



An approach to the social construction of agroecological principles in Latin America

Abordagem à construção social do princípio agroecológico na América Latina

Aproximación a la construcción social del principio agroecológico en América Latina

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ABSTRACT: As an emergent glotopolitical field in Latin America, Agroecology offers a critical and sustainable guide about agrifood systems. Its conversion into a food global agenda by FAO underlined a unique, glocal and social experiment because it is trying to organize local agriculture skills towards Agroecology production. All of this implied certain confluence of social actor multiplicity (mainly small rural producers) that, from their rural communities, dialogically reproduce and apprehend a particular lifestyle. Therefore, the aforementioned suggests a deconstruction of Agroecology's epistemological foundations. The main goal was to define the dynamics of agroecological principles in Latin American research. For this purpose, it was necessary to identify a set of agroecological systemic principles, correlating them with a partial sample of Latin American agroecological thought from the second decade of the 21st century, which consisted in 3,110 documents from 23 countries. It was observed that there were no 100% agroecological experiences; to the contrary, each research study is comprised by several combinations of agroecological principles that obey the social actors' needs. In the same way, certain inter-sectional systemic behavior was evidenced, which is creating news agroecological principles. All of this means new opportunities, but also new risks to Agroecology itself.

Keywords: agroecology; food security; glotopolitics; human geography; rural sociology.

RESUMO: A agroecologia como um espaço glotopolítico emergente na América Latina oferece um guia crítico e inadiável sobre a sustentabilidade dos sistemas agroalimentares. Sua conversão em agenda alimentar mundial pela FAO indica uma experiência social inédita em nível global na tentativa de estruturar o potencial da agricultura local para a produção agroecológica. O que isso implica é a confluência de uma multiplicidade de atores sociais (principalmente camponeses e camponesas) que dialogicamente reproduzem e aprendem com suas comunidades rurais um determinado sistema de vida, portanto, sugere também uma desconstrução dos próprios fundamentos epistêmico da agroecologia. O objetivo desta análise foi determinar a dinâmica desses princípios na pesquisa agroecológica latino-americana. Para isso, identificou-se um conjunto de princípios sistêmicos agroecológicos que se correlacionam com uma amostra limitada do dito pensamento latino-americano da segunda década do século XXI que é composta por 3.110 documentos de 23 países latino-americanos. Observou-se que cada obra é uma mescla de princípios agroecológicos a partir das necessidades e interesses dos atores sociais. Da mesma forma, evidencia-se um comportamento sistêmico interseccional que está gerando novos princípios agroecológicos, o que significa novas oportunidades e riscos para a própria agroecologia.

Palavras-chaves: agroecologia; segurança alimentar; glotopolítica; geografia humana; sociologia rural.

RESUMEN: La agroecología, como un espacio glotopolítico emergente en América Latina, ofrece una guía crítica e impostergable sobre la sustentabilidad de los sistemas agroalimentarios. Su conversión en agenda mundial alimentaria, por parte de FAO, indica un experimento social inédito a nivel global, al tratar de estructurar las potencialidades de las agriculturas locales hacia la producción agroecológica. Esto implica la confluencia de una multiplicidad de actores sociales (principalmente campesinas y campesinos) que reproducen y aprehenden dialógicamente, desde sus comunidades rurales, un determinado sistema de vida, por lo tanto, también sugiere una deconstrucción de los propios fundamentos epistemológicos de la agroecología. El objetivo de este análisis fue determinar la dinámica de dichos principios en la investigación latinoamericana agroecológica. Para esto, se identificó un conjunto de principios sistémicos agroecológicos correlacionándose con una muestra acotada de dicho pensamiento latinoamericano de la segunda década el siglo XXI, compuesta por 3,110 documentos, provenientes de 23 países latinoamericanos. Se observó que cada trabajo es una mezcla de principios agroecológicos en función de las necesidades e intereses de los actores sociales, así mismo, se evidenció un comportamiento sistémico inter-seccional que va procreando nuevos principios agroecológicos. Esto significa nuevas oportunidades y riesgos para la propia agroecología.

Palabras clave: agroecología; seguridad alimentaria; glotopolítica; geografia humana; sociología rural.

1. Introduction

The decomposition of agrifood systems is forcing societies to explore alternatives that ensure sustainable agrifood production/consumption. This has driven an ample field of social movements and new organization models, involving producers, consumers and public, private and international institutions (Hatanaka and Busch, 2008; Dubuisson-Quellier *et al.*, 2011; Hernández & Villaseñor,

2014; Morales *et al.*, 2019). In this context, due to the 2007-2008 food crisis and to acknowledging the need to transform conventional agrifood systems, FAO is driving a global agenda targeted at the transition to sustainable agrifood systems (FAO, 2019a, 2009), with direct repercussions on the meso-pretensions of Agroecology; as a practice, movement and science.

The main instrument of such agenda is a narrative and conceptual axis with 10 agroecological

principles (biodiversity, knowledge construction and exchange, synergy, efficiency, recycling, resilience, human and social values, food-related culture and traditions, governance, circular and supportive economy) (FAO, 2019b), as a result of a synthesis of various conceptual stances, with the following ones standing out: Gliessman (1998, 2007), Altieri (1987) and Sevilla and Woodgate (2013), the integration of agroecological values of organized civil society and various community experiences regarding agroecological production. These principles were realized in different regional meetings about Agroecology between 2014 and 2017 (Tittonnell 2014; Hainzelin, 2014; FAO, 2018; Wezel *et al.*, 2020; Barrios *et al.*, 2020).

Paradoxically, FAO's intention was not to define the Agroecology principles but merely to identify a set of elements that *might* serve as a guide for a reconversion to a sustainable agrifood system (Wezel *et al.*, 2020); however, certain conceptual cacophony was generated, which ended up considering these 10 golden rules as final, where "...The essential components are described, as well as the key interactions, the emerging properties and the favorable conditions longed-for in the agroecological transitions to sustainable agriculture and food systems" (FAO, 2024, p. 1). With this agenda, FAO opened a broad range of random dialectics around the Agroecology field, dynamizing a unique social rhizome comprised by multiplicity of social actors that, in their dialogical practices, gradually produce a torrent of conceptual interchanges that enriches such field. But in the FAO context, such conceptual torrent becomes rarified, as it has to negotiate with an opposing narrative: the agroindustrial extractive semantics, derived from the Green Revolution.

Thus, Agroecology is immersed in an uncertain setting since, as global agrifood regulator and guarantor of worldwide agrifood governance, FAO:

a) constituted itself into a market instrument, turning the (mainly poor) countries' food security into a currency to control what is eaten and produced (how, with what, when, where, with whom and at what prices), playing a central role in wealth concentration by agrifood corporations (Santos 2014, p. 49; Cabrera *et al.*, 2019); and

b) is characterized as a space for the consolidation of the agrifood hegemon (agreed upon between governments and corporations) where, on the pretext of an apparent institutional neutrality, the historical, economic and political contexts that in fact produced poverty and hunger in the world are decontextualized, disregarding the critical stances to the growing prominence of agro-corporations on the planet's food chain and considering cultural biodiversity as a decorative element (Pottier, 1999; González, 2007).

We suggest that the creation of these 10 agroecological principles makes certain agrifood narrative explicit from a hegemonic space, in order to co-opt and assimilate the definition of Agroecology, conceiving it not with its potential to profoundly change the extractive ethos of conventional agrifood systems, but as a set of technologies:

a) devoid of the critical sense against power mechanisms and resource exploitation that gave rise to the current agrifood debacle

b) susceptible to be compatible (assimilated) with technological areas such as Biotechnology, Transgenic products and Genetic manipulation to

increase productivity (Levidow *et al.*, 2014; Giraldo & Rosset, 2017).

This alludes to an attempt at exerting an impact (plunder) on the complexity of the fundamental pretensions of Agroecology as a practice, social movement and knowledge field, foundations that are generated in a continuous intertwining from peasant agriculture.

The first pretension refers to a complex universe comprised by huge number of family agriculture practices, type of cultivar, land plot, agriculture cycle and agro-geographic format of the production unit. This universe gradually modifies its organizational patterns based on the reality of each peasant family. The second pretension expresses multiplicity of agroecological production anti-establishment movements against the Capitalist food model (Veraza, 2007), fertilized with a broad sociopolitical range of anti-system community manifestations, transforming the concept of continuity into a synonym of social mobilization, connection, inclusion and complexity, from geographical-territorial benchmarks to intangible, symbolic, made-up and/or virtual territories (Marinis, 2005; Pineda, Meneses & Téllez, 2013; Sandoval & Godínez, 2013). The agroecological movement amplified its social and political voice by connecting to glocal protest, becoming a vehicle to disseminate agrifood criticism and articulating itself around the recovery/strengthening of self-sustainable agriculture and livestock food production capabilities, both of indigenous/rural communities and of working-class neighborhoods and/or urban communities (organic flea market collective groups, urban farm production in yards, terrace roofs, vacant lots, etc.). In turn, as a gnoseological area derived from a profound cultural matrix

characterized by low energy inputs inherent to traditional agricultural systems, Agroecology is presented as a (traditional/non-traditional) knowledge field for sustainable food production (Agrawal, 1995; Toledo, 2022).

Based on these three pretensions, Agroecology becomes a glotopolitical *nomos* (Guespin & Marcellesi, 1986; Agamben, 2010; Marabini, 2019), both distributive and community-based: political events intervene in it through the peasants' languages, to the extent that it proposes rescuing the agroecosystems' sustainability, but also the decolonization of the extractive semantics inherent to the global agrifood system. In addition, as a collective practice, language is a political action, a social movement, a space for connection and an ideological phenomenon at the same time. This allows considering Agroecology as a field marked by social resistance and movements under constant recoding (Nuñez *et al.*, 2022), producing a vast space of life experiences, complicities and interpretations... *sine fine*, as a constantly-flowing *logos*, even feeding on contradictory stances.

In this context, during the congress held in 2018 by the Latin American Agroecology Scientific Society (*Sociedad Científica Latinoamericana de Agroecología*, SOCLA) in Ecuador, a prominent researcher studying Latin American Agroecology asserted the following in an informal conversation: "...most of the papers presented [in the congress] do not deal with Agroecology". Such statement is not the cannon of agroecological thinking, but it is rooted and branched out towards similar stances. Can Agroecology be determined from an immediatist stance?

1.- If the researcher was right, then there was a systemic deficit in the congress filters. 2.- If he was not, the setting would be more complex:

a) The papers presented came from a multi-form sociocultural field of agriculture realities that blur the limits between organic/traditional agriculture practices and local agrifood movements, among others; despite not complying with a given agroecological regulation, the mere existence of these experiences might indicate a structural convulsion of transient orders (Balandier, 1994) that a probable agroecological *mainstream* fails to distinguish, but because it lacks the epistemological perspective to rationalize it; therefore:

b) Agroecology would suppose some social *polyphenism* that represents a challenge for agroecological scientific research, which, when faced against the challenge of grasping the complexity inherent to the Agroecology movement, will be forced to accept (at any moment) that “when it was thought that all the answers had been found, all the questions were changed” (Anonymous, in Benedetti, 1993, p. 46). Consequently:

c) supposing that Agroecology is full of contingencies and dialectics (Nuñez & Navarro, 2021), each peasant agriculture experience would mean a specific agroecological formula and, therefore, certain profusion of actors who seek to devise alternatives that are different from food-related hegemonies, confirming a glotopolitical space across agroecological narratives, but also presence of ideological antagonisms in Agroecology itself.

As a *nomos* of the peasant sociopolitical and cultural complexity, Agroecology is permeated by tribal systems of interpersonal relationships

(Dunbar, 1993) and is unveiled as a networked world that has never been neutral, whether socially or ecologically. Kuhn (1977) associated this type of tensions to the feat of divergent cognitional areas (search for new for new formulations, distancing from old solutions) and convergent cognitional areas (scientific tradition, certainty of the already established and proved), causing epistemological gaps among paradigms (Kuhn, 2004). Given this, we suggest that there are convergent and divergent Agroecology systems that share purposes but go along different and unpredictable paths. In addition, such differentiation is not only in contrast with FAO but also to the inner components of agroecological movements (Ayala *et al.*, 2023; Bellwood-Howard & Ripoll, 2020; Levidow *et al.*, 2014; Rosset & Martínez-Torres, 2014). This would mean the emergence of ideological and social “mainstreams” in the same agroecological narrative, allowing to consider it from a dramatic perspective: the constitution (and confrontation) of “alternative hegemonies” (William, 1977; Allen *et al.*, 2003).

According to Gramsci (1975, p. 17, 107-108, 117), hegemony refers to the construction of some ideological consensus by a given social group and/or class, in order to justify/preserve their dominance (moral, political, economic or intellectual, among others) before other groups. Such hegemony is achieved once the uniqueness of the dominant narrative paired with society's general interests is legitimized (Eagleton, 1991, p. 16). And this is attained by controlling the economic, expression, education and administration means, as well as the linguistic ones, and even religious institutions. In this sense, hegemony lies on accepting a given doctrine/narrative that disables a person to recognize and question the preconceived and partial nature

of the social reproduction mechanisms in which he/she is born, grows up and develops, and which imperceptibly shape his/her ideas and behaviors and even limit his/her life based on the languages used (Goffman, 2011).

Bourdieu transits a parallel path when he refers to imposing a “doxa” on the social structure, where the arbitrariness of the dominant groups is kept imperceptible and diversified through systems of rules that favor them (Bourdieu, 1977). In turn, Foucault (1999) decentralizes such hegemony with the concept of governmentality, a process in which people's ideas and behaviors are institutionally determined by semantic/behavioral technologies and programs that turn individuals into fervent believers/reproducers of the system itself. Although Foucault was referring to the State's intervention, incorporating Agroecology to FAO's institutional language illustrates the possibility of a “doxa” endowed with governmentality instruments and dominant narratives. It should not be forgotten that hegemony is a valence that is reformulated in social confrontation and consensus. And the exercise of power (in a network) constantly exposes people to suffering it and/or putting it into practice (Foucault, 2000, p. 27).

In this sense, the emerging socioagroecological rhizome evidences a broad glotopolitical field marked by ideological “ruptures” inherent to emerging paradigms (Nuñez & Navarro, 2021). However, it also evidences spaces for discussion, innovation, growth and foundational “learning”. For example, the commercial “success” or organic agriculture broadened the agricultural and ecological consumption frontiers. The local agrifood networks followed a parallel path: they expanded their production and communities. According to

Nelson (2012, p. 31), such expansion weakened both alternatives. The first one became too expensive for small producers and low-income consumers (e.g., organic production centralization and costly certifications). The latter ones were transformed into communities closed to local producers from other regions, and were pointed out as promoters of North-South inequalities for precluding imports from southern producers and disregarding topics related to power and wage disparity at the local level. This was intensified when competing for market niches in retail monopolies. These alternatives are characterized by excluding small producers from the decision-making process at the international level (García, 2011), adopting an agroindustrial mercantilist behavior and trivialized its very anti-system alternative. According to Allen and Kovach:

“the original and holistic paradigm of organic agriculture was dissected into market components... the profit drops resulting from competition lead farmers, input providers, processors and retailers to accelerate production, reduce costs and increase product sales...” (Allen & Kovach, 2000, p. 224).

This gave rise to a conventional productive chain dependent on technological inputs (pesticides and modified seeds), unequal in its production and distribution phases, and dynamized by notions of competition and productivity. These “alternatives” ended up replicating the productivism and extractivism inherent to the agrifood mercantile hegemon, reinforced with the growing presence (and consequences) of corporate agrifood brands (Klein, 2001).

In turn, Agroecology delves into various aspects of agricultural production (sowing, harvest,

etc.), packaging areas, transportation, institutional/productive management and social justice, among others, thus expanding as a critical but also administrative social base, paradoxically emulating a productive chain. In addition to this, the intersection with the FAO system would imply considering the agroecological narrative as a path with multiple directions and marked by conflicts for the internal control of its narratives; hence, its main challenges and risks.

It is worth noting that it would be unwise for this document to seek to encompass the entire agroecological narrative. However, understanding its foundations is not an unfeasible exercise; therefore, the intention is to clarify some doubts from a fragmented and partial perspective: Is Agroecology a predetermined quality or is it differentiated based on the peasants' realities, needs and resources?

2. Methodology

In the agroecological melting pot, the diversity of languages and perceptions in which peasant and indigenous agriculture is conceived and practiced converge and enrich one another. The constant recombination among agricultural systems, actors and social representations deconstructs the Agroecology foundations (practice, movement and knowledge) into a specific semantics; therefore, the agroecological *nomos* is subjected to certain systemic contingency and expansion that allows conceiving it as follows:

1.- As a historical process saturated by conceptual articulations over which there is no final consensus (nor in terms of characteristics and/

or purposes), mainly because Agroecology has gradually integrated principles from other knowledge fields, hence its multi-dimensionality (Álvarez-Salas *et al.*, 2014) and trans-disciplinarity (Ruiz, 2006): it expanded its research definitions and methodologies, increasing its *corpus* of principles and encompassing the entire food system (Wezel *et al.*, 2020); but it also developed profuse confusions in its environment, to the extent that some of these foundations fail to manifest themselves whether ontologically or tautologically, as they do not strictly stipulate their or the means to attain the agroecological purpose (Gómez *et al.*, 2017);

2.- As a dynamic system: there are areas inevitably aligned with sustainable energy principles (edaphological fertility, balanced pH values, uncontaminated water, biodiversity preservation/protection, etc.); in other areas, such parameters are being reformulated according to the realities and needs of peasant agriculture. This means a complex sociosphere that gradually articulates and modifies the agroecological principles into an epistemological and dialogical rhizome that precludes considering it in an atomist, monotheist and immovable way as a theory but, rather, as a structural life cycle; and

3.- As a philosophical paradigm (Caporali, 2007) and as a tool for the analysis, intervention and recovery of the socioecological complexity and resilience inherent to agroecosystems (Altieri, 1999; Salas *et al.*, 2011).

This broadens the debate because it exposes the following:

a) the separation between the theoretical (political) approach and the operationalization of variables in functional Agroecology experiences;

b) the definition of “resilience” as a quality to determine capabilities that are modified and operate irregularly in each moment, space and organizational level (Kalawski & Haz, 2003; Escalera & Ruiz, 2011); and

c) the diversity/complexity that shapes local agroecosystems worldwide.

The vastness of these characteristics and their profound intertwining suggest that the structural ambiguities of Agroecology are transferred to its epistemological principles.

In this context, by randomly selecting a set of prominent researchers involved in Agroecology and risking a tight synthesis, it can be seen that Gliessman (1998) defines the agroecological principle as a systemic, biochemical, ecological and adaptive complex, but edaphological and agronomic in its core. In turn, Toledo (1995) condenses such principle as a philosophical and systemic precept of complexity and structure, based on the metabolic processes of low energy and technological inputs generated by the peasant and family units themselves, with significant resource flow rates (extraction-investment) and agraphic, ethnoecological, ontological and semiotic gnoseological exchanges among rural communities (Toledo *et al.*, 1986; Toledo, 1995; Toledo, 2022). On the other hand, from a methodological, pluralist and intuitive Agroecology framework, Altieri (1999) proposes a subdivision between intervention and measurement (epistemological and cumulative) principles, developed in the sociocultural dispersion of peasant agriculture practices, establishing a direct correlation between the study of traditional agroecosystems and strengthening such principles as a condition (from Ecological Engineering) to assemble and develop more

sustainable agroecosystems (Altieri, 1999, p. 136; Altieri & Nicholls, 2000, p. 78).

According to Reijntjes *et al.* (1992), the metabolic principle expresses the energy diffusion and transfer capability among agricultural production peasant units to constitute an entire surrounding system. Hence the property of peasant knowledge as a tool to rationalize and leverage such energy flow. In this sense, they consider distribution and differentiation of Agroecology knowledge among peasant communities as an agroecological condition. However, they propose conventional technical/scientific assistance to accelerate the progress of peasant technology (Reijntjes *et al.*, 1992, p. 112), hinting to the possibility of “productivist” Agroecology. Other principles would be the edaphological one (preservation and recovery of the biotic structure by resorting to organic matter and external fertilizers), and synergy in using genetic resources to obtain “integrated farm systems with a high degree of functional diversity” (Reijntjes *et al.*, 1992, p. 61).

From the historical Materialism perspective Sevilla conceives Agroecology as a social and political reaction to the practical and theoretical marginalization of peasant agriculture by major social, political, economic and philosophical thought schools (Sevilla, 1991), which not only confirms the social mobilization principle (Sevilla & Woodgate, 2013) but also the metabolic principle, as a result of the internal contradictions of the Capitalist accumulation/extraction process: it is indispensable to preserve agroecological sustainability through a structural equivalence in two aspects:

a) regeneration of resource productive aptitude: equivalence between the collection and regeneration rates; and

b) rearrangement of the waste generated in production: parity between waste emission rates and the assimilation capabilities of the ecosystems to which this waste is released (Sevilla & López, 1993).

Agrawal (1995) conceives peasant/indigenous and scientific knowledge within the same ontological matrix: the diversification of indigenous knowledge (epistemologies and philosophies) in all world spaces is closely connected to it, so that its method and ritual are matched in human life course (e.g., soccer rituals and cockfights); however, he draws the attention to the utilitarian trend with which “neo-indigenists” limit peasant and indigenous knowledge by turning it into a condition for promoting development, technically and politically tending to isolate, document and store it *ex situ* in hard-to-access files for indigenous peoples themselves (Agrawal, 1995).

In their bibliographic review about Agroecology (limited by the automatisms used), Wezel and Soldat (2009) suggest that the main feature of the agroecological principle is its horizontality and sustainable glocality, as three approaches persist in understanding Agroecology, namely: the crop plot/field scale; the farm agroecosystem/scale; and the approach to the food system. In this context, they point out the need to address the principles (such as the edaphological one, and its ample methodological variability) in a cross-sectional way.

For González *et al.*, (2021), the agroecological principle is made up in an ontological, systemic, metabolic, political-institutional and epigenetic way and is materialized in the organizational process: the change in the institutional configuration of the corporate agrifood regime expresses a “political-

-institutional-energy” agroecological principle. It is for this reason that social mobilization, institutional transformation and energy reconversion (social metabolism) should be simultaneous political processes for the organization of agroecological systems. Although the energy exchange and adjustment obey *dissipative* systems (Prigogine, 1983), such systems are reorganized from specific political-cultural systems. In this sense, the agroecological principle is one of epigenetic and biomimetic linking of intergeneration transmission of both information (energy) and sustainability, giving rise to the following:

- a) availability, recovery and emergence of less extractive productive historical memories; and
- b) availability of energy reserves through civilizationally-defined agricultural systems.

In relation to this last aspect, González *et al.*, (2021) confirm the edaphological precept as inter- and cross-sectional, where the system's inner energy is integrated, managed and distributed: a reduction in such capability generates cross-sectional entropy processes.

The aforementioned suggests an irregular *corpus* of agroecological principles derived from differentiated narrative and epistemological subsystems, although characterized by a systemic and inter-sectional behavior: they address organic matter accumulation and recycling on the soil, preservation and regeneration of natural resources, agrobiodiversity and crop rotation, among other topics; however, they also deal with the construction of agrifood and social systems that improve the peasants' quality of life. This latter aspect broadens/diversifies/problematises their role: There are more concrete and assertive principles (the edaphological one), but also

those that fail to indicate the conceptual mechanics to implement them (e.g., synergy). Each principle is defined in terms of its own fields, but not as part of a reticular system. However, we suggest that the Structure–Connection Principle designates the following:

- 1) An epistemological integration/differentiation area, in terms of the Agroecology actors' realities, needs and resources (Figure 1a); and
- 2) A dynamic and two-way gnoseological structure between: a) a part ruled by technical principles (e.g., soil pH assessment), characterized by a precise metric about flow, material and energy exchanges but not enabled to apprehend the socio-cultural complexity inherent to peasant agriculture; and b) a dilated phase that integrates everything into an institutional and sociocultural generic agenda but which dilutes technical acuity to determine the sustainability of the peasant system (Figure 1b). The

agroecological discourse is broadened, glocalized and deconstructed when it moves between such extremes.

Apprehending Agroecology as a tool to reassemble the agroecosystems' components means involving various Agroecology research and education systems that are intertwined and profoundly permeated by reticular innovation capabilities (Granovetter, 1973). In other words, complex agroecological thought reservoirs. Since mid-21st century, the analysis about conventional agricultural systems has recognized an analogous need (Wellhausen *et al.*, 1951). Given that, we suggest that the *corpus* of agroecological principles pointed out fails to delimit the entire Agroecology field, although it does elicit some questions: How are agroecological principles delimited, converged and/or differentiated?

When proposing a partial answer to the above:

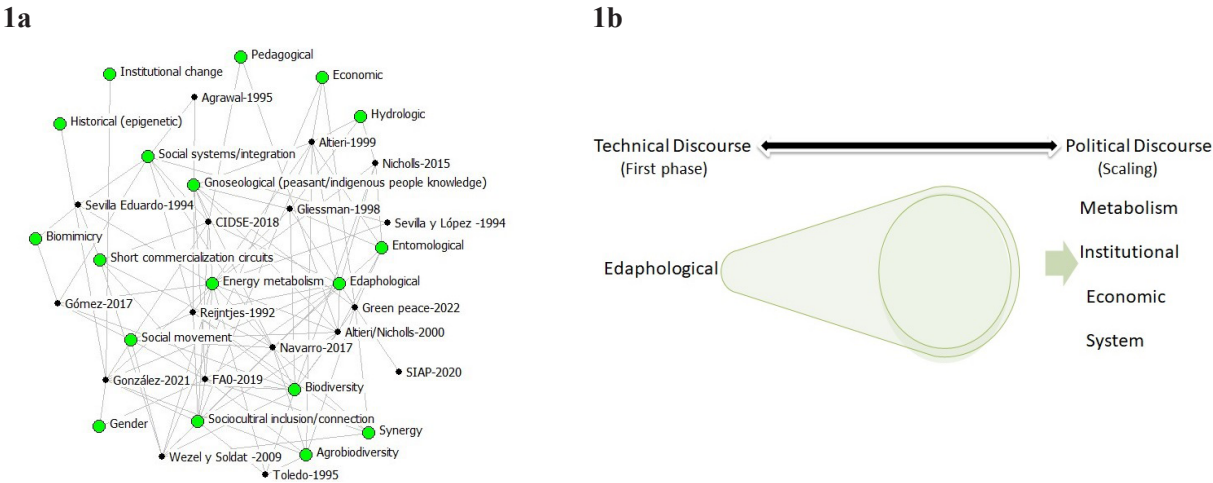


FIGURE 1 (a-b) – Fragment of the gnoseologically-networked dynamics of the Latin American agroecological discourse.
SOURCE: the authors.

I.- A total of 15 Agroecology principles common to organizations, researchers and institutions, among others, were identified, namely:

- 1) Construction/Conservation and recovery of optimal edaphological conditions for the development of crop systems;
- 2) Flora and fauna space-time diversification;
- 3) Feedback loop systems (recycling) of nutrients and organic matter;
- 4) Conservation/Recovery and enhancement of positive interactions/synergies) between biotic components (plants-animals-microorganisms);
- 5) Substitution of inputs external to the system;
- 6) Efficient use of renewable resources (soil-water-plants);
- 7) Conservation (rehabilitation) of local resources;
- 8) Fostering synergic ecological relationships between system components;
- 9) Fostering/Recovering and preserving biodiversity by implementing multiple crop agricultural systems;
- 10) Resilient agrifood systems;
- 11) Enhancement/Adaptation to local conditions of the agricultural and livestock systems by minimizing environmental impacts;
- 12) Construction/Recovery of food security and sovereignty;
- 13) Promotion and rescue of traditional knowledge, integrating it to local technological innovations;
- 14) Valuing environmental and human health; and
- 15) Mitigation of factors triggering climate change. (Reijntjes *et al.*, 1992; Toledo, 1995; Agrawal, 1995; Gliessman, 1998; Altieri & Ni-

cholls, 2000; Nicholls, Altieri & Vázquez, 2015; CIDSE, 2018; Green Peace, 2022; SIAP, 2020).

Such principles are characterized as follows:

- 1) They correspond to different epistemological matrices;
- 2) They have given rise to various interpretations/applications.
- 3) They have different editorial-style (even non-concordant);
- 4) They delimit specific agroecological areas;
- 5) They serve as a basic sustainability guide in agrifood systems; and
- 6) Their diversity is expanded to various agroecological paths.

The aforementioned lead to seeking a more synthesized compendium. Based on such principles, Pérez *et al.*, (2014) propose a functional and partial synthesis comprised by eight generic principles:

1. Fostering ecological relationships (biological interactions and synergies, biodiversity, agroecosystemic resilience);
2. Improving the soil properties (recycling of organic sources and space/time diversification of crop systems);
3. Fostering biodiversity (diversification and protection of phytogenetic resources);
4. Enhancement/Adaptation to local condition (reduction of high-cost inputs, integrated soil and water management);
5. Valuing traditional knowledge and technologies (participatory methodologies in research and development about genetic and edaphological phyto-zoo resources);

6. Promotion of the agricultural producers' organizational and self-management processes (participation and inclusion, decentralized governance);

7. Promotion of local markets and economies (commercialization networks and value chains); and

8. Financial and technical independence (technologies with local and low-impact inputs).

II.- Such principles were correlated to a set of agroecological research studies developed between 2011 and 2018, gathered in SOCLA's historical file (Mexico -2011-, Peru -2013-, Argentina -2015-, Brazil -2017- and Ecuador -2018-) (SOCLA 2011-2018), which has served as an integration, connection, practice, analysis and discussion node in agroecological research in the subcontinent (FAO, 2021). A set of 3,110 abstracts and methodological sections from agroecological research documents from 23 Latin American countries was analyzed, which constituted a non-deterministic, for-convenience and restricted sample of Agroecology thinking in Latin America during the second decade of the 21st century. It is worth noting that the abstracts of scientific documents represent an abbreviated construction of their contents. Each of the means to disseminate scientific knowledge requires that such abstract should be coherent and concise, that it addresses and condenses all the essential scientific elements included in the document (Nagda, 2013) and that it uses simple and easy-to-understand language to successfully convey a scientific idea and its findings, as a significant success share for the material to be published and read lies on its abstract: it is the first paragraph a reader reads. This construction represents a cognitive and systemic filter of the authors' mastery regarding their topic, as well as

certain rational and emotional combination, as they seek to arouse interest in potential readers of their scientific paper (Almeida *et al.*, 2010; WC, 2011; Quintanilla, 2016; Devyatkin *et al.*, 2018). This allowed considering that each of these documents contains a conceptual and local construction about Agroecology, thus enabling to meet the objective of this paper: To propose an approach to the dynamics and construction of agroecological principles in Latin America.

III. The World Coffee perspective (Brown & Isaacs, 2005) was resorted to, involving specialists from similar areas (Agroecology, Sustainability and Natural Resources), who worked in separate groups to analyze the materials provided. From the list of agroecological principles provided, each specialist indicated those that reflected the paper under review. This yielded a set of differentiated and shared assessments about such materials, with irregular distribution: some research studies were approved with 1 principle, whereas others with 3 or 6, etc.; this allowed systematizing and analyzing them by regions, countries and convergence points.

3. Results and discussion

In all, 92.22% of the papers reviewed was concentrated in 5 Latin American countries, namely: Brazil (68.97%), Mexico (8.17%), Argentina (7.36%), Colombia (5.18%) and Ecuador (2.54%). Considering the agroecological convergence/divergence assumption, it was evidenced that most of the papers (80.3%) presented from 1 to 3 agroecological principles, whereas 19.1% included from 4 to 6. The papers dealing with 7 and 8 principles only represented 0.6%.

In the distribution of all 8 Agroecology principles, it was observed that 40.65% of the references made were mainly for “Valuing traditional knowledge and technologies” and for “Promotion of organizational and self-management processes”. Principles more related to adaptation, biodiversity and ecological processes followed them in importance. A third group involved economic empowerment principles. The edaphological principal was pointed out in the last place (Table 1).

3.1. The Latin American system of agroecological principles (2011-2018)

In the dynamics of the *corpus* of principles (Figure 2), differentiated flows and turning points

were observed in regional Agroecology, namely: “Valuing traditional knowledge and technologies” increased considerably in 2017, but decreased in 2018. This was noticed more moderately in the case of “Promotion of organizational and self-management processes”. The “Promotion of local markets and economies” principle was reduced between 2011 and 2018. It draws the attention that “Enhancement/Adaptation to local conditions” and “Fostering ecological relationships” increased in 2015 but decreased in 2017. The “Fostering biodiversity” principle showed a reduction between 2011 and 2017 but increased in 2018. The edaphological principle had a turning point with a downward trend in 2017 but regained momentum later on. In turn, “Financial and technical independence” presented an incipient behavior.

TABLE 1 – Presence of agroecological principles in research studies about Agroecology in Latin America.

Agroecological principles	%
Valuing traditional knowledge and technologies.	20.57
Promotion of organizational and self-management processes.	20.07
Enhancement/Adaptation to local conditions.	16.61
Fostering biodiversity	11.93
Fostering ecological relationships.	11.46
Promotion of local markets and economies.	7.08
Financial and technical independence.	6.45
Improving the soil properties.	5.83
TOTAL	100.00

SOURCE: SOCLA (2011-2018).

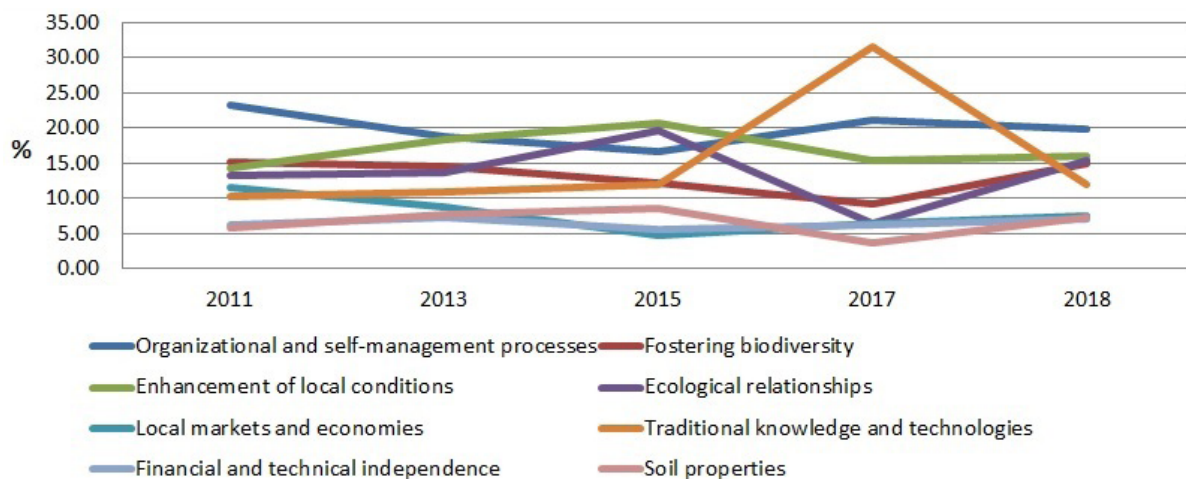


FIGURE 2 – Dynamics of Agroecological principles in Latin America (%).
SOURCE: SOCLA (2011-2018).

3.2. Agroecological principles by Latin American region

Considering an agrogeographic, ecosystemic and historical assumption and dividing Latin America into 4 regional agroecological *continuums* (Figure 3), it was observed that Agroecology leans on the following: “Organizational and self-management processes” and “Enhancement/Adaptation to local conditions”, as well as on “Traditional knowledge and technologies”. The low incidence of the edaphological and economic/financial rise principles stands out. This might be due to the incipient emergence of economic principles to the obviousness of the edaphological principle. However, this would suppose a core exclusion in the agroecological foundations: although the edaphological principle is integrated into the “Enhancement of local conditions” and “Traditional knowledge and

technologies” principles, it is disregarded as an agroecological subsystem.

3.3. Agroecological principles in 5 Latin American countries

Considering the main countries analyzed (Figure 4), it was noticed that the Brazilian Agroecology mainly fed on “Traditional knowledge and technologies” (25.72%) and on “Organizational and self-management processes” (21.01%), accounting for a total of 46.73%. The Agroecology development in time evidenced a structural rise of the entire *corpus* of principles in 2013, mainly for “Local markets and economies” and “Financial and technical independence”. Subsequently, this *corpus* of precepts was reduced in 2015, to then increase and stabilize from 2017 onwards. “Organizational and self-management processes” and “Fostering biodiversity” had similar dynamics; an analogous

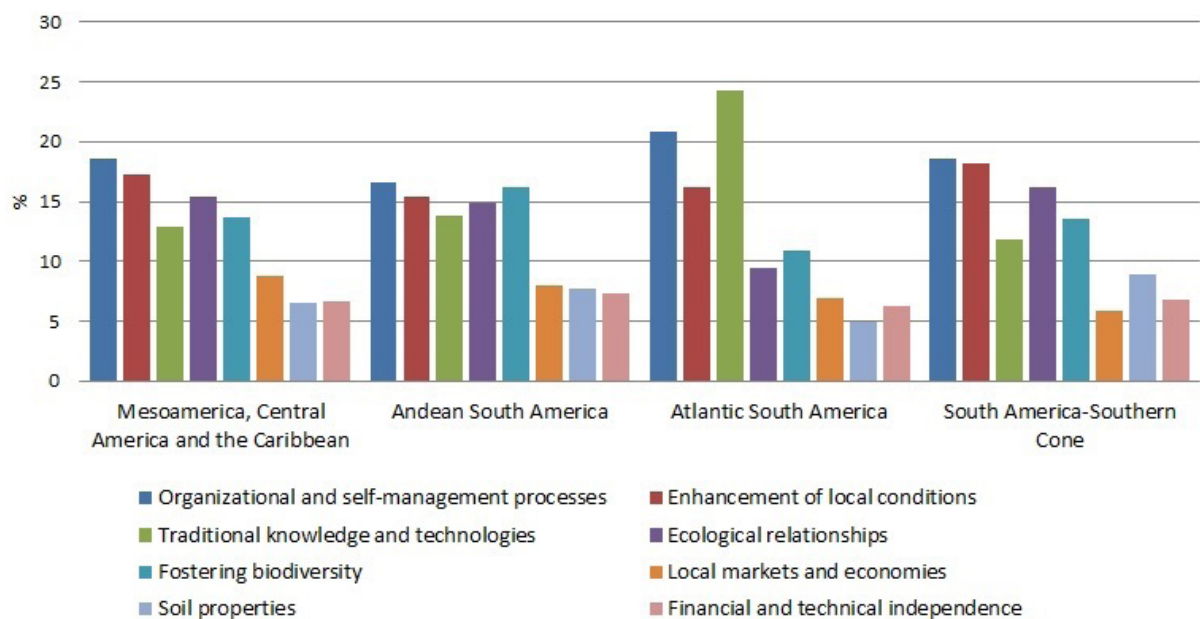


FIGURE 3 – Agroecological principles in 4 Latin American regions (%).
SOURCE: SOCLA (2011-2018).

situation was observed with the “Enhancement of local conditions” and “Soil properties”: they were degraded in 2015 but then stabilized. “Ecological relationships” started with a downward trend but was the least degraded, rising from 2017 onwards.

The distribution of its agroecological principles was irregular in Mexico. The main principles (50.65%) were as follows: “Organizational and self-management processes” (18.31%), followed by “Enhancement of local conditions” (16.77%) and by “Ecological relationships” (15.58%). In its dynamics, it was noticed that “Organizational and self-management processes” was degraded from 2011 onwards, stabilizing in 2013 and increasing in 2017. In turn, “Enhancement of local conditions” presented a downward trend but stabilized between 2013 and 2017, whereas “Fostering ecological

relationships” rose between 2011 and 2015 but decreased in 2017. The “Fostering biodiversity” principle had an average behavior during the period analyzed. In turn, “Valuing traditional knowledge and technologies” rose between 2015 and 2017.

The Argentinian Agroecology leaned mainly on the “Enhancement of local conditions” (18.64%) principle, with “Organizational and self-management processes” in second place (17.58%), followed by “Ecological relationships” (17.58%) and by “Fostering biodiversity” (13.79%), for a total of 67.42%. In turn, the dynamics of the corpus of principles between 2011 and 2018 stood out for an upward-trend performance from 2011 onwards, mainly in “Local markets and economies”, which decreased between 2013 and 2017. The other principles rose between 2011 and 2015. They were

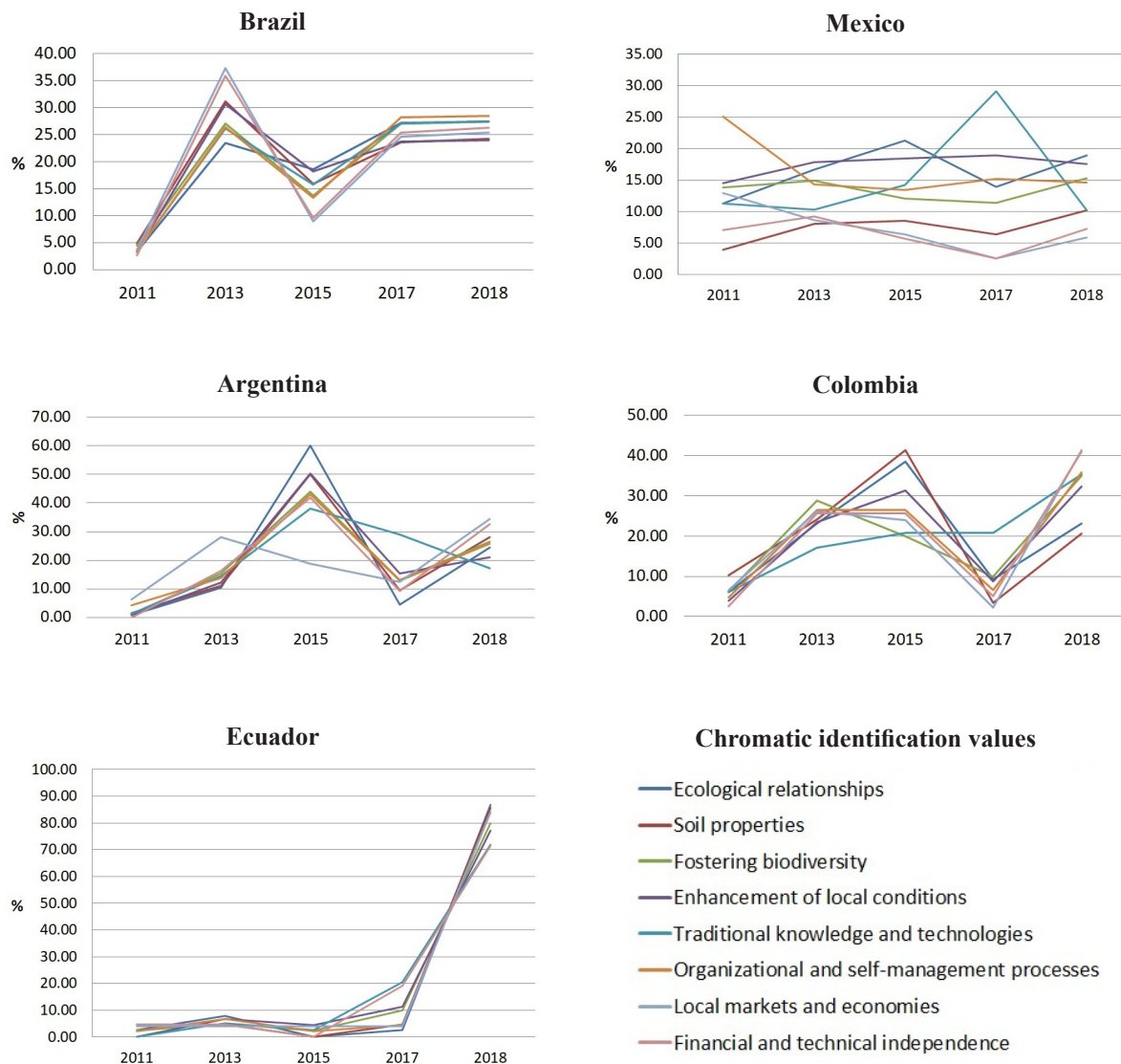


FIGURE 4 – Agroecological principles in 5 Latin American countries.
SOURCE: SOCLA (2011-2018).

then degraded until 2017, with the exception of “Traditional knowledge and technologies”. The other principles started showing an upward trend from 2017 onwards.

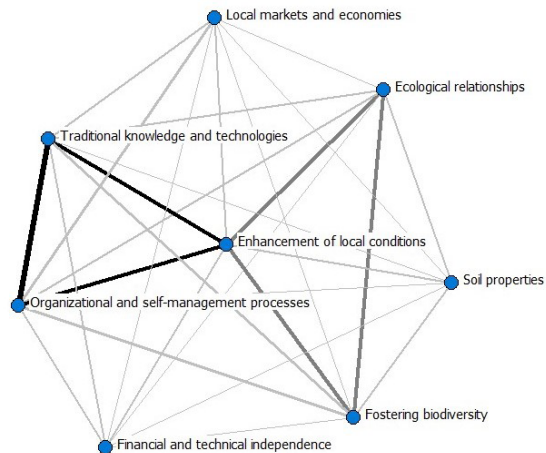
In Colombia, 67.40% of the references involved the following principles: “Organizational and self-management processes” (19.31%), “Enhancement of local conditions” (18.58%), “Traditional knowledge and technologies” (14.94%) and “Fostering biodiversity” (14.57%). The “Ecological relationships” and “Enhancement of local conditions” edaphological principles rose in their evolution from 2011 to 2015, to then decrease in 2017 and regain power in 2018. In turn, “Organizational and self-management processes” and “Financial and technical independence” were increased between 2011 and 2013, degrading in 2017 and rising in 2018. “Fostering biodiversity” decreased between 2013 and 2017, but rose in 2018. In turn, “Traditional knowledge and technologies” showed a constant increase during the period recorded (Figure 4).

In Ecuador, the main principles (61.41%) were as follows: “Enhancement of local conditions” (16.18%) and “Organizational and self-management processes” (16.18%), as well as “Fostering biodiversity” (14.71%) and “Traditional knowledge and technologies” (14.34%). Low performance was observed in the development of these precepts between 2011 and 2015. “Traditional knowledge and technologies” and “Financial and technical independence” rose from 2015 onwards. In a similar dynamics, they were followed by “Fostering biodiversity” and by “Enhancement of local conditions”. The other principles maintained a limited behavior, although a particular systemic behavior was observed from 2017 onwards: all the principles significantly increased their presence (Figure 4).

It is worth noting that the edaphological principle ranked last in the 5 countries.

3.4. Convergence among agroecological principles

The convergence of agroecological principles allowed expressing narrative co-occurrence structures. The “Indegree” and “Outdegree” categories (Wasserman & Faust 2013, p. 152) presented the “Enhancement of local conditions” principle as a connection node of the agroecological language, followed by “Organizational and self-management processes” and by “Traditional knowledge and technologies”. When expanding this reticular assumption as a narrative plateau, certain structural cluster was observed among the aforementioned principles, as well as an incipient structural cluster among “Enhancement of local conditions”, “Ecological relationships” and “Fostering biodiversity”, which allowed supposing a broader epistemological axis in the agroecological *agora* (Figure 5).



Agroecological principles	Outdegree	Indegree
Ecological relationships	2,229	0.000
Enhancement of local conditions	1,718	1,257
Fostering biodiversity	1,556	762
Traditional knowledge and technologies	1,245	1,346
Soil properties	824	317
Organizational and self-management processes	628	2,182
Local markets and economies	178	1,175
Financial and technical independence	0.000	1,339

FIGURE 5 – Networked clusters between agroecological principles.
SOURCE: SOCLA (2011-2018).

4. Conclusions

The glotopolitical field of agroecological principles is a space full of dialectic contingencies for the hegemonic control of the Agroecology biopolitical narrative. Their scientific definition is not sufficient to apprehend the structural complexity of the agroecological system, reason why there is the acknowledged need to devise complex agroecological thinking reservoirs.

There is shared concern about rescuing/preserving and constructing sustainable agroecosystems, although it responds to specific pulses in Agroecology. This hints to certain epistemological amplitude that dissociates the limits of the fields converging into it (but which also reasserts them), suggesting the following:

a) convergent Agroecology systems associated to a given epistemological mainstream, precluded

from apprehending the complexity inherent to the agroecological sociocultural variable; and

b) divergent Agroecology systems directly derived from the traditional peasant innovation and/or production areas.

In this sense, it was mostly observed that no experience is *100% agroecological*. The most common combination of principles encompassed from 1 to 3, whereas the least representative had 7 and 8 principles. This evidenced certain offset between the methodological interpretation and the agroecological reality. In this context, the “Promotion of organizational and self-management processes” principle was the most habitual across the regions analyzed, which was not the case with the edaphological systemic principle. This was intensified at the country level.

In some cases, the evolution of the agroecological narrative suggested a politically-driven process (Brazil and Argentina, although lacking evidence in this sense), whereas such narrative proved to be incipient in others (Colombia and Ecuador). In cases such as the Mexican, this dynamics showed greater dispersion and less planning, but with significant innovation levels. Such behaviors might be due to the asymmetric political development of some agroecological research and intervention areas, with some principles consolidating over others.

The inter-sectional systemic behavior corroborated the Structure–Connection principle and denoted the behavior of Agroecology when pre-creating and connecting with other foundational principles for its global scaling. Given this, we suggest considering the community-based and sustainable conjunction of the various principles, as well as apprehending Agroecology as a re-esta-

blished agro-*nomos*. Hence the importance of the cross-sectionality inherent to the Structure–Connection principle.

Derived from civilizational gnoseological cycles, Agroecology expresses the epistemological recombination/overlap of traditional agricultural systems (selection of seeds, domestication of cultivars, etc.) and, therefore, the agroecological principle of Fertilization permeated by peasant knowledge: peasant agricultural tools have been and are developed in complex agro-technological community-based systems that are dynamic and highly adaptable (each cultivar is a technology) and manage to provide food to most of the world population (e.g., corn, potato and manioc/cassava, which became basic food products for regions such as America, Africa and Europe). And it is in this path that formally educated scientists have implemented epistemological “expansions” of these peasant innovations (e.g., creole corn, hybrids, etc.), which although not always promising, comprise a reality of peasant agriculture systems. This would express a compound and ethnoecological-scientific epistemological principle and, on the other hand a “Community, integration and traceability” principle where two differentiated semantic strands (not exclusive of each other) are merged between peasant Agroecology and “scientific” Agroecology.

Each “mix” of agroecological principles is different according to the organizational level where it intervenes; the “Inter-sectionality and intertwining of sets of principles” precept is suggested, implying a differentiated formula/barrier of agroecosystemic complementarity, synergy and resilience. Some overlaps would involve edaphological, hydrological, eolic and energy balance principles.

In relation to this, the cross-sectional basic principle of Energy sustainability stands out: The peasant agricultural system is local, regional and transregional: through civilizational spaces and times, it has given rise to glocal agricultural/livestock processes that are translated into permanent, multiple and irregular information (energy) flow systems until constituting full and functional agroecosystems. It is a system that materializes and condenses itself into regenerative and heterogeneous polycultivars. This is the Agroecology fundamental aspect: being an instrument to glocally manage, recover and redirect the energy flow that the agroindustrial hegemon has channeled towards an extractive semantics called “Productivity”.

Such energy reconversion enables the “Agroecological glocal scaling” principle, but from a notion of communality and dispersion of the agricultural processes from the land plots themselves, as part of a regional continuum: the buffering system proposed is at the territorial and societal levels: the producers’ “land plots” are agroecological for managing a given sustainable production system, but mainly because it is part of a community, regional and territorial system that disseminates all aspects related to Agroecology.

This latter encompasses an intangible dimension of Agroecology as a social movement in two directions:

a) Its scaling implies an inclusion, social diversity and synthesis foundation: it combines vertical and horizontal processes in a specific territorial context whose relationships, process, public policies, institutions and social actors involved and benefited determine the scope of such scaling. In addition, this signals a less fictitious perspective of

the scaling principle: expansion and socialization of agro-productive accountability. If agriculture was a technological/community instrument that allowed civilizations to settle, it should be conceived as a community-based activity of all social sectors. This means:

b) the Agroecology principle of Civil responsibility. The food demand of large population-consumption centers implies transforming the extractive anthropotechnological semantics of Productivity into a community concept of sustainable agrifood consumption that can add energy and biotic reinvestment units to devastated ecosystems in order to find a specific recovery solution. This would imply an unprecedented, necessary and urgent systemic societal reconversion. The weight of agrifood should not only lie on the shoulders of those that had been historically, unfairly and unequally burdened with it, but also on the potentialities of the other actors of society. If Agriculture is a primary activity, it should be responsibility of all of us, as consuming citizens.

As a glocal structural loop, the Agroecology praxis implies a Delocalization principle: condensing agricultural/livestock production in peasant, complex and community units (rural and/or urban) to avoid the emergence of agroecological corporate “inventors” of Agroecology, who monopolize and concentrate traditional peasant knowledge. Otherwise, this would imply another marginalization level on traditional farmers: their history expropriated by “agroecological” corporate-academic actors.

In this context, the energy sustainability criterion should be maintained as a red line; hence, the emergence and need of the Degrowth principle, as a reaction to the economicist theological-chrema-

tistic obstinacy: Productivity = Economic Progress = Development = Accumulation. In addition, the “Promotion of local markets and economies” and “Financial and technical independence” principles should be monitored in order to prevent the financialization of Agroecology and the creation of conventional agrifood chains. Hence the importance of disconnecting Agroecology from the growing marginal trend of the conventional rural development benefit rate (“Growth”), considering it more as an energy preservation/recovery/recycling process towards sustainability of the social reproduction material base. Paraphrasing Maturana (1984), all of this would mean recovering the principle of Agroecology as an autopoietic system.

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