the region and its natural environment as well as the human communities that call it home, into environmental, economic, and social crisis.

Efforts to initiate a new phase of social development in Latin America, one of the regions with the highest social inequality in the world (Burchardt and Lungo Rodríguez 2023), were aligned with the so-called "left turn" strategy that began in Venezuela in 1998 and continued in the Andean countries of Argentina, Bolivia, Ecuador, and, to a lesser extent, Chile. In short, this strategy aimed to strengthen the state institutionally, while addressing the social question in a positive way, with the goal of deepening democratic legitimacy and introducing new environmental protection instruments. The economic driver of this strategy was raw material exports, which were further accelerated by high world market prices. The increase in the exploitation of raw materials was seen as the ideal strategy to reach the objectives because high revenues from raw material export would fill state coffers and create the conditions needed for active economic and social policies to pave the way for eventual economic diversification and ecological development.[10]

The new extraction strategy produced a decade of economic prosperity and nurtured hopes for independent development in the Andes. Social accomplishments were

[9] The term extractivism originated in the context of colonial powers that exploited their colonies' raw materials and labor force for the colonial powers' own benefit. A newer usage, neoextractivism, refers to the post-independence emphasis on exporting raw materials to grow the economy and use the revenues to improve living conditions and promote development independently from the major economic powers.

[10] Ecological development refers to efforts to preserve the environment and the organisms living there while promoting biodiversity and development that does not compromise future generations or the future of the ecosystem.

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remarkable. The poverty level across Latin America was reduced from 44 percent in 2002 to 28 percent in 2013, lifting 60 million Latin Americans out of poverty across countries (CEPAL 2015). However, it is now clear that the longed-for independence based on a few commodities has not been achieved, despite significant shifts in this direction. It was impossible to increase the labor productivity of agricultural domestic production in order to become less dependent on the world market. When commodity prices collapsed in 2014, the total vulnerability of the model became apparent. Latin America and the Andean region once again slid into crisis with many social achievements sent to the chopping block, and living conditions of the poorer, especially rural, population deteriorated drastically. Progressive governments lost political support and were punished at the ballot box and even replaced in some cases by conservative governments (Burchardt 2017).

Neoextractivism was controversial, as it pushed the narrative of sacrificing ecological concerns at the altar of development and provoked political upheavals that are still unsettled. While new constitutions were written in Bolivia and Ecuador that gave central importance to nature and environmental protection, in practice, the exploitation of raw materials expanded to ever-newer heights, with environmentally harmful technologies in industrial mining and fracking gaining influence. At the same time, ideas surrounding sustainable development, such as the indigenous concept of the good life, *buen vivir*, were also written into government programs but were not practiced, nor did they garner international attention.[11]

If extractivism is understood as a model of society beyond purely economic considerations, then recourse to rent-theory approaches will help in understanding the failure of these recent development initiatives (Burchardt, Dietz, and Warnecke-Berger 2021). Rent-theory approaches conceive commodity income as an income that is not based on its labor output; thus, social reproduction is primarily based on distribution. The state responsible for a given area has limited resources and is dependent on economic output and income taxes, and tends to secure its political support through co-option, patronage, and corruption. Consequently, democratic demands or controls are disrupted. Additionally, environmental pressures resulting from the plunder of natural areas[12] provoke local protests that can effectively impede

[11] *Buen vivir*, or more precisely *Sumak kawsay*, is a central principle in the cosmovision of the indigenous peoples of the Andean region that seeks material, social, and spiritual satisfaction for all members of a community, but not at the expense of other members and not at the expense of the natural basis of life, and can be understood as living together in diversity and harmony with nature. The concept found its way into the new constitutions of Ecuador and Bolivia but has had limited (or no) impact on Andean economies, politics, and society (Cortez 2021).

[12] For example, monocultures of maize, potatoes, quinoa, and other crops are spreading in the Andes region, although these crops are unsuitable for mountainous areas because they require the use of expensive agrochemicals, which in turn lead to agrobiodiversity loss and

resource extraction through democratic rights contestation and territorial autonomy, threatening state revenues.[13] Many Andean governments facing this situation have responded to such demands with increasing repression (such as Peru and Venezuela). Thus, guaranteed rights (e.g., indigenous constitutional rights to self-determination) were weakened or withdrawn, and agreements with indigenous and ecological movements were canceled or criminalized outright. It is precisely these extraction conflicts that dominate social disputes today in large parts of the Andes and also worldwide (Engels and Dietz 2017).

The natural resource-exporting development models in the Andes are characterized by one key determinant: natural resource exploitation, on which the economy, agriculture, and society at large rely, and it is managed mainly through political distribution and allocation mechanisms.[14] Labor performance or productivity is economically subordinated. The prospects of independent regional and local development are of little relevance, and politicians treat securing state legitimacy as an unnecessary hassle. Thus, there is little need to implement decentralized, integral, and sustainable development strategies. Nevertheless, through the last economic boom phase in the Andean region (2003–2014), and despite different political programs, the productivity of local agriculture was hardly promoted. Ever since colonization, this extractive (and later neoextractive) model has shaped the internal logic and social patterns that continue to stand in the way of sustainable development in the rural Andean region.

The external impetus to break from these patterns does not appear on the horizon. A look at global politics clearly shows that environmental policy actions are dramatically lagging or even actively undermining the fundamental requirements for protecting the planet. The envisaged energy transition may initiate a socioecological transformation in the Global North. However, it is misdirected to assume that this will constitute a global turnaround. With the shift toward renewable energy resources, leading industrial nations are shifting away from fossil energy sources. Yet more mineral raw materials are needed to generate and store these renewable energies. Here is an illustrative example: there are six times as many raw materials in a Tesla today as in a conventional car. Lithium, copper, and cobalt are replacing oil without

soil degradation. In addition, there is a massive loss of forest due to logging and cattle breeding.

[13] Rent theory has recently reacted to the challenges of today's variegated forms of resource extraction, building a bridge from pollical economy to actor coalitions and culture (Warnecke-Berger 2021; Warnecke-Berger and Ickler 2023).

[14] Coronil (2008, 19) has put this quite succinctly: whereas in market economies, "the business of politics is business," i.e., the state defines the key parameters for capitalist accumulation, in rentier states "the business of business is politics."

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serious inquiry as to where these raw materials come from, how they have been mined, and by whom (Aronoff et al. 2019).

Many of these raw materials are located in the Andean region.[15] The global energy transition provides impulses to change dependence on fossil raw materials on a superficial level. Still, it reinforces the exploitation of other mineral raw materials and hardens already existing social arrangements. The Andean region (for example Chile and Colombia) is already preparing for this new phase of raw materials exploitation under the banner of "green extractivism," a model in which the use of ecofriendly high-tech and climate-friendly resource extraction methods supposedly reconcile the extraction and valorization of natural resources with the principles of sustainable development and the goal of a "low-carbon" future for all.[16] This is the dark side of sustainability as currently conceived. The sustainability agenda remains too limited and centered on the Global North, externalizing the costs of socioecological transformation to the Global South.[17]

Moreover, it is becoming increasingly apparent that in the search for sustainable alternatives, ecological and social concerns can no longer be set against each other, but, rather, must go hand-in-hand. It has been sufficiently documented scientifically that the key to fighting global hunger lies in small-scale, regional agroecology (IAASTD 2009). Compared to industrialized agriculture, agroecological farming with local seeds and without chemicals produces much higher yields, uses less water, protects biodiversity, produces less food waste, ensures higher quality work, and supports gender equality, all while doing much more to combat climate change. However, today, animal feed is planted on a third of the world's fields, and energy crops are grown instead of food, for example, biodiesel or ethanol. Sustainability does not need more genetically modified crops and a new green revolution, but agricultural reforms and committed support for rural areas.

For this, climate change, the high CO_2 emissions in industrial agriculture, the loss of biodiversity, the risk of new zoonoses[18] from factory farming—which the COVID-19 pandemic has highlighted—and the new goals of sustainable development, require a rethinking and new action in agriculture. Basically, a worldwide re-regionalization of agriculture now is necessary, which relies more on regional and local supply instead of deepening global value chains. In the Andes, it is a question of developing adaptation strategies that enable sustainable regional development, that are

[15] It is expected that the lithium demand will grow more than 2000 percent by 2050, followed by rare earth minerals, nickel, iron, and copper (Gielen 2021), turning the Andean region into a critical hotspot for supplying raw materials needed for the global energy transition.
[16] With regard to lithium, see Voskoboynik, Macmillen, and Andreucci 2021.
[17] See www.extractivism.de/en for ongoing research on this topic.
[18] A zoonosis is a disease that can be transmitted to humans from animals.

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balanced in a socially and ecologically compatible manner, and that are used to deal with the problems aggravated by climate change, such as drought, heavy rainfall, scarcity of water and resources, energy supply, and increasing morphodynamic processes (glacial collapses, landslides, and soil erosion). Answers for climate-related adaptation are sustainable land use (organic farming to increase the resistance of plants), the use of water-saving irrigation technologies, and bioengineering or the expansion of renewable energies (geothermal, solar, wind, and hydropower).

Challenges of Creating a More Sustainable Model: What Can We Learn from the Incas?

The experiences of the Incan agrarian society described in the second section have a lot to offer for these challenges. Their rural communities were often based on the traditions of community awareness of solidarity and reciprocity, individual responsibility toward the community, and caring for the environment.[19] The Incans' cosmovision, based on a recognition of the relationships between climate, space, and time, faced climatic and geological risks and took advantage of the diversity of ecosystems and climatic influences. Furthermore, their in-depth knowledge of soil quality and the agricultural calendar show that their technology can become a basis and practice of sustainable agroecology today.

The Incans' prominent techniques included, among many other sustainable forms of production, the highly productive technique of raised fields (*waru waru*), which allows "green manuring," doubles the depth of the fertile topsoil, and protects against frost by storing solar heat. In addition, highly nutritional grains such as quinoa were cultivated. Well known is the technique of terracing, which enables highly efficient water and climate management, increases crop production, reduces the risk of drought, and allows several harvests per year. Terraces not only increase the area available for agriculture on the steep slopes of the Andes but also prevent erosion and improve the efficiency of canal irrigation systems.[20] In addition, the practice of mixed cultures was used, which reduces the risk of wind and frost as well as pest infestation and disease (Clark 2018). Also worth mentioning are the building

[19] Kosiba (2018, 242) sees this more critically with a focus on the social dynamics of the Incan society: "Despite the expertise of their environmental engineering, however, Inca agricultural practices may not have been sustainable. By reducing agriculture to dual or diverse landscapes, the Incas introduced profound social tensions: first, a contradiction between how subject communities and state authorities saw the land and its products; and second, a practical and scheduling contradiction between labor for the community and labor for the state."

[20] Basically, terrace cultivation and its canal system shaped the entire social organization of the Incans. They created interdependent systems of humans and plants that required synchronized work, task planning, and shared ritual practices among the inhabitants of scattered settlements, leading to a close connection of land, terraces, and cities.

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techniques that required no CO_2 emissions to fit the stonework and the technique of "water seeding," which involves creating small artificial lagoons (*qochas*) in the tops of hills to collect rainwater and channel it to aquifers in the mountains. During the dry season, these aquifers feed streams and bogs, preventing them from drying out before the next rain.

We can learn a lot from the Incans. Their agricultural policies offer clever answers for strategies of sustainable rural and regional development, which aim at a more small-scale, careful use of resources and the long-term safeguarding of local livelihoods. This involves the broader use of new environmentally friendly techniques and the strengthening of small farming communities through community participation.

Based on his empirical work in Ecuador, Bebbington (1997) sees rural development in the Andes as a complex process between tradition and modernity. This process consists of neither the resistance of village communities to modernization, market opening, and therefore to external influences nor to the pure continuity of local cultural tradition. Regarding sustainability strategies, not a purely agricultural subsistence economy nor an unrestricted opening to the market seems desirable, but rather multiple and multilocal livelihood systems (Stadel 2008). Attempts must be made to reconcile locally anchored development and autochthonous natural and human, especially indigenous, resources with national and international requirements (Rhoades 2006).

The Incans showed that these two poles can be successfully combined. This could become a sustainability program for the future. Therefore Andolina, Laurie, and Radcliffe (2009, 11) speak of "alternative modernities," that is, of progress and development in harmony with the cultural values of human communities. There is no doubt that the Andes are an important area for research with crucial examples of how to help sustainable strategies achieve more significant influence and success. Indigenous communities have preserved natural and human resources that can draw on several millennia of tradition and experience in sustainable agriculture. Combining such potentials with today's knowledge of diversification, efficiency, and new techniques could help create "islands of sustainability" (Bebbington 1997) from the former "vertical archipelagos" of the Incans. The Andes have always been the scene of great changes in human civilization. There are good reasons why this will remain so in the future.

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Works Cited

Acuto, Félix A., and Iván Leibowicz
2020 "In Pursuit of the Sacred: Understanding Inka Colonialism in the Andes." *Comparativ* 30 (3/4): 313–326, https://doi.org/10.26014/j.comp.2020.03-04.08.

Alconini, Sonia, and R. Alan Covey, ed.
2018 *The Oxford Handbook of the Incas*. Oxford: Oxford University Press.

Andolina, Robert, Nina Laurie, and Sarah A. Radcliffe
2009 *Indigenous Development in the Andes. Culture, Power, and Transnationalism*. Durham, NC: Duke University Press.

Aronoff, Kate, Alyssa Battistoni, Daniel Aldana Cohen, and Thea Riofrancos
2019 *A Planet to Win. Why We Need a Green New Deal*. New York: Verso Books.

Bang, Peter Fibiger, and Christopher Alan Bayly
2016 *Tributary Empires in Global History*. London: Springer.

Baudin, Louis
1944 *Essais sur le socialismo: Les Incas du Pérou*. Paris: Libraire de Médicis.

Bebbington, Anthony
1997 "Social Capital and Rural Intensification: Local Organizations and Islands of Sustainability in the Rural Andes." *Geographical Journal*, 163 (2): 189–197, https://doi.org/10.2307/3060182.

Binet, Laurent
2021 *Civilisation*. London: Harvill Secker.

Braje, Todd J., Tom D. Dillehay, Jon M. Erlandson, Richard G. Klein, and Torben C. Rick
2017 "Finding the First Americans." *Science* 358 (6363): 592–594, https://doi.org/10.1126/science.aao5473.

Brosseder, Claudia
2018 "The Conquest of the Andes from Andean Perspectives." In *The Andean World*, edited by Linda J. Seligmann and Kathleen S. Fine-Dare, 161–174. New York: Routledge.

Burchardt, Hans-Jürgen
2017 "La crisis actual de América Latina: causas y soluciones". *Nueva Sociedad* 267: 114–128.

Burchardt, Hans-Jürgen, and Irene Lungo Rodríguez, eds.
2023 *Wealth, Development and Social Inequalities in Latin America: Transdisciplinary Insights.* New York: Routledge.

Burchardt, Hans-Jürgen, and Johanna Leinius, eds.
2022 *(Post-)colonial Archipelagos: Comparing the Legacies of Spanish Colonialism in Cuba, Puerto Rico, and the Philippines*. Ann Arbor: University of Michigan Press.

Burchardt, Hans-Jürgen, Kristina Dietz, and Hannes Warnecke-Berger
2021`"Dependency, Rent, and the Failure of Neo-Extractivism." In *Dependent Capitalisms in Contemporary Latin America and Europe*, edited by Stefano Palestini and Aldo Madariaga, 207–229. London: Palgrave Macmillan.

Burger, Richard L.
1992 *Chavin and the Origins of Andean Civilisation*. London: Thames and Hudson.

Cant, Anna
2018 "Agrarian Reform and 'Development'." In *The Andean World*, edited by Linda J. Seligmann and Kathleen S. Fine-Dare, 325–339. New York: Routledge.

CEPAL
2015 *Panorama Social de América Latina y el Caribe*. Santiago: CEPAL.

Christian, David
2011 *Maps of Time: An Introduction to Big History*. 2nd ed. Berkeley: University of California Press.

Clark Erickson
2018 "The domesticated landscapes of the Andes." In: *The Andean World*, edited by Linda J. Seligmann and Kathleen S. Fine-Dare, 53–67. New York: Routledge.

Cook, Peter J.
2022 "Resources and Reserves in a Carbon-Constrained World." *Mineral Economics* 35 (3-4): 361–371, https://doi.org/10.1007/s13563-022-00318-2.

Coronil, Fernando
2008 "It's the Oil, Stupid!!!" *ReVista. Harvard Review of Latin America* 8 (1): 19–20.

Cortez, David
2021 *Sumak kawsay y buen vivir, ¿dispositivos del desarrollo? Ética ambiental y gobierno global*. Quito: FLACSO Ecuador.

Covey, R. Alan, and Brian S. Bauer
2002 "Processes of State Formation in the Inca Heartland (Cuzco, Peru)." *American Anthropologist: Journal of the American Anthropological Association* 104 (3): 846–864, https://doi.org/10.1525/aa.2002.104.3.846.

Cunill, Pedro
1981 *La América Andina.* Barcelona: Editorial Ariel.

Denevan, William M.
2001 *Cultivated Landscapes of the Andes and Amazonia*. Oxford: Oxford University Press.

Dillehay, Tom D.
2000 *The Settlement of the Americas: A New Prehistory*. New York: Basic Books.

Dobyns, Henry F.
1963 "An Outline of Andean Epidemic History to 1720." *Bulletin of the History of Medicine* 37: 493–515.

Engels, Bettina, and Kristina Dietz
2017 *Contested Extractivism, Society and the State. Struggles over Mining and Land*. London: Palgrave Macmillan.

Erickson, Clark
2018 "The Domesticated Landscapes of the Andes." In *The Andean World,* edited Linda J. Seligmann and Kathleen S. Fine-Dare, 53–67. New York Routledge**,**

Fisher, Andrew B., and Matthew D. O'Hara, eds.
2009 *Imperial Subjects: Race and Identity in Colonial Latin America*. Durham, NC: Duke University Press.

Gielen, Dolf
2021 *Critical Materials for the Energy Transition.* Technical Paper, 5/2021. Abu Dhabi: International Renewable Energy Agency.

Hemming, John
1970 *Conquest of the Incas*. New York: Harcourt.

IAASTD (International Assessment of Agricultural Knowledge, Science and Technology for Development)
2009 *Agriculture at a Crossroads. Global Report*. Washington DC: IAASTD, https://wedocs.unep.org/20.500.11822/8590.

Izumi, Shimada
2018 "Prehispanic Social Organization, Integration, and Hierarchy." In *The Andean World*, edited by Linda J. Seligmann and Kathleen S. Fine-Dare, 80–95. New York: Routledge.

Kiple, Kenneth F.
1993 *The Cambridge World History of Human Disease*. New York: Cambridge University Press.

Kosiba, Steve
2018 "Cultivating Empire: Inca Intensive Agricultural Strategies." In *The Oxford Handbook of the Incas*, edited by Sonia Alconini and R. Alan Covey, 227–246. Oxford: Oxford University Press.

Lane, Kris
2019 *Potosí: The Silver City that Changed the World*. Berkeley: University of California Press.

Lauer, Wilhelm
1993 "Human Development and Environment in the Andes: A Geoecological Overview." *Mountain Research and Development* 13 (2): 157–166.

LeVine, Terry
1992 *Inka Storage System*. Norman: University of Oklahoma Press.

Lechtman, Heather
2007 "The Inka and Andean Metallurgical Tradition." In *Variations in the Expression of Inka Power*, edited by Richard L. Burger, Craig Morris, and Ramiro Matos Mendieta, 323–365. Washington DC: Dumbarton Oaks.

Lovell, W. George
1992 "Heavy Shadows and Black Night: Disease and Depopulation in Colonial Spanish America." *Annals of the Association of American Geographers* 82 (3): 426–443.

McEwan, Gordon F.
2008 *The Incas: New Perspectives*. New York: W.W. Norton.

Moseley, Michael E.
1992 *The Incas and their Ancestors: The Archaeology of Peru*. London: Thames and Hudson.

Murra, John V.
1978 *La organización económica del Estado Inca.* Translated by Daniel Wagner. Madrid: Siglo XXI.
1980 *The Economic Organization of the Inka State*. Greenwich: JAI Press.
2003 *El mundo andino. Población, medio ambiente y economía*. Lima: Instituto de Estudios Peruanos.

Patterson, Thomas C.
1991 *The Inca Empire. The Formation and Disintegration of Pre-capitalist State*. New York: Berg Publishers.

Platt, Tristan
2009 "From the Island's Point of View. Warfare and Transformation in an Andean Vertical Archipelago." *Journal de la Société des américanistes* 95 (2): 33–70, https://doi.org/10.4000/jsa.12817.

Rhoades, Robert E.
2006 *Development with Identity. Community, Culture and Sustainability in the Andes*. Wallingford, UK: CABI Publishing.

Roberts, Neil
2014 *The Holocene. An Environmental History.* 3rd ed. Chichester, UK: John Wiley & Sons.

Sales, Rachel K., Crystal N. H. McMichael, Suzette G. A. Flantua, Kimberley Hagemans, Jesse R. Zondervan, Catalina González-Arango, Warren B. Church, and Mark B. Bush
2022 "Potential Distributions of Pre-Columbian People in Tropical Andean Landscapes." *Philosophical Transactions of the Royal Society B: Biological Sciences* 377 (1849): 20200502, https://doi.org/10.1098/rstb.2020.0502.

Shady, Ruth, and Christopher Kleihege
2008 *Caral, la primera civilización de América = Caral, the First Civilization in the Americas*. Lima: Universidad de San Martín de Porres.

Stadel, Christoph
2008 "Agrarian Diversity, Resilience and Adaption of Andean Agriculture and Rural Communities." *Colloquium Geographicum* 31: 73–88.

Voskoboynik, Daniel Macmillen, and Diego Andreucci
2021 "Greening Extractivism: Environmental Discourses and Resource Governance in the 'Lithium Triangle.' " *Environment and Planning E: Nature and Space* 5 (2): 787–809, https://doi.org/10.1177/25148486211006345.

Warnecke-Berger, Hannes, ed.
2021 *Development, Capitalism, and Rent. The Political Economy of Hartmut Elsenhans*. London: Palgrave Macmillan.

Warnecke-Berger, Hannes, and Jan Ickler, eds.
2023 *The Political Economy of Extractivism. Global Perspectives on the Seduction of Rent*. London: Routledge.

Wolf, Eric R., and Sidney W. Mintz
1957 "Haciendas and Plantations in Middle America and the Antilles." *Social and Economic Studies* 6 (3): 380–412.