



Article scientifique

Article

2024

Published version

Open Access

This is the published version of the publication, made available in accordance with the publisher's policy.

Planning beyond growth: The case for economic democracy within ecological limits

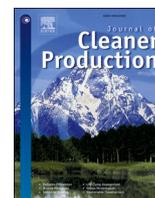
Durand, Cédric; Hofferberth, Elena; Schmelzer, Matthias

How to cite

DURAND, Cédric, HOFFERBERTH, Elena, SCHMELZER, Matthias. Planning beyond growth: The case for economic democracy within ecological limits. In: Journal of cleaner production, 2024, vol. 437, p. 9.
doi: 10.1016/j.jclepro.2023.140351

This publication URL: <https://archive-ouverte.unige.ch/unige:174367>

Publication DOI: [10.1016/j.jclepro.2023.140351](https://doi.org/10.1016/j.jclepro.2023.140351)



Planning beyond growth: The case for economic democracy within ecological limits

Cédric Durand^{a,1}, Elena Hofferberth^{b,1}, Matthias Schmelzer^{c,d,1,*}

^a University of Geneva, Unimail, School of Social Sciences, 40, bd du Pont d'Arve, 1211, Genève 4, Switzerland

^b University of Lausanne, Institute of Geography and Sustainability, Mouline – Géopolis, CH - 1015, Lausanne, Switzerland

^c Friedrich Schiller University of Jena, Institute of Sociology, Leutragraben 1, D-07743 Jena, Germany

^d University of Flensburg, Norbert Elias Center for Transformations Design & Research, Auf dem Campus 1b, D-24943, Flensburg, Germany

ARTICLE INFO

Handling Editor: Giovanni Baiocchi

Keywords:

Sustainability

Post-growth

Degrowth

Democratic planning

Economic democracy

Social-ecological transformation

ABSTRACT

Degrowth and post-growth economics has emerged as a particularly fruitful approach in the debates about the reorientation of economies in the Global North towards environmental sustainability, equality, need satisfaction and democracy. This perspective promotes a *planned* reduction of energy and resource use in the Global North to limit environmental pressures and global inequalities and improving well-being. Yet, the specifics of this “design” are not precisely delineated. On the one hand, there is a wide acceptance, at the abstract, most general, even definitional level, that degrowth involves planning or amounts to a planned transition. On the other hand, there is strikingly little explicit engagement with, debate on, and research into what exactly “planning beyond growth” could look like. This gap urgently needs to be addressed. By exploring the degrowth-planning nexus, this paper seeks to lay a foundation for this effort. First, it identifies in the degrowth/postgrowth literature the obstacles and the opportunities for further engagement with planning. Second, it advances an agenda-setting framework, delineating problems relative to democratic ecological planning beyond growth along three axis: elaboration, implementation and multilevel dynamics.

1. Introduction

Degrowth and postgrowth economics has emerged as a particularly fruitful approach in the debates about the reorientation of economies in the Global North towards environmental sustainability, equality, need satisfaction and democracy (Kallis et al., 2018; Weiss and Cattaneo, 2017; Schmelzer et al., 2022). This perspective promotes “a *planned* reduction of energy and resource use designed to bring the economy back into balance with the living world in a way that reduces inequality and improves human well-being” (Hickel, 2021, 1, emphasis added). Material degrowth requires transforming our infrastructure, for example, shifting away from automobile-dominated mobility and our energy systems away from fossil fuels. More generally, material degrowth would entail a complete restructuring of our modes of production and consumption beyond incessant growth, towards sobriety and the fulfillment of human needs. Such a radical shift is a difficult process that warrants a reconfiguration of core institutional parameters of our economic systems (see the special issues on degrowth in the *Journal of*

Cleaner Production in 2010, 2015, and 2018).

To avoid major disruptions in such a transition process, the degrowth and postgrowth literature proposes to escape the expansionary and accelerating dynamics of the capitalist economy “by design, not disaster” (Victor, 2019). Yet often the specifics of this “design” are not precisely delineated. On the one hand, there is a wide acceptance, at the abstract, even definitional level, that degrowth involves planning or amounts to a planned transition. Some of the most widely cited definitions of degrowth include the term. Besides the above quote by Hickel (2021, 1), Schneider et al. (2010, 11) contrast degrowth to “unplanned” recessions and define it as the “voluntary, smooth, and equitable transition to a regime of lower production and consumption, whereas Schmelzer (2015, 264) defines degrowth simply as “a planned contraction of economic activity aimed at increasing well-being and equality”. In fact, in most definitions the decrease is explicitly qualified – if not as “planned” – at least in similar terms such as “voluntary”, “managed”, “purposeful”, “intentional”, “deliberate”, or “democratic” (Parriquer, 2019, 224).

* Corresponding author.

E-mail addresses: cedric.durand@unige.ch (C. Durand), elena.hofferberth@unil.ch (E. Hofferberth), matthias.schmelzer@uni-jena.de (M. Schmelzer).

¹ All authors contributed equally to the article.

On the other hand, the issue of planning has been a kind of taboo for decades. The brutal experience of Soviet-style planning and its limits (Chavance, 2019; Ellman, 1990) may be one of the main reasons why there is strikingly little explicit engagement, with debates on, and research into what exactly “planning for degrowth” could look like. The planning processes – which institutions can organize planning, including what actors, what questions to decide on and how, whether it is centralized or decentralized, participatory or commons-inspired etc. – is rarely made explicit. Most papers which explore planning and degrowth focus on spatial or urban planning, without connection to macroeconomic level or state policies (cf. Lehtinen, 2018; Xue, 2022; Ferreira and von Schönfeld, 2020). A paper on the relationship between degrowth and the state, for example, does not even mention planning (D’Alisa and Kallis, 2020).

One current of degrowth positions that has recently become more prominent takes a more explicit postcapitalist perspective and expresses the need for ecological and social planning both with regard to downscaling material and energy throughput, emissions and production and consumption and with regard to organizing social provisioning to meet everyone’s needs (Kallis et al., 2020; Hickel, 2020; Smith et al., 2021; Akbulut and Adaman, 2020; Schmelzer et al., 2022). Despite this acknowledgement, the specificities of how planning could work, how to organize these processes democratically, and what it means in practice to manage the transition away from the hegemony of market exchanges are not spelled out. In view of the ambition and challenge of a transition beyond economic growth, this is a gap that urgently needs to be addressed.

Our contribution builds on this strand of research and advances an agenda for the degrowth-planning nexus. It posits that there is a tension in the conduct of the ecological transition between, on the one hand, needs-based and limits-based rationality and, on the other hand, cost-benefit based rationality and that some forms of planning are required to give precedence to the former over the latter (Husson, 1991). In such perspective, planning allows pivoting away from an economy governed by market exchange and profit-driven corporations to a more conscious management of production and consumption systems. Planning beyond growth can thus be defined as a set of institutions supporting decision-making processes informed by bio-physical and social indicators and driven by deliberately stated social and ecological targets.

To progress in our understanding of that institutional path, past and present debates on planning can inform and be informed by degrowth. There is a long tradition of ecological planning in geography and environmental management studies (Ndubisi, 2002; Steiner and Brooks, 1981), with recent contributions in industrial engineering (Denkena et al., 2022) that analyze planning from a functionalist perspective focusing on the administrative branch or the industrial process. Moreover, economic planning has long been an important topic in both economics and socialist literature and is today seeing a revival as a postcapitalist project (Phillips and Rozworski, 2019; Vettese and Pendergrass, 2022; Harnecker and Bartolome, 2019; Saros, 2014; Sorg, 2022) and with a renewed academic interest in industrial policy and price control (Weber et al., 2022; Chirat and Clerc, 2023; Riofrancos et al., 2023; Chang and Andreoni, 2020). So far, most of these planning debates – including the newly emerging strands integrating digitalization and platform tools – have largely lacked a substantial engagement with the question of growth/degrowth and limits in general (Cockshott et al., 2022; Hahnel, 2021; Tremblay-Pepin, 2022). However, there are some exceptions in the eco-socialist tradition (Löwy, 2005; Adaman and Devine, 2017; O’Neill, 2004) and among recent attempts to resuscitate democratic socialist planning in the light of current ecological challenges (Planning for Entropy, 2022; Vettese and Pendergrass, 2022; Dyer-Witherford, 2022).

Our limited objective in this article is to lay the ground for a more substantial engagement between the planning and degrowth and post-growth literature (for the sake of our argument, the differences are not important) by identifying building blocks for this discussion and

advancing an agenda-setting framework to shift from the current economic institutional setting towards planning beyond growth. Section 2 maps the gap about planning in the postgrowth debate. It examines the reasons why planning has so far largely been neglected in this literature but also identifies paths forward. In Section 3 we delineate an agenda, proposing a framework to identify the questions that must be explored to design institutional settings for planning processes beyond growth. The aim of this paper is thus not to resolve the issues at stake, but rather to sketch the challenges and thus lay the foundation for an emerging field of research.

2. Mapping the gap about planning in postgrowth debates

The origins of “de-growth” can be traced back to André Gorz’s (alias Michel Bosquet) comments on the *Limits to Growth* report in the early 1970s (Bosquet, 1973). However, the intellectual appeal of degrowth as a political project only emerged in the 2000s. What unites the degrowth/postgrowth scholarship is an acknowledgement of the necessity of a social-ecological transformation of the economy and of economics, including a fundamental critique of the hegemony of growth. This means a deprioritization of economic growth as a policy goal and a focus on sustainability and wellbeing (Büchs and Koch, 2017; Eversberg and Schmelzer, 2018; Kallis et al., 2018). Notwithstanding this shared vision, conceptual approaches vary. One can distinguish between (1.) anthropological critiques of growth (ACG), which grows out of the cultural critiques of concepts such as “development”, “consumption”, “progress”, and of economics itself, (2.) “steady-state economics” (SSE), which proposes limits to the size of the economy but relies on market instruments to achieve efficient allocation, and (3.) “the new economics of prosperity” (NEP), which is largely inspired by post-Keynesian theory and attempts to achieve “prosperity without growth” (cf. Lange, 2018). For various reasons explicated in this section, this research has not directly engaged with planning. This is however not the case for a more recent strand of system-critical proposals and eco-socialist-leaning literature that acknowledges the need for some forms of planning (4).

2.1. Anthropological critiques of growth tend to be biased toward localism, community, and cultures

A very influential strand of degrowth builds on a cultural critique of economic growth and development. The anthropologist Escobar considers international development as a form of cultural imperialism comparable to colonialism imposed on poor countries (Escobar, 1995). This also echoes the concept of “*sumak kawsay/vivir bien*” (Acosta, 2012), which has been popularized by Andean Indigenous movements as an alternative to development and was inscribed in Ecuador’s new 2008 Constitution and in Bolivia’s 2009 Constitution. The cultural critique of growth is also a pillar of the degrowth current *à la française* (Martínez-Alier et al., 2010) championed by Serge Latouche (2010). It draws on the works of Ellul (2004) and Illich (2009; see also Samerski, 2018), pointing to the alienation resulting from the overwhelming sophistication of technologies, modern institutions, and consumerism, promoting instead voluntary simplicity to foster quality of life and solidarity among people.

Among this cultural critique of growth and development, one particularly resolute perspective comes from economics itself, expressing the poverty of the anthropological norms of the discipline and its dangerous implications for human societies and the biosphere. Calling for a “decolonization of the minds” from economism and qualifying economics as a *Dismal Science*, Harvard economist Marglin argued that economic development is “simply the formalization of modern Western culture” (2003, 26; 2010). Pointing out the destruction of traditional knowledge and solidarity by the modernization path, he insists that “It is in our own self-interest as well as the global interest to promote cultural diversity”, as it “may be the key to the survival of the human species”

(1990, 16). In his view, economic growth is detrimental because “markets substitute impersonal relationships mediated by goods and services for the personal relationships of reciprocity and the like” (2003, 27).

Because these perspectives insist on the riches of interpersonal ties, they tend to be neither interested nor supportive of building macro-planning institutions, which are perceived as abstract, and instead favor an empowerment of autonomous local communities. This cultural criticism of growth makes a convincing case against the alienating dynamics of the real subsumption of labor and everyday life to capitalist technologies. It also rightly stresses the social immiseration related to the loss of community ties due to the extension of market relations. However, the counterpart of the willingness to develop more intense immediate social relations is a radical scaling down of the division of labor, whose consequences are widely overlooked by some degrowth scholars. Indeed, an abrupt disruption of interdependencies could translate into a massive de-specialization of productive activities, a dramatic reduction in the productivity of labor and, finally, an unsustainable reduction of living standards.

One of the strategic blind spots of such thinking is that human societies must deal with the legacies of the past. The current generation must deal with the existing production/consumption nexus. It cannot get rid of this overarching socialization (Mandel, 1986) by simply retracting from intensely connected metropolis to form small local communities. The transition beyond growth also needs to be addressed materially and institutionally (e.g. by phasing out fossil-based or otherwise dirty or unnecessary activities) at a level inaccessible to local actors, which is precisely one of the reasons why planning must be considered, which is not the case in this first strand of research.

2.2. Steady state economics aims at the internalization of ecological externalities

Appreciating the close connection between environmental degradation and economic growth, as well as the thermodynamic limits to breaking this link, SSE seeks to determine a maximum size of the economy at a sustainable level sufficient to provide necessary goods and services for society and hold throughput constant (Daly, 1991). A constant stock of capital (understood as physical artifacts) and a constant population size are deemed necessary to maintain this “sustainable scale” which sets the limits to growth. The steady state of the economy thus concerns biophysical processes and not economic growth in monetary terms, as accounted for by GDP.

Alongside the goal of a “sustainable scale”, SSE aims for “efficient allocation” and “just distribution” to achieve greater equality and fairness in the economy. Allocation refers to the use to which the resources available in an economy are put, i.e. the goods and services produced therewith. Allocation is deemed efficient, and therefore good, when conforming “with individual preferences as weighed by the ability of the individual to pay. [...] [R]elative prices determined by supply and demand in competitive markets are considered as most suited to achieve this goal” (Daly, 1992, 186). This approach proposes phasing the use of resources that balances between the needs of the present and those of future generations.

Although proponents of SSE criticize neoclassical economics for its continued pursuit of economic growth and acknowledge many market failures that need to be resolved via participatory democratic processes and non-market allocation, the framework adheres to market and price mechanisms to achieve efficient allocation and thus ultimately rests on neoclassical foundations (Daly, 1992; Pirgmaier, 2017). The problem of the economy’s limitless drive towards economic expansion is deemed to be solvable by setting limits to the absolute size of the economy. The fundamental relations of capitalist economies that give rise to the degrading patterns of growth are not in the focus. Rather, SSE theorists argue that the price system and market mechanisms should be extended to areas hitherto not governed by these institutions, including natural resources and population. To achieve a steady-state economy, Daly

(2014) proposes the establishment of absolute caps on both resource depletion and population size, coupled with market mechanisms to manage the efficient allocation of resources and birth quotas, as well as minima and maxima for income and wealth to counter inequality. Not only does such a program raise ethical questions. It is also inconsistent. On the one hand, SSE correctly emphasizes the need for macro targets in terms of uses of resources and radical intervention in income and wealth distribution. On the other hand, it commits to largely remaining within the boundaries of the current economic system. The supposition that even a radical ecological and social “distributist policy [can] be based on impeccably respectable premises: private property, the free market, opposition to welfare bureaucracies and centralized control” (Daly, 1991, 54), we would argue, disregards the role of capitalist institutions in the systemic drive for expansion (on this, see Cahen-Fourot, 2022; Durand and Légé, 2013; Schmelzer et al., 2022)).

Overall, while acknowledging that the achievement of sustainable scale and just distribution require social decisions, SSE endorses the efficiency of market competition and politically managed price mechanisms to steer the reduction of throughput, supposing a high plasticity of economies to adapt to the ecological constraint. Such an approach to economic growth and transformation impedes the conception and exploration of the full range of alternative forms of economic organization, including planning. Recent contributions to SSE have elaborated the policy catalogue to achieve a steady-state economy. While this has included a shift away from market-based approaches to the stabilization of population, a debate around planning has failed to materialize (Dietz and O’Neill, 2013; Fanning and O’Neill, 2016; O’Neill et al., 2015).

A notable exception is Lawn (2011, p. 12) who writes that “central planning would still play a key role in a steady-state economy because (...) decisions regarding the sustainable rate of resource throughput and the equitable distribution of income and wealth must be based on ecological and ethical criteria”, which would require both bureaucratic support and democratic legitimacy. However, setting some broad targets to delimitate the operating space for markets is not what is generally considered as economic planning which involves at least industrial policy and some forms of socialization of investment, i.e. public funding and oversight of capital expenditures.

2.3. The new economics of prosperity focuses on macroeconomic stability with constant or declining GDP

The socialization of investment is a distinctive feature of Keynes’ theoretical legacy. While Keynes’ concern was first and foremost with unemployment related to macroeconomic imbalances, he was fully aware that the macroeconomic question could not be completely detached from more structural objectives, whether these involved coping with changes in international competition, organizing a war effort, reconstruction or pursuing a development strategy. And he advocated early on for a combination of public investment, industrial policy, and employment policy (Crotty, 2019). Such a policy mix was largely implemented in the context of the so-called Keynesian macroeconomic management in the post-war era, including the explicit planning for growth targets (Schmelzer, 2016). In some countries such as France, it was articulated with formal planning institutions (Kuisel, 1981). Keynesian thinking is thus perfectly compatible with some form of economic planning.

Despite the intellectual roots in the (Post)Keynesian tradition, research within the “new economics of prosperity” (NEP) did not substantially engage with the issue of investment socialization and related planning mechanisms. Its agenda has been dominated by research exploring the macroeconomic conditions for “managing without growth” (Victor, 2019), exploring the related aggregate demand, inequality, monetary and credit dynamics (Cahen-Fourot and Lavoie, 2016; Jackson and Victor, 2020). The objective was generally to represent the economic-ecological dynamics within the current economic system dominated by market coordination rather than to model

potential paths forward with distinct institutional settings (Hardt and O'Neill, 2017).

Another shortcoming is that despite incorporation of class relations in some models, they overlook the social-relations underpinning macroeconomic regularities and, especially the class relations and competitive struggles that sustain the systemic drive toward monetary growth (Cahen-Fourot and Louison, 2022; Durand and Légé, 2013). They could thus be overly optimistic about the socio-economic possibilities for shifting towards a postgrowth regime without major alterations of the basic parameters of capitalist economies.

Nonetheless, the contribution of this strand of research is of the utmost importance for ecological planning debates. The integration into modelling of environmental variables and other methodologies developed by post-Keynesian scholars such as stock-flow-consistent system dynamics, integration of environmental, financial and economic variables into physical and monetary input-output frameworks and agent-based models are particularly promising (Cahen-Fourot, 2021; Hardt and O'Neill, 2017; Magacho et al., 2023).

Those ecological macroeconomic models have a distinct appeal because they allow the design of clear and feasible transition pathways, which is an indispensable input for planning processes. Indeed, to be meaningful, planning requires modelling since, as stated by Wassily Leontief (1976): "A plan is not a forecast. The whole idea of planning assumes the possibility of choice among alternative feasible scenarios".

2.4. Humble beginnings of discussions of planning in the system-critical and ecosocialist degrowth literature

Degrowth being a contested terrain, there are divergent currents within the degrowth spectrum – some of which are more open to planning (Eversberg and Schmelzer, 2018). In particular those degrowth currents that combine anthropological perspectives with ecological, feminist, and Marxist economics and system-critical proposals for alternatives have tended to explicitly acknowledge the need for some forms of planning (Kallis et al., 2020; Schmelzer et al., 2022; Hofferberth, 2021; Hickel, 2020; Chertkovskaya et al., 2019). Three areas are particularly noteworthy: A first focus has been on strengthening all types of economic democracies – often understood not just pertaining to workplace democracy, but also spanning society-wide questions of participation, bottom-up deliberation, and autonomous forms of non-centralized planning – taking cues from the Cuban agroecology (Boillat et al., 2012), climate citizens councils (Lage et al., 2023) or urban planning (Kaika et al., 2023; Ruiz-Alejos and Prats, 2022). Second, degrowth literature has promoted macroeconomic and macro-financial planning for the selective growth and degrowth of certain sectors and economic activities, based on considerations of needs and limits, scaling back less necessary and energy-intensive forms or production and focusing on productive capacities instead on social-ecological goals, equity and well-being (Hickel, 2020; Schmelzer et al. 2022), and additionally focused on related financial arrangements to both mobilize funds for investing in the democratically planned green transition as well as planning the downsizing of private finance and buffering stranded assets and related repercussions of divestment from fossil fuels and curtailing excess income (Olk et al., 2023; Schmelzer et al., 2022; Hofferberth, 2021). A third aspect of planning that has been highlighted in degrowth literature is the deliberation of sustainable consumption corridors and the related democratically organized and de-commodified provisioning of universal basic services (Pirgmaier, 2020; Liegey, 2013).

However, also in these discussions of the need for economic planning and related goals and frameworks, the mechanisms of planning have not been outlined in detail. Most famously, the Japanese Marx expert Kohei Saito has argued (based on a close reading of the writings of the late Marx) that the development of the "productive forces" under contemporary capitalism does "not automatically prepare the material foundation for [a] new postcapitalist society," but rather is more likely to

contribute to "the robbery of nature." Rich societies thus need to transition toward degrowth. And achieving degrowth requires democratic ecological planning, that is, a collective effort to reorganize the provisioning system toward equity and sufficiency. As Saito states: "Social planning is indispensable to banning excessive and dirty production and to staying within planetary boundaries while satisfying basic social needs." (Saito, 2023, 177, 242). Yet overall, Saito's writings stay vague on the specificities of planning.

More topical is an entire issue focusing on "planned degrowth" in the *Monthly Review* in July/August 2023, in which various ecosocialist and degrowth authors advance critical research frontiers in terms of planning, focusing in particular on the overall goals and of a planning framework (Foster, 2023), but also on specific aspects related to technological innovations and planning the development of productive forces (Hickel, 2023; see also Vetter, 2018), on global climate justice and redistribution (Hickel, 2023), the spatial division of labor (Graham, 2023), or on key areas for degrowth planning (Schmelzer and Hofferberth, 2023). Recent contributions have explicitly argued for economic policies aimed at deaccumulation and de-commodification, including radical and participatory democratic planning from below to dismantle socially undesirable sectors (from fossil fuels production to planned obsolescence to the military), to decentralize the economy to favor local cooperatives, to drastically reduce working hours, and to break up monopolies and abolish rents (Pedregal and Juan Bordera, 2022; Schmelzer et al., 2022, 215–228). That this involves changes to ownership structures and related institutional settings is also highlighted: "Seeing economic decisions as political problems requires overcoming the idea of a universal yardstick to measure all activities (whether that is GDP, money, or any other indicator), or the hope of delegating efficient production to algorithms (even though they might be extremely useful as tools). The democratization of the economy involves various dimensions, from resources to organizations, with collective management replacing private ownership and governance." (Schmelzer and Hofferberth, 2023, 147; Li, 2023; implicitly Hickel, 2023).

What is lacking, so far, is mainly an overall framework within which to situate and discuss the various challenges and complicated (research) questions of planning beyond growth – a task we want to start to tackle in the next section. One of the most forceful and precise contributions in favor of planning from this strand of literature is John O'Neill's (2004) defense of Neurath against Hayek. By pointing out the relevance of *in natura* calculation and multi-criteria decision making, O'Neill lays a solid ground for the design of planning institutions.

Overall, the degrowth literature provides crucial insights for thinking about ecological planning in terms of critical assessment of the alienating dynamics of capitalist production and consumption processes (ACG), the necessity to encapsule economic activities within imperative physical limits (SSE) and the importance of complex macro-modelling to establish feasible scenarios (NEP). However, although those three strands of the literature can contribute to conceptualizing ecological planning beyond growth thinking, they do not explicitly engage with planning. This is not the case of a fourth current which considers that institutional planning devices are an indispensable alternative to pro-growth capitalist institutional settings. However, besides the issue of ecological calculation forcefully explored for several decades, there is still no precise engagement with this issue, nor comprehensive agenda-setting articulation of the problems at stake, which is what we propose to advance in the next section.

3. An agenda-setting framework for planning beyond growth

Undoubtedly, the design of an institutional framework for planning beyond growth is a formidable task that cannot be properly accomplished without a substantial engagement with ongoing historical processes. It is obviously without reach within the limits of a single

academic paper and calls for a much broader social engagement. Nonetheless, the lack of a proper organization of research on this topic is a significant hurdle to progress our understanding of the stakes and an obstacle to a more precise delineation of relevant proposals. Based on a normative stance aiming at strong sustainability (Dietz and Neumayer, 2007) and democratic decision-making (Descola, 2018), this section addresses this issue by advancing a reasoned presentation of three sets of challenges for planning beyond growth and articulate them in what we propose to call an *agenda-setting framework* (Fig. 1). The following subsections explain this framework, respectively focusing on the problems of multilevel dynamics, elaboration, and execution.

In this, we approach the economy as a process of social provisioning, mediating between biophysical processes and social outcomes (O'Neill et al., 2018; Fanning, O'Neill, and Büchs, 2020). Ecological planning aims at the sociopolitical effort of defining the boundaries, needs, and the corresponding conscious socioeconomic regulation of the provisioning systems which includes the purposeful development of productive forces and the expedient organization and distribution of work.

Of course, currently, the world is not devoid of planning. It could even be argued that the reach of corporate planning has dramatically extended since the beginning of this century with the deployment of digital capabilities (Bensussan et al., 2023). In the meantime, states and international organizations operate multiple specialized agencies whose actions allow the projection of public operations over the medium and the long run in a very wide array of fields such as technology, transportation, energy, defense, education, or healthcare. Those existing planning devices encompass sophisticated know-how that could be repurposed for ecological planning. However, the latter departs from them in three crucial aspects. Firstly, delineating and managing socioeconomic activities within a safe operating space implies a multilevel consistency of planning processes instead of the pursuit of parallel, unarticulated, and even competing private and public plans. This means a prevalence of public, arguably state-backed, democratic planning

institutions over other forms of planning. Secondly, while profit-making, competition, and specific sectoral targets are currently orienting corporate and state planning activities, in the case of ecological planning there is a common purpose to the planning institutions, namely the sustainable mastering of the metabolism between human activities and nature, which also requires a shared set of norms to coordinate activities across scales. Thirdly, contrary to prevailing planning practices, deliberation and pluralistic democratic inputs are foundational in ecological planning, both from an epistemological point of view and from the perspective of their legitimacy and thus their robustness.

3.1. Dynamics: experimentation and change through multi-level iteration

While the proposal of institutional parameters for a potential planning framework beyond growth may inspire social actors and garner interest and trust in its feasibility, one must appreciate that social transformation is an open-ended process, and that any framework will necessarily benefit from and be shaped by the unmatched creativity and unsurpassable pluriversality (Escobar, 2020) of real-world practical institutional making.

Postgrowth planning will have to articulate distinctive levels of planning and facilitate experimentation. This very abstract architecture could in principle go from the local up to the global level. We visualize this challenge in Fig. 1 through the colored areas that indicate different interdependent but relatively autonomous levels of planning. This encompasses the design and deployment of the rules framing provisioning systems at the top, local and sectoral levels as well as grounded unfolding at the microlevel. At each planning level, the two white squares represent the *elaborative and executive planning bodies* and their respective administrative apparatus.

Spatio-temporal projections of the plan by the executive bodies – both material (resource allocation) and semiotic (communication of signs and meanings) – need to exert an effective constraint vis-à-vis the

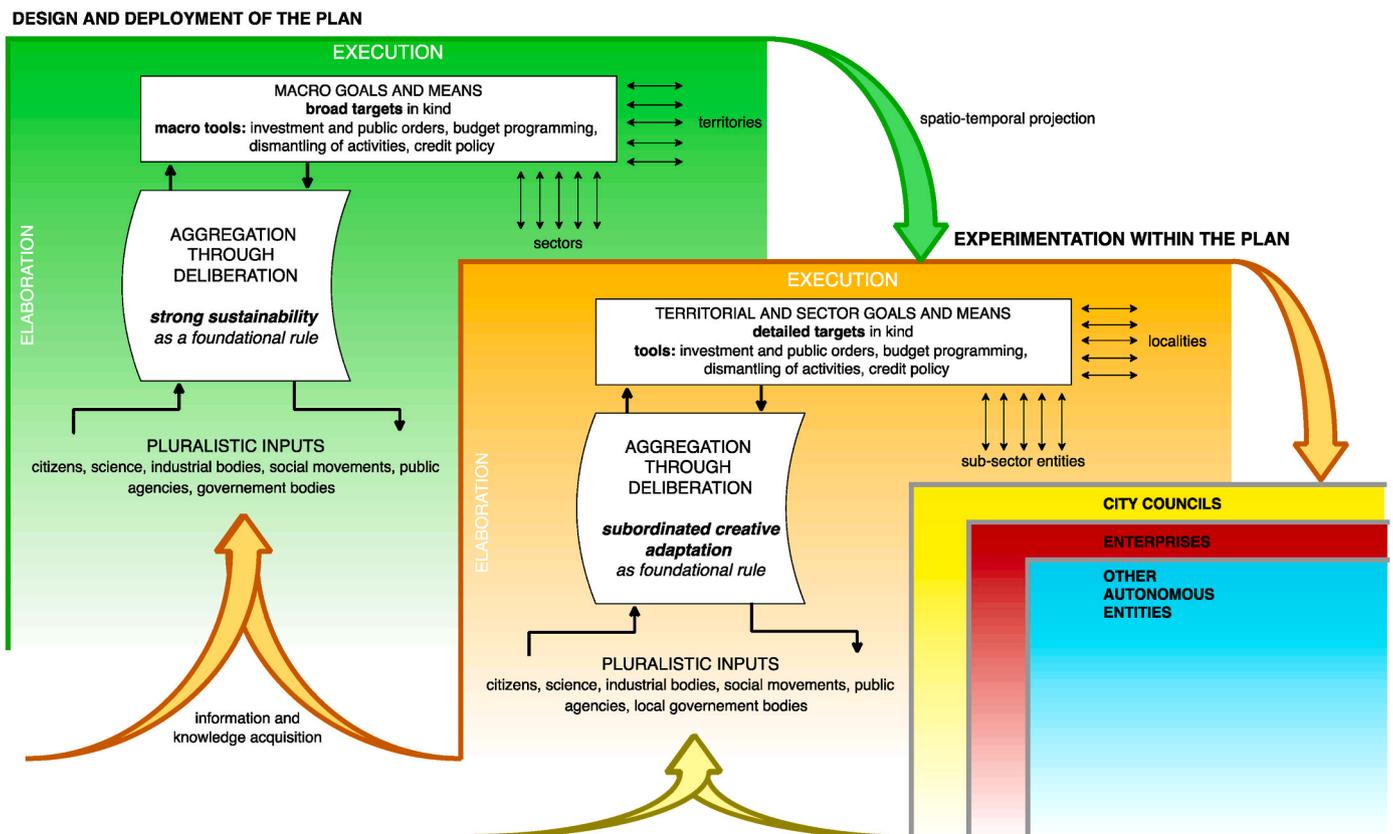


Fig. 1. Setting an agenda: a fractal architecture of multilevel ecological planning beyond growth.

subordinated levels (Bensussan et al., 2023). This does not have to be conceptualized as an absolute constraint, since during its implementation the plan is renegotiated to adjust to the irreducible uncertainty of real-life processes. More importantly, while this constraint delineates a space for the development of the territorial/sectoral/grounded activity, it does not necessarily prescribe this activity, as subordinated levels are actively encouraged to *experiment*. Within this space, there must be space for autonomous processes of self-organization and bottom-up planning.

The relative autonomy of the subordinated level implies that there are limits to the reach of the planning process at the superior level. This provides for additional space to cope with the infinite complexity of the concrete and preserves a diversity of socioeconomic practices, thereby limiting the risk inherent to technical monoculture and top-down organization. Moreover, it gives room to people to make sense of their personal activities, their subjective investment, and to meaningfully influence the labor process (Clot, 2014).

Applying the principle of subsidiarity could facilitate the greatest possible autonomy at the lowest level of organization and the coordination at higher levels, where needed ((Devine, 2019). What *can* be dealt with at the lowest level *should* be dealt with at that level. Issues that warrant coordination with other entities will have to be deliberated and enforced at a higher level. Decisions taken at a higher level then reimpose themselves on the lower levels, e.g. resource limits and social goals determined at the upper level. Although this is “top-down” in some sense, the autonomy of higher levels is only relative because 1) decisions are nurtured by the inputs from the lower level in addition to other specific sources of knowledge and information (scientific bodies, professional entities, etc.) and 2) a wide range of decisions are not centralized but made by individuals and local structures. This constitutes a strong bottom-up element of the framework. We envision planning as an iterative process, continuously integrating and implementing decisions at the different levels involved. Existing specifications of iterative multi-actor planning can serve as basis to advance degrowth planning. Laibman’s (2015) “Multilevel Democratic Iterative Coordination”, for instance, focuses on the interplay between “local production units” and “a Central Planning Authority” to organize economic activity. A structure of federated worker and consumer councils constitutes the basis of the iterative planning process in Hahnel’s (2021) “Participatory Economy”.

3.2. Elaboration: setting limits, priorities and need satisfiers

All dimensions of democratic planning rely on pluralistic inputs to acquire the relevant information and knowledge and elaborate a plan for socially and environmentally viable provisioning. Decisions over the definition of planetary boundaries, the priorities in terms of specific products or activities, and the according distribution of work will need to appreciate views from scientific communities, workers, industrial bodies, social movements, and public agencies, affected and Indigenous communities for example (Kunze and Becker, 2015). The crucial challenge emerges to decide who will have a say, and who decides who has a say. The democratic quality and density of the process is crucial to ring-fence the legitimacy of the plan and ensure its deployment over the relevant time frame, guaranteeing commitments to long-term goals despite any subsequent change in conditions. It must thus combine representation and participation of concerned actors and marginalized groups with an adequate mobilization of competencies. A democratic planning process with social-ecological ambitions will not only need to ensure participation of relevant stakeholders but also shield against capture through actors with adverse particular interests (Després, 2019). We conceptualize this process of elaboration as qualitative aggregation and integration through deliberation. The *bottom-up shading* of each square suggests the evolution from messy inputs to a formal plan.

Various sources of inspiration exist for the design of adequate processes. Büchs and Koch (2019, 161) propose to follow “a dual strategy”

which unites expert knowledge with the knowledge and visions of those whose needs are to be satisfied. The “dual strategy” in its original formulation envisions a combination of “central planning and democratic participation” to allow for need satisfaction (Doyal and Gough, 1991, 297). Devine (2019, 2022) envisions “negotiated coordination” as a means to bring together heterogeneous agents and sources of information and thereby elaborate economic plans in a participatory manner. The experiences of direct citizen’s involvement, such as in the citizens assemblies instituted for the climate emergency in various countries or the citizen assembly convened in France after the 2018 *gilets jaunes* uprising, show that attempts to build microcosmic representation of the people using quotas, random draw and a rich process of expert gathering could provide an effective basis for deliberation (Pech, 2021).

The main tasks of the elaborative bodies are thus: 1) to integrate/aggregate diverging views via deliberation; 2) to engage in a dialogue with the executive bodies about the elaboration of alternative scenarios of social, ecological, and economic pathways; 3) to deliberate and choose between them.

One key challenge to assess need satisfaction within biophysical limits relates to the ambiguity of the notions of “limits” and “needs”. Research on planetary boundaries allows the delineation of a “safe operating space” within limits that, if transgressed, will push the planet beyond the relatively stable conditions of the Holocene during which human societies evolved (Rockström et al., 2009, 2; Persson et al., 2022; Wang-Erlandsson et al., 2022). The metaphor of “limits” has proven successful to communicate the necessity of breaking with the idea that natural capacities can be infinitely exploited and substituted. Nonetheless, these notions should be used cautiously (Althouse, 2022, 144–48). While there are phase shifts and non-linearities, there is no such a thing as a clear-cut threshold between sustainability and collapse, but multiple and multidimensional interrelated thresholds (Norgaard, 1995, 130). This indicates that the limits cannot be objectively defined: while “thresholds in key Earth System processes exist irrespective of peoples’ preferences, values, or compromises based on political and socioeconomic feasibility”, “normative judgments influence the definition and position of planetary boundaries” (Rockström et al., 2009, 5). This is due to the uneven distribution of vulnerabilities and sensibilities to environmental change across the ecological and social space.

The theory of human needs helps identify a set of universal basic needs whose satisfaction represents a prerequisite for human flourishing. Yet, the specific ways in which these needs are satisfied differ according to context, time, and space (Doyal and Gough, 1991; Gough, 2020) and they are not reducible to bio-physical parameters (Kuecheyan, 2019). Need satisfiers are thus a range of diverse and changing institutional and material means of meeting human needs.

At the crossroad between those two literatures, the notion of limits has been criticized for mobilizing the ideology of scarcity at the expense of the infinite pathways of possible developments with a balanced relation between human societies and the rest of the biosphere. Clearing the notion of “limits” from its Malthusian association (Kallis, 2019) allows one to acknowledge that if science must inform the definition of ecological boundaries, those must be deliberated and evaluated by a scientifically informed *political* process in relation to need satisfiers.

Drawing on research on needs and limits, many scholars such as Raworth (2017) and Brand et al. (2021) acknowledge that the delimitation of a safe and just space for human societies to flourish within the biosphere (the “doughnut”) requires a political intervention in the economic realm. However, there remains a void regarding the concrete deliberation mechanisms that could allow for a consistent articulation and dynamization of the two boundaries of the doughnut as part and parcel of the social metabolism. That is why we propose the agenda-setting framework that enables the planning of the doughnut.

3.3. Execution: governing provision systems

The implementation of the hitherto elaborated priorities represents

another key challenge related to the effective management of provision systems (Fine et al., 2018; O'Neill et al., 2018). It warrants bodies that are responsible vis-à-vis the elaborative institutions and mobilize adequate resources and instruments for the execution of "the plan". In a first instance this requires the operationalization of the elaborated social and environmental priorities. Doing justice to their complexity, this is likely to require consistent in-kind calculation apparatuses that combine quantitative and qualitative targets such as carbon quotas, biodiversity targets, ceilings concerning the artificialization of the soils and detailed indicators regarding housing, energy, mobility, education, and health service provision. The deployment of ecological accounting frameworks, management procedures and control instruments suited to attain these targets is a second task the executive bodies would need to fulfil.

Several examples can help design processes to align in-kind targets with actual processes of provisioning. IKEA's centralized supply chain planning already combines operational, tactical, and strategic management procedures to anticipate and organize the sourcing and distribution of products on various horizons (Jonsson et al., 2013). Such mechanism could be deployed to connect the ecological statistical apparatus to private business central planning systems, thus allowing the gathering of data and provision of concrete paths to align sourcing and distribution practices with the overall objective of planning. Cybernetic loops of the kind envisioned in the Cybersyn Chilean project, a project conceived for the management of the national economy during Salvador Allende's term, would facilitate to directly link producers and consumers via immediate feedback, real-time centralization, and the shared diffusion of relevant metrics (Medina, 2011). Governments can mobilize economic and material resources via various policy tools, such as public investment, industrial policy, public budgeting, credit policy (Monnet, 2018), experts' appointment policy, etc. Monetary-fiscal coordination and other innovative monetary policies could be effective to pursue qualitative developmental objectives such as funding needs for investment in cleaner production and the dismantling of dirty activities (Kedward et al., 2022; Olk et al., 2023).

The effectiveness of executive bodies hinges on their effective control over respective resources and instruments as well as on their capacities to oversee the attainment of the set goals and deal with discrepancies and other unexpected developments. This brings to the fore the challenge of enforcement and related to that, the role of the state (or supranational politico-administrative bodies). Planning processes can in principle take place beside and in part autonomously from the state apparatus. For instance, in the post-war era, the French planning system was explicitly conceived as a means to bypass government departments and actively mobilized the most modern segment of the private sector (Kuisel, 1981, 371). However, planning institutions require a legal basis to operate. Citizens assemblies, for instance, may contrive plans for cleaner transport yet their implementation warrants legal and material support (cf. Wells, Howarth, and Brand-Correa, 2021). Most of the above policy tools are exclusively available to governmental institutions.

Planning can be used to operationalize key material and socioeconomic variables, but it does not exhaust socioeconomic activity, leaving room for the ongoing development of production and consumption regulated by market or commons-oriented modes of coordination. Some constraints are posed by top-down decisions, which tend to cascade from one level to the next, e.g. in terms of available resources and predefined targets. However, institutional safeguards should ensure that, at each level, actors will be free to decide how to attain those targets and to define their own complementary distinctive goals. Planning beyond growth leaves scope for a panoply of organizational forms, old and new.

4. Conclusion

Addressing the aggravating social-ecological crises of our time demands a fundamental rethinking of our economic system. Achieving rapid decarbonization while maintaining high standards of living by overcoming economic growth amounts to a major society-wide social-

ecological transformation of the magnitude comparable to that which took place during the Industrial Revolution. Postgrowth and degrowth have emerged as increasingly influential proposals for such radical reorganization of society. The scope and speed in which it needs to happen represents a major challenge and warrants mechanisms of coordination that are decidedly designed for that purpose, especially when viewing it as a democratic and participatory process.

Against that backdrop, we argue that degrowth scholars should engage more actively in past and ongoing debates about planning, and further investigate which kinds of planning material degrowth could involve. To advance this discussion, we critically scrutinize reasons for why planning has so far largely been neglected in postgrowth research and stress the contributions of that scholarship to the emerging field of ecological planning. The analysis of the alienating dimension of capitalist technologies, the necessity to set ecological boundaries to economic activity, the advances of input-output and stock-flow consistent modelling and the critical engagement of capital's systemic drive toward expansion are crucial insights for the advancement of ecological planning.

Based on this analysis, the second part of the paper provides an agenda-setting framework for identifying and debating key challenges of the degrowth-planning nexus around three sets of problems: multilevel dynamics, elaboration, and implementation. We first focus on the overall dynamics of the planning architecture. This invites a reflection on a multilevel framework allowing for democratic processes and experimentation at the various scales resulting in consistent dynamics at the macro level and favoring cross-fertilization of learning processes and ongoing institutional diversity. Developments concerning the spatial and scalar dimension of planning call for collaboration with economic geographers and political scientists, while the emphasis on learning processes point to research on innovation systems and education.

We then argue that both ecological limits and social priorities must be elaborated through a scientifically informed democratic deliberation process. If "planning the doughnut" requires pluralistic and democratic procedures to define the limits and prioritize the need-satisfiers, a forceful engagement with political science research on democracy and popular participation appears as a key axis of the ecological planning research agenda.

The third axis concerns the implementation of planned provisioning systems. How can societies mobilize effectively in-kind ecological calculation and deploy management tools allowing to attain socio-ecological objectives? Concrete responses remain elusive and call for an in-depth engagement of postgrowth scholarship with accounting and management science but also research on information systems. It is also necessary to engage with administration and legal scholarship to advance institutional designs adequate to articulate the governance of planned economic processes to democratic policymaking.

Looking beyond this paper, the prospect for ecological planning appears to be mixed. On the one hand, with the acceleration of the ecological crisis, moving beyond market coordination is increasingly accepted with a spectacular comeback of industrial policy (Crisuolo et al., 2022), price controls (Weber et al., 2022), and even an official endorsement of ecological planning in France (Goar, 2023). Moreover, many years of degrowth and postgrowth scholarship comes to fruition, providing solid insights on which the development of ecological planning can rely. On the other hand, while research operates under an increasingly pressured timeframe, the gap to be bridged to advance a comprehensive framework for planning beyond growth is still extremely wide. We hope that by clarifying those stakes and identifying key axes, this contribution will help to foster the emergence of a vivid interdisciplinary community of policy-oriented research.

Funding

This work was supported and has received funding from the European Union's European Research Council (ERC) Synergy program, REAL

project (ERC-2022-SYG REAL 101071647), and SNIS CLIMACRO.

CRediT authorship contribution statement

Cédric Durand: Conceptualization, Investigation, Methodology, Writing – original draft, Writing – review & editing. **Elena Hofferberth:** Conceptualization, Investigation, Methodology, Writing – original draft, Writing – review & editing. **Matthias Schmelzer:** Conceptualization, Investigation, Methodology, Writing – original draft, Writing – review & editing.

Declaration of competing interest

The authors have no conflict of interest to declare.

Data availability

No data was used for the research described in the article.

Acknowledgements

For critical comments, questions and suggestions on an earlier draft of this paper we would like to thank the very critical, engaging and productive comments by various anonymous reviewers, and further comments by Jeff Althouse, Louison Cahen-Fouroth, Pierre Charbonnier, Alexandre Chirat, Jan Gross, Simon Grothe, Razmig Keucheyan, Lorenz Keysser, Lukas Müller-Wünsch, Christopher Olk, Thea Riofrancos, Mohamed Sir, Christoph Sorg, Julia Steinberger, the participants of the History, Economy and Society lunch seminar at the University of Geneva, and participants in a presentation of the paper at the 2023 international degrowth conference in Zagreb.

References

- Acosta, Alberto, 2012. *Buen Vivir Sumak Kawsay: Una Oportunidad Para Imaginar Otros Mundos*. Editorial Abya-Yala.
- Adaman, Fikret, Devine, Pat, 2017. Democracy, participation and social planning. In: *Routledge Handbook of Ecological Economics*. Routledge, pp. 517–525.
- Akbulut, Bengi, Adaman, Fikret, 2020. The ecological economics of economic democracy. *Ecol. Econ.* 176, 106750.
- Althouse, Jeffrey, 2022. Ecological macroeconomics for a shared planet: towards a political ecology of money, finance and production. PhD thesis Université Sorbonne Paris Nord. <https://hal.archives-ouvertes.fr/tel-03835611>.
- Bensussan, Hannah, Durand, Cédric, Rikap, Cecilia, 2023. 100 Years of Corporate Planning. From Industrial Capitalism to Intellectual Monopoly Capitalism through the Lenses of the *Harvard Business Review* (1922-2021). UNIGE Political Economy Working Papers, 05/2023.
- Boillat, Sébastien, Gerber, Julien-François, Funes-Monzote, Fernando R., 2012. What economic democracy for degrowth? Some comments on the contribution of socialist models and Cuban agroecology. *Futures* 44 (6), 600–607.
- Bosquet, Michel, 1973. *Critique Du Capitalisme Quotidien*. Éditions Galilée.
- Brand, Ulrich, Muraca, Barbara, Pineault, Éric, Sahakian, Marlyne, Schaffartzik, Anke, Novy, Andreas, Streissler, Christoph, et al., 2021. From planetary to societal boundaries: an argument for collectively defined self-limitation. *Sustain. Sci. Pract. Pol.* 17 (1), 265–292.
- Büchs, Milena, Koch, Max, 2017. Postgrowth and Wellbeing: Challenges to Sustainable Welfare. Palgrave Macmillan.
- Büchs, Milena, Koch, Max, 2019. Challenges for the degrowth transition: The debate about wellbeing. *Futures* 105, 155–165.
- Cahen-Fouroth, Louison, 2022. "Looking for growth imperatives under capitalism: money, wage Labour, and market exchange". Post-Growth Economics Network Working Paper Series 2022/1.
- Cahen-Fouroth, Louison, et al., 2021. Capital stranding cascades: the impact of decarbonisation on productive asset utilisation. *Energy Econ.* 103, 105581.
- Cahen-Fouroth, Louison, Lavoie, Marc, 2016. Ecological monetary economics: a Post-Keynesian critique. *Ecol. Econ.* 126, 163–168.
- Chang, Ha-Joon, Andreoni, Antonio, 2020. Industrial policy in the 21st century. *Dev. Change* 51 (2), 324–351.
- Chavance, Bernard, 2019. La planification centrale et ses alternatives dans l'expérience des économies socialistes. *Actuel Marx.* 65 (1), 26–34.
- Chertkovskaya, Ekaterina, Alexander, Paulsson, Barca, Stefania (Eds.), 2019. *Towards a Political Economy of Degrowth*. Rowman & Littlefield.
- Chirat, Alexandre, Clerc, Basile, 2023. Convergence on inflation and divergence on price control among Post-Keynesian pioneers: insights from Galbraith and Lerner. *EconomiX Working Paper 2023-4*, University of Paris Nanterre.
- Clot, Yves, 2014. *Travail et Pouvoir d'agir*. Presses Universitaires de France.
- Cockshott, Paul, Dapprich, Philip, Cottrell, Alin, 2022. *Economic Planning in an Age of Climate Crisis*. Independently published.
- Crisuolo, Chiara, Gonne, Nicolas, Kitazawa, Kohei, Guy, Lalanne, 2022. Are Industrial Policy Instruments Effective? *OECD Science, Technology And Industry Policy Papers*. OECD, Paris.
- Crotty, James, 2019. Public investment and state planning in 1924: The real Keynesian Revolution begins. In: *Keynes against Capitalism: His Economic Case for Liberal Socialism*. Routledge, New York, pp. 48–62.
- D'Alisa, Giacomo, Kallis, Giorgos, 2020. Degrowth and the state. *Ecol. Econ.* 169, 106486.
- Daly, Herman E., 1991. *Steady-State Economics*. Island Press.
- Daly, Herman E., 1992. Allocation, distribution, and scale: towards an economics that is efficient, just, and sustainable. *Ecol. Econ.* 6 (3), 185–193.
- Daly, Herman E., 2014. *From Uneconomic Growth to Steady-State Economy*. Edward Elgar Publishing.
- Denkena, Berend, Wichmann, Marcel, Simon, Kettelmann, Matthies, Jonas, Reuter, Leon, 2022. Ecological planning of manufacturing process chains. *Sustainability* 14 (5), 2681.
- Després, Laura, 2019. Une planification écologique et sociale: un impératif! *Actuel Marx* 65 (1): 103-118.
- Descola, Philippe, 2018. Humain, trop humain. In: *Penser l'Anthropocène*. Presses de Sciences Po, pp. 19-35.
- Devine, Pat, 2019. *Democracy and Economic Planning: The Political Economy of Self-Governing Society*. Routledge.
- Devine, Pat, 2022. *Negotiated Coordination and Socialist Democracy*. Science & Society 86 (2).
- Dietz, Rob, O'Neill, Daniel W., 2013. *Enough Is Enough: Building a Sustainable Economy in a World of Finite Resources*. Berrett-Koehler Publishers.
- Dietz, Simon, Neumayer, Eric, 2007. Weak and strong sustainability in the SEEA: concepts and measurement. *Ecol. Econ.* 61 (4), 617–626.
- Doyal, Len, Gough, Ian, 1991. *A Theory of Human Need*. Macmillan Education, Basingstoke.
- Durand, Cédric, Légié, Philippe, 2013. Regulation beyond growth. *Cap. Cl.* 37 (1), 111–126.
- Dyer-Witherford, Nick, 2022. Biocommie: Power and Catastrophe. *PPPR*. 2022. <https://projectpppr.org/populisms/biocommie-power-and-catastrophe>.
- Ellman, Michael, 1990. Economic calculation in socialist economies. In: Eatwell, John, Milgate, Murray, Newman, Peter (Eds.), *Problems of the Planned Economy*. Macmillan, pp. 91–96.
- Ellul, Jacques, 2004. *Le Système Technicien*. Collection Documents. Le Cherche midi, Paris.
- Escobar, Arturo, 1995. *Encountering Development: the Making and Unmaking of the Third World*. Princeton University Press.
- Escobar, Arturo, 2020. *Pluriversal Politics: the Real and the Possible*. Duke University Press.
- Eversberg, Dennis, Schmelzer, Matthias, 2018. The degrowth spectrum: convergence and divergence within a diverse and conflictual alliance. *Environ. Val.* 27 (3), 245–267.
- Fanning, Andrew L., O'Neill, Daniel W., 2016. Tracking resource use relative to planetary boundaries in a steady-state framework: a case study of Canada and Spain. *Ecol. Indic.* 69, 836–849.
- Fanning, Andrew L., O'Neill, Daniel W., Büchs, Milena, 2020. Provisioning systems for a good life within planetary boundaries. *Global Environ. Change* 64, 102135.
- Ferreira, António, von Schönfeld, Kim Carlotta, 2020. Interlacing planning and degrowth scholarship: a manifesto for an interdisciplinary alliance. *DISP* 56 (1), 53–64.
- Fine, Ben, Bayliss, Kate, Robertson, Mary, 2018. The systems of provision approach to understanding consumption. In: Kravets, O., Venkatesh, A., Miles, S., Maclaran, P. (Eds.), *The SAGE Handbook of Consumer Culture*. SAGE, pp. 27–42.
- Foster, John Bellamy, 2023. Planned degrowth: ecosocialism and sustainable human development. *Mon. Rev. (July-August)* 75 (3), 1-29.
- Goar, Matthieu, 2023. Emmanuel Macron dessine les contours de son 'écologie à la française': inciter sans contraindre. *Le Monde.fr*, 26 September 2023.
- Gough, Ian, 2020. Defining floors and ceilings: the contribution of human needs theory. *Sustain. Sci. Pract. Pol.* 16 (1), 208–219.
- Graham, Nicolas, 2023. Planning and the ecosocialist mode of cooperation. *Mon. Rev. (July-August)* 75 (3), 126–141.
- Hahnel, Robin, 2021. *Democratic Economic Planning*. Routledge.
- Hardt, Lukas, O'Neill, Daniel W., 2017. Ecological macroeconomic models: assessing current developments. *Ecol. Econ.* 134, 198–211.
- Harnecker, Marta, Bartolome, Jose, 2019. *Planning from below: A Decentralized Participatory Planning Proposal*. NYU Press.
- Hickel, Jason, 2020. Less Is More: How Degrowth Will Save the World. William Heinemann.
- Hickel, Jason, 2021. What does degrowth mean? A few points of clarification. *Globalizations* 18 (7), 1105–1111.
- Hickel, Jason, 2023. On technology and degrowth. *Monthly Review (July-August)* 75 (3), 44–50.
- Hickel, Jason, Sullivan, Dylan, 2023. Capitalism, global poverty, and the case for democratic socialism. *Mon. Rev. (July-August)* 75 (3), 99-113.
- Hofferberth, Elena, 2021. *Pathways to an Equitable Post-Growth Economy. Towards an Economics for Social-Ecological Transformation*. University of Leeds. <https://ethes.s.whiterose.ac.uk/31117/>.
- Husson, Michel, 1991. *Planification: 21 Thèses Pour Ouvrir Le Débat*. Critique Communiste, No. 106–107. alias Maxime Durand (May). https://www.contretemps.eu/wp-content/uploads/Planification_Husson1991.pdf.
- Illich, Ivan, 2009. *Tools for Conviviality*. Marion Boyars.

- Jackson, Tim, Victor, Peter A., 2020. The transition to a sustainable prosperity—a stock-flow-consistent ecological macroeconomic model for Canada. *Ecol. Econ.* 177, 106787.
- Jonsson, Patrik, Martin, Rudberg, Holmberg, Stefan, 2013. Centralised supply chain planning at IKEA. *Supply Chain Manag.: Int. J.* 18 (3), 337–350.
- Kaika, Maria, Varvarousis, Angelos, Demaria, Federico, Hug, March, 2023. Urbanizing degrowth: Five steps towards a radical spatial degrowth agenda for planning in the face of climate emergency. *Urban Stud.* 60 (7), 1191–1211.
- Kallis, Giorgos, 2019. *Limits: Why Malthus Was Wrong and Why Environmentalists Should Care*. Stanford University Press.
- Kallis, Giorgos, Kostakis, Vasilis, Lange, Steffen, Muraca, Barbara, Paulson, Susan, Schmelzer, Matthias, 2018. Research on degrowth. *Annu. Rev. Environ. Resour.* 43, 291–316.
- Kallis, Giorgos, Paulson, Susan, D'Alisa, Giacomo, Demaria, Federico, 2020. *The Case for Degrowth*. Polity.
- Kedward, Katie, Gabor, Daniela, Ryan-Collins, Josh, 2022. *Aligning finance with the green transition: from a risk-based to an allocative green credit policy regime*. UCL Institute for Innovation and Public Purpose, Working Paper Series (IIPP WP 2022-11). <https://www.ucl.ac.uk/bartlett/publicpurpose/wp2022-11>.
- Keucheyan, Razmig, 2019. *Les Besoins Artificiels: Comment Sortir Du Consumérisme*. Zones.
- Kuisel, Richard, 1981. *Le Capitalisme et l'Etat en France. Modernisation et dirigisme au XXe siècle*, Gallimard.
- Kunze, Conrad, Becker, Sören, 2015. Collective ownership in renewable energy and opportunities for sustainable degrowth. *Sustain. Sci.* 10 (3), 425–437.
- Lage, Jonas, Thema, Johannes, Zell-Ziegler, Carina, Best, Benjamin, Cordroch, Luisa, Wiese, Frauke, 2023. Citizens call for sufficiency and regulation — a comparison of European citizen assemblies and National Energy and Climate Plans. *Energy Res. Social Sci.* 104, 103254.
- Laibman, David, 2015. Multilevel Democratic Iterative Coordination: An Entry in the 'Envisioning Socialism' Models Competition. *Marxism* 21 12 (1), 307–344.
- Lange, Steffen, 2018. *Macroeconomics without Growth. Sustainable Economies in Neoclassical, Keynesian and Marxian Theories*. Metropolis-Verlag.
- Latouche, Serge, 2010. *Farewell to Growth*. Polity.
- Lawn, Philip, 2011. Is steady-state capitalism viable? *Ann. N. Y. Acad. Sci.* 1219 (1), 1–25.
- Lehtinen, Ari Aukusti, 2018. Degrowth in city planning. *Fennia* 196 (1).
- Leontief, Wassily, 1976. National economic planning: methods and problems. *Challenge* 19 (3), 6–11.
- Li, Minqui, 2023. Degrowing China - By Collapse, Redistribution, or Planning? *Monthly Review* (July-August) 75 (3), 51–71.
- Liegey, Vincent, et al., 2013. *Un projet de décroissance. Manifeste pur une Dotation inconditionnelle d'autonomie*. Les éditions Utopia, Paris.
- Löwy, Michael, 2005. What is ecosocialism? *Appl. Econ. Lett.* 16 (2), 15–24.
- Magacho, Guilherme, et al., 2023. Macroeconomic exposure of developing economies to low-carbon transition. *World Dev.* 167, 106231.
- Mandel, Ernest, 1986. In defence of socialist planning. *N. Left Rev.* 159 (1), 5–22.
- Marglin, Stephen A., 2003. Development as poison. *Harv. Int. Rev.* 25 (1), 70.
- Marglin, Stephen A., 2010. *The Dismal Science: How Thinking like an Economist Undermines Community*. Harvard University Press.
- Martínez-Alier, Joan, Pascual, Unai, Franck-Dominique, Vivien, Zaccai, Edwin, 2010. *Sustainable de-growth: mapping the context, criticisms and future prospects of an emergent paradigm*. *Ecol. Econ.* 69 (9), 1741–1747.
- Medina, Eden, 2011. *Cybernetic Revolutionaries: Technology and Politics in Allende's Chile*. MIT Press.
- Monnet, Eric, 2018. *Controlling Credit: Central Banking and the Planned Economy in Postwar France, 1948–1973*. Cambridge University Press.
- Ndubisi, Forster, 2002. *Ecological Planning: A Historical and Comparative Synthesis*. JHU Press.
- Norgaard, Richard B., 1995. Metaphors we might survive by. *Ecol. Econ.* 15 (2), 129–131.
- Olk, Christopher, Schneider, Colleen, Hickel, Jason, 2023. How to pay for saving the world: modern Monetary Theory for a degrowth transition. *Ecol. Econ.* 214, 107968.
- O'Neill, D.W., Fanning, A.L., Lamb, W.F., Steinberger, J.K., 2018. A good life for all within planetary boundaries. *Nat. Sustain.* 88 (95), 88–95.
- O'Neill, D.W., Fanning, A.L., Lamb, W.F., Steinberger, J.K., 2015. What should be held steady in a steady-state economy? Interpreting daly's definition at the national level. *J. Ind. Ecol.* 19 (4), 552–563.
- O'Neill, John, 2004. Ecological economics and the politics of knowledge: The debate between Hayek and Neurath. *Camb. J. Econ.* 28 (3), 431–447.
- Parrique, Timothée, 2019. *The Political Economy of Degrowth*. PhD thesis. Université Clermont Auvergne. <https://tel.archives-ouvertes.fr/tel-02499463/document>.
- Pech, Thierry, 2021. *Le Parlement Des Citoyens: La Convention Citoyenne Pour Le Climat*. Seuil.
- Pedregal, Alejandro, Juan Bordera, 2022. Toward an ecosocialist degrowth: From the materially inevitable to the socially desirable. *Mon. Rev.* 74 (2), 41–53.
- Persson, Linn, Carney Almroth, Bethanie M., Collins, Christopher D., Cornell, Sarah, Cynthia, A., de Wit, Miriam, L., Diamond, Peter, Fantke, et al., 2022. Outside the safe operating space of the planetary boundary for novel entities. *Environ. Sci. Technol.* 56 (3), 1510–1521.
- Phillips, Leigh, Rozowski, Michal, 2019. *People's Republic of Wal-Mart: How the World's Biggest Corporations Are Laying the Foundation for Socialism*. Verso.
- Pirgmaier, Elke, 2017. The neoclassical trojan horse of steady-state economics. *Ecol. Econ.* 133, 52–61.
- Pirgmaier, Elke, 2020. Consumption corridors, capitalism and social change. *Sustain. Sci. Pract. Pol.* 16 (1), 274–285.
- Planning for Entropy, 2022. *Democratic economic planning, social metabolism and the environment*. *Sci. Soc.* 86 (2), 291–313.
- Raworth, Kate, 2017. *Doughnut Economics: Seven Ways to Think like a 21st-Century Economist*. Random House.
- Riofrancos, Thea, Kendall, Alissa, Dayemo, Kristi K., McDonald, Kira, Hassan, Batul, Slattery, Margaret, Lillehei, Xan, 2023. "More Mobility Less Mining." *Climate and Community Project Report*. UC Davis. <https://www.climateandcommunity.org/more-mobility-less-mining>.
- Rockström, Johan, Steffen, Will, Kevin, Noone, Persson, Åsa, Stuart Chapin, F., Lambin, Eric, Lenton, Timothy M., et al., 2009. Planetary boundaries. *Ecol. Soc.* 14 (2).
- Ruiz-Alejos, Carlos, Prats, Vincent, 2022. In quest of implementing degrowth in local urban planning policies. *Local Environ.* 27 (4), 423–439.
- Saito, Kohei, 2023. *Marx in the Anthropocene: towards the Idea of Degrowth Communism*. Cambridge University Press.
- Samerski, Silja, 2018. Tools for degrowth? Ivan Illich's critique of technology revisited. *Technol. Degrowth* 197, 1637–1646.
- Saros, Daniel Earl, 2014. *Information Technology and Socialist Construction: the End of Capital and the Transition to Socialism*. Taylor & Francis.
- Schmelzer, Matthias, 2015. The growth paradigm: history, hegemony, and the contested making of economic growthmanship. *Ecol. Econ.* 118, 262–271.
- Schmelzer, Matthias, Vetter, Andrea, Vansintjan, Aaron, 2022. *The Future Is Degrowth: A Guide to a World beyond Capitalism*. Verso.
- Schmelzer, Matthias, 2016. *The Hegemony of Growth: The OECD and the Making of the Economic Growth Paradigm*. Cambridge University Press.
- Schmelzer, Matthias, Hofferberth, Elena, 2023. *Democratic Planning for Degrowth*. *Monthly Review* (July-August) 75 (3), 142–53.
- Schneider, Francois, Kallis, Giorgos, Martinez-Allier, Joan, 2010. Crisis or Opportunity? Economic Degrowth for Social Equity and Ecological Sustainability. Introduction to this Special Issue. *J. Clean. Prod.* 18, 511–518.
- Smith, Thomas S.J., Baranowski, Mariusz, Schmid, Benedikt, 2021. Intentional degrowth and its unintended consequences: uneven journeys towards post-growth transformations. *Ecol. Econ.* 190, 107215.
- Sorg, Christoph, 2022. Failing to plan is planning to fail: toward an expanded notion of democratically planned postcapitalism. *Crit. Sociol.* 49 (3), 475–493.
- Steiner, Frederick, Brooks, Kenneth, 1981. Ecological planning: a review. *Environ. Manag.* 5 (6), 495–505.
- Tremblay-Pepin, Simon, 2022. Five criteria to evaluate democratic economic planning models. *Rev. Radic. Polit. Econ.* 54 (3), 265–280.
- Vetter, Andrea, 2018. The matrix of convivial technology – assessing technologies for degrowth. *J. Clean. Prod.* 197, 1778–1786.
- Vettesse, Troy, Pendergrass, Drew, 2022. *Half-Earth Socialism: A Plan to Save the Future from Extinction, Climate Change and Pandemics*. Verso.
- Victor, Peter A., 2019. *Managing without Growth: Slower by Design, Not Disaster*. Edward Elgar.
- Wang-Erlandsson, L., Tobian, A., van der Ent, R.J., Fetzer, I., te Wierik, S., Porkka, M., Staal, A., et al., 2022. A planetary boundary for green water. *Nat. Rev. Earth Environ.* 3 (6), 380–392.
- Weber, Isabella M., Lara Jauregui, Jesus, Teixeira, Lucas, Pires, Luiza Nassif, 2022. *Inflation in Times of Overlapping Emergencies: Systematically Significant Prices from an Input-Output Perspective*. UMass Amherst Economics Department Working Paper. <https://doi.org/10.7275/0C5B-6A92>.
- Weiss, Martin, Cattaneo, Claudio, 2017. Degrowth – taking stock and reviewing an emerging academic paradigm. *Ecol. Econ.* 137, 220–230.
- Xue, Jin, 2022. Urban planning and degrowth: a missing dialogue. *Local Environ.* 27 (4), 404–422.