

The Limits to Growth: Ecosocialism or Barbarism

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This year marks the fiftieth anniversary of The Limits to Growth. This report warned of the serious ecological consequences for industrial society of maintaining the trajectory of global economic activity. Half a century later, however, the situation has only worsened in terms of environmental pressure and impact, while ideologies and practices built around the fetish of economic growth have continued to expand. The scientific community warns that time is running out and that the only way to avoid an environmental collapse with catastrophic consequences, especially for the most vulnerable social sectors, is to rescale economic activity to a level compatible with the planet's limits. Some international institutions and various national governments are approving programmes and policies to achieve these objectives, with meagre results. The alarm is growing at the possibility of a reactionary and eco-fascist solution to the eco-social crisis. In this article, we assess the state of the question and review how the model of production and consumption is behind the ecological disorders and why the only democratic political solution to the ecosocial crisis is the ecosocialist project.



Picture by Álvaro Minguito

Introduction

It has now been fifty years since the scientist Donella Meadows led the publication of a report titled The Limits to Growth, which aimed to analyse the physical impacts of economic growth patterns on the planet. A computer model was used for the assessment, which looked at, among other things, the effect of economic exploitation on soils, the

exhaustion of non-renewable resources such as minerals, and the resulting climate distortions. Various scenarios were put forward, the worst case being that, if no action were taken to correct the trajectory being followed at the time, industrial society would collapse in the mid–twenty-first century.

The report became an international reference point and highlighted the ecological consequences of the dynamics of growth that, until then, had been seen as positive. The scientific team's model, together with its findings, was nevertheless fiercely contested by economists.¹

The notion of economic growth is intrinsically connected with the social notion of progress

Economic growth is indeed habitually seen as something desirable, limited in space and time, even as a reflection of the natural evolution of societies. The very notion of economic growth is intrinsically connected with the social notion of progress, both of which arise from the Enlightenment and have suffered from forced, equivocal analogies with the natural sciences, particularly based on Darwinist theory.² In short, we have firmly internalised and naturalised the notion of economic growth.

Thirty years later, Meadows herself maintained that economic growth should be understood as a tool and not as an end in itself, that it was necessary to question the rationale of such growth, who benefits from it, and whether there were sources and sinks on the planet to make it possible. This had similarities with what the economist Simon Kuznets had suggested when he designed the gross domestic product (GDP) indicator and put it forward to the U.S. Congress. According to Kuznets, it should not be inferred that this indicator, which measures the monetary value of production, could also be an expression of social well-being. More and more voices have been raised since then, warning that GDP is not a good tool for measuring human development and social well-being.³

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The main problem underlying conventional economics is its reliance on a conceptualisation of the economy that deliberately ignores the physical context of which it is necessarily part, including the most elementary laws of physics. This means combating the assumption that resources and energy are unlimited, without even considering the fallout of the activity or the planet's limited carrying capacity. In view of the hegemonic nature of economic thought and its ability to mould the framework of social thought, this is crucially important, because it makes finding effective solutions to the eco-social crisis virtually impossible.

Defective Economic Models

Economic growth can be seen as the result of greater production capacity on the part of a particular society. To simplify, this means that a society that produces a larger quantity of product than it did in the previous year is said to have grown economically by an amount equal to the difference between the two levels of output. In this way, a country that produces ten units of food in a particular year and produces twelve units of food the following year is said to have

¹ ↪ Robert M. Solow, "Is the End of the World at Hand?," *Challenge* 16, no. 1 (1973): 39–50.

² ↪ Robert Nisbet, *Historia de la idea de progreso* (Barcelona: Gedisa, 1980).

³ ↪ Donella Meadows, Jorgen Randers, and Dennis Meadows, *Limits to Growth* (London: Earthscan, 2006); Jean Gadrey, "What's Wrong with GDP and Growth? The Need for Alternative Indicators," in *A Guide to What's Wrong with Economics*, ed. Edward Fullbrook (London: Anthem, 2004), 62–76; Kate Raworth, *Economía rosquilla: 7 maneras de pensar la economía del siglo XXI* (Barcelona: Ediciones Paidós, 2018).

experienced a 20 percent growth in food units. These two new food units are considered as economic surplus. The systematic buildup of economic surpluses lies behind the development of societies, inasmuch as historically it has enabled societies to become more complex.⁴

Capitalism as an economic system emerged around five centuries ago. It introduces a series of incentives, through competition, to discipline companies and force them to grow in each period, as well as to reinvest profits in order to raise their production capacity to a higher level, awarding a growing share of those profits to the people who supplied the capital. In this way, under capitalism, the whole entrepreneurial fabric is pushed toward boosting production capacity. This is what, under specific institutional arrangements, has driven the spectacular increase in economic activity, infrastructure, and the living standards of people over the past two hundred years.

The historical reality of capitalism has, however, demonstrated that the process of economic growth is neither constant nor spared from serious upheavals (leading to phenomena such as unemployment and lack of paid work for large sectors of society). Economists have also devoted themselves to the task of untangling the difficulties of economic growth for more than two hundred years. Most of them, however, have used a set of theoretical instruments that neglect the ecological issue—that is, the ecological prerequisites for economic growth and the ecological consequences of that growth.

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Classical economists, the founders of political economy as a discipline, have nevertheless undoubtedly been aware of what we might call the social metabolism: the relationship between nature and the economy.⁵ Their predecessor, the physiocratic school, whose principal exponent was François Quesnay, had already interpreted the economic question in the eighteenth century on the basis of agrarian flows and concluded that any surplus is possible thanks to the gifts given to us by nature. David Ricardo, in turn, was aware of differing soil fertility and put together a theory of decreasing land yields that led him to think that capitalism could not grow indefinitely. Reverend Thomas Malthus introduced his now famous thesis on population growth as a constraint on economic growth. Karl Marx and Frederick Engels, too, considered that capitalism would come up against limits to its own development due to the downward trend of the rate of return, but all within an essentially teleological philosophy of history according to which the whole system would inevitably advance phase by phase until the culmination of communism (Garzón, 2017).⁶ Marx was extremely interested in the scientific advances of his time and accorded considerable importance to the concept of social metabolism, which he is widely credited with having introduced into social science.⁷

In the twentieth century, in striving to make the discipline more scientific, economic thinking moved further away from the physical and even social conditions under which any economy must necessarily operate. Neoclassical thought, as reformulated by Léon Walras, Alfred Marshall, and William Stanley Jevons, among others, permeated economic science as a whole and led to a break with the previous political economy, giving rise to notions of production and wealth completely disconnected from a natural base. Meanwhile, the search for theoretical explanations of economic growth

⁴ ↪ Sergio Cesaratto, *Heterodox Challenges in Economics: Theoretical Issues and the Crisis of the Eurozone* (Cham: Springer, 2020).

⁵ ↪ Helmut Haberl, Marina Fischer-Kowalski, Fridolin Krausmann, and Verena Winiwarter, *Social Ecology: Society-Nature Relations Across Time and Space* (Cham: Springer, 2016); Manuel González de Molina and Víctor M. Toledo, *The Social Metabolism: A Socio-Ecological Theory of Historical Change* (Cham: Springer, 2014).

⁶ ↪ Garzón, A. (2017): Por qué soy comunista. Península.

⁷ ↪ Paul Burkett, *Marxism and Ecological Economics* (Leiden: Brill, 2006); John Bellamy Foster and Brett Clark, *The Robbery of Nature: Capitalism and the Ecological Rift* (New York: Monthly Review Press, 2020); Kohei Saito, *Karl Marx's Ecosocialism: Capital, Nature, and the Unfinished Critique of Political Economy* (New York: Monthly Review Press, 2017).

and its possible failures continued with the economists Roy F. Harrod and Evsey Domar, who developed a model that concluded that economic growth was fundamentally unstable and that meeting the conditions for stability was extremely complicated.⁸ This Keynesian-inspired model provoked a response from neoclassical economists such as Robert Solow and Trevor Swan, who laid the foundations for the paradigm of economic growth and whose models are still being studied as a priority in every economics department around the world. These are the models that, in the end, define to a large extent economists' scope of thought.

The cornerstone of every model of economic growth is the aggregate production function. This function represents the economic production process and, in its most basic formulation, only involves capital and labor, while resources and energy are always considered as fully available. In this way, capital and labor are taken to be the only production resources that, together, generate the surplus of an economy. This surplus, in turn, makes up the amount to be distributed between wages and profits.

This is the basis of a large proportion of policy discussions around accumulation and distribution in capitalist societies. Ethical and political issues as important as the level of wages or profits or, even more, their relative share of income, are addressed from the standpoint of the effects of those changes on economic growth. Each model belongs to a distinct

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school of thought due to its specific configuration, determined by different starting assumptions. In general, neoclassical models consider that restrictions on growth come from the supply side, so they suggest that profits must be increased to encourage accumulation, while post-Keynesian models focus on restrictions from the demand side and usually suggest changes in the

distribution of income and increases in wages (or public expenditure) to support demand. The large majority of current discussions of economic policy fall within one or the other of these perspectives. Nevertheless, the general paradigm is always shared, and the debate really turns on ways to maximise economic growth.

Students of economics are often surprised when studying these models, especially the most basic ones, that there is apparently no possibility of unlimited growth. For example, Solow's model establishes that the production factors, capital and labor, have decreasing returns, which supposes that each additional unit provides an ever-smaller quantity of product. In its dynamics, the model tends toward a stationary state where there is no economic growth. Nevertheless, when technical progress, in whichever possible formulation, is incorporated into these basic models, it is then possible for potentially unlimited growth to exist. This is what happens with the AK growth or endogenous growth models, as well as all models incorporating growing returns in the aggregate production function. In effect, students soon learn that unlimited economic growth is technically possible thanks to technology and, in the case of certain heterodox models drawing inspiration from Allyn Young, Gunnar Myrdal, Nicholas Kaldor, and Anthony Thirlwall, also the central role played by the industrial sector.⁹

This brief review of the relationship between economic models and public policy should make it clear above all that economists, past and present, generally tend to think within analytical and conceptual frameworks defined on the basis

⁸ ↪ José Manuel Naredo, *La economía en evolución: Historia y perspectivas de las categorías básicas del pensamiento económico* (Tres Cantos: Siglo XXI, 2015); R. F. Harrod, "An Essay in Dynamic Theory," *The Economic Journal* 49, no. 193 (1939): 14–33; A. K. Sen, *Growth Economics* (New York: Penguin, 1970).

⁹ ↪ Daron Acemoglu, *Introduction to Modern Economic Growth* (Princeton: Princeton University Press, 2009); David Romer, *Advanced Macroeconomics* (New York: McGraw-Hill, 2000); Robert A. Blecker and Mark Setterfield, *Heterodox Macroeconomics* (Cheltenham, UK: Edward Elgar, 2019).

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of the search for maximum economic growth. The responses given are dependent on the use of a set of theoretical instruments that, whether explicitly or otherwise, are limited by their own deficiencies. Bearing in mind the fundamental role played by economists in framing public debate, disseminating their own ideas, influencing the decisions of public institutions, and, as in

the case of central banks, directly holding absolute control of particular levers of power, it is necessary now more than ever to go to the source of these limitations.

What all these trends and schools of thought have mostly ignored, both in their methodological foundations and in their policy proposals, is the connection between productive activity per se and the natural foundations on which it sits, and which it cannot do without. In other words, there is absolutely no vision of the social metabolism, which entails starting from a worldview where the economy is seen as a subsystem of the biosphere and not the other way around. This lack, wholly illegitimate in our times, relates to the physical aspects of the economic process, the use of energy and natural resources, and the ecological pressures and impacts of the production process.

Natural Resources and Energy

The economist Nicholas Georgescu-Roegen was one of the first to warn of the serious deficiencies in traditional ways of thinking about the economy. In particular, he highlighted the gap in economic models regarding the consumption of energy and materials. Both components restrict the possibilities of economic growth in ways that economics had ignored until just a few years ago.¹⁰ In fact, planet Earth is a closed system of materials so that, aside from the very exceptional arrival of a meteorite or the removal of a human artefact, neither of which are significant in quantitative terms, the mass of materials is always the same. In the case of energy, Earth is an open system inasmuch as we receive energy flows from solar radiation, but, even then, the laws of physics impose limits on energy use.

These days, we accept that most of the products we use in our daily lives are made from a combination of energy, water, and other materials, and that we need energy sources in order to extract and process those materials for the production process. We also know that they come from the geochemical cycles of Earth and most originated millions of years ago due to plate tectonics, which not only generated but also geographically distributed resources across the planet,

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although obviously not uniformly.¹¹ For this reason, some regions of the planet are rich in petroleum and natural gas, while others are rich in other minerals—all have clearly shaped the historical development of societies and, of course, have led to wars over resources as well. These resources are in large part non-renewable, meaning that they exist in

fixed quantities and their natural regeneration occurs over a time frame inaccessible to human beings. Any resources that do renew themselves cyclically are limited by their own pace of regeneration.

Moreover, every human process involves the use of a series of energy sources governed by the laws of physics, particularly the laws of thermodynamics. The second principle of thermodynamics establishes that the quality of energy

¹⁰ ↪ To be fair, the most recent models incorporate a new productive resource known as *natural capital*, although with significant limitations deriving from the difficulty in reducing the complexity of ecosystems to a single monetary value.

¹¹ ↪ James R. Craig et al., *Recursos de la tierra y el medio ambiente* (Madrid, Pearson, 2012).

usable by human beings is decreasing and that, in converting energy (for example, converting the energy from solar radiation through photosynthesis or generating electricity through photovoltaic panels), it is not possible to maintain 100 percent of the available energy. Much of the energy is dissipated as heat, so conversion presupposes the transformation of high-quality, low-entropy energy, such as carbon, into low-quality, high-entropy energy such as heat. The history of technological development is the history of a constant struggle to improve the energy efficiency of such conversions.¹²

Flows of materials and flows of energy can be understood as two distinct aspects of the same process. In fact, a continuous flow of materials is only possible if there is a continuous flow of energy at the same time. In addition, these two restrictions on economic growth interact in very diverse ways, and the ecological pressure and impact of productive activity also show up in the alteration of geochemical cycles.

It is common, however, to differentiate between pressure and impacts deriving from productive activity. On the one hand, productive activity exerts pressure on the environment, for instance through the emission of carbon dioxide resulting from burning fossil fuels. On the other hand, the impact of productive activity on the environment shows up in phenomena such as climate change or global warming resulting from the sustained build-up over time of greenhouse gases in the atmosphere. Over the last few decades, the availability of information has significantly improved and many indicators have been put together with a view to measuring the level of pressure and impacts exerted by the production and consumption model on the natural environment.

The Planetary Boundaries

There is no doubt that human beings have lived on Earth for at least two hundred thousand years, although most of the time they did so in hunter-gatherer social groups. The end of the last ice age, which occurred some twenty thousand years ago, gave way to an extraordinarily warm climate that, in turn, enabled human beings to develop new economic and social practices, such as agriculture (developed some twelve thousand years ago). Scientists have agreed to call this warm era the Holocene, in which current civilisations developed.

Since the Industrial Revolution, the use of resources and energy by humanity has, however, increased to a marked degree. Many studies on environmental history describe these transformations very well. This intensive use of resources and energy, especially energy from fossil fuels, has brought about a rise in living standards and with it an increase in population throughout the world. These trends have sped up, especially since the mid-twentieth century, as can be seen in Charts 1 and 2 in this article. The period beginning at that time has been called the Great Acceleration.¹³

In more general terms, the scientists Paul Crutzen and Eugene Storer coined the term Anthropocene more than two decades ago to refer to the change from one geological epoch to another, meaning that, these days, as a consequence of the development of the global economic system, humanity mobilises more land and sediments than any other natural process.¹⁴ Other authors have used Capitalocene instead, to point to what is ultimately responsible for all of these transformations: the type of economic system.¹⁵

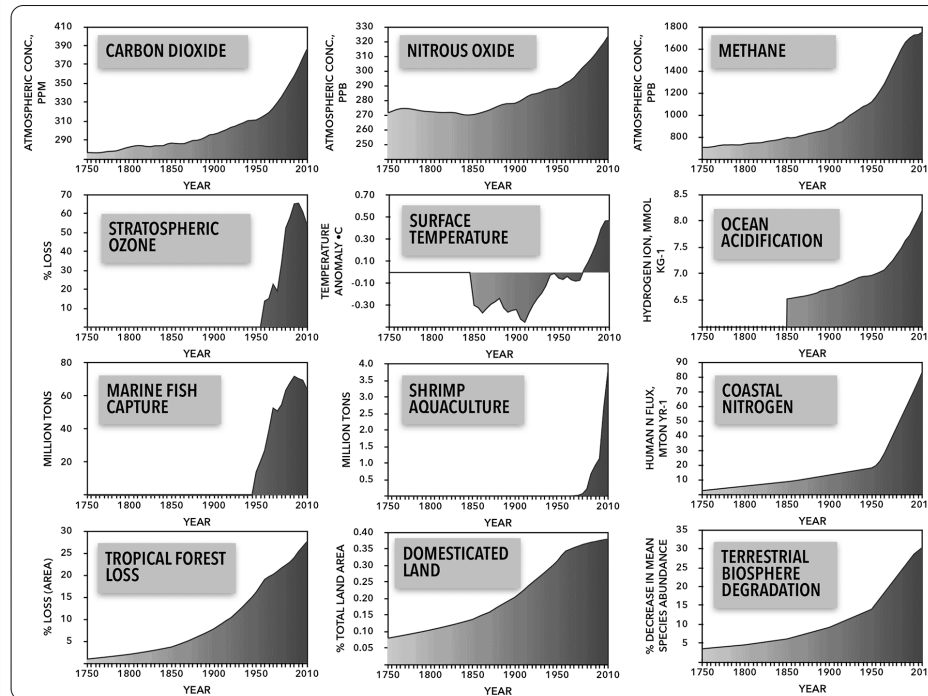
¹² ↪ Vaclav Smil, *Energía y civilización* (Barcelona: Arpa, 2021).

¹³ ↪ R. McNeill, *Something New Under the Sun* (New York: W. W. Norton, 2001); Will Steffen, "The Earth System, the Great Acceleration, and the Anthropocene," in *Sustainability and the New Economics*, ed. Stephen J. Williams and Rod Taylor (Cham: Springer, 2022), 15–32.

¹⁴ ↪ The term *Anthropocene* first appeared in English in E. V. Shantser, "The Anthropogenic System (Period)," *Great Soviet Encyclopedia*, vol. 2 (New York: Macmillan, 1973), 140.

¹⁵ ↪ Foster and Clark, *The Robbery of Nature*.

Chart 1. Earth System Trends

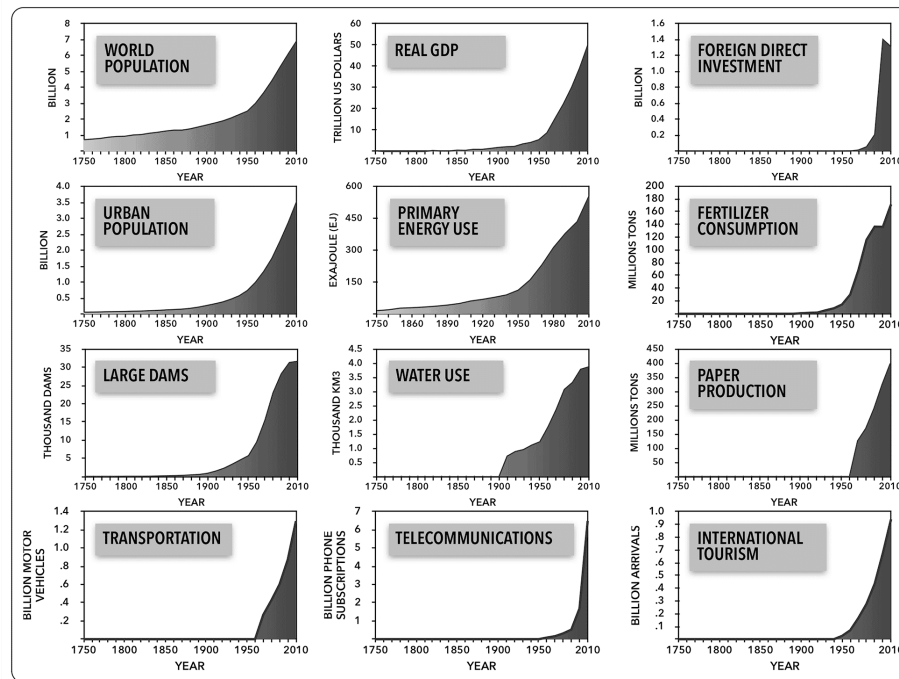


Source: Ian Angus, [“When Did the Anthropocene Begin...and Why Does It Matter?”](#) — The Jus Semper Global Alliance, November 2020.

In 2009, a group of scientists developed the framework of planetary boundaries, with reference to the main ecological thresholds that, if lowered, could entail significant planet-wide alterations in natural cycles.¹⁶ The main virtue of this framework is that it extends the range of attention beyond global warming, much more generally recognised, to encompass other environmental impacts such as the loss of biodiversity, acidification of oceans, and contamination due to excess nitrates or plastics. Nine biogeological phenomena were identified that, if specific limits were exceeded, would trigger irreversible processes threatening life itself. This understanding is based on the existence of a safe space, with boundaries determined by the specific biogeological parameters of the Holocene, within which human beings could live with a degree of security. At the moment, five of the critical thresholds for life are thought to have been passed, highlighting the urgency of a forceful response to these imbalances.

¹⁶ ↪ Johan Rockström et al., “Planetary Boundaries: Exploring the Safe Operating Space for Humanity,” *Ecology and Society* 14, no. 2 (2009).

Chart 2. Socioeconomic Trends



Source: Ian Angus, [“When Did the Anthropocene Begin...and Why Does It Matter?”](#) — The Jus Semper Global Alliance, November 2020.

One of the main problems with the planetary boundaries framework, however, is that it looks at social metabolism in an essentially technical way. If the analysis is not broadened, the framework seems to place responsibility on abstract

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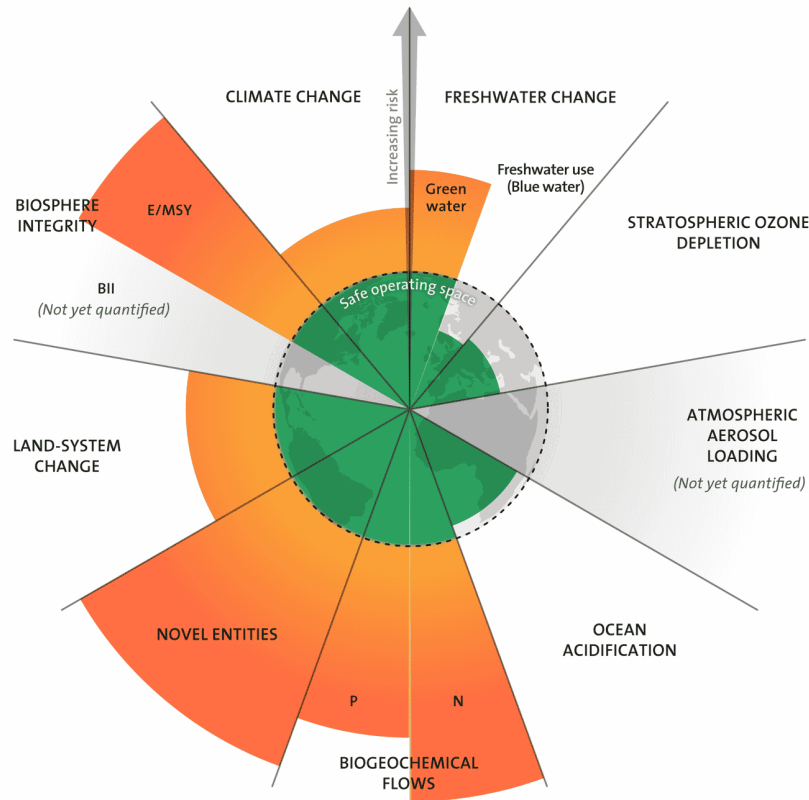
notions such as humanity or the human being, when it is obvious that neither the causes nor the consequences of the ecological impact are symmetrically distributed across class or geography. There is in fact no global ecological crisis that means the same thing for all people. Therefore, it is much more appropriate to talk of an eco-social crisis, because it helps to highlight the importance

of sociopolitical relationships when assessing environmental degradation processes and seeking solutions.¹⁷

Some authors, such as the English economist Kate Raworth, have added a social dimension to the sphere of planetary boundaries. The result, popularly known as the circular economy, points to the need for people in modern societies to live above decent minimum living standards (social floor) and below the planet’s biophysical limits (ecological ceiling), thereby establishing a safe, fair space for humanity. This contribution is useful in that it allows for the incorporation of aspects such as inequality, poverty, and decent work into an understanding of biophysical limits.

¹⁷ ↪ Ulrich Brand et al., [“From Planetary to Societal Boundaries: An Argument for Collectively Defined Self-Limitation”](#) — The Jus Semper Global Alliance, October 2022.

Chart 3. Planetary Boundaries Update



Source: "Planetary Boundaries Update: Freshwater Boundary Exceeds Safe Limits," Potsdam Institute for Social Research, April 16, 2022. Designed by Azote for the Stockholm Resilience Centre.

The Impact of Consumption

Since the publication of *Limits to Growth*, the close link between economic growth and the heavy ecological pressure and impacts threatening life on the planet has been generally acknowledged. For this reason, the United Nations developed the Sustainable Development Goals. Target 8.4, for example, is to "improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation." The European Union also adopted this agenda and has, since then, approved a large number of standards designed to achieve those goals.

The scientific work built up over the last few decades has resulted in the proliferation of indicators to measure the impact of economic activity on the planet, which has facilitated the pursuit of these commitments. The general public, for example, has become familiar with indicators measuring carbon dioxide in the atmosphere and is even aware of the impact of their carbon footprint on daily life and consumption decisions. Nonetheless, as we have already noted, environmental impacts go beyond climate change and also require other indicators.

One of the most advanced approaches in this regard has to do with the flow of materials involved in the production and consumption model. The extraction and processing of resources is responsible for approximately 50 percent of greenhouse gas emissions and more than 90 percent of the loss of biodiversity on the planet. It has been proved that there is a direct, close relationship between the consumption of materials and economic growth.¹⁸ This is basically the result of the impulse to consume.

Consumption (referring here to aggregate economic demand, that is consumption plus investment plus government, and

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not simply consumer spending) is the main driver of global ecological impact, far ahead of other demographic factors such as age, household size, cultural capital, or housing structure. It must be stressed that consumption is required to close the capital cycle—that is, for production to be sold and economic growth to exist.

Consumption and production are, in this sense, two sides of the same coin.¹⁹ After all, under capitalism, production is geared toward economic gain rather than satisfaction of human need, so that economic actors are disciplined to ensure that their production is sold and consumed, and the profits are reinvested in greater production (growth). If aggregate demand were insufficient to cover production and stocks in a particular period, the system would be facing a crisis. Thus, under capitalism, the incessant consumption spiral mirrors the incessant production spiral.

It should be remembered that any product coming onto the market carries with it a baggage of both visible and invisible resources, meaning that any product involves the use of the materials it is made of, but also the materials necessarily consumed in manufacturing that product. For example, a single smartphone is made up of dozens of mineral substances such as lithium, aluminum, silicon, copper, and nickel, but its production also relies on the consumption of huge amounts of water—according to some estimates, twelve thousand litres of water per unit—and other materials, in addition to the waste generated due to its early obsolescence. With economic globalisation and the development of global value chains, the material and technological complexity of products has increased and with it the commercial exchange of raw and other materials and waste between countries. This applies not only to the consumption of electronic products but also to food products (the world agri-food system is responsible for 34 percent of greenhouse gas emissions) and the global tourism industry (the cause of 8 percent of greenhouse gas emissions). All our daily activity is tied to a particular level of resource and energy consumption that exerts pressure on and impacts the natural environment.²⁰

The extraction of material resources has in fact been stepped up throughout the world in recent decades, as is clear from Chart 1, which goes back to the beginnings of the last century. It can be seen, moreover, that there has been incredible growth since the second half of the last century, a good demonstration of the Great Acceleration period. In 2017, for example, the average person consumed 65 percent more resources than in 1970.²¹

¹⁸ ↪ *Global Resources Outlook 2019* (Nairobi: UN Environment Programme, 2019).

¹⁹ ↪ Thomas Wiedmann, Manfred Lenzen, Lorenz T. Keyßer, and Julia K. Steinberger, “Scientists’ Warning on Affluence,” *Nature Communications* 11 (2020); David Harvey, *The Limits to Capital* (Londo

²⁰ ↪ Helen Burley, *The Land and Water Footprints of Everyday Products* (Amsterdam: Friends of the Earth, 2015); M. Crippa et al., “Food Systems Are Responsible for a Third of Global Anthropogenic GHG Emissions,” *Nature Food* 2 (2021); Manfred Lenzen et al., “The Carbon Footprint of Global Tourism,” *Nature Climate Change* 8 (2018).

²¹ ↪ Fridolin Krausmann, Christian Lauk, Willi Haas, and Dominik Wiedenhofer, “From Resource Extraction to Outflows of Wastes and Emissions: The Socioeconomic Metabolism of the Global Economy, 1900–2015,” *Global Environmental Change* 52 (2018):131–40; *Global Resources Outlook 2019*.

The domestic extraction indicator is generally used to find out the precise impact of the production and consumption model on the use of natural resources in a particular territory. It measures natural resource use within the borders of a country. The drawback of this procedure, however, is that it does not record the impact of international trade and can lead to the belief that certain countries, traditionally net importers of products, are improving their indicators of the impact of resource use when this result might, for example, reflect the fact that they have relocated material-intensive industries. Another indicator used is domestic material consumption, which does take account of international trade, but only adds the physical weight of the apparent consumption of imported and exported goods. This means that no account is taken of the quantity of resources used to produce the imported and exported goods. To solve this problem, a much more accurate indicator has been developed. Known as the material footprint, it describes the consumption of both domestic natural resources and imported goods, also including the resources used in producing those internationally traded goods.²²

The material footprint is therefore the best available indicator to assess the impact of the production and consumption model on resource use. At the aggregate level, the material footprint necessarily coincides with material extraction, due to the fact that imports and exports cancel each other out on a global level—which means that the growth of the material footprint has also been spectacular over the last fifty years. It has nevertheless been asymmetric, because not all regions are equally responsible for this growth in natural resource use. If we look at per capita resource use, we can see that North America, mainly due to the United States, is clearly in the lead with an average consumption of 30 tons per person in 2019. This is 1.5 times the consumption recorded in Europe and up to 7 times higher than the figure for Africa.

This is somewhat similar to what happens with greenhouse gas emissions at a global level, given that the Global North has been responsible for 92 percent of cumulative carbon dioxide emissions since 1850. The United States alone accounts for 40 percent of those emissions, while the countries making up the current European Union are responsible for 29 percent.²³

When we begin to look at the situation within different countries, we find that the upper income strata are the largest

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Moreover, some research has shown that, internationally, the richest 10 percent are responsible for between 25 and 43 percent of carbon dioxide emissions, so it is clear that the ecological impact is driven by the richest citizens of each country.²⁴

In the case of Spain, the country's material footprint has grown in the last fifty years, although with two clearly differentiated sub-periods. Until the financial crisis, the trend was upward, speeding up at the beginning of the century with the housing boom, but the subsequent downward trend has continued ever since. This pattern points to possible dematerialisation, that is, less resource consumption per year. This is due to a large extent to the economic crisis, but it

²² ↪ Wiedmann, Lenzen, Keyßer, and Steinberger, "Scientists' Warning on Affluence."

²³ ↪ Jason Hickel, "Quantifying National Responsibility for Climate Breakdown: An Equality-Based Attribution Approach for Carbon Dioxide Emissions in Excess of the Planetary Boundary," *Lancet Planet Health* 4 (2022): 399–404.

²⁴ ↪ Benedikt Bruckner, Klaus Hubacek, Yuli Shan, Honglin Zhong, and Kuishuang Feng, "Impacts of Poverty Alleviation on National and Global Carbon Emissions," *Nature Sustainability* 5 (2022): 311–20.

may also reflect changes in the production structure—toward less resource-intensive sectors—or an increase in technological efficiency.

The problem with the material footprint measurement, as well as all the other previously mentioned indicators, is that they only reflect the consumption of materials. To take account of other types of impacts, the European Commission has developed a new methodology based on the full product life cycle, which has led to the construction of two new indicators: the domestic footprint and the consumption footprint.²⁵

The domestic footprint reflects the ecological impact (not of resources alone, but also a further fifteen aspects), taking account solely of what is produced within the country. As the consumption footprint also covers the effect of international trade, it incorporates the impact of all the goods produced abroad but consumed in our country (deducting the impacts of what we produce here for consumption in other countries). In the case of the European Union, the data show that in the period between 2005 and 2014 there was a relative reduction in environmental impacts, although with very different indicators from one country to another. The most significant environmental impact was felt in countries that are traditionally importers of fossil fuels, meat, minerals, and manufactured products, resulting in a higher consumption footprint.²⁶

All in all, at this point, fifty years since the publication of *Limits to Growth*, the debate no longer centres on whether

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economic growth is associated with pressure and impact on the natural environment (there is an overwhelming consensus in this regard), but whether it is possible to decouple the two phenomena from growth sufficiently and quickly enough to prevent the

social metabolism from reaching the point of no return in the crossing of planetary boundaries. This is, precisely, the debate between green growth and degrowth.

Degrowth and Technological Efficiency

According to the dominant view of international institutions like the United Nations and European Union, to avoid the worst ecological scenarios we must reconcile economic growth—which is considered essential to social well-being—with use of resources and energy remaining within the planetary boundaries. This would be possible if there were a decoupling of some variable used to measure economic activity (normally GDP) from the variables used to measure ecological pressures and impacts (such as carbon dioxide emissions, use of material resources, and so on).

When the ecological pressure and impact variables grow at a slower rate than GDP, a relative decoupling is said to have

Great hope has been placed in technological efficiency. This is the technological optimism on which the whole narrative of green growth is based.

occurred, whereas if GDP grows but the pressure and impact variables decrease, an absolute decoupling is said to have occurred. To achieve these objectives, great hope has been placed in technological efficiency, seen as the

set of technologies that, applied to the production process, enable the latter to consume fewer resources and less energy

²⁵ ↪ Serenella Sala et al., *Indicators and Assessment of the Environmental Impact of EU Consumption* (Luxembourg: European Union, 2019).

²⁶ ↪ Sanyé-Mengual, M. Secchi, S. Corrado, A. Beylot, and S. Sala, "Assessing the Decoupling of Economic Growth from Environmental Impacts in the European Union: A Consumption-Based Approach," *Journal of Cleaner Production* 236 (2019).

per unit of product in monetary value. This is the technological optimism on which the whole narrative of green growth is based.

Nevertheless, most of the analyses carried out have concluded that, in general, no decoupling between economic activity and environmental pressure and impact is happening, and, furthermore, is unlikely to happen at any point. In most cases, no kind of decoupling is taking place with regard to consumption of materials, energy consumption, water use, greenhouse gas emissions, or loss of biodiversity. Where studies have found some evidence of decoupling, it has been based on local analyses, restricted to specific countries or regions, for short periods of time (during a crisis, for example) or on an insufficient scale to tackle the ecological challenges.²⁷

It is obvious that strategies to increase technological efficiency must be complemented with sufficiency strategies, that is,

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with a reduction in the material scale of production and consumption in many sectors so that economic activity can fit within the planetary boundaries. This is where the proposals for degrowth have emerged most forcefully. Degrowth began as a political and social movement and should not be understood either as an economic concept

or as a consistently structured theory, but as a broad, heterogeneous stream of thinkers and proposals seeking to ensure development of the global economy within the planet's biophysical limits. Quite simply, degrowth should be understood as a criticism of the theory of decoupling and green growth, and as an affirmation of the need to reduce the pressure of human beings and their economic model on ecosystems and the natural environment without betting everything on technological promises.²⁸

Ecosocialist Strategies versus Barbarism

Fifty years since *The Limits to Growth*, we are now fully aware that the production and consumption model is causing pressure and impacts on the natural environment to such an extent that life itself is threatened. What is lacking, however, is the political will to make decisions equal to that challenge, as the institutional policies followed to date have proven clearly insufficient. Despite the speeches and rhetoric from the governments of the most developed countries, the commitment in the Paris Agreement not to raise the global temperature by more than 1.5°C above pre-industrial levels is currently undeliverable. On the contrary, according to research by the UN Intergovernmental Panel on Climate Change, the world is on a path toward a catastrophic rise of 2.7°C by the end of the century.²⁹

This being the case, the key task of democratic societies should be to build resilient communities capable of prioritising the well-being of their members without permanently damaging the natural environment that sustains them, as well as to prevent escalation of the social conflicts and wars increasingly linked to the eco-social crisis.³⁰ As we have seen,

²⁷ ↪ Timothée Parrique et al., *Decoupling Debunked* (Brussels: European Environmental Bureau, 2019); Helmut Haberl et al., "A Systematic Review of the Evidence on Decoupling of GDP, Resource Use and GHG Emissions, Part II," *Environmental Research Letters* 15, no. 6 (2020).

²⁸ ↪ Jason Hickel, *Less Is More* (London: Penguin, 2021).

²⁹ ↪ Climate Change 2021: The Physical Science Basis (Geneva: IPCC, 2019).

³⁰ ↪ Elke Pirgmaier and Julia K. Steinberger, "Roots, Riots, and Radical Change—A Road Less Travelled for Ecological Economics," *Sustainability* 11, no. 7 (2019); Oliver Belcher, Patrick Bigger, Benjamin Neimark, and Cara Kennelly, "Hidden Carbon Costs of the 'Everywhere War,'" *Transactions of the Institute of British Geographers* 45, no. 1 (2019).

however, achieving this eco-social-political objective necessarily entails scaling down the material dimension of the economy to bring it within planetary boundaries, with far-reaching political, social, and economic implications. To begin, a complete reframing of the realm of consumption is needed. Though it is true that consumers cannot make decisions concerning the supply side, such as the location of major production centres, they do have plenty of room to influence decisions on the demand side. It is not easy to take advantage of this capacity, because capital is a social relationship and, therefore, far more than a production and consumption model; it is a way of life. This means looking at the values and principles of capitalist consumption, which go beyond human needs and planetary boundaries, the ways such practices are socially reproduced, and what potential centres of resistance could be generated. When it comes to the necessary achievement of ecologically sustainable consumption, the starting point must be that the market is incapable of distinguishing between goods meeting basic needs and goods of a luxury nature. We need to move in the direction of an economy based on the satisfaction of human need.³¹

Approaches of this type, inspired by Amartya Sen and Martha Nussbaum and their influence on the UN Development Programme, together with the contributions of Manfred Max-Neef and Ian Gough, should replace the dominant paradigm of economic growth. The utilitarian tradition in economics maintains that there is a positive, infinite relationship between income growth and happiness/well-being. Specialist literature has nevertheless argued in favor of the existence of the Easterlin Paradox, according to which increased income does not, beyond a certain point, result in increased individual happiness.³²

In adapting the production and distribution processes to be socially just, there must also be a significant flow of redistribution between social classes and a general reorientation of production toward activities that may be low intensity when it comes to ecological pressure and impact but significantly satisfy human needs. To this end, guaranteed work programs can help combat unemployment.³³

Moreover, democracy will only survive the coming social tensions if it can put itself forward as a complete program of positive safeguards, meaning that it must be in the republican tradition, with an underlying positive conception of the notion of freedom. Consequently, consolidating and ring-fencing public services such as health, education, housing, and pensions, among others, is an essential part of a both ecologically sustainable and socially just society.³⁴ These alternative policies must nevertheless start from a concrete analysis of reality. A large part of scientific research concerning the eco-social crisis has given us ever more accurate information on what is happening in the social metabolism. It is much harder, however, to find the reasons this is happening, which specific actors are responsible, and which obstacles stand in the way of changing direction.

First, it is unusual to find research that, along with a technical analysis of the eco-social crisis, also provides a specific analysis of how power operates. When all is said and done, power is a social relationship that inevitably defines the limits of what is possible. At the same time, the possibilities of implementing policies that may look simple on paper move closer or further away. For example, although the need to reduce global meat consumption to combat climate

³¹ ↪ Elke Pirgmaier, "Consumption Corridors, Capitalism and Social Change," *Sustainability* 16, no. 1 (2020); Ian Gough, "Recomposing Consumption: Defining Necessities for Sustainable and Equitable Well-Being," *Philosophical Transactions of the Royal Society* 375, no. 2095 (2017): 1–18.

³² ↪ Santiago Álvarez Cantalapiedra, "Economía política de las necesidades y caminos (no capitalistas) para su satisfacción sostenible," *Revista de Economía Crítica* 16 (2013); Richard A. Easterlin, "Does Economic Growth Improve the Human Lot? Some Empirical Evidence," in *Nations and Households in Economic Growth: Essays in Honor of Moses Abramovitz*, ed. Paul A. David and Melvin W. Reder (Amsterdam: Elsevier, 1974).

³³ ↪ Alberto Garzón and Adoración Guaman, *El Trabajo Garantizado: Una propuesta necesaria frente al desempleo y la precarización* (Madrid: Ediciones Akal, 2015).

³⁴ ↪ Luigi Ferrajoli, *Poderes salvajes* (Madrid: Trotta, 2011); Alberto Garzón, *La tercera república* (Barcelona: Ediciones Península, 2014).

change has been sufficiently documented, it is not easy to find an analysis that also incorporates thinking about how to put such notions into practice. In other words, analysis of the political ecosystem extending to power in its various guises (business lobbies, major production companies, productive system, mass media, political and trade union alliances, and the state itself) is lacking.³⁵

Second, if power is missing from many current analyses, absence of thought about the ultimate causes of the eco-social

An analysis of the relationship between economics and the environment truly wishes to go beyond the frontiers of academia and, consequently, genuinely seeks to transform the material reality it is examining, it must be capable of drawing on dynamic approaches to the study of the system that currently links together economic, social, and environmental spheres—that is, capitalism.

crisis is even more marked. It is true that the drivers of environmental destruction are associated with the social pressures and impacts that influence the disproportionate use of resources and energy, greenhouse gas emissions, and more. But there is no use in reaching that point if no link is made with the ultimate, systemic causes of the persisting catastrophic process. In the end, without an understanding of how capital operates and how it pushes all actors (from the working class to major companies) to

achieve economic growth ad nauseam, the analysis will be insufficient. If an analysis of the relationship between economics and the environment truly wishes to go beyond the frontiers of academia and, consequently, genuinely seeks to transform the material reality it is examining, it must be capable of drawing on dynamic approaches to the study of the system that currently links together economic, social, and environmental spheres—that is, capitalism. The central contradiction of this economic system, as we have already remarked, is that it functions and operates as if it were disconnected from the natural base on which it necessarily stands. As Marx suggested, the main problem with capitalism is its huge success in achieving its objectives. We now know that life simply cannot bear the costs associated with this “success.”

The central ideological opponent of capitalism has historically been socialism, a sociopolitical movement without which even modern democracy itself could not be understood. But, as it arose in the nineteenth century, socialism has been characterised by a longstanding ignorance of environmental pressures and impacts. Most of the theoretical output concerning the economic measures to be taken in defence of the working class ignores its ecological consequences—even the most recent theoretical work. As I have already pointed out, the influence of the traditional way of thinking about the economy has seriously contaminated that of socialists and the left in general, as can be seen in uncritically productivist approaches from which economic policy proposals and measures often classed as leftist are derived. Some researchers even speak of the role played by these authors as protagonists of a passive revolution—a concept Antonio Gramsci used to describe the ability of the dominant classes to co-opt the leaders of the subordinate classes.³⁶ These policies, however, are not just the result of a specific conception of the world but at the same time serve to educate entire generations of opponents of capitalism in a particular political culture.

This longstanding weakness is not the only dangerous legacy from the past. The type of society we presently know, which has seen rapid development over the last two hundred years, is a result of intensive use of natural resources, especially fossil fuels. The predominant role of fossil fuels can hardly be exaggerated. The whole social architecture we see before us now is due to fossil capital, and not just in historical terms. Everything from productive activities through to

³⁵ ↪ Doris Fuchs et al., “Power: The Missing Element in Sustainable Consumption and Absolute Reductions Research and Action,” *Journal of Cleaner Production* 132 (2016).

³⁶ ↪ Clive L. Spash, “Apologists for Growth,” *Globalizations* 18, no. 7 (2021).

the layout and design of our cities, not to mention the way of living imposed on working families, is shaped by the dynamics of fossil capital. Serving as an emblematic demonstration is the fact that, when there have been other upheavals in energy markets, as happened in the 1970s and is happening again now following the Russian offensive in Ukraine, the whole social system is transformed both materially and ideologically. The dependency on fossil capital is an expression of the fragility of the whole social system.³⁷

The issue here is obvious. In a world with finite natural resources and fossil fuels reaching or exceeding their respective peaks, the crossroads at which we find ourselves should not be underestimated. We already have before us the first signs that one of the alternatives gaining ground in the face of this eco-social crisis is a new form of fascism, which promotes a type of closed, authoritarian social organisation aimed at meeting the needs of select social groups to the detriment of the rest of the population. This type of social closure, characterised by insider/outsider dynamics, has fundamental

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sociopolitical implications. A growing proportion of international migratory flows are currently due to climate change and environmental crises and their effects on impoverished countries, while the neofascist response to migration brings traditional racism into line with climate denial and a commitment to authoritarian solutions to the eco-social crisis.³⁸

This route can only lead to barbarism. It is not by chance that the rising tide of global reaction is happening at the same time as we have the best and most accurate information about the way humankind is running out of time under this economic model. Clearly, it is not sufficient to be correct. Currently, some of the social and generational frustrations of our time are being articulated politically through a reactionary solution that seeks to defend “our own” against the “foreign.” An ideological and material retreat of broad social sectors is taking place in the face of the fundamental uncertainties of the Anthropocene era. Old wine in new bottles.

Taking up these challenges will not be a matter of simple political prescription, nor will it be a question of winning arguments. Rather, it will have to do with the ability to put together broad social and political alliances to prepare the ground for a whole historical and social bloc to emerge. Local initiatives and global proposals, classical traditions, and new ways of thinking, along with social and institutional action, must play a part in this broad community, in an effort to build a social fabric that looks toward a horizon of peace, justice, equality, and social rights within planetary boundaries.

In the past, the idea of an alternative—socialism or barbarism—was popularised by Rosa Luxemburg against the

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bellicose backdrop of the First World War. The traditional Marxist conception of the time theorised that capitalism was at such an advanced stage of development, in its imperialist phase, that the only thing that could come out of the war was international socialist revolution or the destruction of every trace of civilisation. In a way, there were indeed

revolutions and a lot of destruction. Not only Europe but the whole world was devastated by two world wars and numerous repressive regimes, which swept away millions of human beings, including Luxemburg herself, who was assassinated in 1919 during the Spartacist uprising.

³⁷ ↪ Timothy Mitchell, *Carbon Democracy* (New York: Verso, 2013).

³⁸ ↪ Andreas Malm and the Zetkin Collective, *White Skin, Black Fuel: On the Danger of Fossil Fascism* (New York: Verso, 2021).

Presently, that alternative is perfectly valid. Human civilisation, any civilisation, can only build horizons of justice and well-being if it can find a way to do so within the planetary boundaries. Fitting within or readjusting to those boundaries, if we may put it like that, can happen in either an organised or a chaotic manner, the worst-case scenario being ecological collapse. Any of the intermediate scenarios will in any event oblige us to reorganise ourselves through other rules. But we must not forget that the politics striving hardest to prevail in these situations of emergency and collapse is that of authoritarianism, discrimination, inequality, and militarism. It is, once again, barbarism. To avoid it, we must open an alternative road based on other principles and values, democracy, human rights, and social justice. It is a matter of ecosocialism or barbarism.

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❖ **About Jus Semper:** The Jus Semper Global Alliance aims to contribute to achieving a sustainable ethos of social justice in the world, where all communities live in truly democratic environments that provide full enjoyment of human rights and sustainable living standards in accordance with human dignity. To accomplish this, it contributes to the liberalisation of the democratic institutions of society that have been captured by the owners of the market. With that purpose, it is devoted to research and analysis to provoke the awareness and critical thinking to generate ideas for a transformative vision to materialise the truly democratic and sustainable paradigm of People and Planet and NOT of the market.

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