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POLITICAL ECOLOGY OF PANDEMICS IN LATIN AMERICA - INTERSECTIONALITY BETWEEN THEIR CAUSES, THE SOCIO-BIODIVERSITY, AND THE CURRENT AGRI-FOOD SYSTEM[1]

ECOLOGIA POLÍTICA DAS PANDEMIAS NA AMÉRICA LATINA - INTERSECCIONALIDADE ENTRE SUAS CAUSAS, A SOCIOBIODIVERSIDADE E O SISTEMA AGROALIMENTAR ATUAL

ECOLOGÍA POLÍTICA DE LAS PANDEMIAS EN AMÉRICA LATINA - INTERSECCIONALIDAD ENTRE SUS CAUSAS, LA SOCIOBIODIVERSIDAD Y EL SISTEMA AGROALIMENTARIO ACTUAL

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Abstract: The purpose of this article is to find intersectionality points between the theme of biodiversity and associated traditional knowledge, including the current agri-food system and the generation of pandemics and epidemics. To do this, we first present a theoretical framework that encompasses: a) the environmental precautionary principle, which differs from the environmental prevention principle; and b) the concept of *organized irresponsibility* found within the theory of the Global Risk Society from Ulrich Beck. An additional specialized literature review included the interface between the destruction of terrestrial ecosystems and the COVID-19 pandemic. Next, we address how the current agri-food system threatens socio-biodiversity, and more especially, the traditional knowledge

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that is linked to biodiversity, and how both are related to the pandemic. Thirdly, we seek to identify the main aspects—from a political ecology perspective—related to and relevant to the problem discussed. Finally, the intersectionality of the three elements is explicitly unveiled.

Keywords: Intersectionality; Traditional knowledge; Agri-food system; Political ecology; Pandemics.

Resumo: O objetivo deste artigo é encontrar pontos de interseccionalidade entre o tema da biodiversidade e os conhecimentos tradicionais associados, bem como o do sistema agroalimentar atual e a geração de pandemias e epidemias. Para tanto, inicialmente é trazido à tona o referencial teórico do artigo. Este é composto por: a) o princípio ambiental da precaução, que se diferencia do princípio ambiental da prevenção; e b) o conceito de irresponsabilidade organizada presente na teoria da Sociedade de Risco Global de Ulrich Beck. Feito isso, e apoiado em revisão bibliográfica especializada, apresenta-se a interface entre a destruição dos ecossistemas terrestres e a pandemia da COVID-19. Em segundo lugar, procura-se perceber como a sociobiodiversidade (especificamente o conhecimento tradicional associado à biodiversidade) é ameaçada pelo atual sistema agroalimentar e o que ambos têm a ver com a questão da pandemia. Em terceiro lugar, identificam-se os principais aspectos – a partir da perspectiva da ecologia política - relacionados e relevantes para o objeto em questão. No final, a interseccionalidade dos três elementos colocados em cena é explicitamente desvendada.

Palavras-chave: Interseccionalidade; Conhecimentos tradicionais; Sistema agroalimentar; Ecologia política; Pandemias.

Resumen: El objetivo de este artículo es encontrar puntos de intersección entre la cuestión de la biodiversidad y los conocimientos tradicionales asociados; así como el sistema agroalimentario actual y la generación de pandemias y epidemias. Para ello, se esboza en primer lugar el marco teórico del artículo. Este consiste en: a) el principio ambiental de la precaución, que difiere del principio ambiental de la prevención; y b) el concepto de irresponsabilidad organizada presente en la teoría de la Sociedad del Riesgo Global de Ulrich Beck. Luego, y con el apoyo de una revisión bibliográfica especializada, se presenta la interfaz entre la destrucción de los ecosistemas terrestres y la pandemia COVID-19. En segundo lugar, se intenta comprender cómo la sociobiodiversidad (concretamente los conocimientos tradicionales asociados a la biodiversidad) se ve amenazada por el actual sistema agroalimentario y qué tienen que ver ambos con la cuestión de la pandemia. En tercer lugar, se identifican los principales aspectos -desde la perspectiva de la ecología política- relacionados y relevantes con la cuestión que nos ocupa. Al final, se

desvela explícitamente la interseccionalidad de los tres elementos puestos en juego.

Palabras clave: Interseccionalidad; Conocimientos tradicionales; Sistema agroalimentario; Ecología política; Pandemias.

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1 Introduction

To deepen the recommendation to consider the interrelationship and interdependence of the problems and causes of the ecological crisis, the analysis of the situation of vulnerability of the genetic heritage[4] (GH) and traditional knowledge associated with biodiversity (TK) demands that we do so also in the sphere of the possible causes of the COVID-19 pandemic crisis.

This is because there are a growing number of studies pointing to a possible relationship between the increase in epidemics and pandemics and the agri-food system that negatively impacts biodiversity and, consequently, the traditional knowledge associated with it. In other words, indicating that the pandemic had the dimension it had, due to the existence of other crises, with emphasis in this work on the environmental one.

To take this path, the present work uses the environmental precautionary principle, which is guided by the idea that a lack of certainty or scientific evidence on a given issue should never serve as a justification for not adopting measures to protect the environment.

In this sense, if the environmental principle of prevention addresses a concrete risk, one that is notorious or scientifically proven, the

[4] Using the definition of Brazilian Law No. 13,123 of 2015, genetic heritage refers to "information of the genetic origin of a plant, animal, microbial or species of another nature, including substances arising from the metabolism of these living beings". (BRAZIL, ACT 13,123/2015, *our translation*)

environmental principle of precaution, on the other hand, refers to the risk in the abstract, thus promoting actions *in dubio pro Natura*.

Thus, precaution is care (*in dubio pro securitate*) and is related to intergenerational and transtemporal security (DERANI, 1997). From this premise, the author points out that one must take into account not only the notorious risks, already known by the scientific community, but also those future ones, "which our understanding and the current stage of development of science can never capture in all its density". (DERANI, 1997, p. 167)

And it is precisely for this reason that, in the present work, we choose to expose a position, based on the environmental principle of precaution, even though such a position cannot, in the current scenario of available scientific knowledge, be proved absolutely, relying only on indicative studies that corroborate the hypothesis raised.

Therefore, this principle, associated with the theory of the Risk Society from Ülrich Beck (2002) will constitute the support anchor for the argument defended here.

On this horizon, despite the fact that vaccination has proven to be essential in dealing with the pandemic, it cannot be forgotten that treating only the consequences of a given problem without paying attention to its causes is an unjustifiable mistake.

In this context, although there are more and more studies on the current scene regarding the COVID-19 pandemic, it is worth mentioning that for more than a decade there have been studies indicating the existence of a relationship between the ecological crisis and the emergence of epidemics and pandemics. It is only that, perhaps, they have not gained as much notoriety as the studies of today. As an example, the

international organization GRAIN[5] had already published, in 2008, the warning:

> The world is undergoing major changes with regard to global animal diseases. We are moving towards more diseases, more deadly types of diseases and more capacity to spread these diseases. There is **also an increased likelihood of the emergence of zoonotic diseases and global pandemics.** However, the **international response to this situation so far has largely failed to reflect the gravity of the crisis**. The fault lies in the **reluctance of governments to confront the dominant powers** of industrial animal husbandry - be it the pharmaceutical companies and their patents or the industrial meat corporations and their **industrial farms**. If there is an upside to this bleak prognosis, it is that **solutions are at hand: local food production systems**, which continue to feed and provide livelihoods for billions of people around the world, are our best defense against this emerging disease crisis**. These systems need support and it is vital that they begin to take their place in international thinking** on disease control. (GRAIN, 2008, p. 25, *our translation, our highlights*)

As for recent studies, the Spanish researcher Patrícia Manrique, for example, who collaborated with the collective work entitled *Wuhan Soup - contemporaneous thought in pandemic times* (2020*)*, is one of the several authors *who will be mentioned in this article, who understand that zoonoses represent "a dis*placement of diseases between animals and humans that occurs in environments with **less and less diversity**". (MANRIQUE, 2020: 159, *our translation, our highlights*)

In this sense, the degradation of natural ecosystems, which leads to the loss of biodiversity and TKB[6], and the pandemic must be approached in a holistic context that considers the interrelationships between them. And, although it is possible to point out which of the crises is more irreversible than the other, choosing which one is more serious would not be the best method of approaching the problem.

Because the question is not about choice but about how an integrated analysis is able to bring more faithful results. Even so, it is in the

[5] A small international non-profit organization that works to support small farmers and social movements in their struggle for community-controlled, biodiversity-based food systems. For more information, see: https://grain.org/en/pages/organisation

[6] As indicated before, TKB stands for "Traditional Knowledge Associated with Biodiversity".

context of the system itself that the real cause of all these crises, namely, their interrelationship, remains almost imperceptible or even inaccessible to the eyes of societies.

In this sense, polarized debates do not lead to facing the epicentre of the issue, which is found in the fact that everything is part of a system that is mutually related. In this regard, Boaventura de Sousa Santos observed:

> [...] while the **pandemic crisis** can somehow be reversed or controlled, the **ecological crisis** is already irreversible and now it is only necessary to try to mitigate it. But **even more serious is the fact that the two crises are linked**. The coronavirus pandemic is one manifestation, among many, of the model of society that began to impose itself globally in the 17th century and is now reaching its final stage. This is the model that is leading humanity into an ecological catastrophe today. One of the essential characteristics of this model is the unlimited exploitation of natural resources. This exploitation is fatally violating humanity's place on planet Earth**. This violation translates into the unnecessary death of many living beings of Mother Earth, our common home, as defended by indigenous peoples and peasants all over the world**, supported today by ecological movements and ecological theology. This violation will not go unpunished. Pandemics, like the manifestations of the ecological crisis, are the punishment we suffer for such violations. **This is not Nature's revenge. This is pure self-defence**. The planet has to defend itself to guarantee its life. **Human life is a tiny part (0.01%) of planetary life to be defended**. (SOUSA SANTOS, 2020a, p. 22, *our highlights*)

This recognition is what leads, therefore, to the challenge of refusing to put one crisis in front of another, but rather to promote an analysis of how they relate. Thus, while the immediate[7] priority when confronting a pandemic or epidemic must be to protect people from the virus that causes them, as well as to treat those infected, the long-term response must take into account such interdependence between crises so that new ones do not arise.

This form of analysis leads to considering the context of Global Change that occurs on the planet, a term used to refer to the fact that there is no need to talk, for example, only about climate change—a term that became most notorious when we think about the environmental

[7] Considering here the period in which this work was written, during the COVID-19 pandemic.

issue— but rather to a whole context of changes on a planetary scale that encompass, in addition to the climate issue, other aspects as well, such as the loss of biological and cultural diversity.

Therefore, there is no need to prioritize one theme over the other, as interrelationships and interdisciplinarity are inherent, like environmental themes. For example, even if a paper proposes to focus more on the theme of biodiversity, at certain times it inevitably makes reference, for instance, to the issue of climate change. Or to the theme of the current agri-food system when talking about biodiversity, socio-diversity, and health crises.

Thus, what is highlighted is just the need not to lose sight of the fact that, in the analysis of a given topic, it is necessary to consider, when necessary and even tangentially, aspects of the other. By the way, considering the analysis of issues related to biodiversity in many instances in an integrated way is what Jussara Carvalho, International Advisor for Climate Change of the State Secretariat for the Environment of São Paulo, for example, recommends. (MUDANÇAS CLIMÁTICAS, 2020)

In this sense, the purpose of this article is clear: to find intersectionality points between biodiversity and associated traditional knowledge, the current agrifood system, and the generation of pandemics and epidemics.

To do this, initially, the theoretical framework that supports the argument defended will be brought to the fore. This does not mean that the underlying theoretical framework is concentrated only on the aforementioned initial item, since throughout the entire article we seek to dialogue with different theories and authors about the facts discussed dynamically. The theoretical framework that is initially presented refers to a theory and a basic principle that can be taken as a foundational background throughout the reading of the article.

Then it will establish an interface between the destruction of terrestrial ecosystems and the COVID-19 pandemic. Second, the

relationship between the current agri-food system and sociobiodiversity will be explored, along with how they both relate to the pandemic issue.

In the sequence, the main political aspects related to the issue at hand will be identified, and after that, some consideration will be given to the controversial call for a possible ban on the consumption and sale of wild animals.

At the end, in the concluding note, the intersectionality of the three elements placed in the scene is explicitly unveiled.

1 Theoretical framework guide to the argument defended

The theoretical framework that supports the argument defended here is divided into two parts: the first one will explore axiologically the environmental principle of precaution; the second moment will resort to Ulrich Beck and his theory of the risk society to collect elements of the concept brought by the author of the "organized irresponsibility between science, politics, and law" that corroborate the arguments presented in this article.

1.1 The precautionary environmental principle

Concerning the environmental principle of precaution, the most direct and initial way of explaining it is to draw a quick distinction from the environmental principle of prevention.

This is because the principle of prevention addresses the concrete risk or danger, that is, it is prevented because the causal nexus is known, well-known, or; proven; it is known what consequences may come with the beginning of a certain activity.

On the other hand, the meaning of the precautionary principle is very different, which addresses *risk in the abstract*, that is, when there is a lack of scientific certainty as to the harmful potential of the activity. However, *the precautionary principle is centered on the idea that such uncertainty cannot be used as a reason for postponing the adoption of measures to protect the environment*.

As Paulo Afonso Leme Machado (2005) observes, the precautionary principle (anticipated caution) is not intended to paralyze human activities. Rather, it intends to defend an existence with dignity (with health and quality of life).

In the perspective mentioned above, the precautionary principle addresses risks that have not yet been proven, and the principle must always be observed when the characteristics of a certain action represent, by their nature, a technical or scientific uncertainty with regard to its harmful potential to the environment or human health.

Examples of abstract risks are many, such as those referring to the use of genetically modified organisms (GMOs) and, in the present work, the question of the relationship between environmental degradation and the generation of new epidemics and pandemics. There is unresolved scientific uncertainty about the potential for harm to human health, both in the present and in the future.

Nevertheless, the precautionary principle defends an early action following the maxim *in dubio pro Natura*, even if it is an abstract risk, not scientifically proven.

As in the principle of prevention, it also refers to acting in advance, to prevent possible damage to the environment. While there is no scientific certainty about the harmful potential of a certain activity or conduct, precaution is imposed as a measure to avoid significant damage to both human health and the environment itself, whose humanity inevitably depends on it for its maintenance on the planet.

For Paulo Afonso Leme Machado (2005), the precautionary principle guarantees temporary security (since it lasts as long as scientific uncertainty lasts) and proportional security (there must be an adequacy between the intended end and the means used) that allows us to rethink progress by recognizing uncertainty, unpredictability, since on many occasions it can be urgent to wait.

Thus, the precautionary principle underpins and axiologically grounds some decisions and actions, even though these cannot be based on scientific certainty.

For Machado (2005), this extension of the State's responsibility is justified by the fact that, in the event of any damage to the environment or human health in the future, and the State having previously failed to take precautionary measures, it will be co-responsible.

In another turn, at this moment we move on to the theoretical lines of the global risk society, indicating how they corroborate the argument in this article.

1.2 The concept of *organized irresponsibility* in Beck's global risk society

Ulrich Beck's theory of risk society, developed in his book "The Global Risk Society," provides the fundamental theoretical framework for the concept of organized irresponsibility (between science, politics, and law[8]) used in this paper. First, it is important to emphasize how the author differentiates the risks of the pre-industrial society from those of the risk society. These originate in the decision-making process of industrial utility, which generates techno-economic advantages, and this decision-making is

[8] For example, consider the phenomenon of judicialization with an ambivalent character, that is, the creation of laws with interests contrary to those that they should protect. To deepen this point, see: VILLAS BÔAS FILHO (2016).

never in the hands of individuals but in the hands of organizations and political groups. The risks of the risk society are characterized by not being limited in time and space and also by the fact that they cannot be compensated.

For the author, the risks of today's society, in addition to not being limited in time and space, assume decisions of industrial utility, in other words, techno-economic ones. Looking back at the present work, decisions related to the current agri-food system could be included here (massive use of antibiotics in uniform animals raised in confinement; commodity monocultures in Latin America, concentration of land in large states, and deforestation for animal feed)

These risks are therefore born in the previous decision-making processes of political groups and organizations, so they are never in the hands of individuals. These risks are therefore beyond the control of society. Furthermore, society is often unaware that they are exposed to these risks, as they are invisible to the eyes of uninformed citizens. (BECK, 2002)

For the author, such risks cannot be calculated by the mathematical sciences because, in this way, they can be underestimated, facilitating or stimulating the exploration of markets.

An aspect that is important to highlight is that this invisibility of risks to the greater part of society is associated with the concept of Organized Irresponsibility.

The “organized” character of this lack of responsibility – existing both in the realm of science, politics, and also in law, and in the relationship that sometimes exists between the three – concerns the silence that exists regarding the destructive risk of certain techniques. and practices, and to the systematic disinformation disseminated by interest groups that seek to alleviate the problem of risks, both through the concealment and distortion of information and the existing negative effects. (BECK, 2002)

Thus, the “organized irresponsibility” between science, politics, and law occurs precisely to do a kind of “aesthetic make-up”, let’s say, in the inadequacy of the actions of these spheres in facing and controlling current risks, causing these institutions to act only symbolically, revealing a sense of normality and security that do not correspond to reality. (BECK, 2002)

Therefore, a significant number of technologically induced dangers, such as those associated with chemical contamination, atomic radiation, and genetically modified organisms, end up being inaccessible to the human senses. (BECK, 2002)

This article adds to the list of examples that can be inserted here, the question of the risks brought by the current agri-food system and the possible relationship that this may have with the emergence of new epidemics and pandemics.

> The main socio-historical and political potential of ecological, nuclear, chemical and genetic dangers resides in the collapse of administration, in the collapse of techno-scientific and legal rationality and in the political-institutional security guarantees that these dangers mean to everyone. This potential lies in the unmasking of the existing anarchy that has developed from the denial of the social production and management of mega-hazards. (BECK, 2002, p. 89, *our translation*)

Furthermore, it should be noted that, according to Beck, the invisibility of risks also has as one of its objectives precisely to avoid participation, since only when properly informed do people tend to comment on some point and, consequently, want to participate.

The phenomenon of organized irresponsibility occurs, according to Ulrich Beck (2002, p. 105), when, to “do the make-up” of the inadequacy of the political, scientific, and legal spheres in facing and controlling the risks existing in today's society, these institutions - that is, the institutions from the political, scientific, and legal sectors - begin to act symbolically,

revealing normality and security that do not correspond to the purposes normally expected of such states (of normality and security).

One of the points that Beck highlights here is the lack of disclosure, either through silence or through systematic disinformation, on the part of the institutions, of the risks of certain techniques approved by them, whose consequences end up reaching groups devoid of power.

This point is also related to the theme of this article because, here, it is understood that - in the list of points highlighted by Beck - the issues of lack of proper disclosure of the risks of the current agri-food system could be inserted, as well as that the intensive deforestation that is part of such a system ends up reaching groups without power (in this case, indigenous peoples and traditional communities).

The issue of the lack of disclosure of the risks of the current agri-food system to society and the speculation about the potential risk of generating new epidemics and pandemics is addressed by authors such as Wallace et al (2020), and brought up in the next item of this article.

In conclusion to this topic, it is said that organized irresponsibility, aimed at meeting economic and political interests, operates subtly, at the mercy of pressure from interested groups, far from the participation of groups devoid of power, and presents relentless results.

To combat such organized irresponsibility, the dissemination of information, to allow awareness, opinion formation, and consequent action, is essential both for the risks to become more perceptible in the eyes of society, as well as, about the legal aspect, to combat the formation of laws contrary to the interests they should protect, on the contrary contemplating the interests of those who are precisely behind this organized irresponsibility (power groups). The emergence of this type of law is frequent both in the indigenist field and in the agri-food field.

2 Interface between the destruction of terrestrial ecosystems and the covid-19 pandemic

Moving through the most recent doctrinal understandings that have been working on the burning theme of the aforementioned interface, first it is mentioned that the Italian sociologist Raffaele di Giorgi (2020), professor at the *Università degli Studi di Lecce*, contacted by the student in an online[9] question in a virtual meeting held during the pandemic, entitled *The global society: Italy, Brazil and the World at COVID-19.*

Asked about the existence of a link between the destruction of terrestrial ecosystems and the COVID-19 pandemic, the Italian author expressed his understanding in the sense of agreeing that there is such a relationship.

In the same sense, Boaventura de Sousa Santos (2020b), in a live meeting[10] organized by the University of São Paulo (USP) during the pandemic, expressed his position that more attention has to be paid to the causes of the COVID-19 pandemic once there is a tendency to focus practically only on its consequences. Thus, if this change of focus is not made, there is a significant risk that the planet will face intermittent pandemics, that is, a sequence of pandemics.

As a result, he shared his understanding that the causes of the generation of this pandemic as well as epidemics are precisely the degradation of habitats and the consequent erosion of biodiversity, citing the case of degradation and deforestation in the Amazon as an example.

From there, the research continued both with the reading of recently published books[11] and scientific articles as well as with the follow-up of

[9] Held on 03.26.2020, by the Zoom application, under the moderation of Prof. Ney Bello (UNB). Meeting ID 955.356.104

[10] Participation in the Science, Education, Equity and Survival Colloquium (in the post-pandemic world), organized by the University of São Paulo (USP), via live on the Zoom platform, on 07.18.2020

[11] Such as The cruel pedagogy of the virus, by Boaventura de Sousa Santos (2020a) and The soup of Wuhan – contemporary thought in times of pandemics, by AGAMBEN et al. (2020).

some virtual meetings promoted by the Latin American Council of Social Sciences (CLACSO), with the *Serie de Conversatorios sobre Ecología Política de las Pandemias* (2020).

Such analysis of the biodiversity and pandemic interface is guided by the holistic conception of the environment and the interrelationship of civilizing problems, which points to the need for another way of imagining the planet and Nature, defended by indigenous people, some traditional communities and by the author of the Epistemologies of the South Sousa Santos (2020a, p. 32), who elucidated this relationship:

> for the last forty years, we have lived in quarantine, in the political, cultural, and ideological quarantine of a capitalism closed in on itself and in the one of the racial and sexual discrimination without which it cannot subsist. The quarantine caused by the pandemic is after all a quarantine within a quarantine. **We will overcome the quarantine of capitalism when we are able to imagine** the planet as our common home and **Nature as our original mother** to whom we owe love and respect. **She doesn't belong to us. We belong to it**. When we overcome this quarantine, we will be more free from quarantines caused by pandemics. (*our translation*)

In this sense, to achieve a greater understanding of the relationship between biodiversity, the agri-food system, and pandemics, it is important to deepen the debate through the consulted authors to provide a brief and introductory contextualization about the interdependent and interrelated nature of the question.

To open the debate, we use the insights of Silvia Ribeiro (2020 a, b), Uruguayan intellectual living in Mexico, the first editor of *Revista Latinomerica Biodiversidad, Sustento y Culturas* and Latin American director for the ETC Group, a group that monitors the impact of emerging technologies and corporate strategies on biodiversity, agriculture, and human rights.

In the author's understanding, the crisis caused by the COVID-19 pandemic, having highlighted the fragility of the system, led to a break with what was conceived as normality. Here, she points out a central aspect

of the industrial agri-food system, ranging from seeds to supermarkets, which, in her view, has a fundamental contribution to the generation of epidemics and pandemics, due to the increase, especially in the last 20 years, of massive industrial animal husbandry in confinement, which she calls “virus factories”.

She points out that there are a very significant number of uniform[12] animals in poor condition, confined, and that for this reason, they have a weakened immune system, added to the massive use of antibiotics for fattening.

The problem at hand is that, while research findings to date have not identified with absolute certainty which particular[13] intermediate animal of the novel coronavirus is, studies[14] have indicated that certain animals, like pigs, are susceptible to becoming intermediate hosts of novel, dangerous pathogens, including various coronavirus types. That is, although it cannot be said with precision, due to a lack of scientific evidence, that the model of industrial animal husbandry is the cause of the COVID-19 pandemic, it can be said that there is susceptibility in the form of industrial animal

[12] In this regard, Eric Fevre, head of the veterinary infectious diseases sector at the University of Liverpool, explains: “By choosing the best dairy cows, the best cattle cows, or the best laying hens, we create populations of animals that generally live in intensive conditions, where genetics is very similar. This creates risks for disease outbreaks, because if these large genetically uniform populations are susceptible, things can spread very quickly.” (THE GUARDIAN, 2020).

[13] For the GRAIN Organization, “In research conducted on wild and domestic animals in China and in animal susceptibility studies to Covid-19, no obvious candidate for an intermediate host between bats and humans emerged — a step that many scientists believe was necessary in the evolution of the virus. In our previous article, we argued that it would be important to investigate pigs in this regard. Since then, two studies that subjected animals of the species to doses of SARS-CoV-2 concluded that there was no infection by the disease in the individuals studied. However, it would be important to interpret these studies with caution, as they were not conducted with the initial strain of the disease that likely made the leap from animals to humans. It is necessary to continue research on the population of pigs and other intensively bred species in China. We maintain our conviction that industrial animal husbandry should be treated as one of the most important sources of new dangerous pathogens, including different types of coronaviruses, in addition to deforestation and our increasing encroachment on the habitats of bats and other wildlife.” (2020, GRAIN, available at https://grain.org/en/article/6437-new-research-suggests-industrial-livestock-not-wet-markets-might-be-origin-of-covid-19 Access on 07.20.2020

[14] According to the GRAIN Organization (2020), "These threats are highlighted in a scientific research published recently with updates for a period of three years regarding the emergence of new types of enteric coronaviruses in pigs in China (known generically by the acronym SeACoV)". For further details and location of some studies already available on the subject, see the page where the GRAIN fragment was taken: https://www.grain.org/pt/article/6439-novas-pesquisas-sugerem-que-a-criacao-industrial-de-animais-e-nao-os-mercados-umidos-pode-ser-a-origem-do-covid-19 For access to the scientific research mentioned by GRAIN in the fragment above transcribed in quotation marks, referring to the emergence of new types of enteric coronaviruses in pigs in China (generally known by the acronym SeACoV), click on: https://jvi.asm.org/content/93/24/e01448-19 Both pages, accessed on 16.06.2020

husbandry that exists in the current agri-food model for the generation of new epidemics and pandemics.

Ribeiro (2020a) notes that the existence of a large number of confined uniform animals must be analyzed in conjunction with the fact that more than 75%[15] of the planet's agricultural land is either destined to produce food for animals or is land destined for industrial breeds and pasture for animals. Citing as an example the transgenic soy from Argentina, much of the transgenic corn produced in the world, and 60% of the grains and cereals produced on the planet are destined to feed confined animals.

3 When sociobiodiversity is threatened by the current agri-food system: what do both have to do with the pandemic issue?

All this destruction of natural habitats that underlies this system includes the dispossession of indigenous and peasant lands due to the advance of the agricultural frontier, which causes these societies to move from their places of origin, the same occurring with animals.

At this point, it is opportune to turn to the famous Brazilian anthropologist Viveiros de Castro (2014), who makes an interesting observation, with its peculiar and very welcome emphatic intonation, regarding the phenomenon in the Amazon, a biome that involves several countries in Latin America and holder of a rich socio-biodiversity:

> The 100 or more centuries of Indigenous presence in the Amazon gave us gifts such as Brazil nut, peach palm, cocoa, babassu, cassava, rubber, dozens of hardwood species, clean and abundant waters, rich fauna, and a variety of other components of the tropical economy. It is not by burning millions of hectares of forest to plant soy or pasture, stealing thousands of cubic tons of wood from the beards of inspection agents, or polluting entire rivers with mercury from the mines that the Amazon will "develop". At this moment,

[15] Information is available in Ribeiro, 2020a, as well as given during the event "*Serie de conversatorios virtuales «Ecología política de las pandemias». Tercer encuentro: Luchas y horizontes eco-comunitarios en tiempos pos-covid"* (2020)

> when the soy mega-plantations are approaching Santarém (PA) or transforming the Xingu Indigenous Park into a green island surrounded by an ocean of straw soaked with pesticides, it seems that it is time to stop and think. (*our translation*)

Returning to Ribeiro (2020 a; b) the author understands that viruses of zoonotic origin, that is, those that originate in wild animals, end up reaching other places because these wild animals had to leave their habitats due to their destruction, mainly due to deforestation and consequent destruction of biodiversity. Emphasizing here that *according to the FAO and the UN, up to 70% of deforestation in Latin America—stressing that this is a conservative figure— is due to the expansion of the agricultural frontier. In Brazil, this percentage reaches up to 80%, also resulting from livestock and agriculture*.

This perception, in her understanding, has an essential character as a justification for the need for changes in this food production system, as she understands that it has not only contributed to the emergence of this pandemic but is also creating new ones at the same time.

In addition to the relationship with epidemics and pandemics, but still directly related to the current agri-food system that causes the erosion of biodiversity, she brings information from the WHO. According to the organization, more than seventy percent of deaths on the planet are related to diseases that have a direct connection with the aforementioned system, such as obesity, diabetes, heart disease, and cancers of the digestive tract. This fact has made it clearer that it is increasingly necessary to add elements to the analysis of how the increase in the agricultural frontier, destroying habitats and, consequently, biodiversity, involves and affects everyone.

The Argentinean Maristella Svampa (2020), professor at the Universidad de la Plata, also shares the same line of comprehension, understanding that society is facing a great crisis that shows the exhaustion of a type of globalization, neoliberal, and also emphasizing the

obturation, on public agendas and most of the media, of the real origin of this crisis.

Even though the zoonotic origin of the virus is presented, its relationship with socioenvironmental devastation and as a consequence of sociobiodiversity is not presented in these same media.

The Indian environmental activist Vandana Shiva (2020) also draws attention to this relationship between the destruction of ecosystems – and as a consequence of biodiversity – and the emergence of diseases, including epidemics and pandemics:

> **Science tells us that by encroaching on forest ecosystems, destroying species' habitats**, and manipulating wildlife for profit, we create the conditions for new illnesses. Over the past 50 years, 300 new pathogens have emerged. It is known that about 70% of human pathogens, including HIV, Ebola, influenza, Mar, and Sars, arise when forest ecosystems are invaded and viruses are transmitted from animals to humans. When animals are cornered on industrial farms to maximize profits, new diseases like swine and bird flu spread. (SHIVA, 2020, *our highlights, our translation*)

The author also raises other important elements, such as the fact that the failure to consider the rights of other species, as well as those of farmers, Indigenous peoples, and women, is related to the problem of their extinction and disappearance. This would be at the root of both this and other pandemics, which will certainly ensue if the illusion of the possibility of unlimited growth, in constant violation of ecosystems, is not altered.

Therefore, when suggesting one of the possible solutions, the author invokes Gandhi's Swadeshi philosophy, based on the idea of local manufacturing, in the sense of a modification in the food production system, citing as an example the work of the NGO Navdanya and its defense of the use of local, biodiverse and organic foods.

In this horizon of ideas, Wallace et al (2020) explain that many pathogens originate at the frontiers of capital production, arguing that zoonotic pathogens will be the more exotic, the greater the deforestation frontier. In this sense, they point out that “ecosystems in which such 'wild'

viruses were in part controlled by the complexities of the rainforest are being drastically reduced by capital-led deforestation". (WALLACE et al., 2020, *our translation*)

The authors understand that, although not intentionally, the way of raising animals is based on actions that corroborate the increase in the danger and transmissibility of viruses, contributing to monocultures – both plants and animals[16] with nearly identical genomes. This would contribute to the pathogenic agents evolving more quickly due to the uniform immunological genotypes of the hosts[17].

In this sense, they understand that the origin of both COVID-19 and other diseases lies in the field of ecosystem relations, with agribusiness having a large share of responsibility. However, such news is blocked by the forces of capital, to their own advantage. A warning to note is that if this situation does not change, society will likely face another deadly pandemic in much less time than the interval of a century since the last one, which occurred in 1918 (which became known as the Spanish flu).

Wallace (2020), one of the authors of the aforementioned study, was asked in an interview with a German magazine about the changes to be made to reduce the appearance of new virus outbreaks, to which he replied:

> **Food production has to change radically**. Farmer's autonomy and a strong public sector can **curb environmental devastation** and the spread of infections (...) Subsidize price support and consumer purchasing programs that **support agroecological production**. Defending these experiments (...) from the threat of state repression directed by capital. (...) Highly capitalized food production depends on practices that endanger all humanity, in this case, helping to trigger a new deadly pandemic. We should demand that food systems socialize in such a way that such dangerous pathogens do not show up. This will require reintegrating food production with the needs of rural communities in the first place. This **will require agroecological practices that protect the environment** and farmers while producing our food. In general, we must **heal the**

[16] Here it is worth bringing again an explanation previously used, by Eric Fevre, responsible for the veterinary infectious diseases sector at the University of Liverpool: "By choosing the best dairy cows, the best bovine cows or the best laying hens, we raise populations of animals that generally live in intensive conditions, where the genetics are very similar. This creates risks for disease outbreaks, because if these large genetically uniform populations are susceptible, things can spread very quickly." (THE GUARDIAN, 2020)

[17] For more details on this topic, see: Wallace et al. (2020).

> **metabolic disruptions that separate our ecology from our economy** (2020, *our emphasis, our translation*)

4 Main aspects - from a political ecology perspective - related to the issue at hand

Considering the reasons that are being identified as generators of epidemics and pandemics, it is urgent to include in them the political aspect, which indelibly influences environmental, economic, and agrarian policy decisions, to mention those that are most closely related to the theme addressed.

Citing as an example only the Brazilian case, as it is the most significant reference among so many in the sense of explicitly meeting the interests of agribusiness in total disregard for nature, Indigenous peoples, and traditional communities[18], we resort to the doctrine of the intellectual and Indigenous leader Ailton Krenak, who very well commented in 2020, on the role of the Brazilian former president Jair Bolsonaro in the face of the pandemic:

> The President of the Republic said the other day that Brazilians dive into the sewer and nothing happens. What we see in this man is the exercise of necropolitics—a decision to kill. It's a sick mindset that is taking over the world. And now we have this virus, an organism on the planet, responding to this sick thinking of humans with an attack on the unsustainable way of life that we have adopted by free choice, this fantastic freedom that everyone loves to claim, but no one wonders what the price is. (...) What is happening is terrible, but society needs to understand that we are not the salt of the earth. We have to abandon anthropocentrism; there is a lot of life beyond us, and we are not lacking in biodiversity. On the contrary,. From an early age, we learn that there are lists of endangered species. As these lists grow, humans proliferate, destroying forests, rivers, and animals. We are worse than COVID-19. This package called humanity is being taken off in an absolute way from this organism, that is, the Earth, living in a civilizational abstraction that suppresses diversity and denies the plurality of forms of life, existence, and habits. (KRENAK, 2020: 27, *our translation*)

[18] We cannot fail to mention, in Brazil, the choice of ministers who are contrary to what they should protect, referring here to actions and attempts at actions contrary to the environment and education expressed by ministers of the environment and education, as elucidated by the video of the April 22 ministerial meeting whose release to the public was authorized by the Supreme Court (STF). To see the video CNN (2020).

It could be said that the most relevant political factors to be pointed out here, following the example of the Brazilian case mentioned above, are often related to political leaders who favor the economic interests of agribusiness in the States, to the detriment of the socioenvironmental agenda, through, for example:

- Policies that prevent deforestation inspection, which results in the eradication of habitats for biodiversity and the expansion of agribusiness and other activities on Indigenous lands, thereby forcing the TK holders to lose territories that are vital to their physical and cultural survival;
- Policies contrary to the rights of Indigenous peoples, such as the lack of demarcation of territories;
- Policies that encourage the monoculture of agricultural products (usually raw materials for export, like soy), the extensive use of pesticides, and the concentration of land in large estates used for the production of these commodities for export as well as animal feed, to the detriment of other forms of food production that are local, less genetically uniform, and involve less concentration of land and pesticides, like permaculture and agroecological production;
- Lack of incentives for the creation of another type of agri-food system, the autonomy of farmers, and consumer purchase programs that support agro-ecological production and other types of local, socio-environmentally responsible production.

All these activities could potentially cause the death of associated traditional knowledge[s] of indigenous peoples and traditional communities in Latin America because they are related to obstacles to the survival of these social groups themselves.

This is extremely harmful precisely because nowadays it is already undeniable, even scientifically, that the knowledge of these social groups is

essential to seeking alternative[19] ways of maintaining the socio-ecological process that sustains life on Earth and protects biodiversity**.**

Remembering that, as analyzed, causes feedback from the consequences. For example, the generation of epidemics and pandemics due to the degradation of habitats caused by a model that favors agribusiness, which in itself already causes the death of Indigenous peoples due to the increase in the deforestation frontier, also ends up taking the very result of this system (COVID-19) into Indigenous territories— inside them —and again causing the death of "living libraries" of oral traditional knowledge.

5 About the call for a possible ban on the consumption and sale of wild animals: some considerations

On a different level, the political factors related to the issue of socio-biodiversity, as well as the impacts of large-scale uniform animal husbandry— both in confinement and cattle in pastures— and the consequent destruction of habitats necessary for the production of their food, are much more complex to analyze than the issue of the recent call for a ban on the consumption and trade of wild animals, another topic that concerns this item.

[19] As Boaventura de Sousa Santos (2016) warned, we are facing modern problems for which we do not have modern solutions. In his words: "It means, above all, assuming our time to be an unprecedented, transitional time in which we face modern problems for which there are no modern solutions" (2016: 74). It is important to emphasize here that the author's quotation is used here, referring to the fact that the current monocultural agri-food system can be seen as a modern problem for which there are no modern, effective solutions. And not, of course, in the sense that the pandemic is a modern problem, as there are many historical records reporting the proliferation of pandemics thousands of years ago. Taking this into account, the logic follows the *rationale* of the following example, also from the same author (SOUSA SANTOS, 2022): For the problem of climate change and pollution, one can offer the solution of electric cars. Even if they can make a difference, they will not solve all the problems if every family in the global North maintains a lot of cars. Against this solution, there are other, alternative solutions, for example, free public transportation. Returning now to the issue of the current monocultural agri-food system as a modern problem with no modern solution: even if a modern solution based on the technology and efficiency of advanced green agriculture could be offered (for instance, climate smart agriculture), it would not solve all the problems alone, as it is systemic and complex. And, for this reason, we need more comprehensive, holistic solutions involving knowledge(s) that, for a long time, were invisibilized, such as traditional agricultural practices, which can be visualized in regenerative agriculture, agroecology, permaculture, and so on.

The issue is controversial, dividing opinions, with some environmental organizations[20] supporting the ban, and on the other hand, there are others [21] that raise the issue so far debated in this section of the chapter: that the agri-food system based on monocultures is the greatest responsible for the destruction of habitats and as a consequence of COVID-19, and not the traditional consumption or commercialization of wild animals.

Far from intending to exhaust the debate, only the elements that compose it and the conclusions that can be reached at the present moment are presented here. They are, however, topics for future research, which will certainly evolve as new conclusions are reached by the scientific community regarding the real causes of COVID-19.

There are types of consumption and trade of these animals—traditional and non-traditional—occurring not only on the Asian continent but also in Africa, so a global reaction to a total ban on these activities could harm the fight against the core of the problem, besides being culturally offensive.

According to Robert Nasi, director general of the International Center for Forestry Research (CIFOR), more deforestation would occur in a shift from protein consumption from wild animals to that from cattle. Banning the consumption of wild animals would, therefore, be counterproductive. (THE GUARDIAN, 2020)

On the livelihood side, John Fa, coordinator of CIFOR's Wild Meat Research Initiative, notes that “wild meat plays an important role in the nutrition of many human populations, accounting for more than 50% of the protein consumption of people in central Africa. You can't just say to these people, ‘You can't do this anymore”. (THE GUARDIAN, 2020)

As for the cultural aspect, it is opportune to resort to the doctrine of Edgar Morin and Anne Brigitte Kern:

> We are witnessing the last phase of the annihilation of the hunter-gatherer cultures that subsisted in the rainforests, the wild

[20] For example, Wildlife Conservation Society (NY).
[21] For example, the International Center for Forestry Research (CIFOR) ; Survival International; Compassion in World Farming.

> mountains, and the desert expanses. Advances in medicine bring hygiene and healing, but they make the medicine and practices of healers lose; literacy brings written culture but destroys oral cultures that carry millenary knowledge and wisdom. (MORIN; KERN, 2005, p. 81, *our translation*)

Therefore, it is not the ban on the traditional consumption of wild animals that will prevent the birth of new epidemics and pandemics. Bans in this regard have already failed in several countries, especially as a result of a lack of policing, says Stephanie Brittain of Oxford University's Interdisciplinary Center for Conservation Sciences. According to the researcher, mentioned in the report below, the ban on the trade in wild animals is not a measure that has conclusive evidence regarding the potential for preventing new zoonotic diseases. According to the researcher,

> Legal trade in safely harvestable species can facilitate improved animal hygiene and welfare, while outright bans can boost clandestine trade, resulting in illegal markets with less hygiene regulation and an increased risk of disease transmission. (THE GUARDIAN, 2020)

On the same horizon, and going back to the cultural aspect again, Delia Grace, leader of the International Livestock Research Institute's program for food safety and zoonoses, also mentioned in the same report that “they need to be regulated and controlled. They should not be banned, as this is not sensitive to the needs of their consumers, who depend on them”. (THE GUARDIAN, 2020)

For Silvia Ribeiro (2020 a; b), in this debate, it is essential to consider the issue of populations and social groups that subsist through the consumption of natural resources based on biodiversity and its commercialization. In this sense, in her view, the prohibition of both traditional consumption and the respective commercialization would be an abuse comparable to fighting small producers.

It draws attention to the related cultural issue, as the ingestion of animals that to Western society seem incomprehensible, such as bats, pangolins, or snakes, is a type of traditional consumption, and there is no problem with traditional consumption because when these animals are in their natural ecosystems, they are controlled by the equilibrium situation within the ecosystem, and the same is true for traditional consumption.

She understands that it is important to consider in this debate that the destruction of habitats, which expels animals, also ends up expelling people from these regions, and then the phenomenon of migration from the countryside to the city comes into play, which produces agglomerations[22], which is somewhat what happens in wet markets.

Thus, the author does not agree with the assertion that COVID-19 was a problem in the wet markets, although she agrees with the fact that the virus appeared in bats. She then emphasizes that none of the viruses that originate in wild animals reach humans directly, because they all have an intermediary, and most of the time these intermediaries have been industrial breeding animals, such as birds and pigs, as in the cases of avian flu and swine flu, which have been the deadliest epidemics in recent decades.

The author therefore has an understanding in the same sense as the organization GRAIN (2020):

> We maintain our conviction that industrial animal husbandry must be treated as one of the most important sources of new dangerous pathogens, including different types of coronaviruses, in addition to deforestation and our increasing encroachment on the habitats of bats and other wildlife. (*our translation*)

Such understandings corroborate the question raised in the opening paragraphs about the dangers that the current agri-food system represents for the ecological crisis and global change, in which those of biodiversity and climate are inserted. In addition to changes in these areas, which

[22] In this regard, David Harvey states: "The conditions that favor rapid transmission through the receiving bodies vary enormously. It appears that high-density human populations are an easy target for recipients. It is well known that measles epidemics, for example, only flourish in large urban population centers but disappear quickly in sparsely populated regions". (HARVEY, 2020, p. 83)

would involve changes in food production systems, a systemic response would also have to encompass substantial changes in diets, with a reduction in the intake of meat from this production model in countries that most consume it. It is necessary to highlight here that this is not a measure aimed at the consumption of meat itself.

Two recommendations are cited here as examples. The first is by Walter Willett (2019), from the Harvard School of Public Health, who believes that a diet with many plant-based foods and fewer animal foods is positive for both health and the environment.

The second, which is understood to be the most complete and correct, from the *Revista Biodiversidad, Sustento y Culturas*:

> We must reduce our consumption of meat from industrial production. This is not a fight against meat consumption itself (although its decrease in the diet of the most consuming countries can be a contribution to climate and health), but a fight against the corporate systems that produce and process meat industrially. **Peasants around the world have bred, traded, and used animals for food and various other uses for thousands of years. This must be the way to continue eating meat as part of our diet, within our cultural diversity**. (BIODIVERSIDAD, 2020, p 30, *our translation, our emphasis*)

6 Conclusion

Equating the shades of the aforementioned considerations, the prevailing agri-food system in Latin America is based preponderantly on:

a) the concentration of land in large *latifundium* (in Latin America, the term “latifúndios” stands for huge farms);
b) in monocultives and monocultures that rely largely on land use for food and animal husbandry as well as for the export of commodities;
c) in the indiscriminate use of pesticides and antibiotics, with legally tolerated levels way above the limits practiced in other countries, such as the European ones;

d) as well as in the **expansion of the agricultural/agri-food frontier, which ends up advancing on indigenous and traditional communities' lands, generating the loss of territories for these social groups.**

Territories are essential for biodiversity, for the associated traditional knowledge (TK), and for the holders of this knowledge. It is precisely there that the present article illuminated the horizons of reflection, from the precautionary principle and the theory of risk society of Ulrich Beck, for bringing arguments to enrich the debate that it is possible to identify a relationship between the current agri-food system not only with the emergence of epidemics and pandemics but also with biodiversity and associated traditional knowledge so present in these territories mentioned at the beginning of this paragraph.

At this point, the prosecutor and PhD in socioenvironmental law Juliana Santilli taught very well:

> The traditional processes, practices, and activities of indigenous peoples, quilombolas, and traditional populations that generate the production of knowledge and innovations related to species and ecosystems depend on a way of life closely related to the forest. **The continuity of the production of this knowledge depends on conditions that ensure the physical and cultural survival of traditional peoples**. (SANTILLI, 2004: 344, *our highlights, our translation*)

Stressing that “the cultural contexts, processes, and practices that promote the production of knowledge, innovations, and practices of Indigenous peoples, quilombolas, and traditional populations must be ensured (...)” (SANTILLI, 2004: 356).

Bringing together the intertones of the multitude of elements brought to the debate here, an important point is concluded. **There are indications that both the cause**—as many authors pointed out as the most likely — **epidemics and pandemics are the same destroy**

biodiversity, and the TK (which is the current agri-food system that destroys habitats and advances in Indigenous lands, affecting the physical and cultural existence of these societies), **as well as the very consequence of these same epidemics and pandemics, also has the same destructive effect as their cause, when they take away entire oral libraries of traditional knowledge, which are lost when indigenous or traditional populations' lives are taken as fatal victims of these diseases.**

This conclusion is all the more important when combined with the fact that, today, as society is faced with modern problems for which there are no modern solutions, it is precisely in the world's inexhaustible epistemological diversity, in the pluriverse of knowledge[s] where traditional and Indigenous knowledge[s] are found, that a significant number of proposals for alternative solutions to these problems can be identified.

Solutions that certainly don't fit into the current agri-food system but rather into practices that are truly regenerative of socio-ecological processes, in line with what has been called *sustainability transformations*.

Beyond monocultures on large estates and the indiscriminate use of pesticides and antibiotics, they point to holistic solutions found in a pluriverse of knowledge[s]. They involve concepts such as agroecology, permaculture, ecofeminism, *sumak kawsay*, biocivilization, food sovereignty, and autonomy, among others. Thus, there is an urgent need for these knowledge[s] to be identified, validated, and given credibility, as epistemologies of the South and the concept of a pluriverse of knowledge[s] emphasize.

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