



Editorial

Innovations and alternatives for sustainable development: between technological promise and necessary transformation

The debate surrounding sustainable development has become one of the central themes of contemporary thinking in the face of the multidimensional crisis currently affecting societies. On the one hand, environmental, social, and economic urgency demands immediate and effective responses; on the other, prevailing development models continue to reproduce patterns of production, consumption, and inequality that have proven to be structurally unsustainable. In this scenario, innovations and alternatives for sustainable development cannot be understood solely as technical advances or isolated solutions, but rather as part of a deeper process of critical review of our way of life.

Over the last few decades, the notion of sustainability has gained a central presence in political, business, and academic discourse. However, this conceptual expansion has not always been accompanied by substantive transformations. Sustainability has often been reduced to a label functional to economic growth, prioritizing efficiency improvements or partial mitigations that do not question the extractive logic or power asymmetries underlying the socio-environmental crisis. In response to this, it is essential to recover a reflective perspective that allows us to distinguish between innovations that open up real possibilities for change.

Technological innovations undoubtedly occupy a prominent place in contemporary debate. Renewable energies, precision agriculture, the circular economy, biotechnology, artificial intelligence applied to environmental management, and smart cities represent

significant and, in many cases, necessary advances. However, their transformative potential depends as much on the technology itself as on the social, political, and ethical framework in which they are embedded.

In this sense, alternatives for sustainable development do not emerge solely from laboratories or innovation centers, but also from social practices that in many cases are rarely used in combination, such as solidarity economies, agroecology, the use of local resources for food sovereignty, community management of common goods, and indigenous knowledge, which offer perspectives that broaden the horizon of development beyond economic growth. These experiences not only propose different technical solutions, incorporating values such as care, interdependence, and respect for ecological limits.

Reflection on sustainability therefore requires an integrative approach that articulates innovation and social transformation, where it is not a question of opposing technology and community alternatives, but rather of recognizing that truly sustainable innovation is that which is capable of dialoguing with local contexts, reducing inequalities, and strengthening collective capacities. This implies rethinking the criteria by which we evaluate success, talking not only about efficiency, but also about well-being, resilience, and equity. In this sense, academic research plays a key role in generating critical and interdisciplinary knowledge, capable of articulating local and global scales, and integrating scientific knowledge with traditional and community



knowledge.

Likewise, the role of public policies and institutions is central to this discussion, with the implementation of solid regulatory frameworks, adequate financing, and participatory governance. Sustainability cannot depend exclusively on individual will or the market; it requires informed collective decisions and a long-term vision that transcends political and economic cycles.

This special issue aims to contribute to this debate by providing a space for thoughtful analysis of innovations and alternatives geared toward sustainable development. Rather than presenting definitive solutions, the works gathered here invite us to examine the limits, tensions, and contradictions inherent in the transition to sustainability. The aim is to recognize that there is no single path or universally applicable model, but rather multiple possible trajectories that must be evaluated in light of their social, environmental, and cultural impacts.

In a global context marked by interconnected climate, health, and social crises, sustainability is no longer an option but rather an indispensable condition for the future. Taking on this challenge means accepting that there are no simple or universal solutions, but rather complex processes of learning, adaptation, and transformation. The innovations and alternatives brought together here should be understood as part of that process, as trials and proposals that, from different territories and disciplines, contribute to imagining and building forms of development that are more just, inclusive, and compatible with the planet's limits.

Finally, it is pertinent to open the discussion to emer-

ging approaches that propose going beyond sustainability understood as simple damage reduction. The notion of regenerative culture proposes a paradigm shift by emphasizing the capacity of social and ecological systems to regenerate, co-evolve, and strengthen each other. From this perspective, the challenge is not only to sustain or care for what already exists, but also to create conditions for the restoration of ecosystems, the revitalization of territories, and the strengthening of resilient communities. Incorporating the vision of regenerative culture into academic debate opens up new possibilities for rethinking development from an ethic of care, reciprocity, and intergenerational responsibility, thus offering fertile ground for advancing toward ways of life that are truly compatible with the limits and potentialities of the planet.

In conclusion, the key question is not whether we have enough innovations, but whether we are willing to transform the foundations on which development is defined, since only through such critical reflection will sustainability cease to be an abstract ideal and become a concrete, collective practice.

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