

Forest sciences for life: beyond forest resources

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Opinion

Conventional forestry, which predominates worldwide, is heir to a Cartesian, Newtonian, and positivist epistemology. This has led to its primary focus being on supplying the timber industry with the aim of contributing to economic growth and, therefore, sustainable development. This orientation falls within the context of responsible (or sustainable) forest management, including the growing development of forest certification. In recent decades, interest has emerged in the role of forests in mitigating the effects of climate change through market-based instruments such as emissions trading, which has led to the valuation of so-called ecosystem services. Furthermore, within the framework of capitalist conservation, there is an interest in safeguarding genetic resources for the industries of the future.

But beyond the importance of having a strong forestry industry for the primary and secondary processing of forest products demanded by the markets, forestry sciences, and therefore forestry activity in general, have the potential to contribute to different areas of human security, such as food security, water security, climate security, and disaster risk reduction, among others. This is why forests have been recognized by geopolitical entities as fundamental elements of human security. However, this recognition is not sufficiently internalized within the forestry sector, which maintains its economic bias.

Given that seven of the nine ecological thresholds have already been exceeded, according to the Stockholm Resilience Centre, several of them linked to forests, such as climate change (catastrophe, emergency), loss (extermination) of biodiversity, land-use change and deforestation (including defaunation), alteration of the biogeochemical cycles of phosphorus and nitrogen (especially from agricultural activities), and water crisis, among others. For example, the impacts of climate change on tropical forests are widely documented.¹⁻⁵ Furthermore, the reduction of the planet's biocapacity (which implies consuming Nature's resources by mid-year), the planetary tipping points—*one* of which is the deforestation in the Amazon—and the fact that several of these tipping points are interconnected globally, among other indicators, confirm that humanity is currently facing a multifaceted civilizational crisis, manifested in areas such as the ecological crisis. It is therefore clear that it is utterly insufficient for forestry professionals to confine themselves to a single-discipline perspective focused primarily on the management, conservation, and restoration of forests for economic growth. Given the potential of Forest Sciences, professionals are needed for rural, urban, and interurban areas, as well as for forestry projects worldwide, who can contribute to generating solutions—in interdisciplinary teams, and even in cross-disciplinary teams—to the challenges of the present.

While most forestry professionals have focused on fulfilling the role that geopolitics and institutions have assigned to tropical countries as continuous and sustained suppliers of raw materials, an interesting phenomenon has emerged in the fields of Social Sciences, Humanities, and Arts: a shift away from the human to recognize non-humans (with various designations such as more-than-human, other-than-human, extra-human, and post-human, among others). This has led to the development of more-than-human sociologies and anthropologies,

among which multi-species ethnographies stand out. All of this has led to the recognition of the multiple ways of conceiving of nature and forests and relating to them. Thus, it is recognized that the expression “forest resources,” which reduces forests to things, raw materials, goods, or ecosystem services (even under the name of nature's services to people), does not do justice to the fact that all expressions of life on Earth are important regardless of their usefulness to human beings. This expression is situated within relational ontologies, which allow us to break down modern dichotomies of nature and culture, organic and inorganic, biotic and abiotic, and even life and non-life. Rather, what is recognized are socio-ecological interrelationships, assemblages, networks, and entanglements—in other words, the continuity of life. Thus, we speak of the need to broaden the moral community and recognize ourselves as co-inhabitants of the Earth (Gaia or Pachamama).

This is why a Forest Sciences for life has been proposed, in contrast to Forest Sciences for markets, for infinite economic growth.⁶⁻¹⁰ This proposal constitutes a radical change in how foresters have been linked to forests, which are no longer interpreted solely as a basket of resources for economic growth. It also implies recognizing the importance of working for human well-being in conjunction with the well-being of ecosystems. Even with the current knowledge about plant intelligence and sensitivity that has been thoroughly developed by foresters, biologists, ecologists, and philosophers, it is necessary to speak of the need to work for the happiness of forests.¹¹⁻¹³ This should not be a cause for surprise, since we come from nature, we are nature, we are interconnected, we exist interdependently. We are all part of the fraternity of photosynthesis and the society of humus, as Donna Haraway (2015) has pointed out.

The proposal for Forest Sciences for Life is situated within the context of a recognized need to move beyond the anthropocentric, colonialist, mercantilist, disjunctive, reductionist, and linear framework that hegemonically characterizes current human civilization. Thus, from the economic field, alternative economies, economies for life, and other economies are being developed. One specific meaning of Bioeconomy refers to the development of an economy for life, in contrast to another conception of bioeconomy more closely linked to biocommerce or biobusiness. Other expressions such as Biodevelopment and Bioethics, among others, also emphasize the revaluation of life. Furthermore, Complexity Sciences are characterized as Life Sciences.¹⁴⁻¹⁸ This phenomenon is not simply a semantic issue; it is a powerful expression of the need to deeply revise a neoliberal capitalist society oriented towards commodities, prices,

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and markets in its incessant and infinite pursuit of accumulation despite or against planetary limits.

Among the principles underpinning the Forest Sciences for Life proposal are the principle of relational ontology, which revisits the decentering of the human; the principle of distributed and more-than-human agency, developed by Bruno Latour and Jane Bennett; and the biocultural ethics proposed by Ricardo Rozzi, which reinforces the principle of socio-ecological justice. Valuable academic contributions from Biology and Ecology further strengthen this proposal. These include the Biology of Complexity (Biocomplexity), Plant Behavioral Biology, Network Ecology, Functional Ecology, Molecular Biology, Plant Ecophysiology, Landscape Ecology, Forest Dynamics and the study of disturbance theory, Ecological Bioacoustics, and Ecohydrology, among others.

It is undeniable that the proposal for Forest Sciences for Life requires a transition process. Implementing this proposal necessitates a gradual program of adaptation that must include changes at the academic, political, and social levels. In the academic sphere, it is necessary to revise curricula to better incorporate the significant philosophical and scientific contributions regarding the recognition of the intrinsic value of life. This implies adopting interdisciplinary approaches to address the reality of the forest from socio-ecological perspectives. Adopting paradigms of complexity contributes to an openness toward epistemological, ontological, and axiological pluralism. In the political arena, it is necessary to broaden discussions focused on well-being, including both human well-being and the well-being of ecosystems. In the social sphere, it is important to recover and revitalize the relational ontologies that can still be found in Indigenous communities. In practical terms, action needs to be directed towards the conservation of natural forests, beyond the categories of protected natural areas, so that biodiversity management is transversal to rural development.^{19,20}

As Marc Dourojeanni states, the best use of natural forests is to value their contributions as ecosystem services. New opportunities for the bioeconomy would lie in the sustainable use of standing forests. Timber should come from forest plantations, adhering to three key requirements: a) that it does not come at the expense of biodiversity, b) that it does not affect watersheds, and c) that human rights and indigenous rights are respected.^{21,22}

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Conflicts of interest

The author declares there is no conflict of interest.

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