



## Uncertainty: The New Situation

**Gilberto C. Gallopín**

Independent Researcher;  
Fellow, World Academy of Art & Science

### Abstract

*In this short article, the author will present his vision and concerns about some megaprocesses that are already beginning to impact Latin America (and the World), which he believes will radically change the frame of reference for policies and development strategies in the region.*

### 1. Some Conceptual Clarifications

Given the diversity of interpretations of some of the central concepts underlying the discussions on Latin American development, it seems relevant to make explicit my perception and definition of them, as I will use them in this article.

First, the very concept of *development*: the notion has been sometimes manipulated and distorted, often being used as a synonym for economic growth. Already in the 1960s, at the global and regional level, there was talk of “*Another development*”, in response to the widespread perception that we were moving in the wrong direction, and not exclusively because of environmental degradation, but in a broader sense: it was felt that, globally, we were living in an unjust society and that it was imperative to generate a new international order based on the idea that another kind of development was possible, with much more desirable goals for humanity, compatible with the environment, that would definitively eliminate the scourge of poverty and that would be much more solidarity with the developing countries.<sup>1</sup> The concept of *development*, in its original meaning of unfolding potentialities and not of mere economic growth (which is only a means and not in all cases necessary) is still fully valid.

The same is true of the concept of *sustainable development* (different from mere sustainability)<sup>2</sup>; it has also been widely manipulated and misused, but I believe it is still fundamental, containing its three basic dimensions (or pillars): social, economic and environmental.

The concept of “*Buen vivir*” (good living) indigenous to Latin America and other older civilizations like it has been proposed as a better indicator of progress than gross national product, and it certainly is, but it is not a replacement for the concept of sustainable development nor for the concept of development. I view *buen vivir* as the result of a successful sustainable development process. In the Latin American World Model (LAWM)<sup>3</sup>, we proposed a process that led to fulfilling the universal basic needs for nutrition, housing, health, and education and, in a central place, the participation of the members of society in the decisions. If this were achieved, each society would endogenously define the type of life desired and how to

satisfy other non-universal needs. The result, from today's perspective, would be *Buen vivir*. The process was essentially sustainable development (although the term did not yet exist at the time the LAWM was published, the model integrated environmental, social and economic dimensions). The model showed that the goal was reachable with the human, economic, and natural resources available in the region, and the limits to development were not physical but socio-political.

## 2. The Unit of Analysis and Action

A frequent situation is the separation between the discourses of environmental and social issues. This dichotomization also extends to analyses and, more critically to policies and actions.

The problem is that scientific studies have abundantly shown that human activities and the environment are functionally coupled and therefore co-determined, making it impossible to fully understand social dynamics without at least considering what is happening in the environment with which that society interacts, nor can ecological dynamics be understood without considering the actions and interactions with the society with which it interacts. Moreover, as both ecological and social systems are strongly non-linear, complex and capable of self-organization, these interactions are multiple and change over time.

Therefore, the natural unit of analysis for understanding, planning, and action should be the coupled system as a whole, or what I have defined as the “socio-ecological system” (SES)<sup>4</sup> on the appropriate scale, from local to global. This, in turn, requires an inter- or transdisciplinary view and a systemic or integrated approach.

This applies also to the concept of Human Security. Granoff<sup>5</sup> and Jacobs<sup>6</sup> have eloquently argued that Human Security must be defined in an integrative manner, and that it should not be confined to the military, political, or police dimensions.

Human Security is closely associated with one of the basic human needs, that of protection, at the individual, society or humanity scale. At the level of the person, human needs are part of one of the two basic components of the Quality of Life (the ultimate goal of development): health and the subjective sense of Satisfaction. Health (in the broad definition of the World Health Organization) results from the fulfillment of Human Needs. At the societal and humanity levels, the notion of requirements can be used instead of needs.<sup>7</sup>

Thus, while the focus of interest may be centered on the concept of Human Security, the unit of analysis should take into account the broader SES involved.

## 3. New Problems

On a global scale, for the first time in the history of civilization, the “Earth System”<sup>8</sup> has been subject to the confluence and coupling of the *globalization process* (economic, cultural, etc.), whose apparent rationale is economic maximization, with *global environmental change*, whose “logic” is the ecological one, of resilience, diversity and redundancy: two complex giga processes interacting under different logics and dynamics. This intermingling

of economic, ecologic, cultural, political, social and demographic factors, associated with the increasing scale and speed of the human capacity to make planetary changes, has led to an unprecedented connection of anthropic and ecological phenomena on a global scale.

This functional coupling includes a qualitative leap in interdependence; historically, the so-called North (the industrial or “first world” countries) exerted and still exerts a dominant influence on the countries of the South. But today, for the first time, poverty in the South can concretely affect the well-being of the inhabitants of the North (for example, deforestation contributes to climate change, which affects everyone on the planet, whether in the South or the North); also international migrations from the South to the North, driven by poverty and inequalities, wars, repression and environmental degradation are impacting), not to mention global terrorism and drug trafficking, which are phenomena of complex genesis but clearly not unrelated to inequality between countries and the loss of hope.

In the past, the North-South relationship was marked by dependence; today, increasingly, interdependence is the relationship on the rise for the reasons mentioned above, which does not imply symmetry (today, in many respects, the influence of the North upon the South is preponderant).

The global power structure is also changing rapidly; in just three decades, we have changed from a bipolar world to a unipolar one, which is already hinting at multipolarity. With the rise of China, world power is again diversifying, and even more so with the emergence, with ups and downs, of the BRICS group (Brazil, Russia, India, China and South Africa). This diversification, which is an interesting change from the previous situation, does not, however, guarantee a more equitable world; this group does not define an alternative to the dominant development style but perpetuates it. Although it is still impossible to anticipate the results and future direction of these geopolitical processes, the new powers will not necessarily be more supportive of global development than the current ones (China, the least capitalist of the new competitors for world power, is increasingly investing in the natural resources of developing countries but to secure resources for its own consumption).

The current war in Ukraine threatens global political security and contributes to world economic instability.

The environmental deterioration at the planetary level is dramatic; it is already known that, at least with respect to climate change, the planet has been pushed into a new state (*no-analogue state*)<sup>9</sup>, in which climatic conditions and other environmental variables have moved out of the range of at least the last half million years. The Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) has launched its reports, warning of an unprecedented decline in Nature and ecosystem services and an acceleration of species extinction rates that can only be resolved through “transformative changes”.

The Sustainable Development Goals<sup>10</sup> are not being reached in Latin America and other regions of the world.

The relevance of the changes can be exemplified by trends on two different fronts: one social and the other environmental. On the social front, inequality has increased dramatically.<sup>11</sup>

On the climate front, changes are occurring faster than predicted; moreover, recent findings from a cross-comparison of the predictions of major climate models show that all models exhibit abrupt changes in the global climate system, with eighteen out of a total of thirty-seven showing abrupt changes as global temperature approaches those of 2°C.<sup>12</sup> This is very alarming, since the target of 2°C or less is the current international political consensus. Such abrupt changes may mean that some of the so-called planetary tipping points are exceeded, with enormous negative consequences.

---

*“The current global trajectory is unsustainable. This does not mean that the world is ending or that life on Earth is coming to an end, but rather that the “business as usual” scenario, in addition to being undesirable, is simply unfeasible and that, for better or worse, in the coming decades humanity will inevitably change its trajectory, whether nations want it to or not.”*

---

From this unprecedented planetary situation of high and growing complexity, interdependence, acceleration and magnification of changes, a great *uncertainty* emerges—which clashes with minds and institutions educated in the illusion of certainty—as to whether it is possible to plan with a high degree of confidence and whether what is not known now can always be known (at least in terms of probabilities) with more research. This tradition of thinking and policy-making dates back to the 19<sup>th</sup> century and earlier, but is still alive and well in most educational and institutional settings.

In any complex system (even in something as minimal as a physical-chemical reaction), there is usually an inherent uncertainty that cannot be eradicated with further observations—a true indeterminacy.<sup>13</sup> This means that unpredictability and surprise can be built into the fabric of reality, not only at the microscopic level (i.e., the well-established Heisenberg uncertainty principle) but also at the macroscopic scale. This obviously occurs more intensely in socio-ecological systems, where inherent uncertainties are combined with those due to ignorance and those arising from the human capacity to make deliberate changes and to exercise the possibility of choice.

We are living in the midst of a convergence of many rapid, and some unprecedented, megatrends. The fundamental uncertainty about our future as a species and as elements of the global SES to which we belong comes from the deeper impact of the fusion and interactions among those social, technological, economic, cultural, and environmental processes, and not just from the simple summation of those. As emphasized by Klaus Schwab,<sup>14</sup> this is what makes the “fourth industrial revolution” fundamentally different from previous revolutions. And these megatrends operate within a strongly connected (and increasingly so) system, the global SES. A large number of causal links have been discovered, but many more have not yet been identified. Thus, we are facing large uncertainties associated with these megatrends

within a global system whose structure and dynamics we only partially know. This situation is a critical one: new opportunities may arise (but can we identify and act in a timely way to bring them into being?), but huge threats also loom ahead.

What kind of thinking is required when we are in these situations? What kind of decisions do we need to make? This is a huge topic for reflection, analysis and research. Thinking and acting in a new way. Latin America has some comparative advantages: in practice, it probably has had more interdisciplinary exercises in living with uncertainty than most of the Global North countries. It has also had original thinking in other aspects, not only from the environmental but also from the economic, social, cultural and technological points of view. It has a critical mass and shared cultural roots that, if mobilized in an articulated manner, can have a great effect (something that does not happen in other more culturally fragmented regions). The region has clear fragilities and weaknesses in the face of the current and new situations. But it has also shown in the past important resilience and creativity in the face of changes and new situations.

#### 4. What to do?

There is ample evidence that the current global trajectory is unsustainable. This does not mean that the world is ending or that life on Earth is coming to an end, but rather that the “business as usual” scenario, in addition to being undesirable, is simply unfeasible and that, for better or worse, in the coming decades humanity will inevitably change its trajectory, whether nations want it to or not. We live in times of bifurcating futures.<sup>15</sup> Some are frankly disastrous, others barely tolerable, and some desirable.

In the situation the Earth System has reached, to escape from the trajectory of irreversible socio-environmental degradation, it will not be enough to promote the Sustainable Development Goals or make gatopardistic commitments or cosmetic changes.

Changes are required in at least four key areas:

- Fundamental societal values (from consumerism and egoism to moderation of material consumption, solidarity, and sustainability)
- Consumption and production patterns (sustainable decrease in countries with material overconsumption, initial sustainable growth in countries with unsatisfied material human needs—until they are satisfied—qualitative changes in the composition of consumption).
- Education and training in new knowledge and skills.
- Development of symbiotic forms of society-nature relationship.

#### 5. Implications

Some policy implications that could be drawn from the precedent considerations are:

- The crisis we face is systemic, not sectoral or incremental. Systemic problems require integrated systemic (or, what is now called *transformational*) approaches.

- Fragmented and incoherent measures and policies will not provide a solution to a systemic crisis; they may, on the contrary, aggravate it.\* Along these lines, a reconsideration of the Sustainable Development Goals is urgently needed to ensure their coherence and synergy.
- The importance of reinforcing long-term systemic perspective in the analysis of policies, considering them in the context of a set of concerted policies of different sectors, and articulating social, environmental, institutional and economic policies.
- The need to implement an international effort to identify and monitor the set of major trends that could significantly modify the global trajectory toward desirable (or away from undesirable) futures.
- The need to agree internationally on the minimum set of attributes sufficient to consider a future state of the world as desirable (or at least acceptable). One mechanism, in addition to national, regional and global discussions and agreements, could be the facilitation of citizen participation on different scales, from local to global, to reach basic agreements. The participation of the media and different social actors could enhance the impact. It cannot be ignored that the attempts to reach these agreements will unavoidably collide with the national and international vested interests and current power structure, and therefore one of the major challenges will be to gather the necessary political will to change course.
- The need to establish international regulatory mechanisms to redirect the systemic crisis towards a sustainable and acceptable trajectory. This could be done through the United Nations (at the moment the only body with broad international legitimacy), with the intellectual and political support of a new international body of committed scientists, thinkers and politicians along the lines of the IPCC.†
- The need to identify and implement strategic measures to change course, and to select the most sensitive causal nodes for the application of the respective actions.

---

*“A crisis tests the system and strengthens its capacity for response and innovation.”*

---

That being said, and considering the narrowing and closing of windows of opportunity for a number of issues (such as climate change, species extinction, etc.), the accumulation of signs that we are heading in the wrong directions, and the prevailing political inertia and shortsightedness, perhaps the best hope lies in the growing ferment of discontent among young people, both in Latin America and globally, as they realize that a cultural change, a change of values, is the only possible way out, towards a less consumerist, more caring, sustainable and desirable society. Today, it is the children of the world who are emerging as significant actors.

Latin America and the Caribbean could, and should, play a significant role in the transformation. An important contribution of the region could be to initiate activities in the

---

\* The well-known system sub-optimization effect.

† Intergovernmental Panel on Climate Change

area of uncertainty management and identification of appropriate strategies, the integrated management of complex systems such as socio-ecological ones, and the identification of systemic solutions to the region's sustainable development problems.

The old adage that says "A crisis is also an opportunity" gains additional force from a system theoretical and complex theory perspective:

- A crisis tests the system and strengthens its capacity for response and innovation (it can also destroy it).
- A system in crisis becomes vulnerable to change (even small but critical ones) and therefore opens an opportunity to change direction and make positive changes.

The change of trajectory is necessary and urgent. But it is not automatic. Only humans can make it possible.

*Author's Contact Information*

Email: [ggallopin@gmail.com](mailto:ggallopin@gmail.com)

## Bibliography

1. See for example the article by Raúl Prebisch (1972) "The Economic Development of Latin America and its principal problems". Available at: <http://archivo.cepal.org/pdfs/cdPrebisch/002.pdf>
2. Gallopin, G.C. 2003. "A systems approach to sustainability and sustainable development". Serie medio ambiente y desarrollo No. 64, Sustainable Development and Human Settlements Division, ECLAC, Santiago, Chile.
3. Herrera, A.O. H.D. Scolnik, G. Chichilnisky, G.C. Gallopin, D. Mosovich, G.L. de Romero Brest, C.E. Suárez, y L. Talavera "Catastrophe or New Society? A Latin American World Model". IDRC064e. Int. Develop. Res. Centre, Ottawa, Canada.
4. Gallopin, G.C., Gutman, P., Maletta, H., 1989. Global impoverishment, sustainable development and the environment: a conceptual approach. International Social Science Journal 121, 375–397. Subsequently called social-ecological, and human-environmental system, by other authors.
5. Granoff, J. 2020. Approaching human Security. *Cadmus* 4(3): 1-4
6. Jacobs, G. 2016. Integrated Approach to Peace & Human Security in the 21<sup>st</sup> Century. *Cadmus* 3(1):48-71
7. Gallopin G. C. 1981. Human Systems: Needs, Requirements, Environment and Quality of Life. In: G. L. Lasker (ed) *Applied Systems and Cybernetics. Vol I. The Quality of life: Systems Approaches*. Pergamon Press.
8. Lenton, T. 2016. *Earth System Science: A Very Short Introduction*. Oxford University Press.
9. Steffen W, Jäger J, Carson D J and Bradshaw C (eds). 2002. Challenges of a Changing Earth. Proceedings of the Global Change Open Science Conference, Amsterdam, 10-13 July 2001. *Springer-Verlag*, Berlin.
10. Sustainable Development Goals-Progress Chart-. United Nations. Available at: <https://unstats.un.org/sdgs/report/2022/progress-chart-2022.pdf>
11. Chancel, L., Piketty, T., Saez, E., Zucman, G. et al. 2022. *World Inequality Report 2022*, <https://wir2022.wid.world/download/>
12. Drijfhout, S., et al., 2015. Catalogue of abrupt shifts in Intergovernmental Panel on Climate Change climate models. *PNAS* 112 (43), E5777–E5786.
13. Nicolis, G. and Prigogine, I. 1977. *Self-Organization in Nonequilibrium Systems: From Dissipative Structures to Order through Fluctuations*. Wiley, New York.
14. Schwab, K. 2017. *The Fourth Industrial Revolution*. Crown, N.Y.
15. Gallopin, G.C., Hammond, A., Raskin, P. and Swart, R. 1997. "Branch Points: Global Scenarios and Human Choice". *PoleStar Series Report N1 7*; Stockholm Environment Institute, Stockholm. Available at: <https://www.tellus.org/pub/Branch%20Points%20-%20Global%20Scenarios%20and%20Human%20Choice.pdf>