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Our tribute to Humberto Maturana

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Editorial

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In times of denial, which find support in conspiracy theories, on May 6 of this year, 2021, Science lost one of its great exponents, the 92-year-old Chilean neurobiologist Humberto Maturana. In this editorial, the journal *Ambiente & Sociedade* pays homage, rescuing important moments in his biography and some reflections that marked his research legacy.

Maturana pursued a medical career at the University of Chile and developed research in neuroscience and at the “*Biología del Conocer*” research center. He also specialized in anatomy and neurophysiology at the University College of London and received a Ph.D. in Biology from Harvard University in 1958. He later developed research in neurophysiology at the Massachusetts Institute of Technology-MIT and dialogued with various fields of philosophy, anthropology and some specific areas of medicine such as anatomy, genetics and cardiology. His activity as a researcher, strongly anchored in an inter and transdisciplinary vision, has the mark of the humanist recognized for his vision of living beings and, mainly, of the human and of the relationships between humans. Thus, his main studies stand out above all in explaining the living being as a producer of knowledge, with a special focus on the human being, seeing him as a self-constructive system, permeated with emotions (RIOS NETO, 2021).

It was in these analyzes that Maturana created the concept of Autopoiesis, from the Greek *autopoiesis*, in the 70s, together with Francisco Varela, to designate the capacity of living beings to produce themselves in a dynamic of permanent transformation. His proposal is substantiated in the following sentence: “the continuous structural change of living beings with conservation of their autopoiesis happens at every moment, incessantly and in many simultaneous ways. It is the throb of life” (MATURANA; VARELA, 2011).

For Maturana and Varela (2011), the human being is a system that defines, organizes and modifies its own organization, having as a reference its behavior and ideas, being self-consistent and autopoietic. In this condition, the conservation and adaptation of a living being to its environment are systemic conditions for life. To maintain your organization, you need to be in a permanent state of congruence with the environment around you. According to their theory, each living being is a closed system that is continually creating itself and therefore repairing, maintaining and modifying itself. However, it needs to resort to resources available in the environment to guarantee its autopoiesis, which gives rise to the notion of “structural coupling”. And this leads to complex thinking that, as formulated by Morin (2007), as a universe of phenomena inseparably woven into order, disorder and disorganization, aggregates existing contradictions in the world in which we live.

Maturana’s extensive scientific production had a direct impact on areas such as sociology, neuroscience, technology, literature and philosophy and leaves us as a legacy a contribution not only to human behavior, but fundamentally social, whose content is centered on a critique of the existing civilization paradigm that rests on foundations that are totally contrary to life-sustaining processes. For Maturana, rescuing human emotions and thinking about the human being from these affective relationships enables encounters in the acceptance of the other as a legitimate other, giving rise, in turn, to social coexistence. His reflections on this conception are more clearly revealed in his following sentence:

“We live in the world and that is why we are part of it; we live with other living beings and therefore share the life process with them. We build the world we live in throughout our lives. In turn, it also builds us in the course of this common journey. Thus, if we live and behave in a way that makes our quality of life unsatisfactory, the responsibility lies with us” (MATURANA; VARELA, 2011).

Maturana remained active until the end of his life and his extensive production establishes an interdisciplinary dialogue. His contribution includes many works criticizing society, politics, neoliberalism and capitalism, climate change, biopolitics, water scarcity and recently in relation to the pandemic as a result of the prevailing logic in society of market dependence and prevailing hyper individualism. Thus, it leaves an enormous legacy to continue in the effort to include affective and cognitive aspects in the rational search and to integrate human life in the broader system of living beings. In this way, his thinking also contributes to an ethical posture that sees cooperation and collaboration among people as the only way to ensure the well-being and survival of the human species (RIOS NETO, 2021).

“They say that we humans are rational animals. Our belief in this statement leads us to despise emotions and extol rationality, to the point where we want to attribute rational thought to non-human animals whenever we observe complex behavior in them. In this process, we made the notion of objective reality become a reference to something that we suppose to be universal and independent of what we do, and that we use as an argument aiming to convince someone, when we don’t want to use brute force.” (MATURANA, 1997)

After this tribute, the journal *Ambiente & Sociedade* presents a brief consideration about our **Special Issue: Energy Territories**, made by Professor Doctor Célio Bermann. Even though the journal has already published several articles related to energy, given the transversal nature of the theme, which embraces areas such as climate change, use of natural resources, social inequalities in access to energy, sustainability, among many others, this volume will publish articles that were prepared by participants of the “International Seminar on Energy Territories, Climate Change and Sustainability of the São Paulo Macrometropolis”, held in May 2019 at Institute of Energy and Environment of the University of Sao Paulo.

The Seminar aimed to strengthen the environmental and energy governance in the São Paulo Macrometropolis through the construction of governance models, that are better, more efficient, more equitable, representative, comprehensive and inclusive. Therefore, it is necessary to promote an open dialogue between the experiences of applied energy and environmental policy and the interdisciplinary contributions.

The Seminar also sought to promote reflection and exchange of knowledge about the possibility of an energy transition in the São Paulo Macrometropolis as a systemic, multi-scale, multidimensional and transdisciplinary issue that needs the involvement and collaboration of different political, academic and social actors.

The energy theme is interdisciplinary and allows for a rich dialogue between dif-

ferent areas of knowledge - engineers of all specialties, physicists, chemists, biologists, geologists, administrators, economists, lawyers, architects, sociologists, anthropologists, geographers, historians, as well as researchers and professionals from fields that interact with energy through particular visions, such as law, journalism, ecology, international relations, among others.

In this sense, this dossier intends to address issues that are at the frontier of knowledge, such as the energy transition that allows the decarbonization of various human activities; new energy sources; public policies that enable the reduction of energy consumption; multi-scale energy governance and society's participation in decision-making for energy projects.

Evidently, such questions do not exhaust the possible themes to be considered in the energy debate. It is up to the academy to propose and expand new themes. The invitation for this debate has been made and the following works constitute the first dialogues for this purpose.

The article: **Energy Poverty: Conceptualization and its link to exclusion. A Brief Review for Latin America**, by the authors *Carina Guzowski, María María Ibañez Martín and María Florencia Zabalo*, deepens the conceptual discussion on poverty, energy exclusion and the antecedents of its measurement, as well as its link with the Just Energy Transition. The authors concluded that the limitations on access to basic energy services are significant, affecting more severely the population of countries with a low level of production and less socioeconomically favored.

The authors *Flávia Mendes de Almeida Collaço and Célio Bermann*, in the article: **Local Energy Planning Potentialities in Reducing São Paulo's Inequalities**, analyze the potential of the PEL, through a simulation model in two scenarios: the first reproduces the policies in the city and the second expands the population's access to energy services. With the implementation of PEL in the first scenario, the city will reach, in 2030, 65% of renewable energy and a 43% reduction in GHG emissions. In the second, 67% renewable energy will be achieved with a 24% reduction in emissions when compared to 2014.

In addition to this special dossier, the journal *Ambiente & Sociedade* announces the opening of its special section **Featured Topic 2021: Decolonial Insurgences and Emancipatory Horizons: Contributions of Political Ecology**. In this first delivery of articles, the authors: *Bruna Cigaran da Rocha, Diego Amoedo Martínez, Hugo Gravina Affonso, Susan Aragon, Vinicius Honorato de Oliveira and Ricardo Scoles*, in the article: **Plunder and resistance in traditionally occupied territories of the Tapajós and Trombetas basins, Pará state, Brazilian Amazonia**, present the social diversity and biocultural heritage of the people that lives in the forest, and reflect on forms of dispossession perpetrated by capital, in collusion with different spheres of the State. This analysis allows us to reflect on the different forms of resistance of the people that lives in the forest, in defense of their traditionally occupied territories and ways of life.

Discussing possible structures between Paleontology and Environmental Justice, the authors: *Camila Neves Silva and Angélica Cosenza* carry out an assessment on the existing environmental conflicts in the paleontological sites of Minas Gerais and discuss the

struggle for territory and decoloniality, as crucial dimensions for a look that seeks restoring the right to their (paleo)territories to populations. The connections between the fields are located here as references for the fight against social inequality. In the article: **Paleontology and Environmental Justice: making connections through Political Ecology.**

We close this editorial with the articles from the **Original Articles** section. In this delivery, the article: **Re-thinking the Academic Role in the Circular Economy Discourse**, by the authors *Giovanna del Pilar Garzón Cortés, Krystle Danitza González Velandia, Helmut Espinosa Garcia and Camilo Torres Sanabria*, addresses the debate involving academia and the generation of scientific production, with the objective of contributing to public policies related to the Circular Economy – CE. The results show institutional research biases in relation to the food packaging industry and propose that academic contributions focus on reviewing incentives for an efficient production that minimizes the mass consumption of materials.

The authors: *Camila Coelho Welerson, Winne Nayadini Barão, Brunna Araújo Quireli, Vanêssa Lopes de Faria, Nivea Adriana Dias Pons, Daniela Rocha Teixeira Riondet-Costa and Ana Luíza de Souza Marcondes*, in the article: **Anthropic expansion of Paraty in Serra da Bocaina National Park, Mata Atlântica Biome**, revised the Municipal Master Plan and the Park Management Plan and used geoprocessing tools to analyze changes in land use and occupation, verifying an increase in human occupation, without respecting municipal planning. They conclude that both documents are insufficient in relation to their objectives.

The article: **Representation of agriculture in water governance in São Paulo**, by the authors *Rodrigo Constante Martins, Alexsandro Elias Arbarotti and Raiza Campregher*, reconstructs the profile of this sectorial representation in the State Water Resources Council and in the Committees limited to rural territories with greater agricultural dynamics and reveals significant political and propositional distances between sectors of agriculture and agribusiness in São Paulo. These distances are related to the structure and capillarity of the representative entities and the very concept of management.

With the aim of investigating the contribution of media coverage in understanding climate change, authors *Sonia Parratt Fernández, Montse Mera Fernández and Paloma Abejón Mendoza* analyzed the content of digital editions of Spanish newspapers with the greatest diffusion in 2017. The results suggest that newspapers only include simple explanations of climate change, offer very little guidance for citizens to combat it, and make limited use of visual aids. In the article: **Approaching climate change to society from the media: formative elements in the Spanish digital newspapers.**

The authors *Alessandra Leite da Silva, Admilson Írio Ribeiro and Regina Márcia Longo*, in the article: **Tools for prioritizing ecosystem services provided by fragments forest in the context of cities**, proposes a methodology for evaluating the potential for providing ecosystem services by forest remnants in the basin urban watershed from spatial metrics of the landscape. The study was carried out in the Campinas/SP hydrographic basin, and verified that the forest remnants develop ecosystem support services or habitat, regulation services and cultural services.

In the article: **Forest restoration in the floodplains of the Amazon estuary subjected to intensive açai management**, the authors *Rosileia da Costa Carvalho, Livia de Freitas Navegantes Alves and Renan do Vale Carneiro* identified and analyzed experiences of forest recovery in floodplain forests submitted to intensive management of açai in the Amazon estuary. The results indicated three types of forest recovery and suggest that forest recovery is capable of promoting sustainable açai production, productive diversity, generate income and ecosystem conservation.

The authors *Mátria de Sousa Lopes and Daguinete Maria Chaves Brito*, in the article: **Socioenvironmental impacts of dam in the Jari Valley, Amapá, Brazil: community perceptions**, applied surveys and conducted a content analysis, in order to examine the perceptions of communities locations. The research revealed that, before the implementation of the hydroelectric plant, the communities had a very intimate bond with the territory and nature. More evident perceptions include environmental impacts, relocation, changes in livelihoods and access to natural resources.

Seeking to reflect on the strategic importance of hydroelectric energy generated in the Amazon region, the author *Carlos Potiara Castro* analyzes the geopolitics of renewable energies, focusing on path-dependence, smart grids and energy-intensive societies and their energy security policies. The authors concludes that the advent of renewable energies can constitute an additional element of a long-term economic specialization in the Amazon, with worrying consequences from the socio-environmental perspective. In the article: **Hydropower and the geopolitics of renewable energies in the Amazon Basin**.

Authors *Adriana Patricia Tofiño Rivera, Diego Armando Ospina Cortés and Yanine Roza Leguizamón*, in the article: **Compatibility of Ancestral and Innovative Agricultural Practices in the Kankuamo People of Colombia**, assessed the compatibility between ancestral practices in the Sierra Nevada de Santa Marta and those of Colombian Agricultural Research Corporation, in beans, facing malnutrition and food shortages. They identified the incidence of education, self-care, gender and food supply, as well as the exclusion of agrochemicals from production, showing the need for technological adoption with a differential focus.

Developing and applying educational and environmental content using didactic strategies that value the prior knowledge of local communities and information related to the context, the authors *Mikaelle Kaline Bezerra da Costa, Magnólia Fernandes Florêncio Araújo, Rita Campos and Eliza Maria Xavier Freire*, in the article: **Demystifying ophidism: bridging schools and society to develop educational resources**, show a positive change in the perception of snakes, indicating that the adopted strategy has strengthened science learning, contributing to public health and the conservation of snakes.

The article: **Biodiversity and the mining Environmental Impact Statements of the state of São Paulo - Brazil**, by authors *Silvia Sayuri Mandai, Raphaela Martins de Carvalho and Marcelo Marini Pereira de Souza*, analyze how the EISs of mining activities considered the topic of biodiversity, using the Index of Biodiversity Inclusion (IBI). They show that most EIAs partially complied with the criteria, representing information gaps in the chapters on biodiversity. The biggest deficiencies were related to data limitations,

impact analysis and insufficiency of mitigating measures.

With the aim of analyzing vulnerability as a historical process, the authors *Ricardo Tschäen, Fabrício Cardoso de Mello and Teresa Cristina da Silva Rosa*, in the article: **Neoextractivism and Samarco's disaster: historical construction of vulnerability in Anchieta (ES, Brazil) in a mining-dependency context**, conduct interviews with the local population and consult macro-economic data, showing that Anchieta's vulnerability is correlated with the process of global modernization and neo-extractive ore-dependence, which places Anchieta in a process of dependence on Samarco's activities.

The article: **Expanding the concept of people affected by HPP: Jirau and Penha village settlements – Rondônia**, by the authors: *Artur de Souza Moret, Clara Miranda Santos, Rafael Ademir Oliveira de Andrade, Berenice Perpétua Simão, Jeferson Cardoso da Silva and Clarides Henrich de Barba*, discusses the concept of the affected and the reconfiguration of the territory and the social lives of two communities not considered affected by the HPP Jirau. The authors concludes that the damage caused by construction in these communities places them as affected, influencing the networks of life, including the river, roads, housing networks, in addition to spaces for escape or refuge.

Based on the integration of socioeconomic, epidemiological and climatic indicators, the authors: *Marcos Ronielly da Silva Santos, Maria Isabel Vitorino, Luci Cajueiro Carneiro Pereira, Marcia Aparecida da Silva Pimentel and Ana Flávia Quintão* relate the vulnerability of municipalities to future projections of climate change, and show that the most vulnerable municipalities are in the Ilha do Marajó region. They believe that these results can contribute to the adoption of public policies. In the article: **Socioenvironmental Vulnerability to Climate Change: Conditions of Coastal Municipalities in Pará State**.

In the article: **Conflicts by water resource use and the case of Araraquara-SP**, the authors: *Larissa Camerlengo Dias Gomes, Nemésio Neves Batista Salvador and Helena Carvalho de Lorenzo* identified the main factors of conflict and the key actors involved. They also identified those responsible for most of the total demand, which are the main potential causes of conflicts between public and private supply. Public policies are also discussed, proposing measures to mitigate conflicts, which must be implemented by the key actors and groundwater users involved.

Based on a census in 2013-2016 and a re-measurement of 15% of individuals in 2019-2020, the authors: *Luis Miguel Acuña Simbaqueva, Hernán J. Andrade, Milena A. Segura, Erika Sierra Ramírez, Diana Skarly Canal Daza and Oscar Enrique Greñas Corrales*, in the article: **Mitigation of greenhouse gas emissions from households with urban woodland in Ibagué-Colombia**, estimated that urban trees fix about 3.81 Gg of CO₂/year, which represents only 2.3% of emissions of the city. Mitigation of 169.2 Gg CO₂/year of the city's homes would be achieved with between 412 thousand and 1.2 million trees of the most dominant species.

In the article: **Cultural ecosystem services and disservices in an urban park in Bogotá, Colombia**, authors *Carmen Montes-Pulido and Victor F. Forero* sought to understand the meaning of the Parque Ecologico entre Nuvens (PEN) for visitors. They identified 7 cultural and 3 regulation ecosystem services, and concluded that no significant associations

were found between preferences for SE, disservices and sociodemographic characteristics of the visitors. Drug abuse was the predominant disservice. These results provide criteria for decision making in the planning of urban conservation units.

The authors: *Andréa Castelo Branco Brasileiro-Assing, Claudia Sattler, Barbara Schröter, Juan P. Alvez, Paulo Antônio de Almeida Sinisgalli and Abdon Schmitt Filho*, in the article: **Social-Ecological System Transformation and Learning: the case of Santa Rosa de Lima's dairy system, Brazil**, combined two different analytical approaches: the transformation process of social-ecological systems and triple-loop learning. They show that the milk production system is in the middle of the transformation process. To successfully continue the process, social learning and financial capital are essential.

Finally, seeking to analyze how individuals apprehend the sustainability construction process, the authors *Ana Fuentes Sánchez, Ana Moura Arroz and Rosalina Gabriel* explored the social representation of sustainable development (SD) from an intentional sample of 64 stakeholders from five cities and identify the three classic pillars of the DS. The central place of the economic aspect is highlighted, interconnected with the environmental and social, although the latter has less emphasis. In the article: **Social representations about sustainable development: the perspectives of residents of small islands' cities**.

We invite everyone to enjoy reading the articles, and we take this opportunity to thank the entire editorial team of journal *Ambiente & Sociedade*, which makes the continuity of these publications possible.

We wish you all a good reading!

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