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From an ethic of sufficiency to its policy and practice in late capitalism

Edited by
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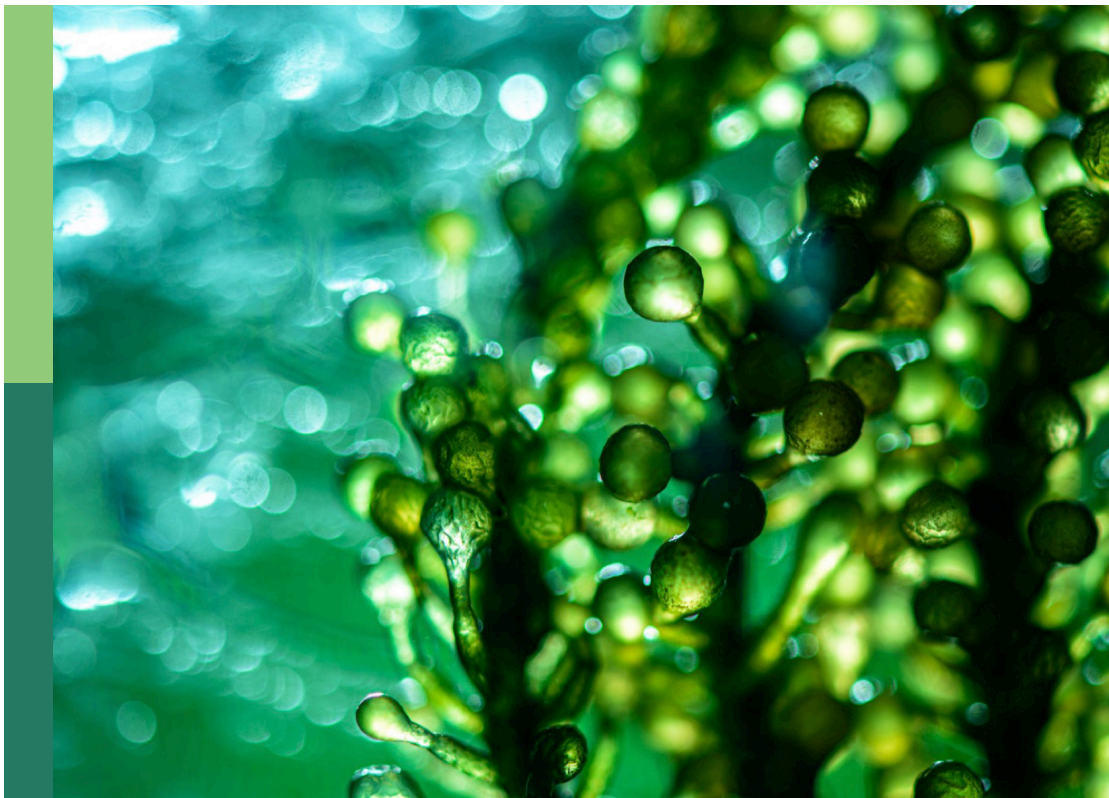

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From an ethic of sufficiency to its policy and practice in late capitalism

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Editorial: From an ethic of sufficiency to its policy and practice in late capitalism

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Editorial on the Research Topic
From an ethic of sufficiency to its policy and practice in late capitalism

Introduction

The intuition that sufficiency is essential for a good life is an old one. It is an idea found across many philosophical, spiritual, and cultural traditions of the ancient world. The economist Amartya Sen opens his book *Development as Freedom*, by recounting a conversation between Maitreyee and her husband Yajnavalkya narrated in the *Brihadaranyaka Upanishad* (7th−6th Century BCE). Maitreyee asks her husband if possessing the wealth of the whole world would give her immortality. No, was Yajnavalkya's prompt response! Reassured, she asks rhetorically, then "what should I do with that by which I do not become immortal" (Sen, 1999). Sen proceeds to suggest that this story is often used in Indian religious philosophy to point to the inevitable entropy of human life, and the limited utility of the material possessions. Inherent in Maitreyee's probing rhetorical question is the generative ethical intuition of living sufficiently or living well with a sense of enoughness. A couple of centuries later the sentiment is seen again in Aristotle's *Nicomachean Ethics*, where he distinguishes between the proximate, contingent nature of wealth as a partial means toward something else, some other good—the good life—that lay beyond.

We live today, many centuries later, urgently seeking to redress the despoilation of the biophysical world, engendered by what we will call the Promethean interlude. For about five centuries, moderns have believed, unlike Maitreyee, Yajnavalkya or Aristotle, that the wealth of the world, once commodified, monetized, and made fungible, was infinite and could indeed deliver us to immortality, or something approximating it—"life, liberty and the pursuit of happiness" unhinged from entropy. However, keeping entropy aside for a moment, modernity's promise of emancipation through economic productivity was believed to be able to break the yoke of feudal and other forms of elite and aristocratic rule that became corrupted. Our reference to the deliberations of Maitreyee, Yajnavalkya, and Aristotle, needs to be read alongside this acknowledgment. By doing so, we take note of the common criticism that talking of sufficiency is an elite proclivity and that the pursuit of production and productivity was emancipatory politics.

However, despite the mindboggling growth in economic productivity over the past five centuries the promise of emancipation for the average individual has fallen short.

Inequality, injustice, and atomization remain very much with us and blight and destitute too many lives. We must concede that the utility of productivity for an emancipatory politics, has proven to be limited. And bringing entropy back into the discussion, we notice that the evidence of social-ecological despoilation, in pursuit of productivity and growth, accumulated now over many decades of scientific research, has forced moderns to begrudgingly acknowledge an intuition like that of the ancients. The evidence forces us to take cognizance, in modern vocabulary, of the limited low entropy matter and energy available for human appropriation.

These trends have culminated in a growing recognition of sufficiency or enoughness as a species of environmentalism within modern secular communities. Human wellbeing is to be pursued not despite biophysical limits, but by working with such inevitable limits (e.g., Mathai, 2004; Jackson, 2009). There is a veritable scholarly production line that has emerged around sufficiency, limits, planetary boundaries, wellbeing corridors, de-growth and post-growth, among many others. As Princen acknowledges, in this volume, sufficiency is a very old idea but efforts to construct it as a social organizing principle is really a 21st century concept necessitated by the inevitable encounter with what Daly (2015) famously framed as the "full-world."

Despite these efforts, large and powerful swathes of economic and environmental policy and practice continue to resist this idea. Or at best, ignore it. They believe, almost as a matter of faith, that modernity's immense technological capacities to deliver energy and material efficiencies and to substitute biophysical resources between themselves, as they are found individually to be economically scarce, will preclude the arrival of ultimate limits. Yet, we have also known, for some decades now, that the rebound effect, within a political economy that channels improving efficiency and economic productivity to more economic growth and accumulation, belies this belief (e.g., Wilhite and Norgard, 2004). Consider, for example, that when the "planetary boundaries" framework was introduced (Rockström et al., 2009), we learned that humanity had pushed three out of nine earth systems beyond a safe operating space. In their 2023 update, these scientists have reported that it's now six out of nine (Richardson et al., 2023).

Flawed though it is in a system limited by entropy, economic expansion is powerfully entrenched. For example, the provisioning of social welfare, or projection of national power, the creation of employment and livelihoods, in nearly all states of the world, rests on continued and accelerating economic growth. Even the promise, in this worldview, of redressing entrenched income, wealth and social inequality is premised on accelerating economic growth (e.g., SDG 8) and the throughput of matter and energy it inevitably implies.

In this context, the problem that invites our attention is how to effect sufficiency, *and* deal with the challenge of inequality and injustice within and between countries. This framing of the problem is generative of several questions that were shared with potential contributors to this volume. The questions range from the design and implementation of development interventions to those about geopolitics and international relations. A complexity arises when we ask about sufficiency in the context of vast, highly consequential, and historically generated differences between the Global North and Global South. How to advance sufficiency when stark material deprivation and overabundance coexist between countries and within them too? Further, how to talk about sufficiency while international relations are entering another century of churn that is unsettling key geopolitical equilibria of the twentieth century? Can economies oriented to sufficiency sustain powerful, domestically legitimate, and geopolitically assertive states? Is the norm of competing nation-states a feasible idea given our entropic biophysical world?

The papers in this volume address some dimensions of these questions that have tended to be less visible in the scholarship so far. The contemporary scholarship on sufficiency seems to lack historicity (e.g., see Jungell-Michelsson and Heikkurinen, 2022). Crucial currents from the 20th century that grappled with the idea of sufficiency within the political economic struggles against imperialism and colonialism (e.g., Kumarappa, 1945, also see Govindu and Malghan, 2016), and then subsequently in debates about the post-War Development project and its then already emergent environmental consequences [e.g., The World Commission on Environment and Development (WCED), 1987; Sachs, 1992] are missing. The absence of such historicity is a lost opportunity because the political economic questions of organizing production-consumption continue to manifest but remain generally overlooked in discussions on sufficiency.

A good example of the consequences of overlooking political economy is the Induction Effect. In their contribution to this volume, "*The Induction Effect: Environmental Impacts of Technologies Beyond the Rebound Effect*" Lange et al. deepen and clarify the characterization and the mechanisms underlying the rebound effect. They observe multiple effects such as economic, psychological and time rebounds associated with technology change. They also show however that visibility into the underlying rebound mechanisms is clouded by the absence of clear distinctions between what is a rebound, and what is not. To resolve this problem, they propose a distinction between the rebound effect and the induction effect. The mechanism underlying the former is efficiency improvements associated with technology change. The latter is "caused or enabled by the emergence of new options arising from technological change." The isolation of a distinct causal mechanism other than the broad category of efficiency improvements—one that operates through novelty of options—is of particular interest. Under present conditions of limited social oversight, production-consumption systems are shaped by competition among a broad array of capitals in search for profitable investment opportunities (Meadway, 2016). In this context, delimiting the consequence of technology change beyond efficiency driven rebound effects, points to what we call "the perpetual production of novelty" to create myriad avenues for consumerism and to pursue opportunities for accumulation. From the vantage of sufficiency then, the challenges are multifaceted. For the Global North the question appears to be how this production of new options, for novelty's sake, might be curbed. In the Global South, the question of bending the production of novelty to socially valuable ends—the common good—is imperative. Ultimately for both, the social control of production-consumption—the subsuming of technology innovation and change to the common good—as social-ecologists like Patrick Geddes, Lewis Mumford, Radhakamal Mukherjee, J. C. Kumarappa

and others in that tradition, have long argued (see Guha, 2006) is essential.

Voices from the Global South, such as Barkin in this volume, who have "seen this movie before" and *know* the limited reach of modern efficiency and innovation, offer foundational critiques and proposals for organizing production-consumption. In "*Shaping a Communitarian Ethos in an Era of Ecological Crisis*," Barkin writes from both Latin America and from the world of indigenous peoples. These worlds have lived for centuries under conditions of inequality, colonial oppression, and devastation of their ecosystems, yet they maintained attachment to and pride in their traditions. This rootedness has allowed conditions and innovations favorable to sufficiency, especially among indigenous peoples. What emerges, according to Barkin, is that sufficiency can only flow from a collective commitment to welfare of all members of an indigenous community, and not from the provisioning of an adequate basket of satisfiers for needy, atomized, individuals. A web of connections to each other and reciprocal social relations which find expression in various ceremonies and cosmovisions of indigenous peoples, is essential. Also essential, is the attachment to territory, to the geographical space they occupy, a space that has a meaning that transcends the Eurocentric concept of property. The accompanying cosmovisions of indigenous peoples, require them to also care for all elements in the natural world—flora and fauna as well as physical and geological features—just as they care for one another. This essential connectedness to people and place makes acute the awareness of the challenges of organizing production-consumption that is not destructive of nature-society and search for social processes and technical approaches attuned to the possibilities of their territories. Barkin's proposal is that sufficiency can only exist on the level of a community. And unless there are communities in resistance against capitalist modernity, sufficiency cannot flourish. This formulation of sufficiency as not necessarily about having enough, but rather, about community, care and reciprocity leading to production-consumption arranged without violence to nature-society, challenges contemporary sufficiency scholarship and practice.

The value of this challenge is brought out by Hayden and Dasilva in their paper, "*The Wellbeing Economy: Possibilities and limits in bringing sufficiency from the margins into the mainstream*." By pointing to the limited success of sufficiency policies framed within the individualist welfare state, the paper lends support, we think, to alternative proposals that are radically different, such as those offered by Barkin. Essentially, Hayden and Dasilva study New Zealand, Scotland and Iceland, admittedly small affluent countries, that all subscribe to the Wellbeing Economy Alliance. These governments supposedly move policies beyond GNP, the conventional metric for economic success, helping to create a Wellbeing Economy. They ask if this growing support for a wellbeing economy represent the long-sought breakthrough for a sufficiency-oriented, post-growth environmental approach? Their findings are mixed. On the one hand, governments attempt to move beyond GNP by launching investments in supporting the less well-off and in preventing ecological breakdown. On the other hand, governments are still holding on to the imperative of economic growth as a means to realize non-economic goals. They exhibit a "weak post-growth approach," dependent as they are on economic growth to achieve employment creation and provisioning of welfare state services in the name of wellbeing. Moreover, regarding sufficiency, such governments tend to be concerned with the floor rather than the ceiling by providing enough means to the poor and to shore up the fragile environment as opposed to confronting the well-to-do and the environmental misconduct of the rich. In contrast, a "strong post-growth approach" would imply disentangling employment and the welfare state from their growth dependency by providing universal basic services and some sort of basic income. The funds for doing so, the authors suggest, would come in part from taxes on wealth, inheritance, and property, including taxes on luxury consumption and a levy on air travel, SUVs and meat consumption. Such policies could move the wellbeing economy, they argue, from dependence on growth to options beyond economic expansion and a rise in consumption.

In his essay "*Sufficiency and The State: A Prospective Project*," Princen argues that the state is umbilically tethered to growth. Could it be, we ask, if a "weak post-growth approach" described by Hayden and Dasilva, is perhaps as far as the state can go? Princen argues that imagining a sufficiency-inflected society needs to have the state as its "analytical focus and interventionist leverage" because it is the state that proscribes the options that individuals, organizations, governments and civil society can exercise. Yet, the state is an "encompassing social structure" that is "organized for surplus where the goal of that organization is the concentration of wealth and power (for which capitalism is only a recent manifestation)." This "perennial wealth seeking" is a positive feedback loop, where more wealth requires even more to manage it and defend it. This predisposition of the state form, as it has evolved over 6,000 years, constitutes the fundamental contradiction for organizing societies under the non-negotiable condition of entropy. Thus, without reanimating this form of social organization with sufficiency as an organizing principle, Princen argues that efforts to advance sufficiency directed at individuals, organizations and economies is of limited use. By placing the state form as the unit of analysis, the essay points to new political spaces for experimentation and social change generated through questioning its permanence. Princen acknowledges that experimentation will inevitably face resistance. But he believes that an imaginative politics of sufficiency is emerging through varied experimental practice—the Communitarian Ethos for example—and will continue, given the reality of a finite planet. He is cautious however, noting that the success of this politics remains to be seen.

In keeping with the theme of varied experimental practice, Klinkenborg and Rossmoeller, open for debates on sufficiency an important space that scholarship tends to shy away from. Their essay "*Connecting Sufficiency, Materialism and the Good Life? Christian, Muslim and Hindu Perspectives*" seeks a way to take the vocabulary of sufficiency and the good-life from its long presence in religion and moral philosophy and make it available to the secular-modern living in late capitalism. It reminds us that faith and religion remain potentially powerful actors that can influence individuals and collectives. In other words, not only do faith and religion shape individual behavior, but given their ability to mold shared values and beliefs and to create shared norms, they are structural forces too, even in late capitalism. Whether these forces will aid the advance of sufficiency is the empirical question these authors shed some light on from the European context. They report on how Christian, Muslim and Hindu Faith Based Associations

(FBAs) based in Europe relate to sufficiency and the idea of a good life. While the word sufficiency isn't widely used in the literature surveyed, all the three religions shared a rejection of overconsumption and excessively materialistic lifestyles as the route to a good life. The interesting differences arise in how the FBA's texts and their interpretations of scripture don't necessarily translate into the actions of individual followers or into policy positions adopted by governments. It would be an error however to discard religion, yet again, from sufficiency debates. While actions and outcomes fall short, it is worth holding onto religion's discursive alignment with sufficiency. In his inquiry into modernity and the contemporary environmental movement, Latour (1993) famously argued that "we have never been modern" to indicate that the absolute separation between nature and society, imagined as constitutive of modernity, has never really been observed in fact. Reality presents itself as a hybrid ontology of networks that freely "translates" back and forth through the imagined rigid separations of nature and society. Thus, while the secular-modern imagines religion and faith as premodern or primitive attributes, they remain potentially enmeshed within the discourse and practice of sufficiency that weaves back-and-forth between purportedly distinct domains of the mundane and the divine. While Klinkenborg and Rossmoeller are writing from a European context, their inquiry into sufficiency, religion and the good life presents an approach to social change that can, and dare we say should, be explored in other geographies and religions as well.

In "*Sufficiency and transformation—A semi-systematic literature review of notions of social change in different concepts of sufficiency*," Lage tries to typologize the process of social change engendered by different concepts of sufficiency. He identifies three different approaches to sufficiency-oriented social change: a bottom-up-approach, a policy-making-approach and a social-movement-approach, each of which differs regarding the role of conflicts and the conceptualization of behavior and social practices. Within the sufficiency concept of the bottom-up approach, Lage subsumes those where a reduction in consumption by changing consumer behavior, new business models and grassroots-movements are central. In concepts of the policy-making approach, the social embeddedness of social practices is emphasized and reductions in consumption are pursued by changes in political framework conditions. Those two concepts dominate the sufficiency discourse, Lage finds. Still, he identifies an emerging third stream of sufficiency concepts considering a social-movement approach where sufficiency is conceptualized as a critical perspective on the nexus of unsustainability, growth dependency, externalization, exploitation, and discrimination calling for a new organizing principle for society. This more radical approach sheds light on structures of power and domination and describes social movements as relevant subjects for transformation. While the three approaches differ regarding the role of conflicts and the conceptualization of behavior and social practices synergies can be observed as well. As Lage summarizes: in an idealized and simplified way, grassroots movements may develop new sufficiency-oriented social practices, which might be supported, mainstreamed, and further developed by political decisions on changing infrastructures and institutions, and social movements may fight for shifting public discourse and other power relations and thereby render a deep shift toward sufficiency possible. It would be useful to learn if the Communitarian Ethos alive among some indigenous communities, or the appeal to faith and religion, which precedes contemporary discussion sufficiency, can be captured in this typology. Is there room in this modern typology to capture a transformation in cosmovisions?

In "*How to make more of less: Characteristics of Sufficiency in Business Practices*," Beyeler and Jaeger-Erben, focus on the practice of sufficiency in business. They address a domain that intuitively, it might appear, cannot align with the notion of sufficiency. After all, the raison d'etre of business is to make and sell more commodities. However, from an admittedly small sample of 14 European businesses, the authors add nuance to this story. Based on three dimensions, or three "rethinkings," needed for sufficiency business practices, the authors identify many practical strategies. These rethinkings are "relation to consumption," "relation to others" and "own social meaning of the organization." The authors find that each of these dimensions is translated into strategies applied by the businesses. For example, these include understanding needs in consultation with customers and employees and using these to co-design products; or production of long-standing products with sufficiency by design, among many other strategies. However, these practices are often undermined by corresponding "ambivalences." They point out for instance, that there is often a lack of knowledge about needs among producers or customers. Similarly, all businesses remain focused on viability and this makes it difficult to limit production or marketing without risking the generation of sufficient revenue—which is a precondition in the dominant political economy of competitive commodity production and exchange.

The study by Sahakian and Rossier, "*The societal conditions for achieving sufficiency through voluntary work time reduction: Results of a pilot study in Western Switzerland*" situated near Lake Geneva focuses on sufficiency as a personal choice, rather than on sufficiency as a technical design principle or as an institutional arrangement. What motivates people to live a rather sufficient life, what are the implications, and what are the conditions? The article explores sufficiency in one of the most affluent economies. The admittedly small sample of 14 respondents, from a particular context, almost all parents with children, have voluntarily chosen to shorten paid working time. In this definition, sufficiency means less income, less power to consume, but more free time. It implies furthermore a dual mandate: respecting environmental boundaries when it comes to consumption patterns, but also maintaining high levels of human wellbeing. In the study, in-depth interviews with people, where men have voluntarily engaged in work time reduction, reveal that some respondents who are limiting consumption and ecological impact, simultaneously enjoy a high level of wellbeing. However, these are almost exclusively couples with high cultural and social capital who have adopted non-consumerist and gender egalitarian norms, despite the "culture of affluence" that dominates in Swiss society. But respondents with low salaries and less education tend to disengage from sustainable consumption. Moreover, reducing work hours and at the same time achieving a high level of wellbeing, would require the provision of public services, such as access to renewable energy in more energy efficient homes, and adequate public transport services, but

also the provision of childcare and elderly care. These enabling collective conditions are the product of specific political economic negotiations, could culminate in living well within limits, as a form of sufficiency, to be accessible to more people. Extending Lage's typology allows us to consider the possibility that such micro experiments might grow into grassroots movements promoting sufficiency-oriented social practices. These might then be further encouraged by political decisions on changing infrastructures and institutions, and these would be entrenched by social movements that shift public discourse and power relations for a deep shift toward sufficiency. But two caveats need recognition. As far as Switzerland is concerned, despite marked successes in reducing per capita ecological footprints, the country still needs a 67% reduction to reach the global average (Swissinfo, 2022). Secondly, options like the voluntary reduction of workdays or hours in one of the most affluent economies of the world, that perhaps benefits the most from global financial capital markets, is likely to have limited resonance with households in most parts of the world. Yet, for the "cultures of affluence" that dot the world, there are likely useful lessons to be learned.

Suski et al. in their contribution, "*Sufficiency in social practices: An underestimated potential for the transformation to a circular economy*" focus on sufficiency as a social practice. They make the connection to the Circular Economy, a theme that has not been discussed so far in this Research Topic. The authors elaborate on the sufficiency potential for a circular economy using a specific example of urban gardening. Data and insights were gathered from a neighborhood project in Germany. In the case researched the concept of "over-availability" was brought into question and replaced with enoughness by the social practice of "farm-boxes," an aquaponic system to grow food. The authors explicitly highlight sufficiency, in line with other recent scholarship (e.g., Figge and Thorpe, 2023), as an essential principle to achieve a sustainable circular economy. Especially circular economy terms like refusal, rethinking, and reduction, they argue, need to be understood as sufficiency strategies and not limited to product design concepts. The reader will see that these strategies may be like the "ambivalences" that Beyeler and Jaeger-Erben highlight above that tend to undermine the viability of businesses given the dominant political economy of competitive market exchange.

Writing in 1958 and trying to understand the age of mass consumption that emerged in post-war America and Western Europe, John Kenneth Galbraith characterized the "affluent society," in his book by the same name, as one characterized by "preoccupation with productivity and production" and a population that desires for "more elegant cars, more exotic food, more erotic clothing, more elaborate entertainment" (Galbraith, quoted in Guha, 2006, p. 220). He captures succinctly a certain individual proclivity for more, ad infinitum, that is also to an extent manufactured to align with the structural need for overall production growth at accelerating rates of productivity. Collectively these forces constitute the policy and practice of late capitalism that staves off economic and political crises through constant economic expansion, even while simultaneously exacerbating these crises through socio-ecological degradation! The challenge then of building "sustainable structures of living together" is still very much with us.

We conclude this introduction by noting an important limitation of this Research Topic. Galbraith's "affluent society" has globalized over the decades and is the norm now across affluent corners of the globe, including many in the so-called "developing world." Yet both the conceptual and empirical papers in this Research Topic are limited, except for one, to authors writing broadly from and about European and North American contexts. This apparent scarcity of studies on sufficiency from the so-called "developing world" is striking and needs correction. Low average per capita resource use or ecological impacts should not hide the extreme inequality and the accompanying tendency of excessive production-consumption for some (i.e., "cultures of affluence") and deprivation for the many that is seen in many "developing countries" (e.g., Bhar, 2023). No doubt grappling with sufficiency in such contexts is more complicated than that in the so-called "developed world." But that only underscores the importance to study and to understand these countries, and we hope more researchers and practitioners take up this challenge.

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Shaping a Communitarian Ethos in an Era of Ecological Crisis

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In response to the deep social and ecological crisis for which the international community is proving incapable of attenuating, many Peasants and Indigenous peoples in Mexico, and in other parts of the Global South, are transforming their visions of their futures, shaping a new ethos of self-management and conviviality, consistent with a responsible relationship to their territories. From the vantage point of the Global South, these peoples constitute a social and economic force that is altering the social and productive dynamics in many countries, proposing models of organization and building alliances among themselves regionally and internationally to exchange information, develop common strategies, and provide political support. In Mexico, many continue to produce traditional crops, while modifying their techniques to incorporate agroecological experiences from other communities, diversifying output and protecting the environment. Recently, they are enriching local practices with a systematization of their inherited traditions and cosmologies, creating effective models of social, political and environmental organization that lend authority to their claims to be able to manage their territories autonomously. There is a growing body of scientific literature that substantiates this capacity, demonstrating that the collective knowledge of the global networks of local communities is more effective in protecting biodiversity and attending to their own basic needs while improving their quality of life than that of societies more fully integrated into the global economy. In conclusion, we describe how these visions are shaping international networks, defining new channels for collaboration, improving the quality of life for people in these communities, while protecting them from the continuing incursions of capital.

Keywords: Communitarian Subject, conviviality, community welfare, Radical Ecological Economics, *comunalidad*

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INTRODUCTION

This thematic issue on the "Ethic of Sufficiency" is framed within the scope of "late capitalism." In their announcement, the editors called for confronting the "daunting challenge of injustice" given the coexistence of stark material deprivation and overabundance. They posed the possibility of "economies oriented toward sufficiency." They raised the question of whether this principle is inevitably rooted in an ethical and religious framework or whether it can be part of a "secular modern" in facing humanity's biggest existential challenge: the environmental crisis.

This essay addresses the "ethic of sufficiency" from the perspective of a significant proportion of the peoples living in the Global South. In contrast to the discussions of injustice related to the stark contrasts between the needy and the wealthy in the recent period in capitalist countries, the societies we are describing have lived with this inequality and suffered from the effects of centuries

of colonial oppression, imperial destruction, and capitalist accumulation (and dispossession[1]) for centuries. The result has been the literal obliteration of myriad cultures, the enslavement of millions of persons, and the devastation of ecosystems around the world, erasing untold founts of biodiversity and threatening the very existence of many societies. In spite of this tragic history, thousands of peoples around the world continue to resist, evolving with the changing circumstances to create societies that are now displaying a new-found strength, forging institutions capable of self-governance, focusing on defending their territories, conserving and rehabilitating their natural endowments, attending to the basic needs of their members, while improving their quality of life.

For people in these societies, the question of "sufficiency" is not one having enough but rather creating communities that are organizing themselves to be in balance with their surroundings. They are acutely aware of the challenges of creating productive systems that are not unnecessarily destructive of their environs while developing social processes and technical approaches attuned to the possibilities of their territories. The resulting social metabolic configurations are a direct result of the centrality of traditional belief systems—cosmovisions—that combine the wisdom of inherited customs with the understanding of the need to incorporate new elements as natural and social conditions evolve.

In this article, I address the problem of "sufficiency" from the perception of a number of communities in the Global South. I suggest that the issue is not one of assuring an adequate basket of "satisfactors" for needy individuals, but rather a problem of a collective commitment to the welfare of all the members of the community while also assuming responsibility for the rehabilitation and conservation of the territory. This obligation is not simply one of attending to the material needs, for in many societies their underlying beliefs also encompass an obligation to care for all elements in the natural world—be the other living creatures (flora and fauna) or physical and geological features. As shall be evident, this extended concern is not simply a rhetorical acknowledgment of the significance of the "outside world," but rather its intricate and intimate integration into the very essence of the collective beings, the societies that are forging the new worlds which are the building blocks to which this essay is dedicated[2].

To develop this argument, I begin by contrasting the alternative paradigms within Euro-centric epistemologies currently being employed to approach the relationship between social phenomena and the planet. This analysis employs a radical approach developed by a group of scholars in Mexico based on our collaboration with indigenous peoples and rural communities to identify alternative paths for confronting the multiple challenges facing humanity. Ecological economics (EE) emerged at the end of the twentieth century as transdisciplinary field of enquiry to bridge the gap between the social and natural sciences, positing the need for a pluralistic approach to understanding the complex interactions that were contributing to the profound planetary transformations that we now recognize as a global environmental crisis. In the face of the generally intransigent attachment to the existing institutional framework of the global world economic system, this alternative "radical" paradigm emerges from the inherited traditions and wisdom of peasant and indigenous communities and their evolving social practices to forge responses to the intensifying multidimensional crises that threaten their very existence. These contrasting paradigms are remarkably similar to the difference I am posing between the philosophical literature on "sufficiency" and the practical commitment of many "non-western" societies to organize inclusive institutions that leave no members behind.

With this background, I then explore the cultural and philosophical foundations shaping these societies. Their activities are generally not understood or misunderstood as part of senseless movements to stop the inexorable advance of "progress," the mobilization of technological advances to efficiently extract the bounty that "nature" bestowed on humanity to assure its "development." Our analysis starts from the vantage point of these actors, the myriad groups coalescing into increasingly strong organizations. As they associate with each other and formulate strategies to assert their demands, they are often adamant about the need to distance themselves from the system of nation-states and the array of institutions that has systematically marginalized and impoverished them.

Finally, I reflect on the nature of the emerging constellation of national, regional and international alliances that are consolidating new systems of governance to assure their viability and strengthen each of their members. Throughout the world these networks offer mutual support, while providing a diversity of approaches to confronting the practical problems of governance, social organization, productive diversification, and environmental management that provide the underpinnings for assuring that the communitarian ethos can contribute to overcoming the multiple crises that confront humanity at present.

ECOLOGICAL ECONOMICS: AN HISTORICAL EXCURSION AND A PARADIGM CONFLICT

Ecological economics emerged as a transdisciplinary field of enquiry to build an analytical bridge between society and the planet. The lack of an (academic) integration of social and ecological dynamics became woefully apparent as the cumulative impact of a critical literature pointed to an impending

[1]Luxemburg (1951) revised Marx's early characterization of "primitive accumulation" asserting that it is a continuing process that will not cease until there are no more lands (resources) or "free laborers" to be brought under the heel of capitalist expansion, that is the extension of the social relation controlled by the owners of the means of production (Perelman, 2000). Harvey (2005) recently expanded on this analysis, labeling it "accumulation by dispossession".

[2]This unity of society and nature was a controversial assertion in Western scholarship when proposed by French anthropologist Descola (2013). Indigenous communities around the world had long been vociferous and eloquent in asserting their intimate interrelationships with the planet and all of its component parts. The subsequent proliferation of literature advancing this perspective is testimony to the changing balance of sensibilities in this matter; see, for example, Danowski and Viveiros de Castro (2017), de la Cadena and Blaser (2018), and Esteva (2019) for poignant examples.

multidimensional crisis: the inability of the capitalist world-system to provide for the needs of a considerable proportion of the world's population while it was devasting the planet's ecosystems (Arrighi et al., 1989). A number of activist scholars produced the foundations for a new wave of critical literature, building on the clarion cries of Kapp (1963) and Boulding (1966) as well as the earlier warning of Polanyi (2011 [1944]) that the system was resting on a house of cards, three fictious commodities: nature, money, and labor. The Club of Rome issued its broadside: *The Limits to Growth* (Meadows et al., 1972) while the "Brundtland Commission" more diplomatically tried to paint a path forward in its *Our Common Future* [World Commission on Environment and Development, 1987]. The International Society for Ecological Economics emerged in this context (1989), bringing together academics attempting to meet the challenge, counting among its earliest participants people who were already warning about the need to dramatically alter the productive system to consider the Second Law of Thermodynamics (Georgescu-Roegen, 1971) and the need for a different metabolic balance (Martínez-Alier, 1987).

Participants in a long tradition of analysis of metabolic systems and warnings of the destructive dynamics of the existing dynamics of the evolving productive structure, it seemed obvious that the assembled experts would muster their combined analytical prowess to design alternative paths for human development and environmental remediation and protection. Instead, much of the energy of the Society's members was directed to using the tired tools of the market place and their focus on ineffective public policy approaches to provide a smoke-screen for powerful corporate interests, intent on feeding the intensifying crises (Söderbaum, 2015; Spash, 2020a,b). The stopgap measures designed to channel "well-intentioned" social and environmental resources to attend the most pressing problems rarely seemed to reach the intended beneficiaries or to protect the vulnerable ecosystems. Another current within the organization, cognizant of the profound social and environmental damage that the global system was wreaking on peoples around the world, embarked an ambitious project to document the thousands of communities threatened by the advance of market forces and corrupt practices; their *Environmental Justice Atlas* (https://ejatlas.org) is proving to be a valuable tool for analysts, politicians, and communities attempting to rein in these practices (Martínez-Alier, 2021); the cumulative impact of this work is clearly improving their ability to wage more effective struggles against the voracity of capitalist expansion.

A different approach, which underpins the analysis of this essay, promotes collaboration with grassroots groups—mostly peasants and indigenous people—engaged in implementing their own strategies of political autonomy and defense of their territories, revealing a particular biocultural dimension in the interaction society-economy-nature, and, above all, giving rise to a deep critique of economic rationality supporting the Western civilizational project. It integrated the seeds of a socio-environmental alternative to the global climate emergency. The starting point of this "radical" current (Radical Ecological Economics, identified as REE in what follows) is the recognition of the heterogeneity of the societies with which we collaborate (Barkin, 2017; Pirgmaier, 2021). It is not only a question of a multitude of languages, ethnicities or nationalities, but also the contrast with the relatively homogeneous image that the genealogy of the social sciences of the North Atlantic world produced and "simplified" compared to the variegated array characterizing the societies of the Global South. In this world, there are profound differences that start from the various cosmogonies and cosmologies of the different groups, as well as the customs, traditions, ceremonies, and social systems of reciprocity and collective organization that they engender[3]. A common element among these cultures is their attachment to the territory, to the geographical space they occupy, a space that has a deep meaning that transcends the concept of property or belonging transformed into (private) property by the Euro-descendent societies analyzed by most of the members of the ISEE.

A second characteristic, derived from the previous one, is the radical ontological difference of what in the Western world is known (and misunderstood) as "Nature." This dimension has tangible and intangible meanings, sometimes expressed as "the web of life" (Moore, 2022) where everything is related to everything and in which many non-Western peoples do not make a distinction between the "I" and the phenomenal world, that is, they do not establish a separation between human beings and other species (Harding, 1986), since, among many indigenous and afrodescendent peoples, they are not only considered part of it, but they are "nature." This profound difference stems from a great diversity of stories rooted in a long tradition to explain the origins of the world and societies (Kopenawa and Albert, 2013). The meaning of this reverence for the planet is central to the analysis of the various issues addressed by ecological economics. It implies not only recognizing the omnipresence of the dialectical relationship between human and non-human natures of the *oikeios* or the web of life, where there is "the creative, generating, and multidimensional relationship of species and the environment" (Moore, 2020, p. 18) and its importance not only to determine our lives, but also for the organization of social life and its institutions.

Just as important as the relationship with the environment, is the character of solidarity within the communities, encompassing responsibility for their own collective performance and for their relationship with the environment. In contrast to the heightened individualism of the "globalized" societies, as explored in the next section, this local solidarity facilitates the ability of individuals to pursue their own interests while contributing to the consolidation of the communities of which they are a part; solidarity, in this sense, also involves ties of reciprocity among

[3]Although this is not the place to explore the richness of these different traditions and heritages, perhaps it would be worth mentioning a few: the *Sumak Kawsay* or Buen Vivir of the Andean world (Huanacuni Mamani, 2010); the *comunalidad* of the Sierra Norte de Oaxaca, Mexico (Martínez Luna, 2010; Meyer et al., 2010; Escobar, 2020); *Lekil Kuxlejal* in Zapatista lands of Mexico (Paoli, 2003; Mora, 2017); South African *Ubuntu* (Terblanché-Greef, 2019; Mugumbate and Chereni, 2020); *Swaraj* of Gandhi's thought (Kothari et al., 2014). For an overview of some Latin American traditions in English, see Beling et al. (2021) and Brand et al. (2021) for a more global analysis.

members of the community. Unlike the globalized societies in which they exist, many of these societies enjoy a long history and a communal dynamic, despite the social forces that were pressuring them toward individualism and assimilation; in some cases, efforts to recover this heritage derive from the blows they suffered in trying to maintain their autonomy or rescue it after unhappy experiences of following the lure of developmentalism of past eras (Wolf, 1982). They are forging collective organizations and dynamics for decision-making by consensus involving the participation of all their members, including women and youth; the significant importance of women's presence is reflected in the flourishing ecofeminist literature that will be referred to below. This participatory or direct democracy enabled the integration of new voices in the formulation of strategies and programs. Of particular note in this regard is the relatively long history of the Zapatistas in southern Mexico (Villoro, 2007, 2015; Esteva, 2021).

Placing the cosmologies of the communities and their collective organizations in the foreground for the formulation of an REE generates another epistemic-political perspective, focused on the care and reproduction of life in all of its dimensions, rather than of capital. It contributes to a different methodology for conducting research and building theory. In this new framework, we identify the ontological and epistemological need to articulate with members of the communities in the work of building knowledge, structuring thinking differently, and promoting new practices and forms of action, since their perceptions, and those of their organizations, are those that will guide the formulation of questions and provide us with paths to look for models of analysis and clues to devise strategies for identifying and solving socio-environmental problems (Fuente-Carrasco et al., 2018; Sáenz Boldt et al., 2021). This indigenous form of consultation and consensual decision-making is based on a dialogical and reflective method known among the Tzeltal peoples as *tijwanej* that allows everyone to participate and consists of "taking out what is in the heart of the other" (Harvey, 2000, p. 83). It is a productive method that comes from the word *tijel* which means to move, and that is exactly the objective of this reflective model in the sense of appealing to the other, to arouse, that is, to put her in motion.

As a consequence, REE also transforms our appreciation of the character of the groups with whom we are collaborating. Without underestimating their knowledge, as collective groups, they are not incorporated as informants or repositories of information, of traditions; nor, do they limit themselves to contributing with their valuable abilities to interpret certain natural phenomena or to mix the ingredients that produce the remedies, the cures, or the prophylactic substances that have served to face different "evils" that they suffer. That is, we are undertaking a symmetrical relationship in the co-construction of new knowledge, and in the implementation of collaborative research strategies. Their traditions and cultural activities, as well as their integration to face the challenges that arise, generate another dynamic that translates into a **Community Subject**, an entity that assumes the responsibility to propose, to move forward with their own resolve, facing the socio-environmental problems (sociometabolic) that arise and overcoming them whenever possible. Then, many of these actors become "social subjects," understanding that they have to transcend both the concept of individuality as well as the institutions within which they have been constrained, forging new procedures to create new political spaces that would allow them a social appropriation of nature (to protect and conserve their territories; Barkin and Sánchez, 2020).

FORGING THE COMMUNITY SUBJECT[4]

Community dynamics offer important contributions to advance in the process of building new socio-metabolic configurations[5] to assure environmental balance, improve the quality of collective life, and reinforce the capacity for self-governance and the advance of demands for autonomy. Among them, we have identified three of utmost importance: (1) in the variety of cosmologies of the different peoples is implicit the centrality of their various social organizations in contrast to the social contract that dominates the main cultures of the North Atlantic world[6]; (2) the possibility for the communities of workers, peasants, indigenous, and afrodescendents to generate significant surpluses through the participation of all their members in the different tasks identified by the assemblies and their leaders, and the commitment to use them for projects based on collective decision-making; and (3) the practical and analytical visibility of the perspective of women in the communities whose struggles opens new windows on their collective practices, as part of the community subject, and their contributions to sustaining life while maintaining the continuity of the territories. On the basis of their own narratives, they have become protagonists in the defense of lands and territories, active participants in the exercise of autonomy, the consolidation of their productive base, the management of the territory, and the consolidation of alliances with other communities. We now explore these core contributions:

1) A feature common to many of these societies is the integration of the service of individuals for the common good, as members of the community strengthening social and political unity. In this context, this service becomes a dialectic of a gift (Hyde, 2019), in the sense of consolidating societies based on redistribution and reciprocity, since it facilitates members' full integration, while generating avenues for each to find

[4]I use the singular form throughout this article to emphasize the collective nature of the participants that come together in each community to bring their projects to fruition. It in no way suggests that one community subject is the same as another, or that their beliefs, forms of organization, or goals are the same.

[5]An important concept that defines the way in which societies organize the relationship with their territories, from the appropriation of their natural endowments, their incorporation into production, circulation and consumption, and finally their disposition. This relationship is at the heart of the possibilities for societies to confront their impact on the planet. Its reorganization within the communities to reduce this burden is key to the profound differences in the configurations that are highlighted in the text (Barkin and Fuente, 2021).

[6]Villoro (1997, 2003, 2004, 2009) has been particularly insistent on analyzing the depth of the difference between the forms of social organization embedded in these communities and the social contracts that derive from the tradition of Locke, Hobbes, and Rousseau.

ways of contributing to the whole. In this way, the individual can excel, strengthening their capabilities and follow their particular interests through agreements established with and by the community, ensuring that their performance contributes to communal projects as well as their wellbeing. The interesting and innovative thing about these contracts is their contribution to reinforcing institutional structures that govern traditional communities around the world, especially when they incorporate a post-humanist vision (Braidotti, 2013) that includes biophysical factors in a community that encompasses the terrestrial as well as the celestial and underworld spheres as suggested by Lenkersdorf (1996, 2005, 2008). This comprehensive relationship with the world around them generally stems from underlying cosmogonies deeply rooted in many of the cultures of the societies with which we are collaborating.

The community expression of the functioning of indigenous peoples has enormous significance for our inquiry into the emergence of a collective ethos or *telos*. They express themselves in different ways in the various indigenous cultures, but a common characteristic is the search for mechanisms to consolidate a collective governance capacity accepted by all of its members, a process that differs profoundly from its counterpart in the Eurocentric sphere. Perhaps the clearest way to characterize this difference is the contrast between representative and participatory institutions that are predominant in each of these "worlds." This collective ethos is the point of entry for the community to avoid the dilemma of people going without: the scourge of deprivation that underlies the need for a discussion of "sufficiency"[7].

2) The possibility of generating and distributing surpluses is directly related to that of the communal organization. It begins with the deep current of reciprocity imbued in social relations, a characteristic that transcends any accounting system, generating new economies of gift and forms of redistribution that are incomprehensible in the capitalist "world system"[8]. Reinforcing these elements is the social character of the recruitment of community members to carry out community tasks and responsibilities. Among most traditional peoples, there are tasks and functions that they have to fulfill on a regular basis, many of which cannot be remunerated. Their assignment depends on customary processes, often carried out within participatory bodies, such as the Assembly or its committees.

The social character of community mobilization, requires varying commitments from those who are involved. In all communities, there are essential tasks to be assumed, generally recognized, for the maintenance or improvement of built infrastructures or ecosystems; in these cases, it is common to observe the forms of generalized participation through mechanisms that take the name of *tequio*, *mano vuelta*, *faena,* or *minga*, among others, depending on the region. In these processes, the active participation of children, young people and the elderly in activities appropriate to their age and gender is also observed[9].

They also engage in other activities that produce and mobilize surpluses not evident in market economies. Some have a symbolic importance, contributing to enrich cultural and traditional heritages, involving celebrations that strengthen social and political ties for community life. On certain occasions, greater material and monetary resources are required that serve to limit the accumulation of great wealth among community members (Scott, 1985). In other cases, the assignment of administrative, political or technical responsibilities reflects the proven capabilities of those selected; in several instances, the rotation of these positions also corresponds to deliberate strategies for minimizing individual ambitions and training new cadres, reflecting ideas for promoting greater equality in the organization. This practice is essential for maintaining and strengthening collective services, such as education and health, and ensure the environmental conservation of their territories. The commitment to promoting deliberate systems for ensuring egalitarian practices is an oft-mentioned concern within these communities, reflecting their cultural practices and the long histories of abuse in the societies from which they are trying to distance themselves.

In this sense, the Communitarian Subject offers an analytical framework and a methodology to accompany these collective processes. It involves enhancing the willingness and solidarity of its members to generate surpluses, permitting them to consolidate their own projects in the construction of post-capitalist societies. It is not a question of devising new utopias, but of forging "anti-systemic" alliances with other equally committed communities and having the strength to move forward in the face of the considerable pressures that the governments of their countries are exerting to integrate them into the world market (Arrighi et al., 1989).

3) REE was born from our interaction with the communities rooted in their territories, but it deepened with the transformation of social relations within them. We witnessed and participated in the emergence of a renewed force of "eco-territorial" feminism that defends not only geographical spaces but also personal ones, opening a new dialogue that

[7]In a text defining their heritage and way of life, a woman in a highland community of Mexico explained: We "is a word born from the heart. I mean what is yours or mine, or is ours. Even so, when we die, that 'we' remains for others, and it is a relationship that never ends because ours, from the moment we make it part of us, we take care of it, we try to do it, but we also do not let it die" (Boege Schmidt and Fernández, 2021, p. 23).

[8]A classic text on the subject of the "Gift" is Mauss (1970 [1925]), whose discussion was updated by Godelier (1999). Another text that explores concepts in contemporary terms is Hyde (2019). Graeber and Wengrow (2021) describe the protagonism of the Community Subject and the constancy of the generation of surpluses for collective wellbeing in an historical context, dating back thousands of years.

[9]The significance of this form of participation for the present analysis of sufficiency cannot be overstated. Not only is it a fundamental social obligation and a basic principle for organizing communal production in societies throughout the Global South, but it is also the foundation for ensuring the community's ability to provide for the basic needs of all members. The Electoral Court of Mexico explained: "Without *tequio* there would be no infrastructure that many indigenous communities currently have; that is, schools, hospitals, roads, and other services" (Bustillo and García Sánchez, 2016, p. 11; see also, Salazar Zarco, 2018).

> confronts the dominant geoculture and proposes relational paradigms and epistemologies from an intersectional perspective where the ethics of care and the sustainability of life are at the center. This is crucial: in the question of sufficiency, the matter of the quality of life in paramount, and the role of people left on the margins by the market in providing this support offers a meaningful substitute for commodities.

In this regard, it is essential to reflect on the transition observed throughout the Global South: the decline of patriarchal domination as a result of the recognition of the significant contributions that women played historically and the leadership they are exercising at present. This was succinctly phrased in a meeting with leaders from a number of indigenous communities in an analysis of the contribution of Zapatista women:

> …patriarchy goes well-beyond the exploitation of women; it explains the systematic destruction of nature. Conversely, matriarchy is not defined by the predominance of women over men, but by an entirely different conception of life, not based on domination and hierarchies, and respectful of the relational fabric of all life. This is why, for all cultures, it can be said that "in the beginning, there was the mother" (in the last instance, Mother Earth), that is, the relation, as ends to still be the case today for many indigenous peoples, who retain a range of matriarchal practices (von Werlhof, 2015).

In the process of adapting to this important social transformation, the Communitarian Subject is strengthened by recognizing the changing situation of women, acknowledging the non-mercantile subjectivities that are vital in the framework of the current ecological and social devastation. By explicitly incorporating women, along with the young and the aged in an intergenerational dialogue, these societies are strengthening their valuable heritage of the dialectic of reciprocity and gift, recognizing the non-economic dimensions of the relationships among members and with the other living beings of their environment "mapping the bodies-territories, in search of the ways of healing and resilience, in dialogue with local and ancestral knowledge" (Svampa, 2021, p. 9).

This evolving ability of women within their communities to assert their importance and the need to upend the behaviors of the past that violate them and make them vulnerable, is forcing communities to recognize the importance of every member. This process has not been easy and continues to pit women and certain groups of leaders against their own relatives and the powers embedded in many areas. In the context of the present essay, it highlights the significance of tackling the challenges of "sufficiency" with extra-market institutions, thereby avoiding the predicaments highlighted in the mainstream literature (e.g., Casal, 2007; Huseby, 2020).

This new dynamic is emerging from the demands of many communities in other areas. The renewed awareness of the meaning of their cosmovisions and cosmogonies highlights the enormous contribution of women as guardians of much of traditional knowledge, of the ways in which they relate to their environments, and of the possibilities of staying healthy and united. In political affairs, the heritage of machismo contributed to disparaging the material contribution of women, both in terms of their role in the reproduction of family and community life, and in the various traditional social and productive activities in which they are leaders.

With the consolidation of these social dynamics, new paths for generating and distributing surpluses are emerging. As this becomes a theme of open discussion, it is surprising to many, to realize how the daily work of women, and the incorporation of the young and the elderly, has facilitated a much more effective mobilization of the community as a whole for collective chores and the organization of traditional and new productive activities[10].

But this recognition and acceptance of the need for equity has other impacts on the daily life of the community. The broadening of the field of analysis to integrate the feminist ecoterritorial vision facilitates the methodological and theoretical "decolonization" tasks so essential for deepening the communitarian ethos (Lugones, 2008; Millán Moncayo, 2011; Escobar, 2020; Smith, 2021). The very action and subjectivity of the Communitarian Subject obliges a reconsideration of the ways in which we interact with institutions that try to condition the rules of social and political organization and the ways in which we build alliances and participate in the spaces of exchange. This decolonization requires profound changes with respect to the ways in which we collaborate with the Communitarian Subject (Fuente-Carrasco et al., 2018) and possibly new directions for the academic agenda of committed researchers.

Accepting the need for a feminist vision is the result of the protagonism of eco-territorial feminisms in the effective defense of the commons and an important force of resistance against extractivism, which although at the beginning of the structural adjustment reforms in the nineties was led by indigenous movements in Latin America, it is now driven by women who understand that patriarchal violence to their bodies, is analogous to what extractivist violence does to territories. However, the inclusion of the feminist perspective is not restricted to recognizing a limited number of rights, but to acknowledging a relational epistemology that requires, among other things, decolonizing and depatriarchalizing the interactions between economy, society and nature. It also underlines the obligation of the researcher to reflect on structures of personal, academic and work relationships, in the same way that it is promoting new dynamics within peasant and indigenous societies.

This vision was translated into action in 2011, in Cherán, Michoacán, when a group of women and young people organized to stop illegal logging and drug trafficking in their forests, recuperating indigenous traditions and language; in the following decade, the community reorganized itself,

[10]This is vividly apparent among the younger generations in the ranks of the Zapatistas in Chiapas. An eloquent first-hand account of this interaction with young women is presented by Mora in Millán Moncayo (2014, p. 155–181). The book presents 13 other essays with a wide range of feminist visions relating to the "decolonization" of "civilization," recounting experiences of peoples moving their communities forward toward a "full and dignified life" (an inadequate translation of the concepts mentioned in textfootnote 3, *supra*).

creating a self-government and local enterprise structure that was recognized by the State which is now obligated to transfer tax revenues for local administration (Gasparello, 2021). Of course, as a consequence, the quality of life has dramatically improved, illustrating the basic tenet of this article.

In summary, one of the most relevant contributions of Latin American eco-territorial feminisms is the need to take seriously the change and displacement of the center/periphery binomial because (against all predictions) the cities that cluster the economic and political power of the global north are no longer the center of the world; instead, it is the forest masses of the planet that in the context of climate change play a strategic role in carbon capture, and therefore, they are where the future of humanity is at stake, in an increasingly clear challenge between capital or life. Similarly, it is the small-scale food producers, concentrated in the Global South, who are the principal producers of food for human consumption, contrary to the exaggerated claims of the international agroindustrial corporations; it is generally agreed that they nourish about 70% of the people with less than one-third of the land (Grain, 2022). It is no surprise that the Anthropocene marks a before and after in the history of humanity, and that women, peasant, afrodescendent, and indigenous peoples are the main victims of social or environmental change; it is in the same process that they have become the main protagonists in the defense of the commons and in underlining their importance for the sustainability of the web of life.

Additionally, feminism has insisted on deconstructing the binomial identity/otherness to think about difference in a different way (Lugones, 2015), post-human and intersectional, to problematize both the male cosmogony that feminizes territories as "virgin" spaces that must be conquered, colonized, and exploited in the name of the mythology of progress and modernization (Brum, 2021). In any case, we must question and dismantle the white political-racial identity that subalternized the world's population in criteria of race, class, gender to adjust them to the objectives of value extraction and capital accumulation (Tornel, 2022). If the above is valid, then Aguilera Klink's (2021) critique of the Anglo-Saxon hegemony of ecological economics becomes more trenchant, in which he proposes to recognize the importance of theoretical contributions from below that comes from the Global South, particularly Africa, Asia, and above all, Latin America.

Finally, in the perspective of understanding and strengthening the Communitarian Ethos, I propose, in the manner of Illich (2008, p. 112), not to make a science *for* people, but a science made *by* people. In this case, what is needed is not only a pluralistic but intercultural methodological perspective, one that goes beyond the pure dialogue of knowledge systems, making evident the power of the subjugated and displaced knowledge systems of indigenous and afrodescendent peoples and eco-territorial feminisms to propose an intercultural epistemic dialogue, to the extent that it responds to this construction from below of the processes of transformation of the structures of domination, whether cultural (epistemic), economic or political, since this subaltern knowledge is a key resource for the agenda of a research that decolonizes the relations of power-knowledge between hegemonic and subaltern sectors. This critical interculturality already constitutes a Eurocentric detachment and a strategy to transcend it (Estermann, 2010; Robert and Rahnema, 2011; Millán Moncayo, 2014).

CONSOLIDATING A COMMUNITARIAN ETHOS: THE *MILPA* AS A METAPHOR

The communitarian ethos is a complex amalgam of cosmology, tradition, history, political organization, and environmental management that is enabling many communities to forge the post-capitalist societies that are empowering them to confront constructively the multiple crises facing humanity in this historical period. This ethos creates a framework for understanding the relationship of society with nature and of the individual with the community. As pointed out above (see textfootnote 3), the ethos takes many different forms, depending on each society's history and context. *Comunalidad* is one such formulation that emerged from the experience of peoples in the Mexican state of Oaxaca (Díaz, 2007; Martínez Luna, 2010).

This Oaxacan version approaches the matter of relationships within society and with the planet in ways that are similar to the dominant vision of "*buen vivir*" (good living) in the Andean area, the *Sumak Kawsay* (Huanacuni Mamani, 2010; Hidalgo-Capitán et al., 2014). In the words of one of the formulators, it is a challenge to the dominant powers: Martínez Luna expressed it clearly in a dialogue with Noam Chomsky: "*comunalidad is the epistemological notion that sustains an ancestral, new and proper civilizatory process*," the inheritance of thousands of years, without ceasing to be new because it is always renewing itself, that is, a dynamic process, capable of stopping the sickly individualization of knowledge, power and culture (Meyer et al., 2010, p. 175). Unlike community, *comunalidad* integrates four substantive elements: territory, authority or power, work and enjoyment or celebration, while the values that articulate it are respect, social justice, and reciprocity.

Perhaps one of the most vivid ways of illustrating this concept and its relevance for explaining how it contributes to advancing this civilizatory process is the "revolutionary" agroecological technology developed by pre-Colombian peoples more than eight millennia ago, a technology that dominates the Mexican countryside even today. Maize is not a naturally occurring grain; it was created by agronomic experimentation over the course of many generations from a native plant, teosinte, by Meso-Americans. Now one of world's most important grains for human and animal consumption, this remarkable history only recounts part of its significance. During those centuries, these peoples advanced further, creating a complex agricultural system, the *milpa*, now widely recognized as one of the most remarkable agronomic innovations of early civilizations, pre-dating the emergence of the western European "civilizations".

The *milpa* is a pluricultural wonder[11] (see **Figure 1**). The genius of the early agronomists and farmers became apparent as they determined to sow the corn together with beans, a very significant scientific advance. Today, we know that the bean is a legume that extracts nitrogen from the air, transfers it through its roots, acting as fertilizer to nourish the corn through the rhizome system: the underground networks of roots that interact and with which beans and corn intercommunicate. So, the nitrogen that the bean transports to the ground feeds the plant and helps the corn to prosper. They also found that it would be very good to plant pumpkin to protect the soil, thus generating a groundcover to prevent the land from drying out; this process of agronomic experimentation included taking advantage of the pumpkin flower, as a food delicacy, diversifying their diet, even before harvest times; to this emerging cornucopia, they added many varieties of chili peppers that add so much flavor to life! They also discovered the value of the wide variety of "*quelites*" that sprung up in the maize fields, flavorful leafy greens with important nutritional benefits. Finally, they discovered the culinary delight of a fungus that appeared on some maize cobs, the huitlacoche, a delicacy particularly cherished in "nouvelle cuisine mexicana!"[12]. The extraordinary invention of the *milpa* was based on a continuous arduous, scientific collaboration of Mesoamerican peoples, illustrative of a cosmic vision, a special relationship between nature and society that sprang from the very fabric of their societies[13].

The *milpa* offers a different way of thinking about the dynamics of nature and society, or as Martínez Luna (2022, p. 1) puts it: "The separation between Nature and society is the logic of power." In this description of the emergence of the *milpa* and its significance for the wellbeing of peoples, we cannot insist enough on the importance of the concept of rhizomes: the subterranean rhizomes in nature, invisible to the naked eye but essential for the wellbeing of the multiple forms of life on the surface. What is extraordinary, is the ability of these peoples in ancient times to realize their existence, their meaning, and the ways to encourage their proliferation. However, the perception and understanding of these rhizomes also extended to their own lives, as there is ample evidence that they went to great lengths to generate and "densify" the social rhizomes, the political, and trade networks that drove a great diversification in the various productive, ceremonial, and cultural activities of which only a few have survived today. The importance of these cooperative organizations within communities is a significant factor that reflects on the way in which society has learned from nature; a striking contrast with the competitive and individualistic dynamics promoted by society in the "globalized" world[14].

In different ways, and a variety of manifestations, we observe in this history of the *milpa* something of the fundamental ethical bases of communality: respect, social justice, and reciprocity. They are the starting point from which many peoples are rejecting the individualistic methodology and market dominance, with the transformative effect on all aspects of life, everything not destined for the market, into positive or negative externalities. This history can contribute to our understanding of the difference between the approach to a "sufficiency ethic" in Eurocentric literature and that offered in this essay.

STRENGTHENING TRADITION THROUGH INNOVATION: RECOVERING SUSTAINABLE SOCIAL METABOLISMS

Recovering a sustainable social metabolism is central to strengthening communities. Forging a sustainable social metabolism poses the challenge of reducing the demands on nature for maintaining the quality of life in communities while minimizing their burden on the planet. Generating local welfare plans is not enough; we find that many of the inherited and updated strategies for production, social care, and environmental management in communities offer solutions for the organization that ensure more balanced approaches to their environmental impacts and are less expensive to implement. This is the case of small-scale rural production, improving traditional systems in the *milpa*, for example, by applying agroecological experiences, transmitted in the peasant-to-peasant schools that have been convened in Mexico and elsewhere; this is an excellent example of the densification of organizational networks, the social rhizomes mentioned in the previous section (Mata García, 2013; López Valentín et al., 2020).

In our work, over 30 years we coined a motto to define how the university can collaborate in this process of the communities: *Strengthening Tradition Through Innovation.* This approach reflects an extremely important element in our relationships with communities: the recognition of their dynamism, and the importance of their ability to experiment, evaluate, and innovate, when it comes to finding new ways to solve problems or improve their conditions. In this sense, Wolf (1982) was emphatic in insisting that to assure their continuity, communities have to modify tradition to changing conditions, if they were to stay strong; that is, the survival of traditional societies depends on

[11]There is an abundant literature on the milpa, its agronomic qualities and significance, and its history. For an accessible English language publication, see Ventura Martínez (2017); a more detailed discussion in Spanish, with an ample bibliography can be found in Lozada Aranda and Ponce Mendoza (2016). A well-documented discussion of its evolution over 8000 years in the Maya region of Mesoamerica is Ford and Nigh (2009).

[12]In present-day commercial agriculture the quelites are considered weeds to be done away with using herbicides and the fungus, known as "corn smut", makes the grain unsuitable for sale!

[13]We have omitted here an equally important discussion of the invention of nixtamalization, as a process to transform corn into a food with nutritional qualities superior to many basic grains in other cultures. This technological advance was decisive for their health, involving adding lime to the mixture that releases the amino acids in the maize that are fundamental for the formation of the complete proteins when combined with beans; the diet was further enhanced with chili peppers and tomatoes, also native to these regions. In this way, ancestors developed a cuisine that offered a source of protein, minerals, and vitamins, affording the Mesoamerican peoples one of the healthiest diets of all the populations in the world before the conquest. An introduction to this important cultural transformation is: Serna Saldivar (2015).

[14]In this context, it is essential to note the importance of the activities of social and solidarity economies in capitalist economies, and the little attention directed to them by researchers of orthodox economics (Gibson-Graham et al., 2013).

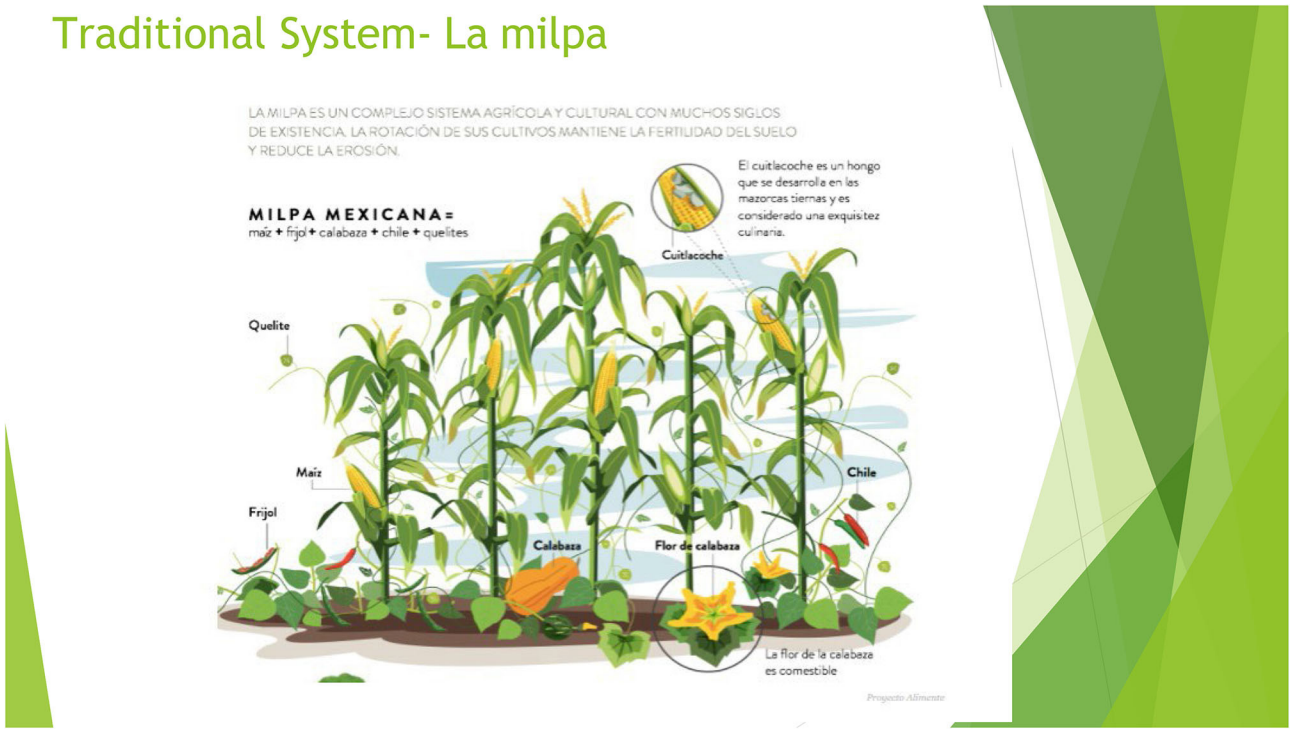

FIGURE 1 | The traditional mesoamerican milpa.

their resilience (Fuente-Carrasco, 2012; Boege Schmidt, 2021). This feature continues to be fundamental in our university work and, for this reason, we ask ourselves: How can university research collaborate, integrate and complement the work and concerns of the communities, with regard to productive activities as well as in organizational, social and political matters?

Two examples of this approach to innovation in our relationships with communities are illustrative. In one project we started by collaborating with a medical doctor from the state university whose pioneering research established that avocados—an important local fruit—are a source of beneficial fatty acids for the human population, reducing the concentration of high-density cholesterol in the blood (contrary to the previous assumptions of the medical community). Combining this result with research among Purépecha communities (the local indigenous group), we proposed a project to produce "lite pork" in backyard plots managed by women. They organized to market the meat to the nearby urban population at a substantial premium, directly benefiting the local economy and empowering the participants (Barón León and Barkin, 2001).

Another example reflects an extremely serious problem throughout the country (and the world): the progressive imbalance between the availability of water and burgeoning demand. In the Sierra Juárez of Oaxaca, the overload on the natural springs caused alarm in a Zapoteca community, which asked for our collaboration to diagnose the situation; from the beginning, they rejected the solution of the State Water Commission to bring the liquid from another source, since this would affect the wellbeing of other communities. Initially, they realized that their pattern of exploiting the forest was part of the problem, calling for a long-term management plan to restore the underground aquifers. But, there was also a need to reduce consumption in the short term; the community assembly was informed of the situation, with a proposal for a radical solution from the local water committee: replace the household faucets with neighborhood hydrants (at a maximum of 25 m from each house) so that families could carefully supervise and reduce their consumption; it also proposed replacing the "English" toilets in the houses with composting units that would be maintained by a collective to guarantee hygiene; as expected, these proposals provoked considerable discussion, but after a long debate, they were approved and implemented with collective work[15] (Fuente-Carrasco et al., 2019)[16].

With these principles, *comunalidad* necessarily confronts collective actors with the "individualistic" approach dominant in our society. The obligation to communicate, to dialogue from this vision, similar to the principle of Andean good living (*Sumak Kawsay*; Huanacuni Mamani, 2010), and similar cosmologies among the peoples in Panama (Kuna; Bley Folly, 2020), the Amazonians who are trying to defend their forests against the encroachment of oil companies, cattle ranchers, miners, and many other corporate enterprises. This heritage of ancient cultures generally incorporates a collective Assembly as an institution to make decisions; in recent years this has resulted

[15]Important exceptions were agreed upon for families with elderly and disabled people, and for community facilities.

[16]Other reflections on this strategy are Barkin and Barón León (2005) and Barkin (2012).

in a dramatic transformation within communities, creating new roles for women, a recognition that patriarchy and machismo were limiting the opportunities for the whole community. There is a new recognition of overcoming this legacy from different historical contexts and social relations, creating conditions for equality in participation, where the productive contributions of women are recognized along with a meaningful role in the political and social process (Millán Moncayo, 2014; Mora, 2017).

FORGING NATIONAL AND INTERNATIONAL ALLIANCES TO SUPPORT THE COMMUNITARIAN SUBJECT

The concerted efforts of communities across the globe to demand their autonomy, strengthen their local identities, and forge the institutions necessary to enable them to govern responsibly, did not occur in a vacuum. During the past half-century, they have been organizing to rise above the long history of oppression and discrimination, to demand recognition as groups with their own identities and abilities to govern themselves and protect the territories that they inherited or to which they have been relegated by the expansion of the colonial and capitalist systems (Barkin and Sánchez, 2020). In order to construct "a world of many worlds" (de la Cadena and Blaser, 2018), they are implementing new social, productive, and territorial management strategies that are fruitfully confronting the effects of the economic, social, and environmental crises facing humanity. This approach is not an ideological or political occurrence of a new emerging political group, but rather the logical outcome of the flow of a deeply embedded "cosmopolitics" "that rejects politics as a universal category and allows modern scientific practices to peacefully coexist with other forms of knowledge" (Stengers, 2010–2011); as Stengers coined the concept, it reflects the variety of methods for organizing life within and among communities as well as the different tactics when negotiating with the "powers" within the nation-states of which they are a part. These alternatives are rooted in the vibrant and diverse histories of peoples in the Global South, actively engaged in interconnected struggles for an ecosocial transition in the face of the profound social and environmental emergencies facing humanity today.

In this analysis, I suggest that the Communitarian Subject is consolidating and expanding. This involves all forms of struggle: ideological, social, political, and even economic. But it also encompasses the proliferation of many organizations that are supporting and broadening alliances among the communities and with sympathetic sectors of Mexican society; among the organizations that continue to play a significant role in this regard are: REMA, Red Mexicano de Afectados por la Minería; CMSS, Consejo Mexicana por la Silvicultura Sustentable; COMDA, Coalición de Organizaciones Mexicanas por el Derecho del Agua; MAPDER, Movimiento Mexicano de Afectados por las Presas y en Defensa de los Ríos; and CNI, Congreso Nacional Indígena. Although some of these coalitions involve important bonds with professional and social organizations committed to accompanying the communities, their strength and vitality depend on an understanding and commitment to the need to create parallel structures that can support the activities of each of the participants.

The postcolonial and anti-systemic dynamics in Mexico analyzed in this text are becoming increasingly integrated into global networks and alliances that are strengthening each of the individual actors. Three of these networks are described below. The largest social organization in the world is La Vía Campesina, formed in 1993, now includes 182 local and national organizations from 81 countries, with a combined membership of more than 220 million small-scale food producers (https://laviacampesina.org). It operates more than 70 schools and training processes based on popular education, which is a method and an approach that puts forward the scaling up of agroecology at the territorial level and the strengthening of peoples' food sovereignty. In addition to these productive activities, it plays an important role in supporting local struggles against land-grabbing and other incursions of national and international capital.

Territories of Life is a global consortium formally created in 2010 to support "indigenous peoples and local communities who are governing and conserving their lands, waters, and territories. Its membership in more than 80 countries is undertaking collective actions at the local, national, regional, and international levels across several thematic streams, including documenting, sustaining, and defending territories of life, as well as youth and intergenerational relations" (https://report.territoriesoflife.org/). It provides a forum for the exchange of experiences, training workshops, and collective action to secure their human rights, and particularly their rights to self-determined governance systems, cultures, and collective lands and territories.

The Global Tapestry of Alternatives is creating solidarity networks and strategic alliances amongst an immense variety of radical alternatives to the dominant regimes in each of their countries. It locates itself in or helps initiate interactions among alternatives. It operates through varied and light structures, defined in each space, that are horizontal, democratic, inclusive, and non-centralized, using diverse local languages and other ways of communicating. The initiative has no central structure or control mechanisms. It spreads step by step as an ever-expanding, complex set of tapestries, woven together by already existing communal or collective webs, building on already existing and new alternatives to dominant regimes (https://globaltapestryofalternatives.org/weavers). It promotes or joins regional, national, and global encounters, when the conditions allow for them, as well as close and synergistic linkages with existing organizations, like the World Social Forum.

These national and global alliances are spreading the communitarian ethos, offering alternative mechanisms to remain at the margins and even counteract the profound crises occasioned by the capitalist system. They are creating new societies, shaping the tools for conviviality that Illich (1973) foresaw as necessary to overcome the dehumanizing effects of globalization. Esteva (2019) anticipated such developments as he accompanied many of these societies on their journeys, avoiding the wreckage strewn around them; he enshrined his on-going

practice of promoting an "inter-epistemic" "dialogue among living systems"[17] to strengthen this communitarian ethos in the Universidad de la Tierra[18].

CONCLUSION

An Ethic of Sufficiency, the subject of this special issue of *Frontiers of Sustainability*, poses an important challenge for societies in the Global South engaged in "delinking" from the dominant world system (Wallerstein, 1974). The mainstream literature is engaged in a laborious debate on how to define "enough" and whether the criteria should be established from below or above. Regardless, it seems evident that today's capitalist system would not be willing to part with sufficient resources to attend to even the most precarious of needs of the world's needy. Furthermore, it is extraordinary, that in almost all of even the wealthiest countries there are considerable masses of people who live below the minimal standards of existence that each of the polities sets for itself.

In contrast, this essay addresses the problem from a distinctly different vantage point. I suggest that the myriad societies with strong traditions for managing themselves, reinforced by unique belief systems and a commitment to communal organization are in fact advancing toward the goals set out in the discussion of "sufficiency." They are generally implementing strategies of self-sufficient food production, as part of a plan to strengthen their autonomy, in collaboration with allies who share the same goals. Just as important, however, are the social dynamics that are becoming institutionalized.

In one region of Mexico, this significant process is called "*comunalidad*." Evolved from the practice of Zapoteca and Mixe ethnic groups, it involves a multidimensional approach to attend the full panoply of social, political, economic, and environmental tasks that the societies establish for themselves. In this way, their communal management system is obliged to consider the complex interactions among the various activities in which they are engaged. Recently, a new element has been introduced. into the process: the full recognition of the contributions that women have been adding to the collective endeavors as well as their unique ability to confront constructively many of the obstacles that have troubled their communities in the past; by recognizing this factor, communities have been able to appreciate the importance of their ability to generate surpluses that are strengthening their social fabric and facilitating other tasks.

This formulation, as well as similar ones developed in other societies mentioned in this article (viz textfootnote 3), directly addresses the problem at hand: the ethos of sufficiency. Although few of the peoples included in its broad scope of the analysis can be considered to be egalitarian, our collaborations in these communities clearly reflect their social commitment to assure that all members are provided for, on the basis of locally established standards for the quality of life. This is particularly evident in the attention lent to education: in the particular cases mentioned in the text each of the societies has dedicated considerable effort to ensuring that they are effectively providing the means for their young people to learn the mores and skills that are necessary for them to fully participate in the society and contribute to its future development.

It is also evident that they are concerned with the appropriate stewardship of their territories. This involves not simply developing institutions to confront contingencies, but also to modify their social organizations and living patterns to adjust them to the possibilities afforded by their environments; this attention to the social metabolism has become a subject of increasing attention in recent years, as the example mentioned in the text illustrates.

In sum, the notion of an ethos of sufficiency in this analysis is not simply a question of providing a minimum basket of commodities. The Community Subject discussed in this article becomes Revolutionary in the process of consolidating the post-capitalist societies that they are building. Moving from disengaging from the world market to shaping increasingly complex social structures to effectively attend the needs of their members and their territories, involves a social process that progressively consolidates their ability to assure an ethos of sufficiency.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

AUTHOR CONTRIBUTIONS

The author confirms being the sole contributor of this work and has approved it for publication.

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[17] A poor translation of his Spanish phrase: "diálogo de vivires".

[18] Gustavo Esteva died while I was completing this essay. His life-long accompaniment of Illich and those ideas will remain a vibrant tribute as we move forward in shaping the world of many worlds that are already emerging.

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Sufficiency and transformation–A semi-systematic literature review of notions of social change in different concepts of sufficiency

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Sufficiency is an indispensable strategy for sustainable development that is gaining growing attention in both the scientific and the political sphere. Nevertheless, the question of how sufficiency-oriented social change can be shaped by different actors remains unclear. There are many different concepts of sufficiency and all of them entail certain notions of social change. However, these notions of social change remain mostly implicit. By conducting a semi-systematic literature review on sufficiency and transformation, this article makes explicit notions of social change in various concepts of sufficiency. Additionally, these notions are structured and discussed concerning their possible contribution to a broader socio-ecological transformation to advance the debate about sufficiency-oriented strategies. The literature was sampled by a systematic search in the databases of Web of Science and the ENOUGH-Network, a European network of sufficiency researchers, and complemented by texts known to the author. In total 133 articles, books and book chapters were reviewed. The sufficiency concepts were analyzed regarding two dimensions: the goal of and the approach toward social change. Various ecological and sometimes social goals that different concepts of sufficiency pursue were identified. Some scholars operationalize the social and ecological goals in a sufficiency-specific way as consumption corridors or a pathway toward a post-growth economy. Furthermore, three different approaches to sufficiency-oriented social change were identified: a bottom-up-approach, a policy-making-approach and a social-movement-approach. Specific contributions and limitations of these approaches were identified. The three approaches differ regarding the role of conflicts and the conceptualization of behavior and social practices. By interpreting the results utilizing the Multi-Level-Perspective of Sustainability Transition Research and Erik O. Wright's transformation theory, synergies for sufficiency-oriented social change were identified. The review founds a

theoretical basis for further empirical and theoretical research on shaping sufficiency-oriented social change.

KEYWORDS

sufficiency, transformation, social change, politics of sufficiency, semi-systematic review

Introduction

In sustainability discourse, the necessity for socio-technical innovations, i.e., the increase of efficiency, the recycling of resources and the switch to renewable energies, can be considered to be undisputed. Nevertheless, evidence is increasing that socio-technical solutions alone will not be sufficient to achieve the climate targets of the Paris Agreement and other sustainability goals. Therefore, sufficiency measures are widely regarded as being necessary (Steinberger and Roberts, 2010; O'Neill et al., 2018; Vita et al., 2019; Wachsmuth and Duscha, 2019; Haberl et al., 2020; Kuhnhenn et al., 2020; Koide et al., 2021; Wiese et al., 2022). Accordingly, sufficiency has been gaining (renewed) attention from scholars in the last decade (Jungell-Michelsson and Heikkurinen, 2022). In 2022, the Intergovernmental Panel on Climate Change (IPCC) mentioned sufficiency as an important strategy to mitigate climate change for the first time in its summary for policy makers (IPCC, 2022, p. 41). To a minor extent, sufficiency has recently been gaining momentum in policy making (Hotta et al., 2021; Zell-Ziegler et al., 2021).

There are many different and sometimes contradictory conceptualizations of the sufficiency strategy, but they share two common dimensions. Firstly, sufficiency is conceptualized as a quantitative limitation of consumption and production on a generalizable level, often referred to as "consumption corridors," which address overconsumption and deprivation at the same time (Di Giulio and Fuchs, 2014; Jaeger-Erben et al., 2020; Fuchs et al., 2021). Secondly, the strategy of sufficiency describes social innovations[1] that are used to change social practices (Lorek and Spangenberg, 2019).

By these two dimensions, sufficiency can be distinguished from the sustainability strategies of efficiency and consistency[2]. Efficiency and consistency strategies are used to reduce the environmental damage per unit of products or services consumed and produced, but, unlike sufficiency, do not describe absolute limits to consumption and production. In addition, efficiency and consistency strategies rely on (socio-)technical innovations. If, for example, the sustainability goal were to reduce CO_2-emissions for space heating in the residential sector, a possible sufficiency measure would not be to install better insulation in buildings (efficiency), or supply renewable energy (consistency), but to reduce living space.

All sustainability strategies encompass certain normative notions of social change since they are used to attain sustainability targets in a certain manner. The implementation of the strategies has effects on different socio-economic structures, such as the modes of production and consumption, norms and values or the distribution of wealth and power. For the cases of socio-technical innovations (efficiency and consistency strategies) significant research has been conducted on how these innovations can be implemented, and how they diffuse into the mainstream and change societal structures (e.g., Geels and Schot, 2007; Grin et al., 2010; Geels, 2019). This cannot be said to the same extent for the sufficiency strategy. The notions of social change mostly remain implicit in the different conceptualizations of sufficiency (Fuchs et al., 2016), and a systematic reflection on the underlying concepts of social change in the sufficiency discourse has rarely taken place. Existing systematic literature reviews on sufficiency provide valuable insights into sufficiency-related rebound effects (Sorrell et al., 2020), sufficiency for businesses (Niessen and Bocken, 2021), specific consumption changes (Sandberg, 2021) or the different theoretical roots of sufficiency concepts and implications of sufficiency on different economic scales (Jungell-Michelsson

1 Social innovations are defined by Zapf (1994) as "new ways of achieving goals, especially new forms of organization, new regulations, new lifestyles that change the direction of social change, (that) solve problems better than previous practices, and (that) are therefore worth imitating and institutionalizing" (p. 33). Similarly, but with a focus on social practices Domanski et al. (2020) describe social innovation as "a new combination and/or new configuration of social practices in certain areas of action or social contexts prompted by certain actors or constellations of actors in an intentional targeted manner with the goal of better satisfying or answering needs and problems than is possible on the basis of established practices" (p. 459).

2 The term "consistency" stems from the German discourse (German: *Konsistenz*) and describes "green" technologies that aim on aligning material and energy flows with natural processes in a less harmful way (e.g., switch to renewable energies) (Huber, 2000). It is also used in English literature, often as an analytical perspective together with the sustainability strategies of efficiency and sufficiency (among others: Allievi et al., 2015; Gunarathne and Lee, 2021; Loy et al., 2021; Tröger and Reese, 2021; Jungell-Michelsson and Heikkurinen, 2022).

and Heikkurinen, 2022). However, none of them have analyzed the notions of social change in different conceptualisations of sufficiency. Given the urgency of socio-ecological crisis, the growing recognition of the necessity of the sufficiency strategy and the difficulties to implement it, a reflection on the different notions of how to create and shape social change within the different concepts of sufficiency could help to advance the debate about sufficiency-oriented strategies.

Accordingly, explicating and discussing the notions of social change in sufficiency concepts is relevant for at least four reasons. Firstly, sufficiency, like all sustainability strategies, aims to achieve sustainability goals and therefore seeks to shape social change in a normative way although the goals sought may differ. In contrast to the sustainability strategies of efficiency and consistency, the sufficiency strategy describes social innovations rather than socio-technical innovations to achieve sustainability goals and thus directly addresses social change (Zapf, 1994). Secondly, in contrast to the sustainability strategies of efficiency and consistency, sufficiency strategies are often at odds with current structures of societal organization, such as the orientation of policymaking toward economic growth (Princen, 2005). Thus, sufficiency-oriented social change is confronted with specific difficulties and requires separate consideration. Thirdly, a reflection on the implicit concepts of social change enables the identification of specific potentials and limits of the respective concepts of sufficiency. Fourthly, such a reflection enables the discussion of contradictions and synergies between the different concepts of sufficiency. Such a reflection on the concepts of social change present within concepts of sufficiency provides a basis for an elaborate discussion on the question of how and by whom social change toward sufficiency can be shaped. As a basis for such a debate, the notions of social change that are often implicit in the concepts of sufficiency need to be explicated and structured. Thus, this paper addresses the following research questions:

A Which sustainability goals and notions of social change do concepts of sufficiency imply?
B What are the specific limitations and contributions of the different concepts of sufficiency concerning their notion of social change?
C What are the contradictions and possible synergies among the different concepts of sufficiency?

With research question C, the different sufficiency concepts are discussed in relation to each other in order to identify fruitful combinations of the different concepts of sufficiency and to put them in the context of a broader socio-ecological transformation. To do this, the findings are discussed in relation to the so-called Multi Level Perpective (MLP) of Sustainability Transition Research (Grin et al., 2010; Geels, 2019) as well as Wright's (2010) transformation theory. While the MLP is the dominant paradigm of social change in sustainability research, Wright's transformation theory can be regarded as one of the most elaborate sociological theories of societal transformation in recent years. His work expands on the role of real utopias in the transformation of capitalism. By "real utopias," Wright (2010, p. 6) describes emancipatory institutions and practices that already exist now but encompass elements of a utopian – in Wright's perspective egalitarian and radical democratic – societal organization, beyond current dominant modes of production and consumption[3]. Following this heuristic, sufficiency policies and practices can be regarded a real utopia in a growth oriented economy and society. Thus, Wright's theory seems to be very applicable for reflecting on the different notions of social change in different sufficiency concepts.

Method

A semi-systematic review methodology was used to develop narratives and synthesize a broad inter-disciplinary strand of literature (Wong et al., 2013; Snyder, 2019). As Snyder (2019) points out, a semi-systematic review can be useful for detecting themes and theoretical perspectives and thus aids the development of a theoretical model. Furthermore, Snyder indicates that a semi-systematic approach can combine different methods of sampling (systematic or non-systematic) and analysis and evaluation (qualitative or quantitative).

Sampling

Three different sets of literature were sampled (Figure 1). The first and foundational set stems from a systematic search for literature in the Web of Science database using the keyword "sufficiency" in the categories of "environmental science," "environmental studies" and "environmental engineering," excluding the keywords "self-," "taxonomic" and "marine." The search was performed in December 2021 and provided 382 articles. The use of 'sufficiency' as the only positive search item ensured a very broad and comprehensive sample of sufficiency literature. This search strategy is similar to that used by Jungell-Michelsson and Heikkurinen (2022) since it includes sufficiency on both the consumption and the production side unlike the work of Sandberg (2021), which limited the search to the consumption side. If only literature that included "sufficiency" and "consumption" had been sampled, the results would have been reduced by ∼75 percent. However, in contrast to Jungell-Michelsson and Heikkurinen (2022) and following their own

3 In his study, Wright (2010, p. 2–5) gives the examples of participatory city budgeting, Wikipedia, the Basque Mondragon cooperatives, and unconditional basic income (UBI). Wright (2010, p. 20–25) argues that the existence (and the analysis) of real utopias do not only enlarge the imaginable but increase the achievable as well, since real utopias render an alternative world possible.

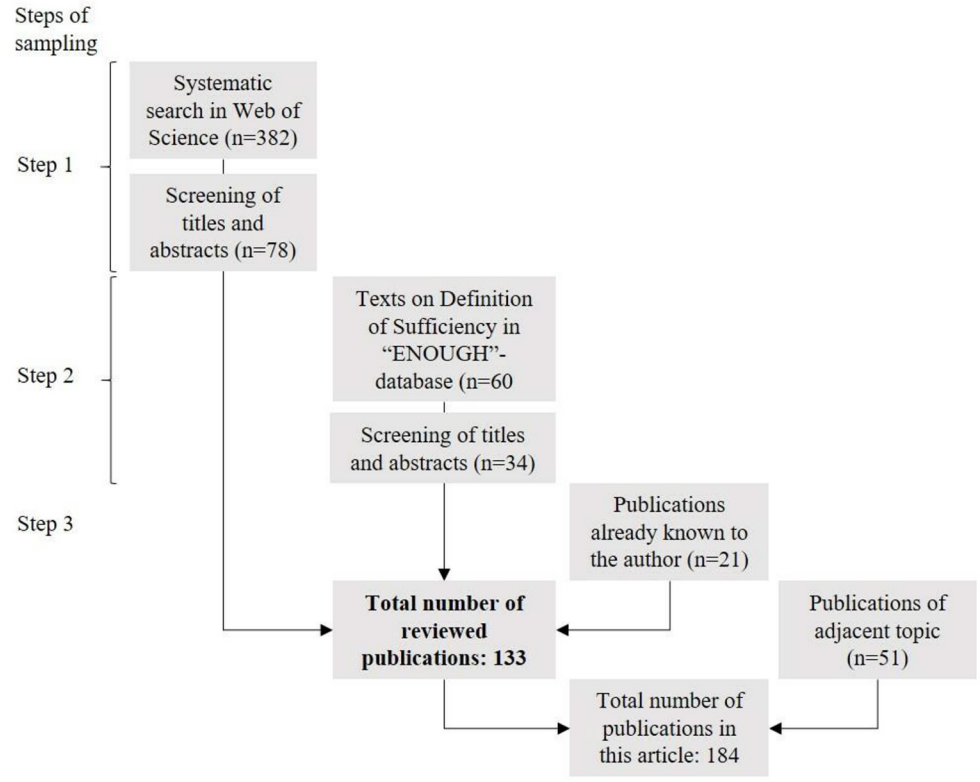

FIGURE 1
Sampling process. Own depiction.

reflections, not only peer-reviewed papers were included but also books and book chapters, which ensures a broader perspective on the sufficiency debate. The abstracts of the selected literature were screened for relevance to the research topic, which left a sample of 78 research articles.

The second set of literature derives from the International Network for Sufficiency Research and Policy (ENOUGH) database. This database is nurtured by dozens of researchers working on sufficiency (see Toulouse et al., 2019). This database is structured by different keywords, so that all texts with the keyword 'definition' were screened ($n = 60$). This screening added 34 articles to the sample. By combining the keyword-based search in Web of Science with a screening of the ENOUGH-Database, it could be ensured that articles, which are relevant to scholars in the field of sufficiency but that are not part of the Web of Science database or do not include the used key-words are still considered in the analysis.

The third set of literature contains publications which were already known to the author ($n = 21$). Whereas, the first two sets encompassed only English literature, this third step added some German publications as well. This sample was supplemented with publications on adjacent topics, increasing the total number of publications in this article to 184.

Data analysis

The data analysis was guided by research question A and aimed at identifying the pursued sustainability goals and a development of a typology of sufficiency concepts concerning their notions of social change. The three sets of literature were analyzed in an iterative process of induction and deduction. First insights obtained from the material were theorized in the form of a typology, which was then tested and further developed by analyzing more literature. During this process, several feedback loops with different groups of sufficiency experts were conducted to strengthen the robustness of the results.

In order to operationalize the main research question and to differentiate notions of social change within the sufficiency concepts, the analysis was guided by three sub-questions. Since sufficiency is a strategy to achieve sustainability goals, an analysis of the goals of the intended social change and their specific operationalisation is one dimension to differentiate sufficiency concepts. Thus, the first question for the analysis asks:

A What are the sustainability goals that the sufficiency concept is aiming to achieve?

This question is answered in the first subsection of the results. In order to analyse the process of implementing sufficiency measures and shaping social change toward sufficiency, two questions focus on the leverage points and the actors of social change:

B What is the object of social change, i.e., what has to be changed?
C Who are the subjects of social change, i.e., who are seen as the central actors of change?

These two questions are answered in the second subsection of the results by developing a typology of different concepts of sufficiency concerning their notions of social change. Based on the results of this analysis the research question B (specific limitations and contributions of the different concepts) is addressed at the end of each identified type of sufficiency concept. The research question C (contradictions and possible synergies among the different concepts) is tackled separately in the discussion section of this paper.

Results

Sustainability goals of sufficiency concepts

Since sufficiency concepts in this review derive from an ecological perspective, it is not surprising that all concepts of sufficiency aim to reduce environmental damage. The sufficiency strategy is used to meet climate targets (Moser et al., 2015, p. 2; Wachsmuth and Duscha, 2019; Kuhnhenn et al., 2020), to reduce the demand for energy and materials (O'Neill et al., 2018), and to reduce land-use change, water use or toxicity (Vita et al., 2019).

Even if in some concepts, social implications of sufficiency measures are excluded from the definition of sufficiency (Fischer and Grießhammer, 2013), other authors highlight that sufficiency may solve ecological *and* social problems (for housing, see Bohnenberger, 2021; for agriculture/food see Brunori and Di Iacovo, 2014). Often described as social or economic co-benefits, sufficiency is associated with an increase in the quality of life (Parks, 2012; Zannakis et al., 2019), with health benefits (Allievi et al., 2015; Creutzig et al., 2021), lower costs (Lenz, 2015, p. 63–64), higher resilience against economic crisis (Alexander and Yacoumis, 2018) and positive effects on social and environmental justice (Hayden, 2019; Kalt and Lage, 2019).

To pursue social and ecological goals is not specific for sufficiency but applies for all sustainability strategies. However, there exist sufficiency-specific operationalisations of these goals: sufficiency as consumption corridors and sufficiency as a way into a post-growth economy.

Sufficiency as consumption corridors

To operationalise the social and ecological goals, sufficiency is interpreted in some concepts in the sense of having the minimum necessary to live well *and* as limits to social practices that cause ecological damage, especially to consumption. From an ecological perspective, these limits are upper ones aiming to reduce overconsumption (Lorek and Fuchs, 2013; Schroeter et al., 2017). Inspired by a discourse in the field of social politics, sufficiency describes minimum limits (of consumption) as well, which is especially, but not exclusively, important when applied to the Global South (Kanschik, 2016; Spengler, 2016; Gladkykh et al., 2021). These minimum limits describe a minimum amount of consumption that is needed for a decent life. This puts sufficiency in the context of debates on social justice (Salleh, 2009, 2010). They usually originate from concepts of basic human needs. Overall, the upper and lower limits define consumption corridors that are socio-ecologically just and sustainable (Di Giulio and Fuchs, 2014; Jaeger-Erben et al., 2020). Most likely it requires more equity in consumption to stay within the corridor (Jaccard et al., 2021, p. 8–9).

For the definition of sufficiency-specific aims, attention needs to be paid to the indicators of these consumption corridors. In some cases, the setting of maximum CO_2 budgets and planetary boundaries (Rockström et al., 2009) or a "safe and just operating space for humanity" (Raworth, 2012, p. 4), which consists of ecological upper and social lower limits, are interpreted as sufficiency-specific limits, because they describe absolute limits (see Darby, 2007, p. 112–113; van Loy et al., 2021, p. 2). However, it is important to note that compliance with social foundations or ecological limits is the goal of any sustainability strategy, such as efficiency or consistency. Sufficiency-specific goals are limits to the consumption and production of services or products, such as limits to the living space per person or the speed limit for cars.

Defining limits to consumption without being paternalistic is a difficult task. In qualitative approaches (e.g., Di Giulio and Fuchs, 2014; Gough, 2015; Fuchs et al., 2021), the conditions of decent human life and wellbeing are defined with regard to the capabilities approach of Nussbaum (1992) and Sen (1993) or the needs and satisfier approach of Max-Neef (1991). In these approaches, needs are more or less generalizable across time and space, whereas satisfiers are flexible and depend on cultural and political contexts. For example, the generalizable *need* of protection in the case of mobility can be *satisfied* by driving a big, powerful car *or* by living in a car-free city. Furthermore, needs are indispensable, irreducible, non-substitutable and limited in number and must be distinguished from endless, untrammeled and subjective desires (Fuchs et al., 2021, p. 13–15). Thus, the distinction between satisfiers and needs in these sufficiency approaches highlights the difference between the means and ends of consumption (Haapanen and Tapio, 2016; Darby and Fawcett, 2018; Gough, 2020).

In contrast to this perspective on human needs as more or less generalizable, other scholars describe necessities as "constituted by routinized and embodied types of thought and action" (Aro, 2017, p. 6) and thus consumption corridors must differ among different political, cultural and social contexts (Cherrier et al., 2012; Lavelle and Fahy, 2021). This approach to define lower limits by investigating what kind and amount of consumption is needed to feel part of society (e.g., minimum income standard), is used in social policy (Davis et al., 2015; Gough, 2020, p. 213). From a perspective of consumption corridors and needs-theory, this approach faces the problem that it merely looks on how people can be part of the current (unsustainable) society and does not approach a bigger societal shift, which would enable a completely different satisfaction of needs. By this, the difference between needs and satisfiers remains unclear. Even though these approaches indicate that a reduction of consumption in high income countries to the minimum income standard would lead to significant reductions in greenhouse gas emissions (Druckman and Jackson, 2010), the remaining consumption would most likely stay above global ecological limits (Gough, 2020, p. 216).

Since the exact definition of such consumption corridors is a political question and needs to be constantly under debate (Darby, 2007; Di Giulio and Fuchs, 2014; Schroeter et al., 2017), quantitative approaches are rare and the results differ widely in terms of methodology and results (for housing sector, see Cohen, 2021; for electricity and natural gas demand see Fournier et al., 2020; for final energy demand see Lallana et al., 2021; for different sectors see Millward-Hopkins et al., 2020).

Sufficiency as a pathway toward a post-growth economy

The consumption corridors defined in the literature above suggest that, at least in most countries of the Global North the current development is way above the limits, which does not necessarily imply that the social foundation is ensured. A study of low-income households in Finland shows that the material basis for a decent life, which was defined by a consumer panel, was not met by most of the households and at the same time, the material footprint was higher than long-term ecological sustainability would require (Lettenmeier et al., 2014). In other words, the results suggest that a decent life within the consumption corridors is hardly possible in Finland today and requires a deep reconstruction of society and the way different needs are satisfied. Similarly, but on a higher scale, O'Neill et al. (2018) showed that out of 150 countries none met basic social needs without exceeding the planetary boundaries conceptualized in the doughnut concept by Raworth (2012)[4]. The authors conclude by describing sufficiency as a strategy that should not only meet social and ecological targets but move beyond GDP growth as measure of progress. Coscieme et al. (2019) describe a "wellbeing economy" as an alternative to guide policy making. Steinberger and Roberts (2010) argue in the same direction and emphasize the importance of growing equity by showing that the energy demand worldwide is sufficient to meet a high standard of living for everyone.

Following such insights, the environmental and social goals are in some sufficiency concepts not only operationalised by limiting consumption to corridors, but by developing an a-growth or degrowth society or a steady-state economy, where societal prosperity is independent of economic growth (Princen, 2005; Salleh, 2009; Lorek and Fuchs, 2013; Hayden, 2014b, 2015; Lorek and Spangenberg, 2014; Alexander and Yacoumis, 2018; Cibulka and Giljum, 2020). These concepts describe sufficiency as a strategy to (re-)embed economy into the ecological sphere. Accordingly, these sufficiency concepts build on sustainability concepts that emphasizes the connection of sustainability and a critique of endless economic growth such as the work on the limits to growth (Meadows et al., 1972) or the doughnut economy (Raworth, 2017). Especially influential early works on sufficiency in German (Sachs, 1993, 1995) and English (Princen, 2003, 2005) builds on work of the ecological economists Daly (1974, 1991, 2015), who views the economy as a subsystem of the ecological sphere and argues for a steady-state economy as a prerequisite for avoiding ecological collapse.

Furthermore, the sufficiency concepts that emphasize a critique of economic growth are linked to concepts of degrowth, which have been deriving from social movements since the early 2000's and have been consolidating into concepts in academic literature since then (Jackson, 2009; Demaria et al., 2013; Schmelzer and Vetter, 2019). The exact conceptual relation of sufficiency concepts to degrowth concepts often remains unclear. Sometimes a cultural change toward sufficiency is described as precondition for a degrowth-society (Alexander, 2013), sometimes a degrowth society is seen as the inevitable result of consequent sufficiency practices and sometimes sufficiency is described as an organizing principle (Spangenberg, 2018) or logic (Princen, 2005) for society, which reveals many direct overlaps with concepts of degrowth. One of these overlaps that is present in many sufficiency concepts is the (re-)politisation of debates among the good live for all beyond economic growth (O'Neill et al., 2018).

Sufficiency as a means or as an end?

Since sufficiency is a strategy used to attain sustainability goals, some authors argue that sufficiency is not an end in

4 The doughnut economy conceptualizes sustainability as "a safe and just space for humanity," which lies in between a social foundation and an environmental ceiling (Raworth, 2012). The social foundations ensures that no one is falling short of life's essentials. The ecological limits ensure that humanity is not exceeding the planetary boundaries (Rockström et al., 2009).

itself, but an indispensable element of effective sustainable development (Spangenberg, 2018). In this interpretation, limits to consumption and the creation of a post-growth economy are strategies to pursue broader sustainability goals and no end in itself.

However, in some concepts the sufficiency-specific (quantitative) limits to consumption (and production) are interpreted not (only) as a means to pursue sustainability goals but as a "direction" (Sachs, 1995, p. 6) or as "goals" (Sorrell et al., 2020, p. 3). These goals could mark a sufficiency-oriented state of consumption (Darby and Fawcett, 2018). Furthermore, Jungell-Michelsson and Heikkurinen (2022) interpret concepts that describe sufficiency as an idea, worldview, vision or a way of life also as descriptions of ends in themselves.

If these limits and visions are interpreted as means or ends depends on the point of view. From a broader perspective, they can be interpreted as means to achieve sustainability goals, from a narrow perspective they can illustrate a desirable state and function as ends to guide individual or political decisions to achieve quantitative reductions in consumption and production.

Despite the question of whether these quantitative limits to consumption and production are described as means or ends, it is important to note that the sufficiency-specific operationalisation of social and ecological goals in the form of quantitative limits is unique, compared to the other sustainability strategies. Because of these quantitative limits, some scholars conceptualize sufficiency as the first or overarching of all sustainability strategies (Schroeter et al., 2017; Lorek and Spangenberg, 2019; Böcker et al., 2021; Gladkykh et al., 2021; Newell et al., 2021). By this, rebound effects of efficiency measures may be reduced and renewable energies need only provide the amount of energy, services and resources that are necessary for a decent, sufficient life.

Notions of social change

Type 1: Bottom-up approach

The following three types of concepts of sufficiency are analytically differentiated due to their (implicit) approaches to social change. The first type describes a bottom-up approach, focusing on changes in individual lifestyles, consumption patterns and cultural change.

Object of transformation

In order to achieve ecological and, in part, social and economic goals, the sufficiency concepts summarized here rely on reductions of individual consumption. The aim of sufficiency strategies is to develop an ecologically responsible lifestyle (Alcott, 2008, p. 771; Heindl and Kanschik, 2016, p. 43; Koide et al., 2021). This lifestyle may be described as low-tech and is thought to encompass a high level of small-scale production and do-it-yourself practices within self-sufficient communities (Alexander and Yacoumis, 2018; Bauwens et al., 2020). In some conceptions, ecological motivation becomes constitutive for sufficiency practices (Alcott, 2008, p. 771; Heindl and Kanschik, 2016). Thus, this conception of sufficiency is closely linked to approaches of voluntary simplicity (Alexander and Ussher, 2012; Rebouças and Soares, 2021), conscious consumption (Freudenreich and Schaltegger, 2020; Kelleci and Yildiz, 2021) or sometimes even eco-anarchism (Trainer, 2019). Research and suggested measures often focus at individual or household level (Parks, 2012; Sahakian et al., 2021; van Loy et al., 2021).

According to Heindl and Kanschik (2016, p. 43), sufficiency strategies that focus on individual consumption reduction fit well into existing liberal economic and policy frameworks and do not have to go hand in hand with more radical degrowth approaches. However, if individual sufficiency practices are implemented in isolation, there is an increased risk of sufficiency rebound effects (Alcott, 2010; Sorrell et al., 2020). This is because, for example, income is in many cases a more influential parameter for consumption than individual values (Moser and Kleinhückelkotten, 2018; Kleinhueckelkotten and Neitzke, 2019; Korphaibool et al., 2021).

Other scholars describe individual changes in consumption patterns as a way of obtaining deeper structural change (Alexander, 2013; Lenz, 2015; Kleinhueckelkotten and Neitzke, 2019). The diffusion and spread of changes in individual consumption patterns may lead to a broader cultural change. A cultural change that follows a notion of sufficiency as the antidote to "excessive greed" (O'Sullivan and Kraisornsuthasinee, 2020, p. 443) does not only question growth in consumption but may lead to reductions in payed work as well, since less money is required for a good life (O'Sullivan and Kraisornsuthasinee, 2020). Cultural change can modify structures of recognition so that a reduction in consumption leads to positive feedback from the social environment (Heindl and Kanschik, 2016, p. 44–45).

Subjects of transformation—affluent consumers, grassroots initiatives and businesses

Based on an individualistic understanding of consumption, one central target group for consumption reductions are the "most affluent consumers" (Schmidt and Matthies, 2018, p. 3), the "global consumer class" (Spangenberg and Lorek, 2002, p. 128) or the wealthy upper and middle classes (Alcott, 2008, p. 771; Moser et al., 2015; Heindl and Kanschik, 2016, p. 44; O'Sullivan and Kraisornsuthasinee, 2020). This is because, according to common argumentation, the high resource consumption of these groups goes hand in hand with a high responsibility for reducing consumption (Baatz, 2014), on the one hand, and suggests a high effectiveness of reduction on the other hand (Spangenberg and Lorek, 2002, p. 128). Consumption reduction can be described as 'individual', when political, social or economic conditions are seen as external to the consumption decision. Accordingly, sufficiency

is conceptualized as an "intentional and informed decision" (Schmidt and Weigt, 2015, p. 209) and a "voluntary reduction of affluence" (Alcott, 2010) and thus builds on the ecological reflection of one's own consumption behavior.

Different reasons are given for the individualization of reductions in consumption. Firstly, some authors argue for the voluntariness and individualization of sufficiency with freedom of choice (Alcott, 2008, 2010; Heindl and Kanschik, 2016). In order not to restrict individual consumption liberties, each individual should be able to decide whether they want to choose a sufficiency-oriented or non-sufficiency-oriented lifestyle. By emphasizing individual responsibility, the decision between sufficiency-oriented and a non-sufficiency-oriented consumption is left to the individuals. If one assumes that non-sufficiency decisions contribute to environmental degradation to a greater extent and thus limit the life chances of future generations, it can be argued that those individualistic sufficiency conceptions (unintentionally) place individual (consumption) freedom above questions of intergenerational justice.

Secondly, Schmidt and Matthies (2018) emphasize that restrictive individual consumption is a moral imperative due to ecological damage. In this context, the role of religion, especially Buddhism, is sometimes mentioned as a motivation and legitimation of individual sufficiency oriented behavior (Ketprapakorn and Kantabutra, 2019; O'Sullivan and Kraisornsuthasinee, 2020; Song, 2020) or as guiding principle for decision makers (Lamberton, 2005). Although Baatz (2014) follows the polluter pays principle and the idea that the individual share of global emissions should not be exceeded, he recognizes that there are structural obstacles to such individual responsibility. That is why he limits the individual's moral obligation to reducing consumption to a responsible level appropriate to the circumstances and considers lobbying for political measures as the primary task of individuals rather than reducing consumption.

Thirdly, some scholars follow a radical bottom-up approach to transformation by stating that political and economic change will only arise by mainstreaming micro-economic practices of sufficiency (Alexander, 2013; Schanes et al., 2019; Bauwens et al., 2020). This notion of sufficiency was dominant in a survey conducted at the degrowth conference in Leipzig in 2014 (Eversberg and Schmelzer, 2018). The underlying assumption is that individual behavioral changes spread through processes of social diffusion and thus contribute to a broader cultural change from the consumption and growth orientation in society (Alexander, 2013; Lenz, 2015, p. 63; Kleinhueckelkotten and Neitzke, 2019; O'Sullivan and Kraisornsuthasinee, 2020). This approach emphasizes the relevance of grassroots initiatives and niche projects in which practices of voluntary simplicity, do-it-yourself and low-tech-lifestyles can be learned and further developed (Alexander, 2013, 2015; Sahakian and Dobigny, 2019; Bauwens et al., 2020). The role of the state in this conception is to "facilitate" the changing values and virtues (Soetebeer, 2015, p. 185). This approach to transformation has many similarities to the "parallel-society" type described by Adler (2016), where alternatives are created aside and, more or less, independent of current institutions.

As well as consumers–either as individuals or as part of grassroots initiatives–businesses are key actors in mainstreaming sufficiency-oriented practices, since consumption describes the relation among consumers and businesses. Sufficiency-oriented businesses respond to changing consumer behavior and influence consumers by shifts in promotion and sales strategies and development of business models beyond fast fashion trends and increasing product sales (Bocken and Short, 2016; Tunn et al., 2019; Bocken et al., 2020; Kantabutra and Punnakitikashem, 2020; Ralph, 2021). Instead of mass consumption sufficiency-oriented marketing emphasizes wellbeing (Kelleci and Yildiz, 2021). For some businesses, especially in the premium sector, such new business models may be beneficial (Bocken and Short, 2016; Bocken et al., 2016, p. 43; Yip and Bocken, 2018; Freudenreich and Schaltegger, 2020). However, empirical studies show that an orientation toward sufficiency among businesses is very rare (Freudenreich and Schaltegger, 2020) as it hinders the growth of firms (Bocken et al., 2014), and that the main focus is on a shift to "greener" products and processes instead of reductions in consumption (Gunarathne and Lee, 2021; Niessen and Bocken, 2021). Thus, the individualization of responsibility for sufficiency-oriented behavior is complemented here by the (individual) responsibility of companies to create sufficiency-oriented offers and to influence consumer decisions in a sufficiency-oriented way (Wieser, 2016). Sufficiency concepts for businesses follow as well a radical bottom-up approach, which includes changes in individual consumer behavior, development of alternatives in societal niches and the diffusion of such practices.

Contributions and limitations

In summary, it can be stated that the concepts of sufficiency presented here are aimed at voluntarily reducing the consumption of a (global) upper and middle class with a bottom-up approach, which relies on individual realization of the problem, diffusion of individual behavior and cultural change. A link to social theories of behavior that emphasize the autonomy of individuals and the ability of independent choices and changes (Ajzen, 1985) is evident in this approach and further elaborated by Spangenberg and Lorek (2019). Accordingly, transformation is conceptualized as an incremental change that results primarily from a tendency to voluntarily change consumption practices. This makes transformation seem relatively free of conflicts.

However, it remains unclear whether the necessary reduction of consumption levels and the accompanying de-privileging of members of upper and middle classes can actually

be achieved through individual realization of the problem and voluntary action. Consumer research and sociologists have indicated that consumption practices are always supra-individual and shaped by political, economic and socio-cultural (Bourdieu, 1982; Røpke, 1999; Schor, 1999, 2007; Veblen, 2003 [1899]) as well as infrastructural (Shove et al., 2015; Yang et al., 2021) conditions. This means that individual changes in consumption are limited, because of the constitution of social institutions such as social norms, legal regulations or the organization of wage- and care work. Numerous studies show that environmental consumption depends primarily on income and to a lesser extent on values and attitudes, which makes voluntary consumption reduction by the upper and middle classes less likely (Jappelli and Pistaferri, 2010; Notter et al., 2013; Dauvergne, 2016; Kleinhueckelkotten and Neitzke, 2019; Verfuerth et al., 2019). Moreover, the potential of sufficiency practices of individuals or companies is diminished by free-riding incentives, for example the possibility that lower consumption by some is offset by increased consumption by others, for example due to falling prices (Cornes and Sandler, 2003, p. 157). The contribution to sustainability of sufficiency approaches based on individual decisions therefore remains limited. According to Linz (2013, p. 47), sufficiency research has for a long time underestimated the inertial forces of routine behavior and the scope of the social embedding of social practices, and has overestimated individuals' willingness to change behavior and the chances for a sufficiency-oriented cultural change.

Type 2: Policy-making approach

Taking up the arguments that emphasize the social embeddedness of consumption practices, a second cluster of sufficiency conceptions interprets sufficiency as a political sustainability strategy and emphasizes the need for political frameworks (Lorek and Fuchs, 2013; Pettersen, 2016; Spengler, 2018; Verfuerth et al., 2019). Modes of consumption are thought to be social practices that cannot be directly controlled but can be shaped by framework conditions (Pettersen, 2016; Spangenberg and Lorek, 2019).

Object of transformation

Sufficiency policy aims to "make the good life easier" by changes in framework conditions and on the production side (Schneidewind and Zahrnt, 2014). Accordingly, sufficiency policy aims to create political, economic, social and infrastructural framework conditions that promote, encourage or enable resource-conserving social practices and avoid or prevent resource-intensive social practices (Lorek and Fuchs, 2013; Tröger and Reese, 2021). By changing framework conditions, the social practices and consumption levels of consumers with a high level of consumption in a global context are to be changed in particular (Fischer and Grießhammer, 2013; Linz, 2013; Lorek and Fuchs, 2013). Changes in framework conditions do not only influence the social practices of consumers but also the decisions of companies, since they are subject to structural constraints in a similar way and are dependent on political framework conditions that enable and foster sufficiency-oriented corporate strategies (Pettersen, 2016; Heikkurinen et al., 2019).

Proposed sufficiency policy measures range from ones with a low level of intervention such as the support of local sufficiency-oriented initiatives (Brunori and Di Iacovo, 2014) to structural measures with a high depth of intervention such as an orientation of policy making toward new wellbeing indicators (Hayden, 2015; Jitsuchon, 2019) or the reconstruction of infrastructures (Schneidewind and Zahrnt, 2014; Burke, 2020, p. 9; Brunner, 2021; Cohen, 2021). The scope of sufficiency measures varies. While sufficiency policy is often related to consumption-intensive sectors such as mobility (Waygood et al., 2019) or housing (Bohnenberger, 2021; Cohen, 2021), some concepts go much further and also relate sufficiency to the entire provision of public services, including education and the health sector, or the transformation of wage labor (Schneidewind and Zahrnt, 2014; Haberl et al., 2020). In some of these concepts it is argued that a sufficient decoupling of economic growth from ecological depletion is unlikely and that growth dependency is enshrined in societal structures (Parrique et al., 2019; Haberl et al., 2020). This implies that a substantial sufficiency policy–which is admitted to be necessary–would require a society that is independent from growth and may lead into a degrowth or steady-state-economy (Parrique et al., 2019; Haberl et al., 2020). The concepts of major restructuring overlap with the third type of sufficiency concepts, outlined below (e.g., Lorek and Spangenberg, 2019). Regardless of the scale of intervention, the orientation toward public policy measures aiming to achieve sufficiency plays a central role in the concepts summarized here.

The political definition and enforcement of upper limits to consumption raises questions on the encroachment on (individual) liberties. A major critique to sufficiency *policy* is that it may tend to paternalism since it aims to influence the individual notions of what a good life is (Muller and Huppenbauer, 2016). In contrast, Linz (2013, p. 47) argues that the space within which freedom can prevail must be politically defined. In the context of consumption corridors Fuchs et al. (2021, p. 68) emphasize that freedom can only be guaranteed by setting and exercising limits. Likewise, Spengler (2018) argues with regard to consumption-oriented sufficiency policies that corresponding encroachments on individual liberties can be justified with the help of the harm principle in liberal democracies. In contrast to scholars, who focus individual sufficiency concepts and emphasize the freedom to choose between sufficiency and non-sufficiency consumption behavior (Heindl and Kanschik, 2016), Spengler emphasizes that such restrictions can also be necessary, because by exceeding ecological limits, i.e., by having non-sufficiency lifestyles, the

freedom of other people can be restricted. An argumentation that can also be found in a landmark ruling by the Federal Constitutional Court of Germany that called for an immediate substantial climate protection policy, as the postponement of climate protection would restrict the freedom rights of the young today as well as future generations (BVerfG, 2021). The debate about a general speed limit on German motorways, among other things, illustrates how contested sufficiency policies can be. Sufficiency policy, as conceived here, thus raises questions of intergenerational justice above or at least to the same level as questions of individual (consumption) liberties, which clearly distinguishes these sufficiency conceptions from conceptions of the first type.

Subject of transformation

The sufficiency concepts of this type are characterized by an orientation toward state institutions and decision-makers to develop sufficiency policy measures and instruments and to examine the process of their implementation (Lorek and Fuchs, 2013; Brunori and Di Iacovo, 2014; Lorek and Spangenberg, 2019; Sandberg, 2021). Accordingly, (sufficiency-oriented) policy makers are central actors of change. Policy recommendations (Thomas et al., 2019; Haberl et al., 2020; Lorek et al., 2021; Zell-Ziegler et al., 2021), best practice examples (Böcker et al., 2021), the development of sufficiency-related scenarios and models (Wachsmuth and Duscha, 2019; Fishman et al., 2021; Poncin, 2021) as well as questions of communication and framing of sufficiency policy (Toulouse et al., 2019) play a role in this context. In the spirit of policy advice, research aims to provide knowledge for decision-makers and thus influence discourses. This relies primarily on the realization of the problem by decision-makers.

Contributions and limitations

In contrast to the first type of sufficiency concepts, those of the second type do not allocate the responsibility for change to individuals or businesses but emphasize the necessity for political change. This perspective builds on insights from social practice theory that emphasizes the embeddedness of social practices in framework conditions such as infrastructures or other institutions. From this point of view, unsustainable infrastructures or institutions are politicized rather than unsustainable behavior.

However, until now far-reaching policies of sufficiency are seldom found in practice. An analysis of national energy and climate plans and the long term strategies of the EU member states shows that there are few regulatory sufficiency measures in place (Zell-Ziegler et al., 2021). Schmitt et al. (2015) studied the climate protection plans of German municipalities and mainly found measures that increase the variety of options for consumers, which put the onus on consumers to decide to act sustainably. Likewise Hayden (2014a) argues that especially those, narrowly defined, sufficiency policy measures with a high symbolic value (such as a ban on plastic bags) or with a potential to generate economic growth (such as the support of local food production) are likely to be implemented, but not those leading to a broader reduction in consumption. This suggests that in a growth-oriented world it might be easier to add more options to choose from than to limit choices. So, a remaining question is how this political change could come into practice.

Most of the concepts of this second type emphasize the necessity for changes in political framework conditions, but pay comparatively little attention to the question of how this change should come into place. Policy-makers are key actors in the second type of concepts, as they need to decide on the sufficiency policies. This means that a sufficiency-oriented change relies, more or less, on the realization of the necessity of sufficiency policies by policy makers. Similar to the first type, social change is conceptualized quite free of conflicts. This focus on the ability of the state to solve ecological and social problems is criticized as being insufficient to overcome the manifest structures of unsustainability since it tends to underestimate how deep the causes of unsustainability are encoded in the political and economic structures (Brand, 2021). This criticism emphasizes that the necessary downshift of consumption in the Global North will be a very conflictual process and that the political decisions will not happen automatically or easily, but will need pressure, for example, from social movements (Steinberger and Roberts, 2010; Newell et al., 2021). Thus, the big question of how sufficiency policies can be implemented and which role different actors play remains for further research.

Type 3: Social-movement approach

Taking up the argument that it seems to be difficult to reduce consumption in a growth-oriented and capitalist society, the focus of the third type of sufficiency concepts is on the structural constitution of current capitalist consumer societies. In these concepts, sufficiency is conceived as a critique of capitalism and domination and as an emancipatory strategy against a society focused on acceleration, externalization and growth. Many arguments in this type of sufficiency concepts are derived from eco-feminist and postcolonial perspectives.

Object of transformation

The object of transformation of these concepts of sufficiency is not only a reduction of consumption and production–may it be voluntarily or incited by adjusted political framework conditions–but a fundamental shift in the mode of production. Sufficiency describes something that cannot be implemented within the current economic and social system without fundamentally changing it. Thereby, sufficiency becomes a lens to criticize and question the present and is therefore described as a "political sting" (Winterfeld, 2007, p. 54; Winterfeld, 2017) or a "critical category" (Winterfeld, 2011).

One major point of criticism of the current modes of production and consumption is the link between economic growth and ecological depletion, which has already been mentioned above and is sometimes part of sufficiency concepts of the first two types. This is a central point in concepts of the third type (Princen, 2005; Wiedmann et al., 2020). In the third type, sufficiency is seen as less about changing social or consumption practices than the first two types. Instead, sufficiency, when applied to the Global North, aims to achieve a stationary or even shrinking economy in order to obtain ecological goals and thus raises, as Sachs (1993, p. 71) writes, "the big question of our time [...]: how is social security, how is a decent life possible without a growing economy?". Thus, sufficiency describes the principle of a different economy and societal organization, which is orientated toward sufficiency rather than efficiency (Princen, 2005; Newell et al., 2021). This could include the establishment of new time regimes (Princen, 2005; Darby, 2007, p. 116), a restriction of private property, an expansion of the commons (Sachs, 1993; Princen, 2005; Lage and Leuser, 2019) or the foundation of sufficiency as one of the core principles of liberal societies (Muller and Huppenbauer, 2016)[5]. In addition to ecological goals, the restructuring of the mode of production is focused on shaping a fairer, and more equal society.

This leads to a second crucial point of criticism, which is highlighted by these sufficiency concepts, namely the connection between economic growth, externalization, exploitation and discrimination (Salleh, 2009). From this point of view, economic growth and the living standard in the Global North is based on the externalization of cost *via* the exploitation of natural resources and people in other parts of the world. Power and domination relationships, which manifest in patterns of discrimination and a dualistic world-view, create hierarchies between "here" and "elsewhere," "developed" and "developing," "men" and "women" or "humans" and "nature," and thus enable externalization from the first to the second. In this context, sufficiency is thought to establish relationships among people and between humans and nature without exploitation and externalization (Salleh, 2010) and to reduce discrimination (Newell et al., 2021). In the reviewed literature, there is a focus on reducing discrimination along the dimensions of race, class and gender (Salleh, 2010; Winterfeld, 2017; Newell et al., 2021). When understood in this way, sufficiency in relation to the upper limit does not ask "what is enough?" but "what is too much" or, put differently, "at whose expense is the current growth taking place?" (Winterfeld, 2011). Reflecting on the impacts of sufficiency-oriented interventions on dimensions of discrimination and externalization can be seen as a contribution to decolonizing the sustainable living debate (Newell et al., 2021). For policymaking, this would mean putting practices of care and community at the center of sufficiency measures to meet human needs in a less materialistic way (Newell et al., 2021) and to focus on redistribution instead of growth (Steinberger and Roberts, 2010). Practices, knowledge and experiences from the Global South, and peasant farmers or care-givers are mentioned as being inspirational and helpful to the organization of a society in line with the logic of sufficiency (Salleh, 2010).

Spitzner (2020, 2021) exemplifies the interpretation of sufficiency from a care perspective with the simple case of mobility. She argues that the car system is often more oriented toward the mobility patterns of wageworkers, rather than toward the mobility patterns of still mostly female caregivers and people in need of care, such as children or the elderly. Accordingly, Spitzner (2020, 2021) argues that the dismantling of the car infrastructure and the expansion of a low-cost public transport system oriented toward the routes of caregivers could be part of an emancipative sufficiency policy. Other examples of connecting sufficiency measures directly with aspects of care or redistribution are the reallocation of revenues from frequent flyer levies on flights of wealthier consumers to subsidized forms of public transport (Newell et al., 2021, p. 8), or an unconditional basic income to enable the development of new time regimes (Sachs, 1993, p. 71). However, concepts of the third type of sufficiency are less focused on concrete bundles of measures and instruments as concepts of the second type, but describe a different logic of societal organization (Princen, 2005). In this sense, Muller and Huppenbauer (2016) understand sufficiency as a new, additional core principle of liberal societies that "addresses the frame for policy making rather than the policy making itself" (p. 107).

The emphasis on the growth-critical and domination-critical dimension of sufficiency in combination with a focus on social movements shows numerous overlaps with the work on "imperial mode of living" (Brand and Wissen, 2011, 2021) and concepts of degrowth (Demaria et al., 2013). Brand and Wissen (2021) analyse how the mode of living (in the Global North) on the expanses of others (human and nature) is interrelated with modes of production and based on structural discrimination. Degrowth concepts, similar to these concepts of sufficiency, can be understood both as critiques of the growth model, which are formulated from different perspectives (Schmelzer and Vetter, 2019), and as fundamental political and economic reorganization (Kallis et al., 2018). Part of this restructuring is the overcoming of growth dependency of current social institutions and the creation of just, more egalitarian, democratic and environmentally sustainable institutions (Demaria et al., 2013). Some scholars emphasize the link between degrowth and post-development studies and other perspectives and

5 The question whether the implementation of sufficiency as a core principle of society is possible *within* a *liberal* society or is contradictive to it because of its criticism of capitalist consumer society depends on the exact notion of "liberal society." Muller and Huppenbauer (2016) argue that implementing sufficiency as a core principle would "redefine the frame that determines how liberal societies should be conceived" (p. 108).

TABLE 1 In a nutshell: Different approaches to social change in sufficiency concepts.

	Bottom-up approach	Policy-making approach	Social-movement approach
Object of transformation	Individual consumption and cultural change	Mode of consumption including framework conditions (infrastructures, institutions etc.)	Structures that suggest economic growth, externalization, exploitation and discrimination
Subject of transformation	Individuals, businesses, grassroots movements	Political decision makers	Social movements
Sufficiency definition	Sufficiency describes conscious and intended reductions in individual consumption and a corresponding cultural change.	Sufficiency policy describes changes in framework conditions that enable, facilitate and shape social practices of reduced consumption.	Sufficiency is a critical perspective on the nexus of unsustainability, growth-dependency, externalization, exploitation, and discrimination and describes a logic of societal organizations (in contrast to efficiency) that is oriented toward socio-ecological justice and "enoughness."
Approaches to transformation	The diffusion of changes in individual behavior shapes a cultural change toward sufficiency, which forms the basis for possible further political measures.	Changed framework conditions shape a broad and sometimes unconscious change of social practices and a reduction of consumption levels.	Social movements politicize structures of injustice and unsustainability, and open up windows of opportunity for structural change.

movements from the Global South (Escobar, 2015; Perkins, 2019).

Subject of transformation

Unlike the first two types, the sufficiency concepts of the third type do not rely on individual realization of the problem to reduce consumption levels, will and knowledge, of either individuals and companies or politicians. Instead, the implementation of sufficiency is described as a question of power and interests (Fuchs et al., 2016; Spangenberg, 2018, p. 7). This highlights the role of conflicts as a driver of social change. However, the final implementation of sufficiency policies still depends on political decisions (Lorek and Fuchs, 2013). A sufficiency-oriented transformation, therefore, needs counter-hegemonic movements and conflictual confrontations to shift power structures and increase political pressure (Winterfeld, 2011, p. 63). Thus, social movements (Princen, 2005; Wiedmann et al., 2020; Newell et al., 2021) and NGOs (Lorek and Spangenberg, 2014) become central subjects of transformation in sufficiency concepts of the third type. Since grassroots movements are social movements as well, some sufficiency concepts of the bottom-up approach and the social-movement approach overlap regarding the subject of transformation. Nevertheless, social movements mentioned by concepts of the third type are characterized by a stronger focus on social struggles, influencing discourses, changing power structures and creating windows of opportunities (Wiedmann et al., 2020; Feola et al., 2021). In this context, social movements from the Global South are highlighted as potential allies and a profound source of knowledge and experience in resisting and overcoming exploitive conditions and reorganization of the Global North toward sufficiency (Salleh, 2010; Kalt and Lage, 2019; Feola et al., 2021).

Contributions and limitations

In contrast to the first two types of sufficiency concepts, concepts of the social-movement approach emphasize the interconnection of ecological and social problems by highlighting mechanisms of exploitation, externalization and discrimination as being fundamental for ecological damage. Thereby, connections to struggles for social justice come much more into focus. This connection may be beneficial for the implementations of sufficiency policies since findings from political ecology highlight that issues of social justice are usually much better starting points for the politicization of non-sustainable conditions than abstract ecological boundaries (Robbins, 2012). Consequently, struggles and conflicts are described as a central driver of social change, and social movements are named as central actors. Since social movements not only resist or demand but sometimes work directly on the development of alternative practices, a link to the grassroots initiatives of type one can be observed. Nevertheless, the role of social movements in processes of implementing sufficiency policies has been seldom examined so far.

One major point of critique of sufficiency concepts of the social-movement approach is that the implementation of sufficiency in this conceptualization seems quite unlikely und unclear. This is because, firstly, sufficiency approaches of any kind are still far away from being a part of mainstream political discourse on sustainability, and the overcoming of

capitalist power and domination relationships and a growth logic seems even further away. Secondly, it is more difficult to translate the sufficiency concepts of the social-movement approach into concrete measures and instruments, which makes direct applicability in the form of concrete political demands and decisions more difficult. This means that the scope of application for policy practice is reduced compared to concepts of the policy-making approach. One major contribution may be to offer a perspective for critical reflection on current patterns of unsustainability and planned measures.

Table 1 summarizes the three different notions of social change within sufficiency concepts in an idealized and simplified way.

Discussion

Nexus between sufficiency goals and different notions of social change

The literature of this study was reviewed concerning two dimensions of social change, namely the goal of and the approach to social change (Figure 2). As part of the goals of sufficiency-oriented social change, some scholars describe sufficiency itself as an end, which was also described by Jungell-Michelsson and Heikkurinen (2022). Furthermore, the sustainability goals and the notions of social change were differentiated by the development of different narratives. Building on this differentiation, the nexus of these two dimensions can be discussed as one part of the relationship of different sufficiency concepts to each other (research question C). The underlying question is whether certain notions of social change are linked in the sufficiency concepts to certain sustainability goals.

One can recognize that all types of notions of social change are conceptualized to attain different sustainability goals. In other words, it is *not* possible to link directly one notion of social change to a special characteristic of sustainability goals, e.g., the sufficiency concepts that emphasize a growth-critique are not allocated to one type of notions of social change.

Nevertheless, some differentiations can be made that highlight some dominant narratives in an idealized way (Table 2). In all types some sufficiency concepts can be found that follow social sustainability goals, but these goals are most dominant in sufficiency concepts of the social-movement approach. Accordingly, in both the first and the second type, concepts exist that describe sufficiency as a strategy to attain ecological goals only. In concepts of the third type, social aspects are crucial, since sufficiency is conceptualized as a strategy to reduce externalization and discrimination. In sufficiency concepts of the bottom-up approach social aspects and a critique of an ever-growing consumption are merely addressed in the context of individual wellbeing. In concepts of the policy-making approach social limits to consumption are discussed as a (political) question of distribution.

The upper and lower limits to consumption as a sufficiency-specific operationalisation of social and ecological goals are mostly present in the second and the third type. Especially in the second type the goal of sufficiency policies is described as to create framework conditions that enable a descent life within the consumption corridors. In the third type, questions of sufficient consumption are linked with questions of externalization and discrimination. In some concepts of the bottom-up approach, the development of generalizable individual lifestyles is pursued by an orientation of individual lifestyles toward ecological upper limits.

Concerning the question of economic growth, in both the first and the second type some concepts exist that describe no conflict of sufficiency measures with economic growth and some that emphasize the necessity of an independence of societal development from economic growth. Concepts of the third type describe sufficiency as a new logic of societal and economic organization.

Contradictions and synergies between different notions of social change

Focusing on the relationship between the three different approaches to social change, one can recognize that they are not equally present in the sufficiency discourse. Most of the literature focuses on the first two types, such as the reviews on sufficiency by Sorrell et al. (2020) and Sandberg (2021), which distinguish an "individual" and a "political" thread that are more or less linkable with the bottom-up approach and the policy-making approach. Both reviews missed the third type, which is not as prominent in the literature as the first two. The question as to which of the first two types is most dominant remains unclear. Sorrell et al. (2020) describe the bottom-up approach to sufficiency as dominant, whereas Sandberg (2021) sees a focus on policy-making approaches. Creutzig et al. (2021) describe even sector-specific differences. In their review on demand-side mitigation, which has significant overlaps to sufficiency, they found the call for overall governance as being dominant in the literature on the housing sector whereas behavioral change was emphasized in the literature on food and consumption (p. 7–8). The question whether the concepts of the bottom-up approach or the policy-making approach dominate cannot be answered here, but the hypothesis is formulated that the discourse is moving from the first type to the second. The third type might gain attention since global social movements, such as Fridays for Future, put climate justice in the center of their actions and are able to influence the sustainability and sufficiency discourse on the local and the global level.

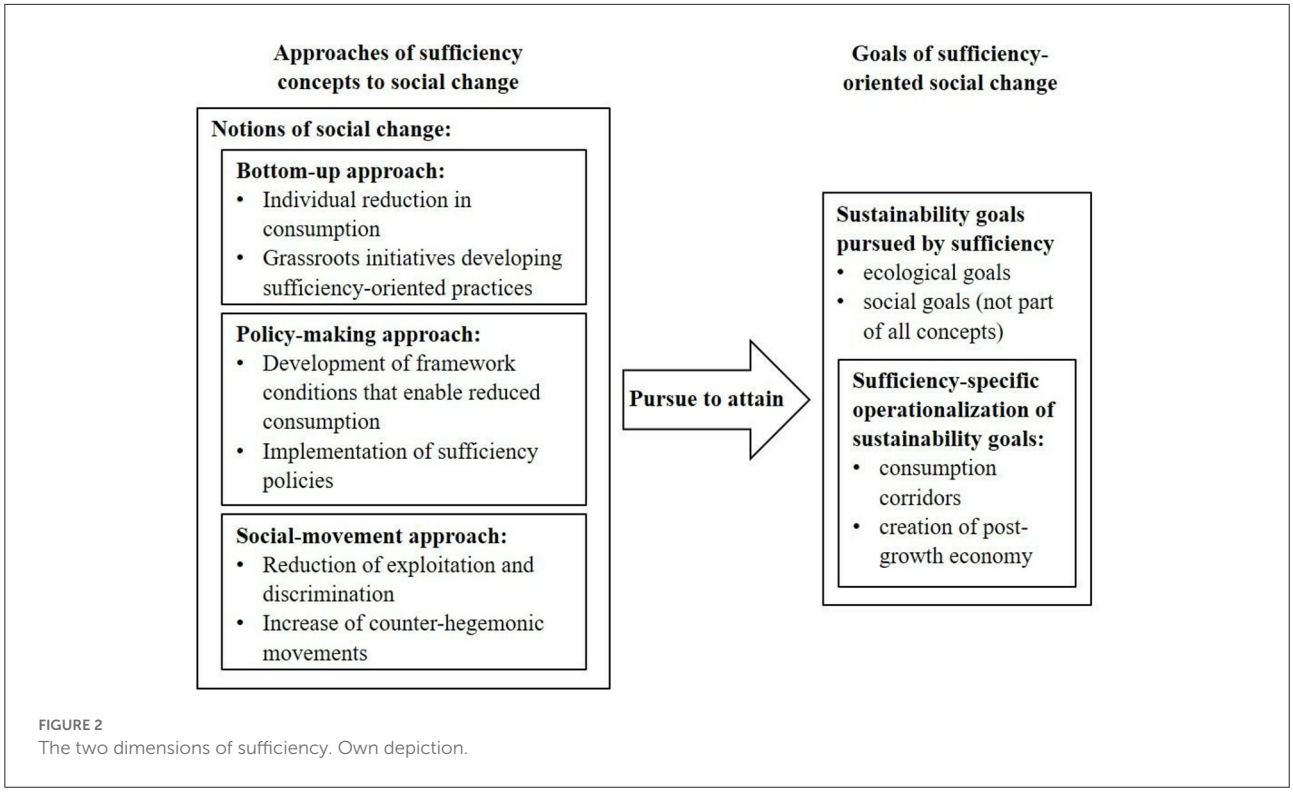

FIGURE 2
The two dimensions of sufficiency. Own depiction.

TABLE 2 Sustainability goals and notions of social change of sufficiency concepts.

		Notions of social change in sufficiency concepts		
		Bottom-up	**Policy-making**	**Social movements**
Sustainability goals	**Ecological goals**	Present	Present	Present
	Social goals	Partly present (mainly in context of individual wellbeing)	Partly present [mainly in context of (re)distribution]	Present (reducing externalization and discrimination)
Sufficiency-specific operationalisation of sustainability goals	**Upper and lower limits to consumption**	Partly present (orientation of lifestyles toward upper ecological limits)	Present (reconfiguration of framework conditions)	Present (linked to externalization and discrimination)
	Create a post-growth economy	Partly present (voluntary simplicity)	Partly present (independence from growth)	Present (sufficiency as a "logic" of societal/economic organization)

Contradictions

The separation into three different types of approaches to social change is an analytical one, which implies that the different types overlap and are to some extent heterogeneous and contradictive in themselves. Nevertheless, this analytical separation enables the identification of contradictions and possible synergies among the different concepts of sufficiency. Two contradictions are highlighted below: (1) different approaches to behavioral change and changes of social practices and (2) the role of conflicts in social change.

First, in sufficiency concepts of the first type social theories of behavior dominate, whereas concepts of the second and the third type are linked to theories of practice. As Shove (2010) points out, these two types of social theories are based on contrasting paradigms. Whereas, theories of behavior, such as the theory of planned behavior (Ajzen, 1985, 1991), describe people as autonomous agents of choice and change, the theory of practice emphasizes the embeddedness of individuals and their decisions in social contexts. In the theory of planned behavior, the focus lies on understanding and influencing attitudes that shape individual behavior. Institutional or infrastructural framework conditions that enable or hinder behavioral change are conceptualized as external to behavior. The aim of policymaking is to adjust these external factors. From

the perspective of practice theory, individuals are carriers of practices and institutions and infrastructures are not external factors but configure and structure the practices. Thus, political interventions are one part of creating new social practices. They are not limited to influencing individual behavior but may question and redesign all institutions and infrastructures. This social practices approach is dominant in the second and the third type of sufficiency concepts, which indicates that they are contradictory to the first type, concerning the approach to social change.

Second, the role of conflicts differs among the different sufficiency concepts. In sufficiency concepts of the first and second type, conflicts play a minor role. When conflicts are mentioned, they are a result of and a barrier to social change that should be avoided (Heindl and Kanschik, 2016, p. 44). Accordingly, higher-level authorities, such as policy makers should "avoid the development of conflicts among local actors" (Bauwens et al., 2020, p. 9). In sufficiency concepts of the third type, conflicts play an important role. Social struggles, as one dimension of conflicts, are described as a driver of social change, since they may politicize injustice and demand for political actions (Salleh, 2009).

The examples of different approaches to changes in behavior/practices and the role of conflicts in social change indicate that the different types of sufficiency concepts are not just different but to some extent contradictive. This implies that the choice of sufficiency concept is highly significant for the analytical perspective on social change and the practical implications for political actions.

Possible synergies

Even though the different types of sufficiency concepts are contradictive in some aspects, it is possible to develop synergies from a broader perspective and draw connections to transformation theory. Sufficiency with bottom up approach can help to develop new, sufficiency-oriented social practices and shift cultural norms, especially if grassroots initiatives and businesses are focused as subjects of transformation. Transformation processes that start in societal niches play a major role in different concepts of socio-ecological change, such as the Multi-Level-Perspective (MLP) (Geels and Schot, 2007), which focuses on socio-technical innovations, or in the sociological transformation theory by Wright (2010). Societal niches are characterized by a quite strong autonomy from dominant power relations and principles of social organizations and thus enable the development of *new* practices. Thus, interstitial strategies–as Wright (2010) calls transformation processes that start in societal niches–may help to envision alternatives and help to "strengthen popular understandings that another world is possible" (p. 365). If approached in such a way, sufficiency concepts of the first type encompass a political dimension and do not merely individualize the responsibility of social change by focusing on individual lifestyles.

The development of new sufficiency-oriented practices by grassroots initiatives in societal niches could empower policymakers to change institutional frameworks and infrastructures, which is part of the second type of sufficiency concepts. The other way around, such political changes could support niche-practices to thrive and occasionally break through into the mainstream (Ziesemer et al., 2019). In the MLP such a link between developments in societal niches and the development of supportive framework conditions is crucial for the breakthrough of innovations into the mainstream (Grin et al., 2010; Geels, 2019). As pointed out above, sufficiency concepts of the second type address policymakers in a merely collaborative way, which tries to avoid conflicts and confrontation. Wright describes this method of addressing policymakers as a "symbiotic strategy" that aims to change institutions and to develop new ones by using current state institutions. In an idealized way, these strategies aim to solve problems collaboratively and generate win-win solutions (Wright, 2010, p. 361). Wright (2010) suggests that symbiotic strategies are more likely to become deeply institutionalized and durable if they effectively solve social problems and serve the interests of elites and dominant groups. He describes the combination of interstitial (bottom-up) and symbiotic (policy making) transformation as a "sustained metamorphosis" (p. 303).

The third type of sufficiency concepts emphasizes the role of conflicts, confrontation and deep structural change and thus does not fit well with the image of a metamorphosis. Nevertheless, sufficiency strategies of the first two types could render a deep shift toward a logic of sufficiency possible. For example, if sufficiency gained center stage in climate-related policymaking and public discourses, it could benefit deeper structural changes such as politics beyond economic growth. At the same time, the concepts of the first and the second type could benefit from the focus on confrontation and social movements, which is associated with the third type. Sufficiency concepts of the third type emphasize that the process of implementing sufficiency will *not* be a smooth, non-conflictual process, but the result of power struggles and competing interests. In this sense, social movements could become key actors in putting pressure on policymakers and changing and influencing public discourse. The MLP is often criticized for underestimating the role of conflicts and confrontation for driving social change (Geels, 2019). In contrast, Wright (2010, p. 308) describes "ruptural strategies" as a third approach to transformation. He states that ruptural strategies "envision creating new institutions of social empowerment through a sharp break within existing institutions and social structures" (p. 303). Wright frequently emphasizes, that "rupture" does not merely describes a systemic rupture, but a conception of struggles as challenge and confrontation in contrast to

the collaborative problem-solving of the other two strategies (Wright, 2010, p. 370–71).

In conclusion, it is possible to develop synergies among the different concepts of sufficiency and it seems plausible that no notion of social change alone is sufficient; a combination of (elements of) all three notions is necessary for sufficiency-oriented social change. To put it in an idealized and simplified way, a virtuous cycle may emerge, if new sufficiency-oriented social practices are developed in societal niches by grassroots movements, infrastructures and institutions are changed by using state institutions, and social movements fight for shifting public discourse and other power relations and thereby render a deep shift toward sufficiency possible. Nevertheless, to date, a profound theory of how to develop a sufficiency-oriented societal change does not exist.

Reflection, limitations and further research

This article contributes to the field of sufficiency research by providing the first semi-systematic literature review of the sustainability goals and the notions of social change implied in concepts of sufficiency. Until now only a few systematic literature reviews on the conceptualization of sufficiency exist (Niessen and Bocken, 2021; Sandberg, 2021; Jungell-Michelsson and Heikkurinen, 2022). These provide valuable insights, but do not focus on the different approaches to shape sufficiency-oriented social change. By structuring the sufficiency debate concerning the different approaches to social change and discussing them in the context of transformation theory, the review helps to advance the debate about sufficiency-oriented strategies. The search strategy, used for the literature sampling, was comparably broad and not limited to a specific sector (like in Niessen and Bocken, 2021), to consumption (like in Sandberg, 2021) or to peer-reviewed articles (like in Jungell-Michelsson and Heikkurinen, 2022). Among other things, the identification of the third type of notions of social change underlines the importance of such a broad search strategy, since this perspective is mostly, but not exclusively present in books or book chapters.

The use of the semi-systematic literature review method has its limitations. The search strategy limited the selected articles to those in English and some in German. Articles in other languages and those without the word "sufficiency" in their title, abstract or keywords were excluded from the search in the Web of Science Database. By screening the ENOUGH-database, the potential of excluding relevant articles because of missing key words, was minimized. Additionally, a search in other literature databases could have enlarged the reviews sample. Furthermore, research on concepts such as Buen Vivir from South America or Ecological Sawaraj from India[6], which might have significant overlaps to concepts of sufficiency but do not or only seldom use the term "sufficiency," might contribute valuable insights into this topic. Further research could explicitly focus on links from adjacent concepts to sufficiency–especially those from countries of the Global South–and thereby enrich the sufficiency debate.

Several concepts of sufficiency problematize the role of endless economic growth. The necessary macroeconomic preconditions for and consequences of comprehensive and deep sufficiency policies have been not sufficiently investigated.

As part of this review, different notions of social change within concepts of sufficiency were identified. In the discussion some contradictions and possible synergies were provided. Nevertheless, the question of how to develop a sufficiency-oriented social change could benefit from a further in-depth analysis from the perspectives of transformation and social theories. Thereby, a theory for sufficiency oriented social change could be developed. As well as this theoretical investigation, more empirical studies on the implementation of sufficiency policies and the way in which they enable deeper sufficiency-oriented social change is needed. More attention could be paid to the role of conflicts, since sufficiency is at odds with dominant structures of the economic system (e.g., economic growth) and conflicts have so far played a minor role in many sufficiency concepts.

Conclusion

In this article, sufficiency literature was reviewed concerning notions of social change, which are inherent in concepts of sufficiency. Since sufficiency is a strategy to influence social change toward sustainability, two dimensions were investigated, namely the goal of and the approach toward social change within sufficiency concepts. Sufficiency is thought to pursue ecological and sometimes social goals. Sufficiency as consumption corridors or sufficiency as a way to post growth economy can be described as sufficiency-specific operationalisations of social and ecological goals and are part of some of the concepts.

Furthermore, three different types of approaches to social change were identified: the bottom-up approach, the policy-making approach, and the social-movements approach. In sufficiency concepts of the bottom-up approach a reduction in consumption by changing consumer behavior, new business

6 Buen Vivir (Sumak Kawsay in Quechua), is an indigenous concept from South America and is often discussed by post-development scholars. Ecological Sawaraj is a concept that emerged from communities in India. Despite several differences both concepts focus on a non-anthropocentric and harmonious relationship between human beings and nature, social justice and organizing a non-capitalistic economy (Kothari et al., 2014). Acosta and Abarca (2018) mention a link between concepts of Buen Vivir and sufficiency explicitly.

models and grassroots-movements is central. One major limitation to this approach lies in the individualization of responsibility for sufficiency-oriented behavior because infrastructures and institutions do not support or even hinder such behavioral change. In concepts of the policy-making approach, the social embeddedness of social practices is emphasized and reductions in consumption are pursued by changes in political framework conditions. One remaining question in concepts of this approach is how these changes in political framework conditions come into place. It seems that in many concepts the decision for sufficiency policy relies more or less on the realization of the necessity to act by decision makers. This limits the potential of this approach and points to the necessity of further research. In sufficiency concepts of the social-movement approach sufficiency is conceptualized as a critical perspective on the nexus of unsustainability, growth-dependency, externalization, exploitation, and discrimination and is described as a new organizing principle for society. These concepts shed light on structures of power and domination and describe social movements as relevant subjects for transformation, as their role might be to increase counter-hegemonic power. The conceptualization of sufficiency in the social-movement approach is very broad and comparably radical. That is why an operationalization in the form of policies seems to be difficult.

The three approaches differ regarding the role of conflicts and the conceptualization of behavior and social practices. Nevertheless, some possible synergies among these different approaches were identified utilizing the Multi-Level-Perspective of Sustainability Transition Research and Erik O. Wright's transformation theory. In an idealized and simplified way, grassroots movements may develop new sufficiency-oriented social practices, which might be supported, mainstreamed and further developed by political decisions on changing infrastructures and institutions, and social movements may fight for shifting public discourse and other power relations and thereby render a deep shift toward sufficiency possible.

Reflecting on possible synergies indicates how important a fruitful combination of these different approaches might be for shaping sufficiency-oriented social change. By this analysis, the article hopefully contributes to an elaborated debate on how sufficiency-oriented social change can be implemented. Building on the possible synergies identified above, further theoretical and empirical research on the implementation of far-reaching sufficiency policies and the role of different actors is needed. For investigating this question, the analysis of the role of conflicts and the combination with related concepts from the Global South could be explored in further detail. A major obstacle to the implementation of far-reaching sufficiency policies might be that sufficiency is a rather radical concept, thought to aim for a major restructuring of the modes of production and consumption. However, such a radical approach might be necessary considering the urgency of current socio-ecological crises, and an investigation of transformation paths toward sufficiency is indispensable.

Author contributions

The author confirms being the sole contributor of this work and has approved it for publication.

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Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The wellbeing economy: Possibilities and limits in bringing sufficiency from the margins into the mainstream

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The idea of sufficiency faces great obstacles in contemporary political economies in which production and consumption growth has long been considered imperative. Despite evidence supporting calls for a sufficiency-oriented, post-growth approach to environmental challenges, only pro-growth environmental perspectives have found significant mainstream political support until now. However, one recent formulation that has a strong affinity with a sufficiency approach—a wellbeing economy—has found growing support among mainstream political actors including governments and international organizations. Does the growing support for a wellbeing economy represent the long-sought breakthrough for a sufficiency-oriented, post-growth environmental approach? To help answer this question, we conduct case studies of New Zealand, Scotland, and Iceland—the three founders of the Wellbeing Economy Governments (WEGo). These nations have (to varying degrees) taken steps to downplay the centrality of economic growth and instead highlight wellbeing as the ultimate goal. They have also moved "beyond GDP" by introducing new wellbeing measurements and using them in policymaking. However, movement in a post-growth direction is limited by continuing dependence on economic growth to achieve intermediate goals, such as employment creation and provision of welfare state services, that are closely associated with the goal of wellbeing. We therefore characterize the emerging practice of the wellbeing economy as a "weak post-growth" approach. To become a "strong post-growth" perspective, it needs to be linked to a much more challenging project of disentangling contemporary societies' dependence on economic growth. The article includes a discussion of ways that WEGo nations could contribute to addressing that considerable challenge and build on the sufficiency-oriented elements evident in the wellbeing economy.

KEYWORDS

wellbeing economy, sufficiency, post-growth economy, beyond GDP, growth dependency, welfare state, sustainable growth, degrowth

Introduction

Ecological debates have long pitted defenders of economic growth against advocates of post-growth approaches. On the pro-growth side, one finds mainstream formulations of sustainable development (WCED, 1987) and related ideas such as ecological modernization/eco-modernism (e.g., Mol et al., 2009; Asafu-Adjaye et al., 2015), green growth (e.g., OECD, 2011), green economy (e.g., UNEP, 2011), and sustainable and inclusive growth (e.g., European Commission, 2010; Jacobs and Mazzucato, 2016). Such pro-growth approaches emphasize the possibility of decoupling GDP growth from negative environmental impacts through improved technologies and greater ecological efficiency, while arguing that environmental policy can create opportunities for greater economic activity, profits, and jobs, with "first mover" advantages and greater competitiveness for countries and companies that lead the way (Jänicke and Jacob, 2004).

On the other side of the debate, post-growth approaches (e.g., Jackson, 2017; Victor, 2019) include calls for degrowth (e.g., Kallis et al., 2020; Hickel, 2021), a steady-state economy (Daly, 1996), and strong sustainable consumption (Lorek and Fuchs, 2019). Related concepts such as "doughnut economics" (Raworth, 2017) and a-growth (van den Bergh, 2011) do not see economic growth as a priority objective, but are agnostic about whether adequate action to address environmental challenges could still allow for some continued GDP growth. While post-growth approaches generally accept the possibilities for some activities and sectors (e.g., renewable energy, care-related activities) to expand, along with some role for technology and efficiency, they also see a centrally important role for sufficiency, i.e., the idea that "there can be enough and there can be too much" (Princen, 2005).

Alongside efficiency and consistency (i.e., technologies and production methods consistent with natural processes), sufficiency can be considered one of three key components of a comprehensive ecological strategy (Sachs and Santarius, 2007, pp. 158–165)—one that mainstream pro-growth approaches neglect. Sufficiency can be understood as "living well within limits" or having enough for a good life, but not consuming so much that it is ecologically excessive—that is, not consuming at a level that undermines possibilities for others, today and in the future, to also lead good lives (O'Neill et al., 2018; Fuchs, 2020; Hayden, 2020).

The concept of sufficiency is discussed in more detail elsewhere in this issue we briefly highlight two points relevant to the analysis that follows. "Enough" involves two thresholds: a minimum and a maximum (Spengler, 2016). Although this article focuses mainly on sufficiency with regard to the upper threshold—i.e., the need for the globe's affluent consumers and consumer societies to limit consumption and production volumes—for those living with very little, sufficiency may require more consumption. This article also emphasizes sufficiency at the macro-economic level, i.e., a critical perspective on GDP growth as a dominant societal goal and the search for post-growth alternatives. However, sufficiency can also involve efforts to limit specific products, practices, or sectors considered excessive due to their social or ecological impacts (Hayden, 2014a,b), or other manifestations of the modern emphasis on "faster," "further," and "more" (Sachs, 2001), and be pursued through a wide range of policies and actions that enable people to reduce specific forms of consumption (Schneidewind and Zahrnt, 2014; Darby and Fawcett, 2018; Toulouse and Attali, 2018; Hayden, 2020).

There is considerable evidence to support calls for a sufficiency-oriented, post-growth approach. Although these issues remain contested (e.g., Hausfather, 2021), the pro-growth project of decoupling economic growth from environmental impacts has produced limited results to date, falling short of what is needed to address climate change and other environment challenges (Parrique et al., 2019; Haberl et al., 2020; Jänicke, 2020; PwC, 2020; Wiedmann et al., 2020). However, until now, only pro-growth environmental perspectives have found significant mainstream political support—largely because they are consistent with the perceived political imperative of economic growth (Dryzek et al., 2003; Richters and Simoneit, 2019; Wiedmann et al., 2020), including the need for economic growth to generate adequate revenues for state expenditure (ranging from military needs to social spending), keep unemployment at bay, and most generally to maintain economic and social stability. Environmental reform efforts thus confront a "glass ceiling" as states must limit themselves to measures that do not inhibit economic growth, with an additional constraint relating to the legitimation imperative and the need to avoid "impinging on the quality of the citizens' lifeworld" (Hausknost, 2020). The result is an unsatisfying impasse between politically viable but ecologically inadequate pro-growth perspectives on one side (Jänicke, 2020), and more ecologically sound but seemingly unachievable post-growth approaches on the other.

Some observers see a possible break in the impasse as one idea with roots in post-growth thinking and a strong affinity with a sufficiency approach—the concept of a wellbeing economy (WE)—has recently found a growing number of adherents among governments, international institutions, and other mainstream political actors (Fioramonti et al., 2022). One understanding of a WE is that it shifts the central goal from economic growth to the generation of human wellbeing in ecologically sustainable ways. In line with sufficiency-oriented thinking, many proponents of a wellbeing economy are critical of the limits of the project of decoupling economic growth from environmental impacts, as well as the limits of further consumption growth in generating wellbeing in already affluent societies, while emphasizing the need for an equitable distribution of income and wealth rather than hoping for economic growth to trickle down

(Fioramonti et al., 2022; WEAll, 2022a). Does the growing support for a wellbeing economy represent the long-sought breakthrough for a sufficiency-oriented, post-growth environmental approach? If not, how can the concept of a wellbeing economy be taken further so as to advance a post-growth environmental politics?

After explaining materials and methods used, the article will examine in more detail differing post- and pro-growth formulations of a wellbeing economy and inroads the idea has made into the political mainstream, before turning to case studies of three countries that have embraced the concept. The case studies examine changes in understandings and measurement of economic success, and policy initiatives related to a WE, with an emphasis on the degree to which post-growth and sufficiency elements are evident. The discussion that follows considers some ways that the WE could become a stronger post-growth concept, notably by engaging with the challenging task of lessening the growth dependency of contemporary societies.

Materials and methods

To examine the question of whether a wellbeing economy represents a long-sought breakthrough for a sufficiency-oriented, post-growth environmental approach, we conducted case studies of three countries—New Zealand, Scotland, and Iceland—that have committed to becoming wellbeing economies. The countries selected are the founding members of the Wellbeing Economy Governments (WEGo).[1] The case studies are based on an analysis of documents from the WEGo nations, with an emphasis on documents that help to assess the degree to which commitment to a wellbeing economy has affected government policy priorities and particularly the orientation toward economic growth. These include: speeches and opinion pieces by government leaders related to a WE, government budgets and related background documents, official documents outlining new "beyond GDP" wellbeing measurements, governing party policy statements, agreements on coalition government policy agendas, and—in the case of Scotland—a document specifically outlining the government's economic transformation strategy to create a WE. In addition, we draw on existing academic research, NGO reports and other gray literature, and media articles on the WE experience in these countries. We focus mainly on governments to understand whether, in practice, a WE represents a post-growth, sufficiency-oriented perspective since governments are the key institutions capable of translating the abstract WE concept into concrete policy actions. To provide additional background, we also examined documents from non-governmental organizations and international/EU institutions related to the more general debate on a wellbeing economy.

1 As WEGo founders, they offer a slightly longer experience to examine as aspiring wellbeing economies than more recent members, Wales and Finland.

Background: Wellbeing economy meanings and inroads

Post-growth formulations

Similar to concepts such as sustainable development and democracy, a wellbeing economy is an idea with potential to find widespread support, although adherents may have quite different understandings of the term. We begin with understandings of the idea put forward by the main non-governmental proponent of the concept: the Wellbeing Economy Alliance (WEAll), which was established in 2018 (Abrar, 2021, p. 163). WEAll (2022a) describes itself as: "a global collaboration of almost 200 organizations, alliances, movements and individuals working together to transform the economic system into one that delivers on five core needs for ecological and human wellbeing: dignity, connection, nature, fairness, and participation." Its membership list includes many ecologically minded, civil-society organizations, including the Doughnut Economics Action Lab, European Environmental Bureau, GNH Center Bhutan, New Economics Foundation, Oxfam, Post-Growth Institute, The Club of Rome, and The Next System Project, among many others (WEAll, 2022b).

WEAll (2022a) provides 16 different "20–30 second descriptions" plus eight short phrases to characterize a WE, including:

- "A Wellbeing Economy is one that serves people and planet. It doesn't focus on growth in economic terms—but instead, growth in human wellbeing, flourishing, environmental quality, which are more important than just money."
- "A different economic system which prioritizes the wellbeing of people and the planet. At the moment, we are chasing economic growth—that is destroying the planet without delivering what we really need as humans. A Wellbeing Economy is aimed at changing this and delivering what we need, the first time around."
- "Building a Wellbeing Economy is about transforming our economic system so that it delivers social justice on a healthy planet, the first time around rather than addressing societal issues after they take place."

These particular statements highlight a transformative, post-growth vision along with emphases on social justice and a preventative approach toward social and ecological problems (themes we will return to below).

Similarly, Fioramonti et al. (2022), who have connections to WE-All, describe a WE as "an economy that pursues human

and ecological wellbeing instead of material growth" (p. 1). In the WE paradigm, "the goal is no longer growth, but balanced sufficiency, equity, and sustainability as drivers of wellbeing" (p. 5). While the WE approach "reject[s] any attempt at making conventional economic growth more socially or environmentally acceptable (as is the case with 'inclusive' or 'green' growth), it calls for completely refocusing the debate away from growth" (p. 3). The authors similarly criticize the SDG agenda, which still has economic growth at its center (p. 6).

The European Environmental Bureau and Oxfam Germany put forward their own post-growth WE vision, in which "all policies are framed in terms of human and ecological wellbeing, not in terms of economic growth" (EEB and Oxfam Germany, 2021, p. 8). Their WE approach emphasizes the need to tackle the "root causes" of exploitation: "the dependency on growth and associated material acceleration of the economy, the vicious circle of economic and political concentration of wealth and power and the perpetuation of exploitative structures, which allow costs to be shifted onto others" (p. 18). A WE thus involves: "a process of global dismantling of neocolonial structures and [countering] structural discrimination and racism," "[d]emocratising the economy, dispersing economic and political power into the hands of the many rather than the few," and "making the economic system independent of growth and thus allowing a reduction in material use" (p. 42). The goal of "reducing the fixation and dependence on growth" entails shifting "the political mindset away from simply growing GDP and global trade to aiming directly for the growth of wellbeing within planetary limits," while related policy tasks include action to "[d]ecouple employment/work and social security systems from economic growth" (p. 47).

WWF's European Policy Office has also called for Europe to embrace a post-growth vision of a "wellbeing economy beyond GDP" to guide recovery efforts after COVID-19 (Humphries et al., 2020). WWF highlights both the "limitations of GDP as the headline measure of progress" and the "fallacies behind 'green and sustainable' growth" (p. 9), calling for "an alternative model that goes beyond green growth" (p. 15). While some observers, as mentioned, have criticized the continued focus on economic growth in the UN Sustainable Development Goals, WWF calls on the EU to adopt a WE strategy "with the SDGs acting as a guiding tool" (p. 6). Among its recommendations are for the EU to use the European Semester to track progress using a new wellbeing measurement framework, while replacing the goal of "sustainable growth" (pp. 26–27).

Inroads in the political mainstream

Finding support in ecologically-minded NGO circles for a post-growth WE vision is one thing, but some leading WE advocates have argued that the wellbeing economy concept is also the most effective way to bring post-growth ideas and policies into the political mainstream (Fioramonti et al., 2022). They identify numerous similarities between a WE and other sufficiency-oriented and post-growth approaches, including degrowth, but argue that there are important differences in terms of political appeal: "Both the WE and degrowth agree that material production and consumption cannot grow forever on a finite planet and that wellbeing can improve while reducing GDP. Yet, … the degrowth approach has not yet had much success in influencing policy making" (pp. 3–4).

The WE concept has key political advantages over other post-growth approaches, Fioramonti et al. (2022) argue, including a more "positive and forward-looking" language: "unlike other critiques of the growth economy that project an image of contraction, parsimony and deprivation, the WE uses a 'positive language' of abundance, wellness and conviviality, with a view to building a forward-looking narrative of opportunities for human creativity, thus inspiring collective action and making governments more amenable to policy change" (pp. 2, 5). Furthermore, they argue that the WE's language and concepts are "more adaptable to different social and economic contexts" than those of other post-growth approaches (p. 1), having relevance not only in high-income nations but also in the global South: "Unlike degrowth, the concept of wellbeing, in its multidimensionality and simplicity, has no boundaries and requires no disclaimers: it resonates the world over" (p. 4). The potentially broad political appeal of a WE is also linked, according to the authors, to the general perception of wellbeing as a "post-ideological" concept (p. 3).

Fioramonti et al. (2022, p. 4) note that the "most striking example of the WE's policy impact is the establishment of the Wellbeing Economy Governments (WEGo)…," which was launched in 2018 by New Zealand, Scotland, and Iceland, with Wales and Finland later joining. The partnership's aims "are to deepen their understanding and advance their shared ambition of building wellbeing economies" (WEAll, 2021). WEGo, which grew out of the idea of creating an alternative to the G7—a "WE7"—promotes sharing of expertise, best practice and policy ideas to advance their "common ambition of building a Wellbeing Economy" (Abrar, 2021, p. 168).

As a further indication of the WE's inroads into the political mainstream, Fioramonti et al. (2022, p. 5) point to the Organization for Economic Cooperation and Development's work in this area. An OECD (2019, p. 4) working paper on "The Economy of Wellbeing" notes that: "As wellbeing has matured as a statistical and measurement agenda, it has become increasingly relevant as a 'compass' for policy, with a growing number of countries using wellbeing metrics to guide decision-making and inform budgetary processes." At a WEGo symposium, the OECD's Secretary-General, Gurría (2019) stated that the OECD is taking action "to help countries build 'economies of wellbeing'," adding that the "pursuit of greater wellbeing for all must become second nature in policymaking."

A wellbeing economy has also found support within European institutions. Before joining WEGo, Finland made the "economy of wellbeing" a major theme during its presidency of the Council of the European Union in 2019 (Ministry of Social Affairs and Health, 2020), leading to an endorsement of the concept by the Council in October 2019 (Council of the European Union, 2019). In January 2020, the European Economic and Social Committee declared that the "EU urgently needs to develop the foundations for a sustainable and inclusive wellbeing economy that works for everyone" (EESC, 2020). The EESC added that "building the wellbeing economy must start by adopting a precautionary approach in which macroeconomic stability does not depend on GDP growth."

Pro-growth and other formulations

While the above-mentioned examples illustrate significant advances into the political mainstream for a concept that first emerged out of a critical perspective on economic growth, one should be cautious before accepting the conclusion that states and international organizations are embracing post-growth ideas through the WE concept. In some hands, the wellbeing economy has taken a pro-growth turn. For example, the OECD Secretary General stated that the "Economy of WellBeing" highlights the need for "a growth model that is equitable and sustainable from the outset" (Gurría, 2019). Similarly, the OECD working paper cited above—whose full title is "The Economy of Wellbeing: Creating opportunities for people's wellbeing and economic growth"—"defines an economy of wellbeing around the idea of a 'virtuous circle' in which individual wellbeing and long-term economic growth are mutually reinforcing" (OECD, 2019, p. 4).

Variations on the theme of the WE as a form of inclusive and sustainable growth are indeed common among governments and mainstream political-economic institutions. In the case of the Council of the European Union (2019), for example, their endorsement of the idea came with this understanding: "Taking wellbeing into account in all policies is vitally important to the Union's economic growth, productivity, long-term fiscal sustainability, and societal stability." Further examples of such pro-growth WE thinking appear in the case studies that follow.

Meanwhile, some understandings of a WE focus on matters other than growth. For Birkjær et al. (2021), a WE "is about actively using wellbeing metrics and tools to inform government priorities and policymaking ...." (p. 5). From this perspective, it is not enough to introduce new wellbeing indicators that go "beyond GDP"; to be a WE, "governments must 'go beyond measurement' and give wellbeing metrics an active role in government" (p. 14). As will become evident, all three cases that we examine meet this criterion, although there are questions about the degree to which they involve a shift toward post-growth politics.

Case studies

New Zealand

Aotearoa New Zealand has long been a pioneer of progressive reform, including women gaining the right to vote in parliamentary elections in 1893, early introduction of welfare state programs, and declaration of a nuclear-free-zone in 1987. It has also been home to influential work critiquing GDP's limits as a prosperity indicator, including that of Waring (1988) that helped set the stage for later "beyond GDP" initiatives. At the same time, the country's colonial history has left a legacy of socio-economic marginalization for indigenous Māori and Pasifika peoples. New Zealand also faced a macroeconomic and political crisis in the mid-1980s and went onto adopt neoliberal reforms and austerity—an experience that still marks the country. This brief background provides some context for New Zealand's emergence as a leader in the wellbeing economy movement.

A "beyond GDP" living standards framework

New Zealand's Treasury began developing the Living Standards Framework (LSF) in 2011, drawing together several different initiatives on measuring social wellbeing in ways that go beyond GDP (Patterson, 2019; Ng, 2022). The LSF, which was formally released in 2018, draws heavily on the OECD's wellbeing approach. It includes a multidimensional dashboard of economic, social, and environmental indicators to assess "intergenerational wellbeing." The LSF dashboard includes indicators grouped into 12 current wellbeing domains[2], as well as indicators for four forms of capital—natural, human, social, and financial and physical. In addition to national-level data to measure the state of "our country," individual-level data allows comparisons across social groups, i.e., "our people," while data on the four capitals help to assess the ability to sustain wellbeing in "our future" (Treasury, 2018b). The LSF can play an important role in highlighting wellbeing differentials within the population. A notable, although unsurprising, finding is that Māori and Pasifika populations have lower wellbeing on many indicators, while less expected is the degree to which older people do better than younger people in most domains, including measures of material wellbeing (Grimes, 2021, p. 280). A revised LSF was introduced in 2021 (Treasury, 2022); we have focused on the previous version that was used to shape wellbeing budgets up to and including 2022.

2 The domains are: civic engagement and governance, cultural identity, environment, health, housing, income and consumption, jobs and earnings, knowledge and skills, safety, social connections, subjective wellbeing, and time use.

Wellbeing budgets

While many countries have introduced beyond-GDP measurement initiatives, what makes New Zealand a pioneer is the degree to which they have used those new measurements in policymaking, notably in "wellbeing budgets" starting in 2019 under a Labour-led government. Information from the LSF was used—along with evidence from sectoral experts and input from government agencies—to determine the budget's five priorities: mental health, child wellbeing, supporting indigenous (Māori and Pasifika) people, supporting a thriving nation in the digital age through innovation, and the transition to a sustainable, low-emissions economy (Treasury, 2018a; Ng, 2022). In their budget bids, public agencies had to show how proposed expenditures aligned with the five priorities and refer to their initiatives' wellbeing impacts. As Prime Minister Ardern (2019) explained: "If you are a minister and you want to spend money, you have to prove that you are going to improve intergenerational wellbeing." Agencies also had to describe how they collaborated with others in developing their initiatives—with the aim of breaking down agency "silos." The LSF was then used as part of the process to assess and rank spending proposals for decisions about budget allocations (Treasury, 2018a; NZ Government, 2019; Ng, 2022). The 2019 budget ultimately included record levels of spending on mental health along with significant investments in efforts to address family and sexual violence, venture capital to help start-ups expand, low-carbon innovation, railways, and fixing hospitals, among other items.

Subsequent wellbeing budgets have each had different emphases. The response to the COVID-19 crisis took center stage in 2020. The 2021 budget was notable for its substantial increase in social assistance benefits with the aim of "tackling inequality and child poverty" and helping "low-income New Zealanders to meet their basic material needs"—underlining a break with past orthodoxy on the thirtieth anniversary of the neoliberal, program-slashing "Mother of All Budgets" (NZ Government, 2021, pp. 14, iv). Other noteworthy elements included a NZ$3.8 billion Housing Acceleration Fund to expand housing supply—a response to New Zealand having some of the OECD's most unaffordable housing—in addition to investments to address the disadvantages of the Māori population in areas such as housing, health, and education (NZ Government, 2021, pp. 14, 18; see also Bartos, 2021).

Three high-priority elements stand out in the most recent 2022 wellbeing budget: new funding of NZ$11.1 billion for the health sector to improve access to and reform the delivery of health services, NZ$2.9 billion in spending from a Climate Emergency Response Fund, and NZ$1 billion in short-term measures to help low- and medium-income earners cope with rising living costs (NZ Government, 2022; see also Ardern, 2022; Robertson, 2022; Shaw et al., 2022). The climate spending, which the prime minister called the country's "biggest investment in climate action ever" (Ardern, 2022), supports the country's new Emissions Reduction Plan. Also noteworthy is the use of a Māori wellbeing framework, He Ara Waiora, in addition to the LSF to develop the 2022 budget.[3]

How much of difference do these wellbeing budgets make? The answer will become clearer over time, but commentators on New Zealand's initial experience have frequently pointed to positive, incremental improvements that fall short of being transformational or sufficient to address core social and environmental challenges (e.g., Bradford, 2022; Hughes, 2022a; Shaw et al., 2022; Spence, 2022). As the Country Lead for the Wellbeing Economy Alliance Aotearoa put it, the 2022 budget "contained many good measures… However it continued the incremental, slow approach to change that won't substantially alter persistent poverty, wealth inequality or the biodiversity and climate crises." While some have called for greater increases in social spending, the government has remained committed to budget responsibility rules that limit spending, prompting one critic to write: "If you're not willing to spend on social problems, a wellbeing ethos alone won't help you" (McClure, 2021). With regard to environmental sustainability, critics have welcomed additional spending and related actions in the country's first-ever Emissions Reduction Plan, while calling for much greater ambition (Bradford, 2022; Hall et al., 2022; Hughes, 2022b; WWF-NZ, 2022).

Although impacts have not been as substantial to date as some had hoped, a WE approach does strengthen the case for more social spending, particularly that which benefits the most disadvantaged, for whom every dollar of spending will generally create a greater boost in wellbeing compared to spending on the already well-off (Bartos, 2021). Wellbeing budgets have also advanced the idea of treating public spending as investment (e.g., early intervention to address mental health) that generates positive social returns and helps prevent future costs (Mintrom, 2019).[4] Another indication that a genuinely new approach is at play is the inclusion of a "wellbeing outlook" for the nation—in addition to a conventional economic outlook—at the beginning of the wellbeing budget documents. The outlook highlights

3 The NZ Government (2022, p. 11) states that, in developing the budget, it considered the "alignment of initiatives with the principles of tikanga (decisions made in accordance with the right processes) and manaakitanga (maintaining a focus on improved wellbeing and enhanced mana for all New Zealanders)," while in future budgets it will include other principles: "kotahitanga (working in an aligned, coordinated way), whanaungatanga (fostering strong relationships through kinship and/or shared experience that provide a shared sense of belonging), and tiakitanga (guardianship and stewardship of the environment, particularly taonga and other important processes and systems)".

4 On this point as well, critics argue that the approach has not been taken far enough; Hughes (2022a) maintains that the government has focused largely on paying costs of damage created by the economic system rather than addressing the factors driving those costs.

successes (e.g., high levels of social trust) as well as problems requiring policy attention (e.g., a 7.5 year gap between Māori and non-Māori life expectancy) (NZ Government, 2021, pp. 4, 6). One limit, however, is that the Outlook's environmental information does not provide a full picture of unsustainability of New Zealand society, a point we return to below.

Post-growth and sufficiency elements in New Zealand

One fundamental change in New Zealand that has an affinity with post-growth thinking is the explicit shift away from GDP as the primary indicator of prosperity toward a multidimensional understanding of wellbeing. As Fioramonti et al. (2022, p. 4) write, New Zealand's "Wellbeing Budget stems upon the understanding that GDP growth does not guarantee improvements in living standards…." Meanwhile Laurent (2019, p. 86) suggests that New Zealand's 2019 wellbeing budget involved a decision to "exit growth" ("*sortir de la croissance*").

It is important, however, not to overstate the degree to which New Zealand is moving in a post-growth direction. What Prime Minister Ardern actually said in the first Wellbeing Budget document was: "while economic growth is important—and something we will continue to pursue—it alone does not guarantee improvements to our living standards" (NZ Government, 2019, p. 2). The Budget document goes on to say: "Sustainable economic growth is an important contributor, but many factors determine people's wellbeing" (NZ Government, 2019, p. 5), while Treasury official Ng (2022, p. 183) explained the approach to growth as follows: "While higher market incomes are a very powerful means to the end of higher wellbeing, they are nevertheless only a means." In her statements on the 2022 Wellbeing Budget, Ardern defended her government's record by stating that it had "delivered one of the strongest economies in the world, with GDP up 5.6% in the past year…." (NZ Government, 2022, p. 2) while also celebrating small and medium businesses for their "potential to accelerate our economic growth" (Ardern, 2022).

Although its actions have raised the hopes of some post-growth theorists, New Zealand clearly has not moved beyond the pursuit of economic growth; however, it has downplayed the centrality of growth to some degree by reframing it as one means among others to achieve the ultimate objective of wellbeing. Also evident are some examples of sufficiency-oriented policies targeted at specific sectors, such as a NZ$375 million allocation in the 2022 budget to reduce reliance on cars by investing in cycleways and public transit.[5] That said, there is as yet no sign of a sufficiency approach to the country's biggest GHG source—its cows—despite the limited scope for technological and efficiency solutions to limit their methane emissions and calls for action to reduce livestock numbers (Hughes, 2022b; see also Levitt, 2021).

While this article is mainly concerned with sufficiency at the "upper threshold"—avoiding ecologically excessive consumption and production—it is worth noting that New Zealand's WE approach puts greater emphasis on providing enough at the "lower threshold" through various (albeit insufficient, according to critics) initiatives to meet basic needs and reduce poverty.

Scotland

Scotland has been led since 2007 by the Scottish National Party, a center-left pro-independence party. Pursuit of a societal project that distinguishes Scotland from the rest of the UK (especially from Conservative-dominated, neo-liberal England) has been central to arguments for independence, and one factor behind the country's commitment to a wellbeing economy (Roy and Lorimer, 2022). The context for Scotland's WE efforts include poor health outcomes (Ball, 2021) and significant concentrations of poverty and deprivation (Oxfam Scotland, 2013), i.e., wellbeing outcomes and inequalities calling out for policy attention. At the same time, Scotland has sought to stand out as a climate leader (SNP, 2021), with some of the world's deepest GHG reductions to date and relatively ambitious future targets: 75% GHG reduction below 1990 levels by 2030 and net zero by 2045.

From performance management to wellbeing

A key step in Scotland's journey toward a wellbeing economy was the introduction in 2007 of a National Performance Framework (NPF), which began as an indicator set used internally by government for performance management of public services (Wallace, 2019). With the NPF's revision in 2018, it had evolved into a wellbeing framework and had become a leading example of national "beyond GDP" measurement (Wallace, 2019; Bache, 2022). As Scottish First Minister Sturgeon (2020) described the 2018 NPF changes, "we made wellbeing at that time an explicit part of our national purpose as a country" (Sturgeon, 2020). The NPF expressed that purpose as follows: "To focus on creating a more successful country with opportunities for all of Scotland to flourish through increased wellbeing, and sustainable and inclusive economic growth" (Scottish Government, n.d.). Some NGOs argued that this reframing of national purpose did not go far enough, as it "justified an unwarranted focus on sustainable economic growth and GDP to measure it," while failing to make clear that economic growth is subservient to—and only one means to achieve—wellbeing (Oxfam Scotland, 2017; Wallace, 2019, p.

5 The NZ$375 million for that purpose should be kept in perspective, as it compares to the NZ$569 million spent on a more conventional technological shift: encouraging people to scrap fossil-fuel-powered vehicles and replace them with low-emissions vehicles (NZ Government, 2022, pp. 35, 36).

58). The Framework identifies 11 priority national outcomes—related to children and young people, communities, culture, economy, education, environment, fair work and business, health, human rights, international contributions, and poverty—behind which is a dashboard of 81 indicators, many of which are linked to the UN Sustainable Development Goals (Scottish Government, n.d.).

Those who highlight the wellbeing economy's ability to bring post-growth ideas into the mainstream have pointed to Sturgeon's July 2019 TED Talk, in which she stated: "Growth in GDP should not be pursued at any and all cost …. The goal of economic policy should be collective wellbeing: how happy and healthy a population is, not just how wealthy a population is" (Sturgeon, 2019; Fioramonti et al., 2022, p. 4). She added that the "limitations of GDP as a measurement of a country's success are all too obvious" and highlighted the importance of promoting "a vision of society that has wellbeing, not just wealth, at its very heart." While such statements differ significantly from conventional growth-centered political rhetoric, Sturgeon (2019) also made clear that "economic growth matters—it is important—but it is not all that is important."

Similarly, in a speech to a Wellbeing Economy Alliance conference, Sturgeon (2020) proclaimed that Scotland is "redefining" what it means to be a "successful country" and "putting wellbeing at the heart of what we are doing." Sturgeon stated that GDP "cannot be … the only measure of national progress" and that it "makes no sense to focus purely on growth." In other words, GDP remains one measure of national progress—indeed, an economic growth indicator is part of Scotland's NPF—and growth is one thing, among others, that the government continues to focus on.

Scotland's strategy for economic transformation

An important document to understand the government's future objectives is *Delivering Economic Prosperity: Scotland's National Strategy for Economic Transformation* (Scottish Government, 2022a). "A wellbeing economy, based on the principles of prosperity, equality, sustainability, and resilience, is at the heart of our vision for the economy in 2032," according to the Strategy (p. 13). Elaborating on the meaning of a WE, the document refers to "a society that is thriving across economic, social and environmental dimensions, and that delivers prosperity for all Scotland's people and places," adding that "We aim to achieve this while respecting environmental limits, embodied by our climate and nature targets (p. 5).

Although a WE is the goal, many elements of the Strategy are indistinguishable from a conventional growth agenda. A core part of the vision is to make Scotland "wealthier," that is, "[d]riving an increase in productivity by building an internationally competitive economy founded on entrepreneurship and innovation" (p. 8). Objectives include international and domestic recognition of Scotland as a "nation of entrepreneurs and innovators," the "best place to start and grow a business," a "magnet for inward investment and global private capital," and a nation "where employers have the supply of skills they need, and fully utilize these to grow and take advantage of opportunities" (p. 7).

Goals include "dramatically increas[ing] the total number of new businesses created" in Scotland" and "a step change in the percentage of Scottish start-ups and existing mid-sized businesses that grow to scale" (p. 17). Not only is economic growth still an objective, but the goal is faster growth than in recent years: "we aim to deliver economic growth that significantly outperforms the last decade, so that the Scottish economy is more prosperous, more productive and more internationally competitive" (p. 4).[6]

The Strategy does make clear that its ambition "is not just to grow our economy," but also to transform Scotland's economic model and "build an economy that celebrates success in terms of economic growth, environmental sustainability, quality of life and equality of opportunity, and reward" (p. 6). In other words, the ambition is not only to be "wealthier," but "fairer" and "greener" as well (p. 8). The WE vision "builds on our previous inclusive growth approach" (p. 13), and includes commitments to "significantly reducing poverty" through "better wages and fair work" (pp. 8, 15), with a particular emphasis on reducing child poverty and improving "health, cultural, and social outcomes for disadvantaged families and communities" (pp. 14, 44).

The Strategy also emphasizes a "just transition" that contributes to "sustainable growth"—in other words, the goal is to "create new jobs, businesses and open up markets in new sectors as well as supporting the transition of existing sectors" (p. 12). Familiar growth-oriented ecological modernization language, which has been standard fare in state environmental strategies since the 1990s, is evident in statements such as "The transition to net zero is not just an environmental imperative but an economic opportunity—one where Scotland will become world-leading and secure first-mover advantage" (p. 15) and in the celebration of Scotland's ranking on a Lloyds Banking Group's UK Green Growth index as "the number one region in the UK for green growth potential and opportunity" (p. 26).

It is not surprising that governments highlight the job-creation and commercial opportunities from, for example, expanding offshore wind dependent (p. 26). Nor is it surprising that they struggle to move beyond the growth imperative and break through the "glass ceiling" of ecological transition

6 To achieve this objective, the Strategy identifies "five key transformational programmes of action that can drive improvements in Scotland's economy: stimulating entrepreneurship; opening new markets; increasing productivity; developing the skills we need for the decade ahead; and ensuring fairer and more equal economic opportunities" (Scottish Government, 2022a, p. 4).

(Hausknost, 2020). What is more concerning for anyone with post-growth hopes for the WE concept is the Scottish government's conclusion that: "As a consequence of the actions set out in this strategy, we will have achieved our vision of building a wellbeing economy" (p. 7, see also p. 54). For the government, achieving a WE appears to require little more than a by-now conventional "sustainable and inclusive growth" strategy other than having a more comprehensive set of indicators to guide it.

While welcoming the economic transformation strategy's commitment to create a wellbeing economy within environmental limits, WEAll Scotland (2022; see also Hardt, 2022) criticizes its insufficient plan of action. It pointed to positive elements, notably the plan for a "Wellbeing Economy Monitor" that expands the reporting of beyond-GDP wellbeing measurements[7] and a review of "how to increase the number of social enterprises, employee-owned businesses and cooperatives in Scotland." However, on the whole, it saw "a continuation of the same flawed logic that has delivered decades of inequality and environmental degradation" i.e., a prioritization of GDP growth and productivity in the hope that wealth will "trickle down"—an economic paradigm that "has driven a cycle of paying to fix what we continue to break" (Hardt, 2022).[8]

Post-growth and sufficiency elements in Scotland

Scotland's adoption of wellbeing as a core objective involves some downplaying of the centrality of economic growth, although to a lesser degree than in some formulations of a WE, in which sustainable wellbeing is the ultimate objective and economic growth is, at best, only a means among others to that end. Meanwhile, Scotland's use of a "beyond GDP" wellbeing measurement framework could be considered a step in a post-growth direction, although there is no indication that Scotland's government sees it as such. Scotland's NPF continues to measure changes in GDP, not merely as an accounting measure useful for limited practical tasks,[9] but in a form that illustrates a belief that the higher GDP growth, the better. The economic growth indicator compares GDP growth in the most recent year with average growth in the three previous years; GDP growth above the three-year average is considered an "improving" situation (Scottish Government, 2022b).

As in New Zealand, some of the most prominent sufficiency elements in Scotland's WE approach are in the emphasis on ensuring enough in terms of minimal consumption levels, i.e., commitments to reducing poverty and creating a fairer society. Whether the Scottish government has an adequate strategy to act on these poverty-reduction commitments is a separate question, beyond the scope of this article; suffice it to say that some critics argue that the prominent rhetorical emphasis on such issues is not matched by sufficient concrete action (Hardt, 2022). Although not the main focus of our analysis, one can also find sufficiency oriented policies targeting specific forms of consumption, such as a policy goal of a 20% reduction of car-kilometers traveled by 2030 (SNP, 2021).

There are also elements in Scotland's WE vision that do not necessarily reflect a sufficiency approach but could contribute to it. One is the acknowledgment of the importance of alternative business models such as social enterprises, employee-owned businesses and cooperatives (Scottish Government, 2022a, p. 37), which can enable a more equitable distribution of the rewards of ownership—an issue that becomes all the more important in in a post-growth society that can no longer rely on increasing the overall size of the economic pie. Such enterprises may also be less constrained by pressures to grow than conventional capitalist firms, as discussed below.

Also relevant is a preventative approach to social and environmental problems. Driven by factors including cost pressures in providing public services, poor health outcomes, costly lifelong effects of child poverty and youth unemployment, and high levels of criminal offending and reoffending, the Scottish government has had an interest in preventative approaches for over a decade (Wallace, 2019, pp. 47, 65–66). The value of spending on preventative measures to protect people and the environment remains an important theme in recent Scottish wellbeing economy debates (e.g., Walker, 2021), although critics would like to see more emphasis on prevention than on fixing problems afterwards (Hardt, 2022).

Iceland

Iceland's commitment to a wellbeing economy builds on a recent history of pushing the boundaries of what is possible economically. Its response to the 2008 financial crisis, which hit the country particularly hard, illustrated different priorities and different decisions about the distribution of the costs compared to other nations (Tan, 2018; Abrar, 2021, pp. 170–171). Iceland decided that its oversized banks were "too big to save" (Tan, 2018). While there were some spending cuts, social benefits

7 The Monitor "will include measures such as healthy life expectancy, fair work indicators, mental wellbeing, child poverty, greenhouse gas emissions and biodiversity" (Scottish Government, 2022a, p. 13).

8 WEAll Scotland's criticisms also included: the lack of public participation in developing the strategy, lack of action to ensure that power is shared more equitable with workers and communities, lack of strategy to ensure businesses contribute to thriving communities, and very limited signs that the government is living up to its responsibility to ensure "that we all have the basics, like safe warm homes, that we expand the economic activities we need more of, such as decarbonisation, not just those that offer the biggest profits" (Hardt, 2022).

9 Even a society that deprioritizes economic growth could track whatever annual variations in economic output occur to facilitate tasks such as government budgeting.

were protected, and Iceland was the only country to criminally prosecute bankers for their role in causing the crisis (Robinson and Valdimarsson, 2016). Iceland also ranks number one in the world in gender equality, according to the Global Gender Gap Report (WEF, 2021). Since 2017, Iceland has been led by an ecological feminist prime minister, Katrín Jakobsdóttir, who heads the Left-Green Movement (Nichols, 2018), which describes itself as a "radical left wing party, with emphasis on equality and sustainability" (Left-Green Movement, 2022). It has governed in an unusual coalition with the center/center-right Progressive Party and right-of-center Independence Party (Önnudóttir and Hardarson, 2017).

Wellbeing measurement and prioritization

An important step toward an Icelandic WE was the commitment in the 2017 coalition government agreement to create a cross-party task force on "the development of indicators to measure economic prosperity and the quality of life" (Government of Iceland, 2017, p. 4; see also Birkjær et al., 2021, p. 34). In 2018, the Prime Minister's Committee on Indicators for Measuring Wellbeing commissioned a survey about the determinants of quality of life most important to Icelanders; the top factors were health (good health and access to healthcare), relationships (with friends, families, neighbors, and colleagues), housing (access to secure and affordable housing), and making a living (income and assets) (Government of Iceland, 2019a, p. 5). The survey contributed to the development of a framework of 39 indicators covering social, economic, and environmental dimensions of quality of life that was introduced in 2019. These indicators, which are linked to many of the UN SDGs, are "intended to complement traditional economic measures, such as GDP" (Government of Iceland, 2019b)—indeed, GDP and economic growth are among the 39 indicators (Government of Iceland, 2019a, p. 2).

In 2019, the government identified six wellbeing priorities—mental health, secure housing, better work-life balance, zero carbon emissions, innovation growth, and better communication with the public—to guide monetary allocations in the annual budget and the country's five-year fiscal strategy (Abrar, 2021, p. 172; Birkjær et al., 2021, p. 35). These priorities were established, in part, based on the 2018 quality of life survey, while also taking into account other government goals such as gender equality and the degree to which government policy could make a difference over a five-year period (Birkjær et al., 2021, p. 35).

Taking the welfare state one level up

Recent policy actions reflect the above-mentioned priorities, illustrating a commitment to a strong Nordic welfare state and relatively ambitious climate action (Jakobsdóttir, 2019a; Government of Iceland, 2021), while also aiming to manage public finances responsibly (Ministry of Finance and Economic Affairs, 2021). The country's WE approach has been characterized as an effort to "to take the traditional Icelandic welfare state one level up," with the goal of creating "a virtuous circle in which citizens' wellbeing drives economic prosperity, stability and resilience, and *vice-versa*, that those good macroeconomic outcomes allow to sustain wellbeing investments over time" (Birkjær et al., 2021, p. 34). In 2019, the prime minister stated that "Our main project has been to invest significantly in social infrastructure, healthcare, welfare, education" (Jakobsdóttir, 2019a). Recent initiatives have included a social housing plan to address affordable housing scarcity, a significant increase in child benefits, and an extension of parental leave (shared between partners) from 9 to 12 months (Jakobsdóttir, 2019b). The 2021 coalition agreement similarly promises to maintain a "strong welfare system" as "the basis of equality" and "promote a healthy society," which includes not only investments in healthcare services, but also "more emphasis … on public health, prevention and mental health" (Government of Iceland, 2021, pp. 17, 21).[10] The latest coalition agreement also proclaims that "We are going to prioritize climate issues." Iceland has an interim goal of reducing GHGs 55% below 2005 levels by 2030 on the way toward "carbon neutrality and full energy conversion no later than 2040," which would "make Iceland the first state to be independent of fossil fuels" (Government of Iceland, 2021, p. 9; see also Nichols, 2018).

The goal of "a strong society of wellbeing and equal opportunity" is balanced with ensuring "that expenditure growth remains modest" in Iceland's fiscal budget proposal for 2022. Moderate spending is related to "the guiding principle underlying the fiscal strategy [which] is to halt the rise in the debt-to-GDP ratio no later than 2026." Limiting the debt-to-GDP ratio and halting debt accumulation is seen as necessary "to ensure the financial resilience of the public sector," i.e., safeguarding the government's ability to respond to future economic shocks and finance public services and transfers even as costs grow due to an aging population (Ministry of Finance and Economic Affairs, 2021). This formulation highlights the constraints on fiscal capacity for public spending to address wellbeing goals that are related both to the level of debt and GDP: action to limit debt expands future public spending capacity, as does an increase in GDP. These issues are related to the growth dependency of contemporary states, which we return to below.

10 The 2022 budget proposal also gives a high priority to healthcare in terms of resource allocation, while continuing personal income tax changes that emphasize reducing the tax burden on lower-income households (Ministry of Finance and Economic Affairs, 2021).

Post-growth and sufficiency elements in Iceland

At first glance, the possibilities for a sufficiency-oriented WE approach appear more promising in Iceland. Compared to other WEGo leaders, Prime Minister Jakobsdóttir's statements illustrate a more critical analysis of the contemporary growth economy and the need to put saving the planet ahead of saving capitalism as we know it (Jakobsdóttir, 2019a), and point toward a more radical post-growth WE vision with a strong sufficiency component. In an address to a WEGo workshop in Edinburgh, Jakobsdóttir (2019b) stated:

> We have built an economic model under which constant growth is not only essential, but also considered positive no matter how it is achieved and at what costs. This has led to increased social and economic inequality and an ever-escalating climate crisis. It has left us in a cycle of wasteful consumption where we need to produce in order to get by and we need to consume so that we can produce more.

She went onto say that the "Wellbeing Economy Governments project differs from this thinking." Jakobsdóttir (2020) later wrote that a WE is an "attempt to develop a new economic model, which is centered on wellbeing rather than on production and consumption." She added: "Our generation has no option but to change the way we live." Echoing sufficiency-oriented ideas of critics of consumerism, Jakobsdóttir (2019b) has argued that: "Carbon neutrality can actually bring us opportunities for increased wellbeing. Less consumption and a slower pace of life will help halt climate change while also increasing general wellbeing."

Such ideas may not be so unusual within left-green political circles, but they are much less common in prime ministers' offices. To what degree has this critical perspective on a growth- and consumption-oriented economic model made its way beyond speeches and into government policy?

Very little, if it all, if one judges by the 2021 agreement that outlined the governing agenda for the re-elected coalition of the Independence Party, Progressive Party, and Left-Green Movement (Government of Iceland, 2021). While the document refers to Iceland as a wellbeing economy and commits to strengthening cooperation with other WEGo nations (pp. 7, 58), the first specific commitment after a general introduction is: "We are going to grow to greater prosperity … Growth and prosperity are the government's guiding lights in economic affairs" (p. 5).

The coalition agreement includes the following commitment: "The growth potential of the economy will be boosted with strong support for innovation, research and development …" (p. 26). This point responds to concern expressed in the country's five-year fiscal policy statement for 2022–2026 about the effects of declining productivity growth and an aging population (Ministry of Finance and Economic Affairs, 2021), which are two factors that have been highlighted as drivers of "secular stagnation" of contemporary economies (Gordon, 2016). Due to these factors, the Icelandic economy's annual potential growth rate has fallen from 2.7 to 2.3%—a rate still well above zero, but which means that annual GDP will be 300 billion Icelandic krona (~US$2.33 billion or US$6,700 per capita), lower in 25 years than otherwise (Ministry of Finance and Economic Affairs, 2021).

In a sufficiency economy, such a trend would be no cause for alarm—and could be welcomed as a sign of the maturation of the economy that will bring environmental benefits. However, Iceland's fiscal policy statement highlights the challenges that lower growth will create and seeks to counter it. It notes that an aging population will increase demand for public spending, while slower economic growth will—unless the tax system is changed—reduce tax revenues and public spending capacity. Rather than accepting slower growth, the statement emphasizes a policy role "in counteracting this trend and promoting increased long-term potential output throughout the economy" through increased investment and by fostering a climate of economic stability (Ministry of Finance and Economic Affairs, 2021).

The fact that the Left-Green Movement governs in coalition with two right-of-center parties—and is the junior party based on parliamentary seats[11]—undoubtedly constrains how far it can move in a post-growth direction. That said, the Left-Green Movement (2022) itself still refers to "sustainable growth" as an economic priority, and justifies its commitment to equality in part by referring to research showing that "increased inequality reduces economic growth. An economic policy that reduces inequality will not only lead to a fairer society, but also to a richer society." (However, the party does highlight a number of sufficiency-oriented ideas targeting particular products or sectors rather than the economy as a whole).[12] Meanwhile

11 The Left-Green Movement was the second largest party after the 2017 election, behind the Independence Party, and fell to third behind the Progressive Party in 2021, although it held onto the prime minister's office.

12 This includes commitments to: reduce consumption of unsustainably produced meat, reduce transportation of imported food by promoting domestic vegetable production, reduce food waste, improve public transit to enable less private vehicle usage, and plan urban areas "so that public transport, cycling and walking become viable options" (Left-Green Movement, 2022).

Prime Minister Jakobsdóttir (2019a,b), despite other growth-critical statements, also speaks of the need for "inclusive growth."[13]

While Iceland clearly has not moved fully into a post-growth growth era, its embrace of the WE concept does involve a more limited—and still incomplete—shift toward seeing wellbeing as the end goal and GDP growth one means among others to achieve it.

One other policy area is worth mentioning in connection with a politics of sufficiency: work-time reduction. Iceland has seen some of the most significant recent experimentation with a shorter workweek. Other WEGo nations have also seen prominent work-time reduction initiatives of their own (BBC, 2021; Taunton, 2021). In 2015 and 2017, Reykjavík City Council and the national government initiated two major trials, involving more than 1% of the country's workforce, with many employees moving from a 40- to 36- or 35-h workweek without loss of income. Success in meeting the trials' goals—improving worker wellbeing, while maintaining (or increasing) productivity and service provision—subsequently led to the negotiation of more permanent, although more modest workweek reductions for tens of thousands of employees (Haraldsson and Kellam, 2021; see also Kobie, 2021; Lau and Sigurdardottir, 2021). Although these work-time initiatives have not been framed mainly as a post-growth alternative to increased consumption and production, building on such experiences could be important in taking the WE concept further in a post-growth direction, as discussed below. Indeed, the Left-Green Movement (2022) wants to continue shortening the work week; one MP has said "the next step is to reduce working hours to 30 hours per week" (Bjarkey Olsen Gunnarsdóttir, quoted in Haraldsson and Kellam, 2021, p. 55).

Discussion

Wellbeing economy as a weak post-growth perspective

WEGo countries are now exploring what it means to create a wellbeing economy, a development that has promise as well as limitations for advancing a sufficiency-oriented post-growth politics.

Advocates of a post-growth transformation have argued that GDP growth must be deprioritized in high-income nations if planetary boundaries are to be taken seriously (e.g., Koch, 2020, p. 123; Corlet Walker et al., 2021, p. 2). The commitment to a wellbeing economy is a step in that direction as wellbeing becomes the overarching goal, with growth relegated to a means to achieve it (a step that is most clearly evident in New Zealand). However, this step is a small one as GDP growth remains important to all three countries. Similarly, a post-growth vision often starts with the idea of moving beyond GDP and measuring progress in new ways (e.g., Alexander, 2016; Jackson, 2020). WEGo nations are indeed measuring wellbeing in more comprehensive and meaningful ways. That said, these new measurements do not mean that governments are ignoring GDP to the extent that many post-growth theorists would like to see (e.g., van den Bergh, 2011, p. 888).

In addition to "measuring what matters," Jackson (2020, p. 5) identifies a second of three key steps for wellbeing economies: "to align government policy as fully as possible with the goal of achieving societal wellbeing rather than with the narrow pursuit of GDP growth." Although work remains on this front, WEGo nations have taken important steps in this direction, e.g., through New Zealand's wellbeing budgets and Iceland's establishment of wellbeing priorities to guide budget allocations and the country's five-year fiscal strategy. Also noteworthy in all three countries are preventative investments to help improve or maintain wellbeing from the outset, discussed in more detail below.

In all three WEGo cases examined, a commitment to sufficiency is more evident with regard to ensuring people have the minimum requirements to live good lives than it is with limiting excessive production and consumption. Indeed, the WE concept shows a clear affinity with strengthening the welfare state. Also evident is a growing emphasis on investments in programs to improve mental health, which are a "new frontier for the welfare state" (Layard, 2012), and have the potential to bring substantial wellbeing benefits.

The emphasis on social spending to improve wellbeing can be seen as a move away from neoliberalism, even if WEGo countries try to remain within fiscally responsible spending limits and critics argue that WEGo policies to reduce poverty and inequality ought to go further. Scotland and Iceland also stand out for relatively ambitious climate targets and policies, while New Zealand, long a climate laggard, has recently introduced stronger climate policies. The net effect could be characterized as somewhat more social democracy and climate action, broadly consistent with ideas of "inclusive and sustainable" growth.

While critics of neoliberalism and climate inaction could hail that as a step forward, post-growth WE proponents have been clear that the goal is not merely an improved growth model. Indeed, Fioramonti et al. (2022, p. 2) maintain that, with the rise of the wellbeing economy, it "is the first time that a variety of national governments," with the support of the OECD, "openly unite on the basis of a post-growth agenda." However, the cases examined here suggest that it is an error to assume that governments that adopt a wellbeing economy language are also embracing the full range of post-growth ambitions that

13 A similar phenomenon of political leaders putting forward a critical perspective on the economic growth paradigm, while reverting to a pro-growth framing in other contexts, is evident in other countries as well (Hayden, 2014b, pp. 125–127, 311–318), reflecting the difficulties of trying to pursue a post-growth politics in a political-economic system still dependent on growth.

motivated those who first developed the concept. While the WEGo case studies illustrate some elements consistent with a post-growth agenda, as noted above, what has made it through the process of political mainstreaming to date is a largely pro-growth WE vision, amounting at most to a "weak post-growth" approach. Meanwhile, institutions such as the Council of the European Union (2019) and OECD (2019) have been explicit all along in depicting a wellbeing approach as a contributor to an economic growth agenda.

Even if governments and political leaders were to have stronger post-growth aspirations, they would still struggle to achieve them in a context of growth dependency. Indeed, some statements by Iceland's Left-Green prime minister, Katrin Jakobsdottir, suggest that she does have a critical perspective on an economy focused on production and consumption growth. However, the Icelandic case shows the strong pressures on anyone managing the state to ensure sufficient revenue to fund wellbeing-enhancing social spending and other state activities. Combined with the challenges of keeping together an ideologically diverse governing coalition and maintaining support among voters, the result is a government policy agenda that emphasizes economic growth as a high-priority means to the end of wellbeing. Another way to state the problem is that simply declaring that economic growth has been replaced by wellbeing as the end goal does not in itself reduce dependence on growth. The "glass ceiling" of environmental transformation (Hausknost, 2020) cannot be so easily broken.

Taking the wellbeing economy in a strong post-growth direction

Tackling growth dependency

In addition to measuring success in new ways and aligning policy with the goal of achieving societal wellbeing, Jackson (2020) identifies a third step in moving beyond growth: tackling growth dependency (EESC, 2020; Petschow et al., 2020; see also EEB and Oxfam Germany, 2021, pp. 28, 29). This is the most challenging of the three steps and the one that WEGo nations have done least to address. We do not claim to have full answers to how to address this complex but vitally important problem, a full analysis of which is beyond the scope of this article. In this section, we point to some ways that WEGo nations, and others, might contribute to finding solutions and thereby help a stronger post-growth WE vision to emerge.

A good start would be to openly acknowledge growth dependency as a problem and support research into better understanding and overcoming it. WEGo nations could make an important contribution by carrying out inquiries into growth dependency of their economies and possible responses, as advocated by Jackson (2020, 2022) for the UK and the European Economic and Social Committee (EESC, 2020) for EU member states, building on existing analysis of such issues (Petschow et al., 2020).

Two of the most fundamental challenges are disentangling employment and the welfare state from their growth dependency. With regard to the former, profit-seeking businesses in competitive markets face strong pressures to increase efficiencies and reduce labor inputs and costs, and the resulting increases in labor productivity threaten to increase unemployment—unless economic output expands at a rate sufficient to absorb those displaced by more productive methods as well as new entrants to labor markets. In the post-growth literature, a widely discussed response to this issue is to use labor productivity gains to reduce work hours, thereby helping maintain employment and economic balance even in a non-growing economy (Hayden, 1999; Schor, 2001; Kallis, 2018; Lange, 2018; Victor, 2019)—while also creating time affluence as an alternative to more material affluence by freeing up time for a less stressful, more convivial life. As noted above, WEGo nations have recently introduced work-time reduction initiatives of various kinds, which provide experiences they could build on. That said, to make a stronger post-growth contribution, the vision for work-time reduction initiatives would have to shift from the recent emphasis on reducing work hours without any sacrifice of output (by ratcheting up hourly productivity) toward seeing work-time reduction as an alternative to continued economic expansion and consumption growth.

WEGo nations could also make contributions by exploring other options to decouple employment—and economic security more generally—from growth, including establishment of a job guarantee (Alcott, 2013), universal basic services (Coote and Percy, 2020), or variations on a basic income (Van Parijs and Vanderborght, 2017). Of course, such policies require funding, which points to a tension—evident in the WEGo case studies—between those aspects of a WE agenda that require greater public spending and a post-growth vision that, all else being equal, would limit state revenues. This leads to the challenging question of reducing the growth dependency of the welfare state. Work on envisioning a post-growth welfare state is a growing topic of its own (e.g., Gough, 2017, pp. 178–184; Büchs, 2021; Corlet Walker et al., 2021; Koch, 2021). We highlight two main issues here: ensuring adequate supply of resources for wellbeing-enhancing programs while also reducing demand for welfare-state services.

On the supply side, in a post-growth environment, there is a need to develop additional revenue sources—ideally ones that contribute to more equitable distribution and curb consumption among the wealthiest in line with a sufficiency approach. Among the options are the introduction, or increase, of taxes on wealth (Marriott, 2022), inheritance, and property, which are less affected by economic fluctuations (Büchs, 2021). Also relevant are taxes on luxury consumption, high-environmental-impact consumption (e.g., meat, air travel), and potentially much higher taxes on high incomes (Koch, 2021)—at the limit, calls in post-growth circles for a maximum income

would in effect establish a 100% tax above the maximum. Expanded efforts to tackle tax evasion would complement such efforts. Measures of this kind will undoubtedly face substantial opposition from vested interests although they may also find popular support—research in Sweden shows substantial support for a wealth tax, for example (Koch, 2021). Such issues suggest that the move to a stronger post-growth WE will be politically contentious and require a politically mobilized base of support to overcome opposition—points downplayed by those who highlight wellbeing's broad "post-ideological" appeal.

Even more contentious than taxation is more equitable ownership, a longer-term challenge that is also relevant to moving beyond growth dependency. In a non-growing economy, if states are to have adequate revenues to provide services and transfers, and individuals are to have adequate income and economic security, then an equitable distribution of ownership becomes increasingly important (Gough, 2017, pp. 179–181). The exact mix of possibilities is open for debate: public ownership of enterprises at national, state/provincial, or municipal levels, sovereign wealth funds, labor- or community-owned enterprises, co-operatives, or other options. Whatever options chosen, as Gough (2017, p. 180) argues, in a post-growth economy, there is a need "to spread the ownership of wealth" and to "give everyone a stake in capital and a non-labor source of income." Beyond the issue of equitable distribution of the rewards of ownership, enterprises with alternative ownership forms may also be less constrained by pressures to grow than conventional shareholder-owned capitalist firms that face strong pressures to deliver returns to investors (Petschow et al., 2020, pp. 49–50, 54, 57). The Scottish Government's (2022a) pledge to review ways to expand the number of social enterprises, employee-owned businesses and cooperatives is a small but potentially useful step toward more equitable ownership; WEGo nations could contribute to a post-growth agenda by going further in this direction.

Regarding demand for public spending, wellbeing economy advocates emphasize a preventative approach to social and environmental problems—aiming to get things right the first time rather than paying to fix problems after they have been created (Chrysopoulou, 2020; Trebeck, 2020). In healthcare, for example, emphasis shifts from (over)-reliance on medical therapies and pharmaceuticals toward the social, political, and environmental determinants of health (Corlet Walker et al., 2021, p. 8). A healthier work-life balance, lower inequality, and less environmental pollution are among the factors that could help reduce needs for costly service provision (Koch, 2020, p. 129; see also Büchs, 2021, p. 326). As noted above, WEGo nations have introduced some preventative initiatives. Going further in this direction, as WE proponents have advocated (Hardt, 2022), stands out as one important way to reduce growth dependency by limiting state revenue needs.

A related issue important to curbing growth dependency is action to eliminate rent-seeking in the provision of wellbeing-enhancing services so that they can be provided at lower economic cost. Analysis of growth dependency in the UK, for example, has also shown that welfare state resources have been diverted from providing services to enriching private investors through the financialization of Britain's social care sector (Corlet Walker and Jackson, 2021; HOCEAC, 2022, p. 20)—a phenomenon that a different policy regime and ownership model could avoid.

This section has provided a brief overview of some of the issues and options related to the difficult challenge of reducing growth dependency. Much more academic and political work on these issues is needed. Research and policy initiatives that grapple with these challenges would be a valuable way for WEGo nations and other WE supporters to make a stronger contribution to a post-growth agenda.

Expanding on other sufficiency-related elements

An additional positive element of the WE concept from a sufficiency perspective is that it draws attention to factors that contribute most to wellbeing—many of which are not about material consumption. The growing evidence base on the determinants of wellbeing and life satisfaction has shown, for example, that factors such as enhancing a sense of social belonging, freedom, fairness, mutual support, and trust have greater potential to improve wellbeing and are more environmentally sustainable than increased material consumption (Barrington-Leigh and Galbraith, 2019; Helliwell, 2019). A wellbeing economy framing thus has potential to open space for debate about how individuals and societies can achieve better lives in less material intensive ways.

A range of sufficiency-oriented policies could benefit from expanded understanding of the sources of wellbeing. Already mentioned is work-time reduction, which can give people give people their "pay increase" in the form of more time rather than higher incomes and consumption. A wellbeing approach also gives a new justification for restrictions on advertising, which might start with limits on ads for GHG-intensive goods and services. Advertising aims to generate dissatisfaction with what people already have; indeed research shows that increased advertising expenditure in nations is followed by significant declines in life satisfaction (Michel et al., 2019), a result that is clearly counterproductive if the end goal is not GDP growth but wellbeing. Urban planning that emphasizes active and public transportation, and enables people to meet daily needs within their neighborhoods—in line with concepts such as the "15-minute city" (O'Sullivan and Bliss, 2020) and "city of short distances" (Marletto et al., 2016; Hamiduddin, 2018)—has considerable promise in enabling people to live well with far less automobile use and, more generally, in improving the

quality of urban life. Some steps in this direction are evident in WEGo nations, as noted above. Undoubtedly one could add many other examples to the list. Action by WEGo nations on issues of this kind, building on synergies between enhanced wellbeing and sufficiency, would be another way to take the WE concept further in a post-growth direction.

One final point relates to the content of the "beyond GDP" indicators that WEGo nations and others have developed. Although a step forward in de-centering GDP, the indicator sets used in the three WEGo cases examined provide only limited information on environmental (un)sustainability, emphasizing domestic environmental quality and territorial GHG emissions, but lacking indicators that illustrate the wider global impacts of domestic consumption (with the partial exception of Scotland's NPF)[14]. Including measures such as consumption-based material, ecological, and carbon footprints or other indicators related to key planetary boundaries would help complement data on current levels of wellbeing and support a post-growth narrative.

Conclusion

As one of the main ways that sufficiency-oriented thinking has made inroads into mainstream politics, the wellbeing economy is worthy of serious consideration, both for its potential and limits to date. Present trends suggest that the wellbeing economy is emerging as a "weak post-growth" perspective—one that moves beyond economic growth as the central goal, and beyond GDP to a more comprehensive set of wellbeing indicators, but in practice remains dependent on economic growth. To become a "strong post-growth" perspective, it needs to be linked to a much more challenging project of disentangling contemporary societies' dependence on economic growth to meet intermediate goals such as employment creation and provision of social welfare, which are closely associated with the ultimate goal of wellbeing. The steps taken so far—important as they are—are only the tip of the iceberg in creating a post-growth wellbeing economy that emphasizes sufficiency.

14 Scotland does include a carbon footprint indicator in its NPF.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

Author contributions

AH and CD contributed to the conception of the study, identification of documents for analysis, and interpretation of results. AH coded the documents and wrote the first draft of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The societal conditions for achieving sufficiency through voluntary work time reduction: Results of a pilot study in Western Switzerland

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Can the voluntary reduction of working hours as a sufficiency practice promote more environmentally sustainable forms of consumption along with human well-being? In this exploratory study conducted at the end of 2018 in Western Switzerland, we use the social practices and systems of provision approaches and a definition of well-being based on human need satisfaction to answer this question in the context of an affluent country where women typically work-part-time after the arrival of children due to limited family policies. In-depth interviews with people in couples, with families, where men have also voluntarily engaged in work time reduction (WTR) (n = 14), indicate that some do indeed simultaneously enjoy a high level of well-being, while limiting consumption and ecological impact. However, these are almost exclusively couples with high cultural and social capital who have adopted non-consumerist and gender egalitarian norms, despite the "culture of affluence" that dominates in Swiss society. Moreover, truly resource-sufficient lifestyles seem to be possible only for people who live in settings that offer ecological options by default, thus emphasizing the importance of systems of provision that make some forms of consumption and well-being more probable and possible than others. The article therefore argues that sufficiency as a practice must go beyond personal motivations to consider the societal conditions that support sustainable well-being.

KEYWORDS

sufficiency, sustainable consumption, well-being, Switzerland, voluntary work time reduction

Introduction

Humanity is facing a major challenge: transforming its production and consumption patterns to respect planetary boundaries and ecological limits (Rockström et al., 2019)[1], while accounting for social justice. Countries in the so-called global north contribute more than their fair share to environmental ailments including the climate crisis and

1 We recognize the "limitations" of the "planetary boundaries" approach (as discussed in Brand et al., 2021), but nonetheless use this concept as a shorthand for delineating environmental impacts at various scales and across several criteria, such as climate change and biodiversity loss.

biodiversity loss, reviving the debate on whether to ascribe more weight to population size, affluence, or technological efficiency when it comes to reducing negative impacts (see Chertow, 2001). We concur with Wiedmann et al. (2020) in seeing affluence as the main culprit in this equation: technological solutions face an uphill battle when it comes to countering the effects of the growing consumption patterns associated with affluence. If the affluence of a population can be related to income revenues, it follows that a voluntary reduction in revenues might indicate a move toward reduced consumption patterns and associated impacts. Voluntary work-time reduction (WTR) is therefore an example of what can be termed a sufficiency practice, aimed at achieving a sense of "enoughness" (Spengler, 2016). A sufficiency practice leads to consumption levels which are sustainable, meaning that they are acceptable both socially (a minima is achieved) and environmentally (a maxima is respected) (Fuchs et al., 2021). Reducing time spent in employment decreases household income and thus the resources available for consumption (Nässén and Larsson, 2015); even if the freed-up leisure time could result in greater ecological damage, changes in income also affect the way leisure time is spent (Buhl and Acosta, 2016). Studying WTR in affluent countries is therefore an interesting avenue for discussing one way in which sufficiency might be practiced.

Sufficiency, as a practice and as studied here through the example of WTR, can be linked to at least two normative aims: respecting environmental boundaries when it comes to consumption patterns, but also maintaining high levels of human well-being. The notion of "sustainable well-being" (Fuchs et al., 2021) effectively captures this dual aim. Several studies consider the links between work time reductions (WTR), reduced environmental impacts, and increased well-being, notably in the degrowth literature (Kallis et al., 2013; Buhl and Acosta, 2016; Gough, 2017; Gunderson, 2019; Gumbert et al., 2022). Starting with the aim of reducing ecological impacts, authors in the Global North have been proposing WTR as part of the solution for at least two decades (Gorz, 1999; Sanne, 2002; Kasser and Brown, 2003; Schor, 2005; UNEP, 2008; Victor, 2008). There is compelling evidence to suggest that countries with long working hours exhibit higher ecological footprints, not least due to consumption patterns (Schor, 1998). WTR may allow for a change in consumption patterns, with free time allocated to more environmentally friendly practices (Buhl and Acosta, 2016). Yet a decrease in income does not automatically lead to a better respect of planetary boundaries, as free time can be spent on consumerist practices (Kallis et al., 2013; Buhl and Acosta, 2016). Based on these studies, the ecological impacts of WTR and related consumption patterns depend on many factors, such as the level of household income and savings, how free time is organized and work-leisure time is coordinated, but also social expectations and meanings around leisure time.

Whether and how WTR achieves human well-being also merits unpacking. The scientific literature tends to emphasize the negative effects of withdrawal from paid work, with paid work seen as a key factor in the well-being and health of individuals (SSAC, 2016). Full-time employment in some contexts, such as Germany, "provides social recognition and status, whereas part-time work leads to a loss of economic and symbolic capital, i.e., a loss of income and occupational status" (Buhl and Acosta, 2016 p. 274). An important exception involves, at least for now, mothers who invest in family work: they maintain an equivalent level of well-being outside of employment as those in employment, especially in less progressive gender contexts such as Switzerland (Hagqvist et al., 2017; Notten et al., 2017; Rossier et al., 2022). In other words, a withdrawal from employment does not necessarily worsen the level of well-being and health of the individuals involved, but it must be socially valued. In the German study, caring for children and personal health were simultaneously cited as the main motivators for WTR (Buhl and Acosta, 2016). For those reducing work to increase leisure time, there can also be positive effect on well-being, so long as certain services are provided for, such as access to education, the availability of leisure activities, the possibility of having a political voice in society, and indeed, a "culture of leisure" that values time off from work (Kallis et al., 2013). However, mothers' part-time work and the gendered occupational segregation which structurally supports these choices are seen as the main factors sustaining gender inequalities in high income countries; these processes are more pronounced where family policies are weaker (Fagan and O'Reilly, 2020).

The brief review above reveals the ambiguity around voluntary WTR, as a proxy for sufficiency practices, in achieving the aim of "sustainable wellbeing." What is clear, however, is that this dual aim is not achievable at the individual level alone. The ability of individuals to exercise autonomy over their work time and consumption choices is one thing, but such motivations are directly linked to cultural and gendered expectations around employment, family care, leisure time, as well as the services, infrastructures and opportunities that are available. The over-individualization of environmental responsibility has been a central critique in sustainable consumption studies for some time, and obscures the more structural and systemic, and thus political, changes that are needed to achieve such an aim (Cairns, 1998; Maniates, 2001; Anantharaman, 2018; Balsiger et al., 2019). These critiques suggest moving beyond the unit of the individual consumer, to consider how people carry out social practices that are embedded in material arrangements and social meanings, but also how systems of provision make certain practices more probable and possible than others. We will further discuss this approach, as well as our definition of well-being, in the conceptual framework below.

It would follow that there are some settings that are more conducive to sustainable well-being. In what Dubuisson-Quellier (2022) calls a moral economy of affluence, societies

are currently organized to support a value regime around abundance, full-time employment and affluent consumption, through policy measures, public discourses, corporate strategies, and the like. For parents with small children, the "breadwinner model" has been applied to maintain high levels of consumption, with men strengthening their involvement in the job market, allowing women to work part-time or retreat from the job market and care for the family (Gibb et al., 2014). The resulting "lock in" to unsustainable levels of consumption and gendered inequalities in these households is not only due to work-spend patterns, the availability of credit, or savvy marketing tactics (Schor, 1998; Sanne, 2002), but also a normative frame around what it means to live the good life (Fuchs et al., 2021). This is further reinforced by what has been termed "social lock in" (Sahakian, 2018), or how such expectations around the good life are tied to social groups, particularly elites, and the reproduction of their acquired status in societies. Switzerland is a highly relevant context in which to study affluence, as the moral economy of affluence is pervasive there: it is shared by Swiss residents. But this culture is also that of the urban elites in the global south. On a planet where local consumption leads to global impacts, not least the climate crisis, how to achieve sufficiency through WTR practices in settings that are more or less affluent, in terms of infrastructures and social policies for example, but nonetheless committed to a moral economy of affluence, is a question we will return to in the conclusion.

The main aim of this paper is to uncover what societal conditions could support WTR among men *and* women as a form of "sufficiency" in Switzerland today, understood as a practice that aims toward sustainable well-being. In the section Conceptual framework that follows, we describe how we understand sufficiency as a social practice facilitated by systems of provision, and cultural and social capital. We also provide our definition of well-being in the eudemonic tradition, as meeting human needs. We then present our methodology, which involved in-depth interviews with 14 people in Switzerland in couples where men as well as women have purposefully reduced their work time. After presenting our results, we discuss the societal conditions that are necessary to support men and women's WTR as a sufficiency practice. In the conclusion, we reflect on the question of scale and social justice, or what the Swiss study implies for other settings.

Conceptual framework

Social practice theory is a combination of affiliated theoretical approaches that build on earlier attempts in the social sciences to address the dichotomy between structure and agents, starting with authors such as Giddens, Bourdieu and Foucault. These authors attempted to answer the fundamental question of whether the site of the social lies in structural elements, such as culture, or rather in the agency of people. More recently, theorists such as Schatzki (1996) and Reckwitz (2002), have proposed a contemporary conceptualization of social practices, which has been widely used in sustainability and consumption studies, and is beginning to be used in family studies (Morgan, 2017; Wilson and Tonner, 2020), among other fields. A key aspect of this understanding of social practice is that the focus shifts from individuals or structures to practices as the object of study: it is the doings and sayings of everyday life that become the site of social inquiry. Building on these ideas, and while acknowledging the heterogeneity of existing definitions, Welch and Warde (2015, p. 85) have suggested a minimal definition of social practice as "...an organized, and recognizable, socially shared bundle of activities that involves the integration of a complex array of components: material, embodied, ideational and affective. Practices are sets of "doings and sayings"; they involve both "practical activity and its representations'."

In the context of our study, examples of social practices are from an "employment and gender" point of view: working part time and dividing paid and unpaid work between spouses; and from a "consumption" point of view: getting around, buying clothes, or heating and living in homes. Social practices, then, are collective patterns of activity that are recognizable and reproduced over time and space, but which are constantly changing because practitioners are always enacting the practices in different ways. Social practices are held together by various elements, such as meanings, materials, and skills (Shove et al., 2012), or in another interpretation by understandings, procedures, and forms of engagements (Warde, 2005), or for yet another, bodily elements – including cognitive processes, emotions, and physical dispositions; as well as material elements – including technology and infrastructure; and social elements – including frameworks, norms, values, and institutions (Sahakian and Wilhite, 2014).

To summarize, how people engage as practitioners in a given activity might relate to the skills and competencies they have acquired, as well as the institutional and material conditions in which they are performing a given practice. Practices always imply certain societal conditions. Empirically, studying practices also implies uncovering the meanings of a given practice, which are culturally specific. In this respect, the notion of "teleoaffectivites" (Schatzki, 1996) is useful, in that it suggests that practices have aims and objectives, to which affects are assigned. As Welch (2017) suggests, these can be studied empirically as "motivations" held by different practitioners. Social practice theory becomes relevant in recognizing that motivations are not individually held, but rather tied up with ways of doing that are collectively understood as shared meanings. Motivations are thus cultural expectations interpreted differently by social groups, such as the value given to leisure time.

In the Bourdieusian tradition, social groups not only share meanings of the good life but also have different resources at their disposal that allow them to effectively live up to cultural

expectations. This might imply access to economic resources (economic capital), a certain education (cultural capital) or family and friend support systems (social capital). Economic capital is made of income, fortune and access to state subsidies. Cultural capital can be acquired through institutions, such as academic degrees, but also through the acquisition of cultural goods, such as works of art. Social capital refers to relations and acquaintances, and all forms of capital help to stabilize social reproduction of a group over time.

How people engage in practices, such as working part time, depending on their gender also reveals broader systems of provision. Compatible with Dubuisson-Quellier's (2022) call to consider the governance techniques that privilege affluent consumption over sufficiency practices, the "systems of provision" or SoP approach "… is based upon understanding the structures, relations and agencies that underpin the chain of activities linking production to consumption" (Fine and Bayliss, 2022). An analysis of the SoP reveals what is needed to be in place, collectively, before any individual act of consumption can occur. It draws from what has been termed "a political economy of excess" (Bayliss and Fine, 2020) in uncovering how affluence and excess have been made possible and even probable in contemporary consumer cultures. Both private and public provisioning determines who gets to consume what and how, in relation to specific socio-cultural settings. A link can be made quite effectively to social practices, as the practice of "engaging in work time reduction" (WTR) is made possible because of certain institutional arrangements, but also underlying cultural expectations: for example, whether women or men are seen as primary caregivers, how this is reinforced through corporate pay structures that privilege men, or the availability of public childcare. Systems of provision reveal societal conditions for sufficiency vs. affluence, some being highly visible – like public transport systems, or shared vegetable gardens; and some less visible but all the more pertinent – such as public or corporate policies, or gendered cultural expectations around childcare and paid work.

Now that we have shared our approach to understanding WTR as a social practice facilitated (or undermined) by (gendered) systems of provision, we now define the two normative aims put forward in this paper: how WTR as a sufficiency practice might achieve environmental sustainability and human well-being. We build on a growing body of literature that explores this notion of "sustainable well-being" (Jackson, 2005; Guillen-Royo and Wilhite, 2015; Gough, 2017; Sahakian and Anantharaman, 2020; Fuchs et al., 2021). In terms of environmental sustainability, we considered in this study certain consumption domains that are acknowledged in the literature as having high environmental impacts in Europe: these involve food, transport/mobility, and energy usage in the home, particularly for heating (Tukker et al., 2005), but also housing surface area (Jack and Ivanova, 2021) and clothing and accessories (Iran and Schrader, 2017). More sustainable consumption patterns imply consumption across these priority categories. How to study well-being is not self-evident, as there are multiple interpretations of this term. For our study, we chose a eudemonic approach based on reducing harm through the satisfaction of human needs. Different lists of needs exist, and each are relevant – such as the Deci and Ryan (2008) approach, which distinguishes three basic psychological needs: autonomy, affiliation and competence. For this study, we use the "protected needs" approach of Di Giulio and Defila (2020), which identifies the human needs of a particular society, those that it can foresee and protect – implying an ethical obligation to provide for and meet these needs (culturally, socially, politically, economically, etc.). Because of our interest in the collective conditions that are necessary to perform sufficiency in Switzerland, their list of nine protected needs (Appendix 1), which was validated through a representative quantitative survey in Switzerland, seemed the more relevant.

The human needs-based approach is compatible with both a social practice and systems of provision approach: if the Di Giulio and Defila (2020) list of Protected Needs are seen as ends in themselves, un-substitutable and satiable (as is the case with other lists), how these needs are satisfied is always context dependent. It is through social practices, which are socially embedded, that human needs are satisfied (Sahakian and Anantharaman, 2020), practices which rely on systems of provision. Meeting needs, in a situation of global constraints and limits, allows for a broader reading of sustainability in relation to social justice: while societies can organize at a local or national level to support sufficiency practices toward the aim of "sustainable well-being," it is important to reflect on how this effects people living now, in different countries, or in the future, for forthcoming generations (Fuchs et al., 2021).

The conceptual framework is summarized in Figure 1. Voluntary work time reduction is apprehended as a potential sufficiency practice, if it achieves the aim of "sustainable well-being," understood as meeting human needs, while reducing environmental impacts, with a consideration for social justice. To study WTR, we consider how such a practice plays out – in relation to people's competencies and motivations, but also societal conditions that involve systems of provision and gendered cultural expectations. Because people are also embedded in social groups, exerting, and indeed reproducing social and cultural capital, it is important to study WTR in relation to different forms of capital, which are unequally distributed within societies. Finally, systems of provision, including infrastructures and policies, are also unequally distributed across societies, when comparing Switzerland to certain regions in the global south, for example. To reflect on how sufficiency practices might be further supported in Switzerland leads us to better

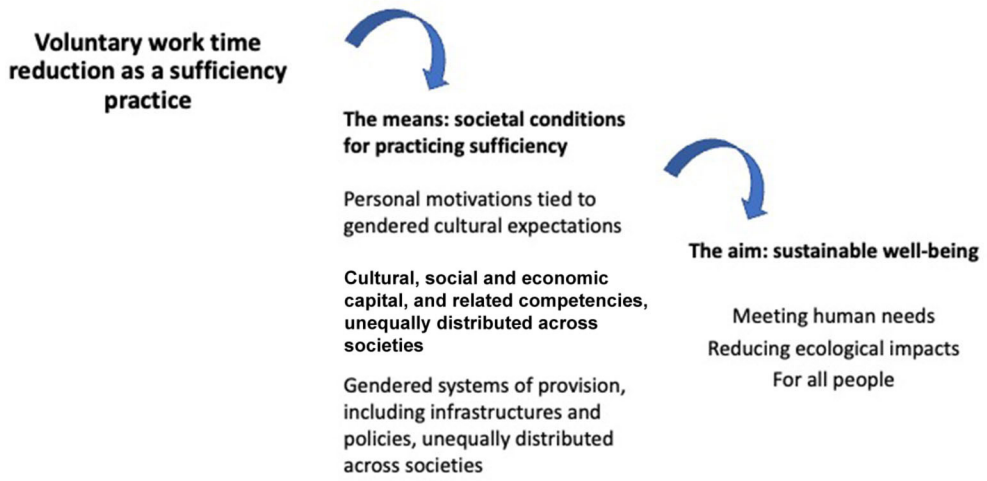

FIGURE 1
Conceptualization of how voluntary work time reduction might lead to sustainable well-being.

understand what might hinder or support WTR as a sufficiency practice elsewhere.

Methodological approach

Using purposive sampling, we recruited 14 people in Western Switzerland of working age and in couples with family responsibilities where the male spouse voluntarily reduced his work time, as well as women in almost all couples. The sampling bias toward male WTR reflects the specific context of Switzerland, where limited institutional arrangements are more favorable to women reducing their work time rather than men, creating strong gender inequalities with the arrival of the first child (Le Goff and Levy, 2016). The small sample size reflects the exploratory nature of the study, whose goal was to develop an integrated conceptual framework grasping at once issues of gender inequalities, well-being and sustainability as applied to voluntary work-reduction.

The study was not intended to be representative but rather diverse in the qualitative tradition, with the aim of seeing typologies emerge from the data. Nine of these respondents are men; both men and women were asked about their own and their spouse's work practices. Most have children aged 12 or younger at the time of the interview, and are in their 30 s or 40 s. One couple in their 50 s has an adult child but is caring for an aging parent who lives in the same neighborhood. Among the respondents, a mother and her ex-partner share the custody of a child, and are considered here to be a "parental" couple. In 13 cases, neither partner works full-time. Despite efforts to diversify the sample, all of the respondents have middle-level jobs (e.g., sports coach, administrator, musician-teacher) or upper-middle-level jobs (e.g., tertiary teacher, interior designer, manager in a non-governmental organization), except for one person in a manual labor job. The table in Appendix 2 details the working hours of the partners, their type of contract, and their cultural, social and economic capital and household composition.

Most of the respondents live in the Lake Leman (Geneva) region. The interviews were conducted mostly in French in the fall of 2018, with two in English; they were recorded, transcribed, and anonymized using fictitious first names. Informed consent was obtained in writing. The interviews were conducted face-to-face, in a few cases by videoconference, and generally lasted 1 h. The interview grid addressed the following topics: the history of the reduction in work time and that of the spouse, their motivations, and the current situation, particularly the issue of work-family balance and consumption. For consumption, individuals were asked about their consumption in high impact categories (mobility, food, housing, clothing). Whether or not their practices achieve well-being was ascertained in two complementary ways: first, respondents were asked to respond to the list of nine human needs proposed at the end of the interview (Di Giulio and Defila, 2020; Appendix 1). Second, the researcher analyzed in what way well-being was being discussed and addressed spontaneously in the interviews.

For the analysis, we started with the themes that structured the interview guide. In addition, we used the different elements drawn from the theory of social practices: meanings and motivations, competencies and cultural/social capital, and material arrangements. An inductive analysis then allowed us to identify additional themes, that also fed into our analysis. For example, while we focused on social practices during the interviews, it became evident in the analysis that certain systems of provision had to be in place to allow for sufficiency practices

to play out, as we presented in the conceptual framework and will further discuss in the findings.

Results

In the following section Results, we will start with a description of male work reduction practices through the motivations people expressed, and the gendered cultural expectations that underly them. We then discuss how WTR relates first to sustainable consumption and second to well-being, understood as the satisfaction of human needs. In the final sub-section, we detail the systems of provision that make "sufficiency" practices more possible and probable than "non-sufficiency" practices.

The reduction of paid working hours: A variety of motivations tied to gendered cultural expectations

All 14 respondents present their and their spouse's reduction in working hours as a choice. Three main reasons are given for moving to part-time work, with respondents most often citing several reasons at once: improved personal well-being by pursuing leisure or community activities ($N = 11$), having more time to care for children (N=10), being more aligned with ecological values ($N = 7$).

The respondents spoke about the non-work activities they have been able to develop and the promotion of their personal well-being. Thus, Jonas is involved in associations and the local church; Luc is involved in the development of a housing cooperative; Iris has founded her own association in the field of ecology; Matthieu plays sports intensively and is part of a political party. Several of the respondents work in their garden, and others are musicians or active in cultural activities in their community. For some people, however, this decrease in work time seems to be linked to setbacks in the professional sphere. For example, Luc, who had a full-time job as an engineer, explains that he had a burn-out a few years ago following problems with a supervisor. He stopped working for 3 months, came back to work at 50%, and then finally returned to work at 80%, having in the meantime become involved in associations and wishing to continue these activities. Other participants have similarly experienced an episode of ill health that seems to have opened a window of opportunity to engage in more meaningful initiatives for them. Iris lost her job at the beginning of her pregnancy; for a while she was a stay-at-home mother, and after her divorce she wanted to return to work, but without success. She is pleased with the associative activities she was able to develop during this time of unemployment. Other respondents did not experience negative health episodes, but explained that a full-time job would be detrimental to their health. Mathieu was working full-time but concluded that 100% was not sustainable because of the fatigue, stress and lack of attention; he changed his field of work to be able to be engaged at 60%. Two other respondents did not mention any such problems, but experienced time off for other reasons, which allowed them to appreciate the benefits. For example, Jonas, who was once offered a 60% position, explains that he felt like he was on permanent vacation, and cannot imagine being full-time after that experience.

The second main motivation that relates to well-being revolves around childcare, and was cited by all the women interviewed. This unanimous female discourse reflects the social norms that instill mothers as the primary care providers and unpaid domestic workers in the Swiss context (Le Goff and Levy, 2016). Sandrine explains that when she worked full-time in another city (with long commute times), she was completely stressed and often found herself raising her voice at home. She took a 60% job close to home, even though it is less intellectually stimulating. Her spouse is working at 80% and is committed to working from home to help with the children. However, several men in the sample also mention this reason: for them, taking care of the children is important to create a more equitable distribution of tasks within their couple. For example, Cyril, whose daughter was born 7 months before the interview, reduced his workload to avoid creating an imbalance in his relationship. Jonas thinks that the long working hours favored by most fathers are a "meager" approach to gender equality, as he puts it. Matthew wanted to be there for his children because his father was absent during his own childhood.

The third motivation refers to the ambition to live in a more ecological way. Some of the respondents explain that they have reduced their working hours because they do not wish to contribute to the society of overconsumption, and mention the positive effects for the environment of the reduction of productivity and consumption cycles. For example, Sandrine, who changed her job to devote herself to her family, states:

> It's very important not to fall into a system where we work a lot and are mainly dedicated to work, which reflects our consumer society. [...] I wanted to change my job to give more space to the human being. [...] With less we consume less, which is also something I think is right.

The ecological argument thus often supports the two other reasons for working part-time. But beyond such general positioning in favor of a less consumerist lifestyle, some respondents also emphasize that time away from work allows them to implement more sustainable lifestyles. For example, Simon is happy to contribute concretely through his gardening and other exchanges of products to "feed as little as possible that which can be capitalist." We will return to this point below.

While half of the respondents mentioned all three motivations, others mentioned only two or one. The mode of recruitment (which targeted people in a couple with family responsibilities, with a part-time male spouse and a diversity of

TABLE 1 Patterns of sustainable consumption in couples with reduced working hours.

Group 1: Low sustainable consumption	Group 2: Moderate sustainable consumption	Group 3: Strong sustainable consumption
No significant reduction in consumption	Reduced consumption in some areas	Reduced consumption in all areas
($N = 6$)	($N = 3$)	($N = 5$)
Matthieu, Juliette, Cyril, Sandrine, Luc, Robert	Pierre, Laurence, Simon	Iris, Nicolas, Marc, Jonas, Beatrice
Low to high economic capital	Low economic capital	Low to medium economic capital
Medium to high cultural capital	Medium to high cultural capital	High cultural capital
Low to high social capital	High social capital	High social capital

consumption practices) no doubt explains in part why the values of family time, gender equality, and ecology are strongly and simultaneously present in the sample. In a more critical stance, one might say that reduced work time may not be as voluntary as the respondents made it out to be – and that these different motivations are used to justify their sense of agency over their present condition. What is "voluntary" is indeed subjective. Reducing working time as a form of sufficiency may have been imposed on people as a new practice, but by becoming adept practitioners, respondents were able to justify their motivation in hindsight as a choice.

However, these three motivations came across quite clearly in all interviews and seem to reflect a form of counter-culture to the dominant paradigm: that of an affluent moral economy based on full-time employment for men, economic gain and the quest for productivity as the main driver of life choices. The findings thus suggest that cultural expectations in Switzerland may be changing, toward privileging gender equality, leisure time and ecological lifestyles, in addition to personal health and fulfillment, a trend which emerged as well in other studies (e.g., Buhl and Acosta, 2016). It is essential, however, to understand these motivations in relation to economic, social and cultural capital, which we discuss below.

WTR and sustainable consumption in relation to economic, cultural and social capital

Although ecological principles are fairly frequently emphasized in the motivations for switching to part-time work, study participants show varying degrees of commitment to implementing sustainable consumption. We asked respondents if they have a reduced or had different than average consumption in high impact categories (mobility, food, housing, clothing) (Table 1). Five participants appear to be strongly committed to more sustainable consumption (Group 3): time spent away from work is invested in gardening, baking bread, or making their own cleaning products. Saving energy is a prime concern: these people travel by foot, public transport, or train, and avoid flying. They buy almost all their food at the market and prefer local and organic products, sold without packaging and in bulk. They also exchange homemade products and services, and look for second-hand products or clothing.

A second group of participants reflects a more moderate commitment to sustainable consumption: they buy organic, local, and bulk produce and have vegetable gardens; they engage in low-impact leisure activities such as hiking or playing board games; but they continue certain resource-intensive practices, such as air travel or using the family car. Finally, Group 1 adheres to the easiest and most accessible sustainability practices: they try to prioritize organic food at the supermarket and public transport but have not changed their consumption patterns and everyday practices further toward more sustainable consumption.

All the people involved in an advanced sustainable consumption approach (Group 3) are endowed with strong cultural capital. This capital can take the form of university degrees, which are among the highest in our sample (Jonas, Iris, Nicolas, Beatrice) and/or a profession in the art world (Marc, Beatrice). Note that in the group of people with relatively moderate sustainable consumption practices (Group 2), two out of three are also engaged in artistic activities (Pierre, Simon). Incomes are low in Group 3 (and 2) due to fewer working hours, while respondents in Group 1 (normal consumption category) have rather "average" incomes (higher working hours). Financial resources also matter more particularly in some consumption domains: good quality shoes and long-lasting clothing, sourced locally, are perceived as too expensive by some of these respondents. They can afford to spend relatively more money on locally sourced and organic food, rather than supermarket food even with a modest income, but the entry cost of sustainable fashion remains beyond their reach. The availability of second-hand fashion markets thus seems critical, assuming cultural expectations around second-hand clothing also evolve to favor such clothing as socially desirable.

In terms of social capital, understood as the number and type of personal relations and resources exchanged with them, respondents in Group 2 and 3 clearly enjoy many quality ties and collective activities, which bring to them a number of resources (Iris being an exception). Respondent engaging in unchanged

TABLE 2 Level of well-being, in couples with reduced working hours.

	Fragile well-being	Satisfactory well-being	Pronounced well-being
	($N = 3$)	($N = 5$)	($N = 6$)
	Matthieu, Iris, Pierre	Juliette, Cyril, Simon, Marc, Nicolas	Sandrine, Luc, Laurence, Jonas, Beatrice, Robert
Social capital	less present	Present or very present	very present
Cultural and economic capital	Less present or present	less present or present	present or very present
Psychosocial skills	Less present	Present	Present

consumption patterns present a variety of social constellations, from rather limited relations with a few relatives and colleagues (Matthieu) to large networks of friends and family, topped with several community or artistic activities (Juliette).

Altogether, more sustainable lifestyles require, at the individual level, time – an inescapable resource – irrespectively of economic, cultural or social capital. Gardening or producing eggs takes time, as does making your own cleaning products, or finding second-hand products, or reducing waste by buying in bulk, or taking a train rather than flying. The reduction of paid work by both members of the couples also frees time used to that end. However, the issue of material and energy resources consumed during leisure activities in the home, such as downloading movies or music, was not addressed at all by respondents. Indirect energy related to different forms of consumption remains invisible to most of them.

WTR and well-being: Need satisfaction in relation to cultural capital and skills

By analyzing responses to the list of human needs discussed during the interview, we classified respondents into three groups: fragile ($n = 3$), satisfactory ($n = 5$), and pronounced ($n = 6$) well-being (Table 2). In the optimal case of pronounced well-being, participants are all fully active in their lives and thrive in multiple social affiliations: they engage in paid and unpaid activities that they have chosen and value, and that are socially valued; they maintain many social relationships through these activities; they advance their skills through these activities. They declare to satisfy most or all of the protected needs presented in Appendix 1. These people all have high levels of education and well-paid jobs, although household income is modest when the percentage of time worked is low.

Respondents with a satisfactory level of well-being have more constraints and fewer opportunities to exercise autonomy. Some of these respondents also have a less favorable socioeconomic situation. In particular, Simon, the only manual worker in the sample, whose partner does not work and who pays child support to his ex-wife, does not have a salary level that allows him to meet all of his needs. For example, he puts off dental work and other major purchases due to lack of funds. His paid work (80%) is repetitive: he would reduce his working hours further without hesitation if it were financially possible. Moreover, his level of training does not allow him to consider another professional project. However, the various artistic, manual and collective activities that he pursues in his free time allow him to enjoy a satisfactory level of well-being. This suggests that WTR, when paid work is not contributing to personal development, can allow for leisure or collective activities that do.

Others in this satisfactory well-being category are either experiencing temporary challenges related to a particular life event or more chronic work constraints. Cyril is in transition: after the birth of his first child, the couple is living in a new rented apartment, geographically cut off from his friends; the weeks are long, between a job in another city and an infant to manage at home. Nicolas is in the midst of a professional transition: dissatisfied with his previous job, he has just started a new training program; a full-time homemaker with two small children, he would like to work part-time (so as to gain a certain percentage of paid employment) but is currently faced with a lack of options on the job market. The social capital of this group is (temporarily?) more centered on the nuclear family for those with toddlers (Cyril, Nicolas), but is high for Juliette, Marc and Simon, who engage in many collective artistic and community activities.

Only a minority of respondents are characterized by a fragile level of well-being. Their social relationships are more limited. The professional activities they engage in only partially value their existing skill set and leaves them little autonomy (Iris) or tend to overload them when working hours are too high (Matthieu, Pierre). These people do not have a particularly poor cultural capital (they have medium to high diplomas) but have experienced negative health or difficult events in the past and seem to struggle with slightly worse psychosocial skills (being quickly overwhelmed by situations, anger, self-discipline). In all three cases, the ecological credo allows them to value their withdrawal from the world of employment, and provides them with avenues to recreate social participation in other ways, for example through exchanges on the Internet, membership in a political party or associations dealing with the theme of sustainability.

The systems of provision that support (or not) WTR in Switzerland

As detailed in the conceptual framework, we understand WTR as a sufficiency practice that could potentially allow people to reduce the environmental impact of their consumption patterns while achieving well-being. In our case, sufficiency is attained by a part of the sample through the practice of male work time reduction, which is linked to personal motivations and cultural expectations, and has direct implications in terms of sustainable consumption and favorable well-being, as in the examples of Béatrice and Marc.

What remains is to detail the Systems of Provision (SOP) that make some forms of consumption more sustainable and some forms of living more satisfactory in terms of meeting human needs. One of the most significant challenges when it comes to the environmental sustainability of consumption in our sample seems to be related to where people live. The size of a home is not something that our respondents questioned, despite the energy intensity of heating, among other high-impact domains in the home. People in our sample were not motivated to move to more energy-efficient housing or to smaller spaces, because housing is a synergistic satisfier – one that meets several needs at once. Housing satisfies many essential needs: social relations in the neighborhood, for example, or proximity to family members, or to employment. In addition, in a more political economy reading, the housing situation in Geneva does not facilitate such moves: people are primarily renters, and the housing market is notoriously difficult to access. Without state support – for example, through a service that would assist people in making a move – it is difficult for people to transfer to smaller homes, even if they want to engage in a more sufficient lifestyle. The centrality of employment to well-being, and the unavoidable time constraints it implies, also explains why people prefer to live in areas close to their jobs.

While cooperative housing has developed in Western Switzerland in recent years, a form of housing that offers both social and ecological advantages, such housing is still relatively rare. In the sample, Simon, for example, lives in a yurt on land shared with several families, a lifestyle that is extremely compatible with sufficiency goals but also with his associative and artistic investments. People living outside of the city, such as Simon and Beatrice, may benefit from village gardens or their own vegetable patches. But in both instances, while they prefer public transport, they are nonetheless more dependent on private cars. Respondents all recognize that the public transportation system is excellent in Switzerland and, when possible, would choose their housing and employment accordingly. Luc, who for the moment does not have a particularly ecological lifestyle, will soon move into a cooperative: he will then share his car with others, will have a food cooperative nearby, and a shared vegetable garden on the roof, all that in the heart of the city. The sustainability of his lifestyle, after he moves, will be much less dependent on his active individual choices and time, and will be greatly facilitated by the opportunities present in his building and area. Luc will then be in a favorable default position, where the choice to live in a green home "locks in" the most sustainable consumption options. Sustainable modes of transportation or food become the easiest solutions.

For Luc also, the building itself represents a more sustainable consumption option by default. The provisioning of housing and energy sources is highly relevant when it comes to the energy and carbon intensity of heating and living in homes. For most residents in our sample, the energy system remains dependent on gas or fuel. Tenants have very little choice in this respect, unless they chose to move to a cooperative housing unit where renewable energy systems are installed. Cooperative buildings tend to be more energy efficient (for heating and lighting), and are designed for reduced living space and more shared, collective areas (such as shared guest rooms or working spaces). Even for certain apartment owners, such as Beatrice, there was no mention of how her heating system might be changed to more renewable sources of energy – despite her attention to various climate related issues. The energy efficiency of buildings and renewable energy provisioning for electricity and heat will be a central issue in Switzerland in the years to come, not only in relation to climate change targets but also in relation to energy security, given that Switzerland is currently dependent on Russian gas for 40% of its needs.[2]

Respondents rarely mentioned their longer-term well-being, i.e., the need to build up savings to meet future needs or counter negative life events, either for their own future or for that of their children. The two-pillar (mandatory and optional) federal pension system in Switzerland is tied to employment and universal old age insurance is minimalist, providing 19 000 EURO equivalent per year for a person living alone (minimum wage is approximately 15,000 EURO, not enough to live in Geneva, whose living costs is among the highest in the world). The future economic security of some of our respondents is thus not guaranteed. Indeed, it is well known that women's underemployment during periods of family care is a major reason for their poverty and poorer health at older ages, because although women often return to employment when children have grown up, the lost contribution years are not made up for (Carmichael and Ercolani, 2016; Comolli et al., 2021). Moreover, their part-time work trajectories often confine them to lower-skilled, lower-paying jobs; they can also lose access to their husband's pension in the event of a divorce (Widmer and Spini, 2017). The long-term economic implications for couples who have both chosen low work percentages remain to be studied. Yet, in the sample, only Peter briefly stated that he will pay for his current lifestyle "in a different way, in retirement."

2 Based on 2019 data, see: https://gazenergie.ch/fileadmin/user_upload/e-paper/GE-GasInZahlen/GiZ_20_fr.pdf.

It is true that in the Swiss context, many human needs seem guaranteed when focusing only on the immediate situation: quality public education, protection of tenants, and (minimal) economic security are available to all inhabitants with a permit of residence. This lack of reflection on the future could therefore reflect a justified lack of concern for people engaged in WTR. However, these socially provided minima may appeal only to some selected groups. The vast majority of people probably have higher expectations, especially to maintain their housing conditions and lifestyle at retirement; they may also aspire to realize some upwards social mobility or want to invest in their children. In the vast majority of respondents with family responsibilities in Switzerland, the man works full time, probably so as not to diminish their capacity to build up economic reserves that are deemed sufficient. In fact, one respondent (Robert) explains that he only reduced his paid work time (his wife remaining full-time) after he had amassed personal wealth that allowed him to take an early retirement.

Another aspect that is rarely mentioned is the use of social services: when posed the question as to whether they benefit from any such services, many respondents answered negatively. With further prompting, they all recognize that the 300 CHF (approximately 300 EURO) received per child and per month is indeed a social service (a universal child allocation, with the amount slightly varying by canton). Perhaps the term "social services" is more associated with "those in need," rather than an amount that people feel they have a right to, as parents. A few respondents rely heavily on need-based public subsidies. Juliette and her companion used to receive state support for their health care insurance, and also state that they receive a small amount of support for their rent. Iris receives unemployment benefits, and is in on a "back to work" program. There are, other – non individualized and non-monetary – ways in which systems of provision meet human needs in Geneva, in addition to public transport, mentioned by many. For example, respondents use the public library or benefit from highly-subsidized sportive or cultural services; they also participate actively in associations, which benefit from state support, and enjoy an easy access to natural surroundings, such as the countryside, lake shore, or public parcs, which they often mention in relation to well-being.

But why then is male WTR not more widespread? On top of a culture of affluence and the need to put savings aside to dealing with events later in life already mentioned, the gender regime in Switzerland, in its economic (labor market), institutional (work-family policy) and cultural dimensions (gendered roles regarding childcare), remains relatively conservative with respect to the division of paid work (Rossier et al., 2022). Childcare costs are high, due to high wages in Switzerland, including those of childcare staff. As a result, it is often less costly for a parent to reduce their working hours, most often mothers who may have anticipated this decision by choosing a less demanding career path (Gianettoni et al., 2015). Men in our sample, who have stepped up to the plate when it comes to household chores including childcare, also have this sense of not being appreciated in this role in broader society. Jonas mentions a gap with the rest of society, being often the only man present at activities where he accompanies his little boy (he is among the rare respondent to be employed at only 50%).

Discussion

In this study, we use the social practices and systems of provision approaches, complemented by a theory of human needs, as heuristic tools to apprehend what remains a novel practice in Switzerland: male WTR and how this might achieve the aim of more sustainable well-being. Our results show that it is possible, today in Switzerland, to simultaneously achieve a high level of well-being and a lower environmental impact through consumption in couples where the male partner has reduced his paid work time. We define this form of living "sufficiency," or a practice where needs are satisfied without impeding the ability of others to do the same; or living well within planetary limits.

However, couples who voluntarily reduce their male work time, and are living well and sustainably in environmental terms, correspond to a very specific subpopulation, that of people with high cultural and social capital. Our results also show that a certain degree of work engagement remains an essential foundation of well-being for these individuals, in that it provides not only financial resources but also social status, social roles, and relational and cultural resources, in so far as work is meaningful. A favorable social position (high cultural, social capital, well-paying jobs) and all the benefits it provides remains a key factor in well-being, regardless of income. It is thus clear that high levels of well-being can be achieved with substantially reducing paid work, but that the arrangements made by couples must correspond to social expectations and relate to sufficient levels of resources for meeting needs.

To achieve *sustainable* well-being, which is far from systematic in our sample, resources need not solely be financial: achieving a sustainable lifestyle implies a considerable personal investment in various sustainable consumption activities, such as gardening. Such resources – not least, available time – also allow people to engage in community or associative work, through their skills and competencies. Such individuals tend to pursue extra-occupational activities (such as music) that provide synergistic satisfiers, i.e., that simultaneously satisfy the needs for affiliation, autonomy and competence. We found that these non-consumerist motivations are underpinned by cultural expectations and meanings that value non-material accomplishments. The long-term implications of this "sufficiency" lifestyle are far from clear, however. Decisions to substantially reduce work time today (both members of the couple) do have implications on social security in the future.

One main finding is that personal motivations are reinforced by cultural expectations around what it means to live the good life. By uncovering meanings, which are central to social

practices, we also uncover the social context that allows for some forms or provisioning to be possible over others. In the case of reduced work time, meanings around "sustainable living" are emerging and become repertoires that both women and men can draw from to make sense of their lives. They are in turn reinforced by institutional conditions, such as climate action plans, which might favor investments in more energy efficient homes, for example. Meanings around childcare also need to change, related to how men and women are understood as taking on parental roles in society. Thus, people's motivations truly are collectively held beliefs and conventions, that are reinforced by how people practice certain activities, including sufficiency. This relates to "invisible" policies which either promote or hinder more sustainable forms of consumption (Greene and Fahy, 2020). People may not be aware of state funding for culture, education etc. They may also not see direct links between energy policies and their daily lives. How to reflect on all the social policies that are relevant for a more sustainable good life is central.

A second main finding is that the provisioning of ways of living is central, for example in the types of buildings that are provided for, or options for more sustainable food or transport in a given area. It is relevant here to look at the level of a building – its energy efficiency, or its renewable energy provisioning – but also at the scale of a neighborhood, or how where we live relates to where we work and what public services are available (i.e., public transport, museums, healthcare and childcare, etc.). Where people live will reveal amenities and opportunities (i.e., access to parks, urban gardens, libraries, etc.), which are more available to some than to others. Here, collective decisions to provide at the local level for human need satisfaction through sustainable forms of production, distribution and consumption will make "sustainable well-being" more possible and probable, for a greater amount of people, than any individual effort to do the same.

Conclusion

Based on an exploratory qualitative study in Switzerland, we uncover what societal conditions could support WTR as a form of "sufficiency" in Switzerland today, understood as a practice that allows for sustainable well-being. How WTR as a sufficiency practice might achieve environmental sustainability and human well-being depends on individual motivations and related cultural and gendered expectations; cultural, social and economic capital, which is unequally distributed in societies; but also, gendered systems of provision, including infrastructures and policies, which are unequally distributed across societies. These favorable collective conditions would allow living well within limits, as a form of sufficiency, to be accessible to more people, in a just transition. And yet today in Switzerland, as is the case in many other parts of the world, neighborhoods exhibit different degrees of social distinction and oftentimes reflect varying socio-economic groups. This is most noticeable in relation to those who can afford to live in city centers as opposed to more peri-urban areas, which might not be as well provisioned for in terms of public services. Because those with existing resources tend to benefit most from collective resources than others, any transition to sufficiency is a question of social justice, both in terms of distribution – who has access to resources – but also in terms of representation and participation, in recognizing that some needs are more accounted for than others, and some voices are more prominent than others in defining the good life, for whom. While sufficiency can be attained by some people living in Switzerland today, it will be critical for sufficiency to be planned for and designed at the collective level, to ensure that systems of provision can make sufficiency a default position for all people, and not a privileged few. The high social and cultural capital of those in our sample achieving sustainable well-being suggests that, more than financial capital, education levels and social relations are important in supporting WTR. At the same time, most respondents have high paying jobs, which precisely allows them to reduce their paid working time and to still maintain modest but sufficient income.

We now turn to reflections on how the Swiss case generates learnings for other contexts as well as opportunities for further research. In her critique of a moral economy based on affluence, which is very much the setting in which we conducted our empirical study, Dubuisson-Quellier claims that: "… sufficiency cannot arise without the development of a new consumption governance regime able to place sufficiency rather than affluence at the core of the process of social and economic value creation." (Dubuisson-Quellier, 2022, p. 45). And yet a culture of affluence and abundance exists in cities around the world, irrespective of their economic ranking: what it means to be a global citizen today is very much tied up with consumerist expectations and economic growth beliefs (Wilhite, 2016). Our approach suggests that, along with cultural and social capital, systems of provision are critical for delivering sustainable well-being, and that WTR can be a sufficiency strategy that allows people to meet their human needs with less environmental impacts. But to achieve such an aim, creating the societal conditions for reduced work time would need to be considered along with the provision of public services, such as access to renewable energy in more energy efficient homes, and adequate public transport services, but also the provision of childcare and elderly care. The concept of basic universal services covers this ambition of meeting human needs through the collective (Coote, 2021). We cannot prove that high levels of consumption do not also yield high levels of well-being: this is where social justice becomes a central issue, as an excessively affluent lifestyle by the few prevents many people from living a good life (Fuchs et al., 2021). More research is needed to uncover what is supportive of or dissuasive when it comes to achieving sustainable well-being when working less. One option might be to create conditions that are un-favorable to

high levels of consumption. Taxing resource-intensive products and services may make them even more desirable to the most affluent, as they seek to further distinguish themselves and communicate pecuniary strength. It is the cultural expectations around consumerism that need to change, and more research is needed on how such expectations come to be shaped and challenged, such as the gendered role of caregiving, but also meanings around leisure time or commitments to civil society. For people without care responsibilities, taking time off from work to engage in personal or collective activities would need to be valued. Here, the media has a crucial role to play, in shaping such expectations. In addition to new policies and governance measures, new imaginaries on what it means to live the good life are sorely needed.

Data availability statement

The raw data supporting the conclusions of this article can be made available upon request.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

Both authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/frsus.2022.956055/full#supplementary-material

APPENDIX 1
List of the nine Protected Needs, based on Di Giulio and Defila (2020). Legend: Group 1 (PN 1–3) focuses upon tangibles, material things, group 2 (PN 4–6) focuses upon the person, and group 3 (PN 7–9) focuses upon community. Building on Di Giulio and Defila (2020).

APPENDIX 2
Respondent profile.

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How to make more of less: Characteristics of sufficiency in business practices

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Sustainable transformation toward a circular society, in which all ecosystems and livelihoods are protected and sustained, requires the integration of sufficiency in circular production and consumption practices. Beyond the technological promises to decouple resource use from economic growth, sufficiency measures to reduce production and consumption volumes in absolute terms are necessary. Businesses integrating sufficiency act as agent of change to transform current unsustainable practices along the entire supply chain. By observing the operationalization of sufficiency in 14 pioneer businesses, this study identifies dimensions and practice elements that characterize sufficiency in business practices. This study observed that the sufficiency in business practices mainly represents a rethinking of business doings on three dimensions: (1) rethinking the relation to consumption; (2) rethinking the relation to others; and (3) rethinking the social meaning of the own organization. Sufficiency practitioners understand production and consumption as a mean to fulfill basic human needs instead of satisfying consumer preferences. They co-create sufficiency-oriented value with peers in a sufficiency-oriented ecosystem and they redefine growth narratives by envisioning an end to material growth. Additionally, this study revealed that *care, patience and learning competences* are essential characteristics of sufficiency in business practices. Sufficiency practitioners reshape their business doings by caring for others and nature; they demonstrate patience to create slow, local, and fair provision systems; and they accept their shortcomings and learn from mistakes. Integrating elements of care, patience and learning in business practices reduce the risks of sufficiency-rebound effects. Ambivalences between the sufficiency purpose and growth-oriented path dependencies persists for sufficiency-oriented businesses. Further research should investigate pathways to overcome these ambivalences and shortcomings that sufficiency practitioners experience, for instance, by exploring political and cultural settings that foster sufficiency-oriented economic activity.

KEYWORDS

sufficiency, enough, production and consumption practices, role of businesses, circular economy, circular society, social practice theory

Introduction

Pressure caused by anthropogenic activities on the biosphere's resilience and its natural ecosystems has grown continuously since industrialization and has not dropped, not even in recent years or since the adoption of the Paris Agreement in 2015 (Rockström et al., 2009; IPCC, 2022a). In 2022, humanity exceeded an additional planetary boundary with environmental pollution by novel entities such as plastic (Persson et al., 2022). The green growth pathway based on efficiency and consistency strategies is currently failing its promises to decouple resource use and environmental impact from economic growth (Zink and Geyer, 2017; Hickel and Kallis, 2019; Parrique et al., 2019). Hence, scholars across disciplines are calling for reduction measures and demand-side mitigations to lessen production and consumption, especially in affluent societies of the Global North (Del Pino et al., 2017; Creutzig et al., 2018; Wiedmann et al., 2020; IPCC, 2022b). In its latest report, the Intergovernmental Panel on Climate Change emphasizes efforts to avoid production and shift consumption practices toward low resource and energy use, for example, in mobility or building sectors (IPCC, 2022b). A paradigm shift strengthening sufficiency-oriented strategies in political, economic, and social spheres is urgent to reach a safe operating space within planetary boundaries (Dearing et al., 2014; Raworth, 2017; O'Neill et al., 2018).

Sufficiency is often defined as the pursuit of a state of enoughness that replaces ever-expanding material consumption (Linz, 2004; Spangenberg, 2018; Spangenberg and Lorek, 2019). Sufficiency encompasses all efforts and strategies to reduce production and consumption in absolute volumes (Spangenberg, 2018; Wiedmann et al., 2020). It also advocates for a fair redistribution of wealth and a universal fulfillment of human needs for a good life (O'Neill et al., 2018; Spengler, 2018). While sufficiency started with consumers voluntarily reducing their material dependency (Gorge et al., 2014; Speck and Hasselkuss, 2015), many studies expand the responsibility for sufficiency to other economic and societal actors (Sandberg, 2021). These include businesses (Bocken and Short, 2016; Niessen and Bocken, 2021; Bocken et al., 2022), governments (Fischer and Grießhammer, 2013; Schneidewind and Zahrnt, 2014; Reichel, 2016; Spangenberg, 2018), and non-governmental organizations (Persson and Klintman, 2021).

Businesses can act as agent of change in the transformation of production and consumption practices toward slow, local, and socially just systems of provision (Heikkurinen et al., 2019; Jungell-Michelsson and Heikkurinen, 2022). Thanks to their strategic position in the supply chain, their decisions, orientations, or activities influence both upstream production and downstream consumption (Spaargaren, 2011). Thus, the possibilities for businesses to integrate sufficiency-oriented strategies have recently gained the attention of scholars. Studies have defined sufficiency-oriented strategies for businesses (Schneidewind and Palzkill-Vorbeck, 2011; Bocken and Short, 2016; Reichel, 2018), developed frameworks for sufficiency-oriented business models (Bocken et al., 2020, 2022; Niessen and Bocken, 2021), or identified marketing approaches to promote sufficiency-oriented consumption (Gossen et al., 2019; Frick et al., 2021).

According to current studies, a business is described to be sufficiency-oriented when the company implements sufficiency-oriented strategies, such as sharing, sufficiency-oriented marketing campaigns or long-lasting design in their business model (Niessen and Bocken, 2021). However, the sole focus on strategies potentially neglects sufficiency rebound effects. The implementation of sufficiency-oriented strategies does not directly guarantee production and consumption reduction. For example, restraining consumption saves costs that consumers might reinvest in other non-sustainable consumption areas (Alcott, 2008; Figge et al., 2014). Or Freudenreich and Schaltegger (2020) warn that current secondhand offers in fashion are not a substitute for primary production, but are rather implemented to gain new consumer segments. As for sharing models, Parguel et al. (2017) observed a consumption increase on secondhand sharing platforms instead of the desired reduction. Sharing is also criticized for prioritizing a commercial over a sustainability purpose (Ryu et al., 2019).

Additionally, empirical studies that observed the application of sufficiency-oriented strategies showed that companies mostly implement incremental sufficiency-oriented strategies, such as no ownerships or green product alternatives, rather than radical ones, which refuse consumption (Niessen and Bocken, 2021). A further study concluded that circular business models mostly focus on incremental innovation and thus only induce weak sustainability changes (Hofmann, 2019). Thus, business model frameworks seem inadequate for the complexity, collaboration, or interdependencies that sufficiency transformation calls for Massa et al. (2018), De Angelis (2022). For example, radical innovation, such as limiting or avoiding production of new goods (Heikkurinen et al., 2019; Jungell-Michelsson and Heikkurinen, 2022), or exnovation activities, where unsustainable practices and technologies are withdrawn from the market (Reichel, 2016), are rarely described in circular or sufficiency-oriented business model frameworks.

Thus, understanding sufficiency in business practices requires to look for characteristics beyond business strategies. Sufficiency necessitates alternative visions, values, or needs, as well as new norms, skills, knowledge that facilitate a cultural and societal context of frugality and enoughness (Schneidewind and Zahrnt, 2014). Through the lens of social practice theories, this study observes the implementation of sufficiency in business as a change of social practices and investigates specific practice elements that characterize sufficiency, such as social meanings (values, visions, norms,

emotions), competences (skills, knowledge), and material arrangement (infrastructures, technologies, products, resources) and their dynamically evolving and changing interactions (Shove et al., 2012; Spurling et al., 2013). Social practice theories understand business as a complex social phenomenon that is routinely reproduced by a network of interlocking practices (Schatzki, 2002; Massa et al., 2018). It breaks with the fixed architecture and economic and commercial logic of the business model. It offers the possibility for example to observe how various goals of a firm are weaved into business routines and how synergies or trade-offs evolve if goals change and practices are adapted. Thanks to their particular focus on how social practices evolve, stabilize, change, dissolve and re-stabilize (Schatzki, 2002; Shove, 2010; Spurling et al., 2013; Loscher et al., 2019), social practice theories are valid as a conceptual background to investigate how businesses transform their doings toward a sufficiency-oriented and circular society (Jaeger-Erben et al., 2021b). This practice-based and empirical study investigated the following research questions:

1. *How do sufficiency-oriented businesses operationalize sufficiency in their practices?*
2. *What are essential practice elements that characterize sufficiency in business practices?*

The study contributes to the development of a systemic understanding and shared definition of sufficiency in business practices by offering insights from empirical data. A better understanding of sufficiency in action is essential for research and transition practice toward a circular society (see, for example, Calisto Friant et al., 2020; Jaeger-Erben et al., 2021a; Jungell-Michelsson and Heikkurinen, 2022). Recommendations for the integration of sufficiency in circular production and consumption practices can be further derived from results of the analysis.

The paper is structured as follows. The conceptual framework of the paper, a short review of the literature of sufficiency in business, and an introduction to social practice theory are depicted in Conceptual background section. Methodology section presents the methodology of the grounded theory applied to the sampling, collection, and analysis of the data. The findings in Results section describe in detail the three dimensions of sufficiency in business: (1) rethinking the relation to consumption; (2) rethinking the relation to others; and (3) rethinking the social meaning of the own organization. Three practice elements—patience, care, and learning processes—which shape all sufficiency dimensions, are also presented, and are revealed to be essential characteristics of sufficiency in business. Finally, in Discussion section, we discuss theoretical and practical implications of the findings, and we conclude by identifying limitations of the study and recommendations for future research.

Conceptual background

Sufficiency in business

Recent studies defined sufficiency-oriented organizations as those that apply sufficiency-oriented strategies in their business models (Bocken and Short, 2016, 2020; Bocken et al., 2020). Sufficiency-oriented strategies support consumers to reduce their consumption and their material dependency (Bocken and Short, 2016). Additionally, sufficiency-oriented strategies allow businesses to reduce own production volume or avoid production in the first place (Reichel, 2013, 2018). Schneidewind and Palzkill-Vorbeck (2011) presented four lessening categories of sufficiency-oriented strategies: decluttering (less), decelerating (slower), disentangling (more local), and decommercialization (less market).

Decluttering entails various material and energy-reduction strategies, for example, product–service systems such as sharing models or energy-contracting services (Reichel, 2013; Tukker, 2013; Wilts and von Gries, 2015). Extending product lifetime with the production of long-lasting products or by offering repair and reuse options are typical decelerating strategies (Reichel, 2013). Strategies from the disentangling category consist of local supply chains (Dewberry et al., 2017; Bocken and Short, 2020) or stakeholder collaboration (Griese et al., 2016). Finally, decommercialization operates outside of market logics, by providing tools or instruction for self-production (Dewberry et al., 2017; Freudenreich and Schaltegger, 2020), or by developing open-source processes (Wells, 2018; Robra et al., 2020).

More recently, scholars observed an increase in sufficiency-oriented marketing that explicitly discourages consumers from purchasing new products (Gossen et al., 2019; Frick et al., 2021; Gossen and Kropfeld, 2022). Several studies connect sufficiency to low-growth strategies, calling for a redefinition of business growth (Khmara and Kronenberg, 2018; Wells, 2018; Bocken et al., 2020; Nesterova, 2020). Table 1 gives an overview of existing sufficiency-oriented strategies described in the literature.

Social practice theories

Social practice theories cannot be described as a coherent theory but as a bundle of conceptual approaches that share their main focus on social practices as the basic unit of analysis (Reckwitz, 2002). In contrast to the methodological individualism, where the social is thought to emerge from the constellation and accumulation of individual action or single interest, in social practice theories, the social is situated in social practices (Schatzki, 2018), which can be understood as routinized and organized activities performed by actors on a daily basis (Reckwitz, 2002). Social phenomena, such

TABLE 1 Existing sufficiency-oriented strategies in sufficiency and sustainable business model literature.

Strategies	Publications
Decluttering (less)	
Providing time for non-consumerist activities	Reichel (2013)
Product–service systems (new revenue models)	Reichel (2013), Bocken et al. (2018, 2020), Wells (2018)
Marketing for consumption reduction	Bocken et al. (2014), Gossen and Heinrich (2021), Gossen and Kropfeld (2022)
Moderate sales and promotions	Bocken et al. (2014, 2020), Bocken and Short (2016), Gossen and Heinrich (2021), Gossen and Kropfeld (2022)
Choice editing and nudging	Bocken et al. (2020)
Demand reduction services (contracting services)	Tukker (2013), Bocken et al. (2014, 2020), Wilts and von Gries (2015), Bocken and Short (2016), Tunn et al. (2018), Niessen and Bocken (2021)
Sharing, no ownership	Bocken et al. (2014), Niessen and Bocken (2021)
Frugal product design (full lifecycle sufficiency)	Bocken and Short (2016), Bocken et al. (2020), Niessen and Bocken (2021)
Decelerating (slower)	
Extending product lifetime	Bocken and Short (2016), Dewberry et al. (2017), Reichel (2018), Wells (2018), Bocken et al. (2020), Niessen and Bocken (2021)
Repair services	Dewberry et al. (2017), Reichel (2018), Niessen and Bocken (2021)
Reuse	Bocken and Short (2016), Reichel (2018), Niessen and Bocken (2021)
Slow fashion	Bocken et al. (2014), Freudenreich and Schaltegger (2020)
Premium pricing	Bocken et al. (2014, 2020)
Disentangling (less global)	
Local supply chains	Dewberry et al. (2017), Bocken et al. (2020)
Local repair offers	Wilts and von Gries (2015)
Decommercialization (less market)	
Providing tools and support for do-it-yourself	Reichel (2013), Dewberry et al. (2017), Freudenreich and Schaltegger (2020)
Stakeholder collaboration	Reichel (2013), Griese et al. (2016), Konietzko et al. (2020)
Peer-production, open source	Reichel (2013), Dewberry et al. (2017), Wells (2018), Robra et al. (2020), Niessen and Bocken (2021)
Exnovation	

as economic production and consumption goods, start-ups, social organizations, or businesses, are grounded in a nexus of connected social practices (Schatzki, 2002, 2018). For instance, businesses are reproduced by a complex set of interlinked social practices such as advertising, financing, strategic planning, or human resource management (ibid.).

The definition of a social practice, and which elements form the practice, differs depending on the scholars of social practice theories (Gram-Hanssen, 2011). For this study, the social practice theory according to Shove et al. (2012) was applied. For Reckwitz (2002: p. 249), a practice consists of "forms of bodily activities, forms of mental activities, things and their use, a background knowledge in the form of the understanding, know-how, state of emotion and mental knowledge." Building upon this definition, Shove et al. (2012) describe social practices as an entity of recognizable elements, which they grouped into three categories:

- Social meaning (values, emotions, social norms, or visions)
- Competences (skills, knowledge, or techniques)
- Material arrangement (objects, things, tangible physical entities, or resources)

The social practices are enacted and reproduced by individuals that perform the practices. Individual actors are understood as "carriers" or "performers" of the practices and their elements (Shove et al., 2012). The performance of social practices requires certain skills, the appropriation of particular purposes and values, or the display of emotions which are mainly attributed to the social practice itself and not to the individual carrier and his or her personal attributes (Reckwitz, 2002; Warde, 2005; Shove et al., 2012). Social practice theories have among other evolved as critic of the agent-based individualism prevailing in economic theory which broadens the perspectives of analysis in organization research (Whittington, 2011), as well as in sustainable transformation research (Shove, 2010; Spurling et al., 2013). Thus, various studies in organizational research apply social practice theory, for example, in organizational learning (Nicolini et al., 2016), information systems (Chua and Yeow, 2010), human resource management (Vickers and Fox, 2010), or marketing (Echeverri and Skålén, 2011). Interest in the practice-based approach is growing in research for sustainable transformation, for example, in sustainable consumption (Brand, 2010; Spaargaren and Oosterveer, 2010; Jaeger-Erben et al., 2015; Parekh and Klintman, 2021), sufficiency-oriented consumption, and lifestyle (Speck and Hasselkuss, 2015); in sustainable value co-creation (Korkman et al., 2010); or in the diffusion of sustainable product–service systems (Mylan, 2015).

According to Shove et al. (2012), social practices are dynamic and changing. Their descriptions of practice as an entity (observable elements) and practice as a performance (reproduction by the carriers) are useful for understanding how

practices change, either through the emergence or disappearance of specific elements and new connections, or in the adapted reproduction of the practice by the carriers (Shove et al., 2012: p. 8). According to Spurling et al. (2013), unsustainable practices can be changed by carriers when they add, suppress, or modify specific practice elements during the practice reproduction. Entire practices can also be substituted with more sustainable alternatives, or transformation occurs when the interaction and connection between practices shift. This study paid particular attention to the change of social practices from business-as-usual to sufficiency-oriented practices of doing business, with the aim to understand how the business practices and the elements they consist of dissolved, evolved or changed, and finally stabilized with the integration of sufficiency.

Methodology

Grounded theory

Social practice theories neither are a coherent theory, nor do they imply a particular methodological approach (Shove, 2017). While the usual approaches are often qualitative inquiries (Halkier et al., 2011) like case studies, participant observation and interviews, there are few examples of quantitative methods (e.g., Browne et al., 2014; Jaeger-Erben et al., 2021a). For this study, we used a variety of qualitative data gathered during interviews, desk research, online documents, and audio recordings. We decided to follow the research design of Grounded Theory (Corbin and Strauss, 1990) in our attempt to explore and understand sufficiency in business practices. According to Suddaby (2006), "[grounded theory] was founded as a practical approach to help researchers understand complex social processes." The integration of sufficiency in business practices can be viewed as a complex social process; namely, a social innovation requiring structural change in doing business. With its conceptual roots in the school of thought of Pragmatism (Strübing, 2007), Grounded Theory research is seen as particularly suitable to understand the contexts, logics, and structure of social practices. Based on empirical data, we build new understandings and classification of sufficiency characteristics in business practices.

We selected multiple cases ($n = 14$) of businesses implementing sufficiency-oriented strategies. Following the recommendation of Hensel and Glinka (2018), we used data triangulation to collected data from multiple sources: primary data from problem-centered interviews and secondary data from publicly available podcasts and written documents from the businesses. In accordance with constant comparison, the data analysis started directly after the collection of the first data. Categories and characteristics emerging from the data analysis were sequentially compared for homogeneity or heterogeneity in further primary or secondary data collection. Thus, the study followed an iterative abductive research procedure (Strübing, 2013). Characteristics of sufficiency in business practices were inductively extracted from interviews and podcasts, and deductively tested in follow-up interviews, podcasts, and in the secondary text material. Abduction is a creative research process, during which researchers produce new forms of knowledge from the abstraction and comparison of the practitioners' subjective experiences (Suddaby, 2006; Reichertz, 2013).

Sampling

Theoretical sampling is—after constant comparison of data—the second essential precept of grounded theory (Suddaby, 2006). Theoretical sampling leaves it open to the researchers to select a diversity of different cases, which describe best various aspects of the phenomenon under study (Hensel and Glinka, 2018). In line with the iterative process, theoretical sampling does not require the researcher to know all the cases at the beginning of the research (Strübing, 2013). Only the first two cases were defined at the beginning of the study. The following business cases were selected during the iterative process of data analysis and collection. To facilitate the research of cases, we, however, still defined specific criteria for the sampling of the business cases. Thus, the following selection criteria were defined:

(1) *Lessening strategies*: The most important sampling criterion was that businesses implement sufficiency-oriented strategies. Thus, the four lessening categories from Schneidewind and Palzkill-Vorbeck (2011)—decluttering, decelerating, disentangling, and decommercialization—served as a guide to identify sufficiency-oriented strategies. As a criterion, it was decided that the companies must apply sufficiency-oriented strategies from at least one of these categories, preferably more. In the course of the iterative research process, we further narrowed the cases down to three main sufficiency-oriented strategies: (1) the production of long-lasting consumer goods (decelerating); (2) the offering of sharing services (decluttering); and (3) the facilitation and diffusion of repair possibilities (deceleration and decommercialization). Thus, all business cases build their business activities around one of these three sufficiency-oriented strategies. Additionally, businesses were selected when they were combining one of these main activities with other lessening strategies; for example, when businesses that produce long-lasting products (decelerating) also considered local supply chains (disentangling) or production limitations (decluttering).

(2) *Sufficiency purpose*: We paid attention to selecting businesses that publicly identified themselves or their pilot project with a sufficiency-oriented purpose, reaching for a

reduction of resource and material use or of production or consumption volumes.

(3) *Fashion and electronics sectors*: The selection of businesses was restricted to B2C companies either in the fashion or in the electronics sector, because, according to the literature, many businesses in both sectors are already integrating sufficiency-oriented strategies. Sufficiency in both sectors is comparable, because both sectors offer long-lasting consumable goods to end consumers. Both increasingly test new business practices enabling, for example, repair, reuse, or supporting consumption reduction. Despite the necessity and high environmental relevance for considering sufficiency in other sectors—such as mobility, energy, or food supply—the dynamics and complexity of these systems were considered too diverse to compare sufficiency in business practices.

(4) *Founders available for interviews or existing podcasts with founders*: Interviews with the founders of the businesses or with employees in strategic positions were central for data collection. Thus, businesses that accepted the conducting of personal interviews were prioritized. Additionally, publicly available podcasts were also relevant for data input.

(5) *European region and languages*: To ensure comparability of settings and practices, only businesses located in Europe were selected. Additionally, only cases with primary and secondary data available in German, French, or English—according to the authors' spoken languages—were selected.

Cases were found via multiple Google searches with various keywords relating to the lessening categories in German, French, and English. Various websites with lists—for example, of businesses for the common good, certified B Corporations, or circular businesses—were also helpful in the sampling process. Additionally, personal connections with circular economy programs or Right to Repair roundtables completed the search for empirical cases. In the end, 11 selected cases were small- or middle-sized companies and three were larger companies with more than 500 employees, for example, one large international company that tested a sharing model of its outdoor products. An overview of the selected businesses is visible in Table 2.

Data collection

The collection of primary and secondary data occurred from May 2021 to November 2021. Additionally, further secondary material to reinforce and actualize the iterative research process was collected and analyzed between July and August 2022. The problem-centered interview format for the collection of primary data suited well the inductive and deductive approach of the study (Witzel, 2000). The interviews were conducted with the founders of the businesses or with employees in strategic positions. The semi-structured questionnaire enabled the sufficiency practitioners to talk freely about the story of their business as well as their daily practices from acquisition of resources to consumption support and closed-loop services. Follow-up questions concerning the governance and culture of the business and the understanding of growth were asked, with the goal to uncover sufficiency elements in further business practices. The interview guidelines are available in the Appendix. We paid attention to select available podcasts that asked similar questions to the interview guidelines. Additionally, for each case, secondary data such as the companies' websites, blog posts, newsletters, TED Talks, sustainability reports, or press interviews were collected. Complementing the primary data with secondary material enabled us to observe the business practices from a different perspective as well as testing the statements from the practitioners *via* additional material.

Table 3 lists all the primary and secondary data collected for the study. It depicts the iterative collection and coding process by showing the different steps of data collection and coding. In each round, new questions for the interviews, the podcasts or the secondary data were addressed. The adaptation of the questions and interview guideline served the comparison process with the aim to confirm or refute categories that emerged in previous data collection and analysis rounds. While we started with small producing companies, larger sufficiency-oriented companies as well as companies with sharing and repair services were added to diversify the data set. Data from the last collection round addressed specific characteristics of sufficiency that repeatedly appeared in the data. Hypotheses about the limits to growth, the diffusion of practices or the care work along the supply chain were for example addressed in this final collection and coding round.

The interviews—either conducted by the authors or by journalists in podcasts—were central for observing business practices and identifying characteristics of sufficiency. Despite the unconscious and routinized performance of practices, practitioners can still talk about the practices they are embedded in Hitchings (2012). Individuals have access to the elements of the practices; they identify with them and thus can also talk about them. Even Bourdieu's concept of *habitus* reports a degree of reflexivity that leaves individuals the possibility to self-reflect upon their situation and perform change (Everett, 2002). In interviews, we were able to discuss and reflect elements of practices, and the strategies that are being tested, without expecting the practitioners to fully understand and describe the sufficiency-oriented practices they are performing (Hitchings, 2012; Shove et al., 2012; Spurling et al., 2013).

Data analysis

Categories and characteristics of sufficiency in business practices were inductively identified in interviews and podcasts

TABLE 2 List of sufficiency-oriented business cases from the study.

Company	Sector	Lessen strategies	Description
Hopaal	Fashion	Decluttering Decelerating Disentangling	Activity: Producer of long-lasting and sustainable clothing Located in: Biarritz, France Size: < 10 employees; Founding year: 2016
Loom	Fashion	Decluttering Decelerating Disentangling	Activity: Producer of long-lasting and sustainable clothing Located in: Paris, France Size: < 10 employees; Founding year: 2016
Fairphone	Electronics	Decelerating	Activity: Producer of fairer and modular smartphones Located in: Amsterdam, The Netherlands Size: < 500 employees Founding year: 2013
Shiftphone	Electronics	Decelerating Disentangling	Activity: Producer of modular smartphones Located in: Falkenberg, Germany Size: <50 employees; Founding year: 2014
Patagonia EU	Fashion	Decelerating	Activity: Producer of sustainable and long-lasting outdoor clothing and gear Located in: Amsterdam, The Netherlands Size: > 500 employees; Founding year: 1973
VAUDE	Fashion	Decelerating	Activity: Producer of sustainable and long-lasting outdoor clothing and gear Located in: Tettnang, Germany Size: >500 employees; Founding year: 1974
TEIL.dein Style	Fashion	Decluttering Decelerating Disentangling	Activity: Renting of secondhand clothing Located in: Bern, Switzerland Size: <10 employees (volunteers); Founding year: 2020
Palanta	Fashion	Decluttering Decelerating Disentangling	Activity: Online renting of fair and sustainable clothing Located in: Amsterdam, The Netherlands Size: <10 employees (volunteers); Founding year: 2019
AlderNativ	Electronics	Decluttering Decelerating Disentangling	Activity: Distribution of sustainable smartphones, pilot project of renting smartphones Located in: Bern, Switzerland Size: <10 employees; Founding year: 2016
Outdoor brand (anonymous)	Fashion	Decluttering Disentangling	Activity: Producers of sports and outdoor clothing, pilot project of renting outdoor gear Located in: n/a Size: >500 employees; Founding year: n/a
Unown	Fashion	Decluttering Decelerating	Sector: Fashion Activity: Online renting of fair and sustainable clothing Located in: Hamburg, Germany Size: <50 employees; Founding year: 2019
Bis es mir vom Leibe fällt	Fashion	Decluttering Decelerating Disentangling Decommercialization	Activity: Repair service for clothing and textiles; repair education Located in: Berlin, Germany Size: <10 employees; Founding year: 2011; repair shop closed in 2022
Ifixit EU	Electronics	Decluttering Decelerating Disentangling Decommercialization	Activity: Free and community-based platform with repair instructions; producer of repair tools Located in: Berlin, Germany Size: <100 employees; Founding year (EU): 2013
R.U.S.Z	Electronics	Decluttering Decelerating Disentangling	Sector: Electronics Activity: Repair services and competences for electronic home appliances Located in: Vienna, Austria Size: n/a; Founding year: 1998

TABLE 3 Collected primary and secondary data per business case.

Rounds	Company ($n = 14$)	1. Collected data for open coding	Questions addressed in interviews and podcasts[a]	2. Collected secondary data for deductive coding	Main questions addressed in secondary data[a]
1	Hopaal	Podcast with co-founder/CEO	What were the motivations for the foundation of the company? How did the company evolve with time?	Website (#1) Newsletters (#27) Blog posts (#8)	Which social meanings, competences and material arrangement cited in the interviews are visible in secondary data? How do the companies exchange, communicate with stakeholders? Which aspects of their practice do they communicate?
	Loom	Interview with CEO	How does the business practices from acquisition to consumption and end-of-life function? What are the strategies to reduce, limit, avoid production and consumption?	Website (#1) Newsletters (#7) Blog posts (#12) TED Talk (#1)	
	Fairphone	Interview with circular material innovator	What is important when implementing these strategies?	Website (#1) Blog posts (#21)	
	Shiftphone	Interview with CEO	How is it to work for your company? What does growth mean for the company?	Website (#1) Blog posts (#22)	
2	TEIL.dein Style	Interview with head of innovation and networking/co-founder	Which needs are sharing models answering to? How do they collaborate or work with other stakeholders?	Website (#1)	Which ambivalences observed in first coding rounds are observable in secondary material?
	Palanta	Interview with CEO/founder	How do they envision to grow and how do they envision the growth of sharing models?	Website (#1) Blog posts (#7)	
	AlderNativ	Interview with head of operation	Where does the starting capital come from? How do companies ensure the caring of products?	Website (#1)	
3	Outdoor brand (anonymous)	Interview with director of business development	What are the motivations for a sharing pilot in a large company? What difficulties and ambivalences for sufficiency occur within the setting of a large company? How does the company envision the spreading of sharing in their business model?	Renting website (#1) Sustainability report 2021 (#1)	How are the sharing pilot and the sufficiency aspects mentioned in the communication of the company?
4	Bis es mir vom Leibe fällt	Interview with founder	How can repair as a sufficiency strategy replace or help reduce the production of new products?	Website (#1) Economy for the common good report (#1)	What differences between repairing of electronics and textile are visible? How do they communicate their political actions for repair?
	Ifixit	Interview with CEO	How do the repair companies influence reduction of production? How do they spread repair practices?	Website (#1) Repair manifesto (#1) Blog posts (#15)	
5	Patagonia EU	Podcast with CEO	How does the company grow? How do they implement their end to material growth?	Press article (#1) Social and environmental responsibility website (#1)	Testing of all codes and categories that appeared in previous coding rounds: which codes are visible in the secondary data of the companies?

(Continued)

TABLE 3 (Continued)

Rounds	Company ($n = 14$)	1. Collected data for open coding	Questions addressed in interviews and podcasts[a]	2. Collected secondary data for deductive coding	Main questions addressed in secondary data[a]
	VAUDE	Podcast with CEO	How does care influence the activities and strategies of the company? Are the strategies and aspects of sufficiency mentioned by small producing companies observable in this larger producing company?	Website (#1) Sustainability report 2020 (#1)	
	Unown	Podcast with co-founder	What are the complementarities between sharing and selling? How do they influence sufficiency-oriented practices?	Website (#1) Impact report (#1) Blog posts (#3)	
	R.U.S.Z	Podcast with founder	What are the company's effort to grow their ecosystem? How does their social franchising system work?	Website (#1) Blog posts (#17)	

[a]The questions from previous rounds of data collection and analysis were repeated in each round for each case. This table shows the additional questions asked respectively Asked to the new cases, with the goal to confirm or refute emerging categories and hypothesis. in the selection of podcasts, podcasts addressing these questions were chosen.

and then deductively tested and compared in the follow-up interviews, as well as in the secondary data sources (Corbin and Strauss, 1990). Primary and secondary data was coded in ATLAS.ti following the three coding phases of Corbin and Strauss (1990); namely, open, axial, and selective coding. The open coding process generated a variety of sufficiency characteristics. The identified codes were then organized into higher-level categories and groups during the axial coding process. The interaction and connection between the categories were investigated during this coding phase. We tried to identify the causes and intervening conditions of sufficiency in business, as well as the consequences of the sufficiency-oriented strategies for the practitioners, for their ecosystems, and for the political and economic context. In the final phase of selective coding, the sufficiency characteristics, and their interactions, were synthetized regarding the research questions, with the aim to deliver a better understanding of the phenomenon sufficiency in business (Strübing, 2013). The writing of memos accompanied the entire data analysis and supported the progressive interpretation of the data.

Results

Sufficiency in business practices emerges in all observed cases from the identification of the growth imperative and consumption affluence as main drivers of environmental destruction and social injustice. The desire to break path dependencies of exponential growth, or of an abundance of consumption, results in a quest for less materialistic, slower, and more local solutions to production and consumption. Sufficiency practitioners examine the manifold of elements that foster the growth imperative with the attempt to tackle these lock-ins directly. For example, practitioners in the fashion sector observe a reduction in textile and clothing quality intended to shorten product lifetime. According to the practitioners, this sort of planned obsolescence is strengthened by a culture that treasures the newest products, trends, or technologies and by rising investments in marketing. Sufficiency practitioners also deplore innovation and technological protectionism, which hinders access to, for example, repair. The race of profit-oriented investors for growth and financial returns is also condemned by the practitioners, so they are often searching for alternative investment sources.

The intention to break the growth and affluence path dependencies consequently leads sufficiency practitioners to take time and offer space to develop a sufficiency-oriented way of doing business. The result show that sufficiency practitioners change their business practices in three dimensions: (1) rethinking the relation to consumption; (2) rethinking the relation to others; and (3) rethinking the social meaning of the own organization. Each rethinking dimensions is characterized by a specific goal and a variety of strategies that are implemented to fulfill the goals. Moreover, these rethinking processes, where alternative sufficiency-oriented business practices are shaped, are characterized by specific social meanings, competences, and material arrangement. Table 4 summarizes all the practice elements identified in the data that emerge and stabilize when

integrating sufficiency into business practices. For example, rethinking the relation to consumption follows the goal to orient consumption toward basic human needs. This process requires among others high consumer involvement to co-create basic minimalistic products and design them to fulfill necessary needs. Rethinking the relation to consumption is also characterized by emotions of happiness and joy that are related to the reduction of material dependency. It is notable from Table 4 that patience, care and learning processes appear in all rethinking processes and that they reveal to be essential characteristics of sufficiency in business practices.

In the following, each rethinking dimension is described in further detail, with an emphasis on the strategies applied and the practice elements emerging. Each dimension is also characterized by ambivalences between the desire to be sufficiency-oriented and the dominant capitalist norms. These ambivalences reveal the difficulty for the practitioners to develop holistic sufficiency-oriented business practices and point to the risks of sufficiency rebound effects. Tables 5–7 summarize for each rethinking dimension the goals, the questions asked by the practitioners, the strategies applied in response, as well as the existing ambivalences.

Rethinking relation to consumption

Defining and answering basic human needs

Sufficiency practitioners want to ensure that their product palette exclusively answers basic human needs for a good life. They differentiate between products that satisfy human needs and products that satisfy superfluous consumer wants. Sufficiency practitioners criticize marketing strategies that created consumer wants and try to orient their activities toward the satisfaction of basic human needs, as described by this practitioner:

> "Let's try to produce only the strict necessary, to buy only what we really need. We try to answer to the need to dress people, with sustainable materials, etc.... and not to create wants." (Hopaal, publicly available podcast, December 30, 2020)

When asked about the basic human needs that the sufficiency practitioners are answering to, different needs are pointed out. Sufficiency practitioners in the fashion sector respond to the need to dress, since it is socially inappropriate to wear the wrong or no clothes. Consumers also have a need for clothing diversity because of the manifold dress codes in different life settings. Sufficiency practitioners in the electronics sector answer to the social need for communication and connectivity. Additionally, electronic devices are increasingly used in the professional environment, increasing the need for reliable hardware and software. Furthermore, the practitioners in both sectors mention the need for sustainable, long-lasting products, and for services to support the longevity of products.

Despite a strong desire to differentiate between needs and wants, the practical implementation appears challenging. The practitioners' selection of human needs to be fulfilled with their products and services does not follow clear evaluation criteria. Sufficiency practitioners randomly or subjectively define which human needs should be fulfilled with the provided goods and services and which should not. This subjective selection of needs does not differ considerably from the business-as-usual marketing of new products and services according to consumer preferences.

Frugal production volumes

Besides aligning the value proposition to fulfill human needs, the sufficiency practitioners ought to define the right quantity of the products or services necessary to fulfill those needs. Contrary to consumer wants, which never reach saturation, needs can be satisfied (Gough, 2015). Sufficiency calls on practitioners to determine an adequate quantity of goods and services necessary to fulfill the needs of their customers.

To limit production volumes, practitioners try to avoid animating unnecessary consumption. Some sufficiency practitioners have no marketing budget and refuse to pay to attract customers. For example, practitioners can avoid advertisements, sales, or digital marketing instruments to manipulate consumers into unwanted or unconscious purchases. Sufficiency practitioners also refuse to offer limited mobile phone contracts, or seasonal and limited fashion collections, which subjectively shorten their use phase. Sufficiency-oriented marketing is confined to organic strategies, such as public relations, non-paid-for social media content, press appearances, or word of mouth. The purpose of marketing for sufficiency practitioners is to transfer knowledge and learnings about sustainable and sufficiency topics, transmit competences for careful material use, render unsustainable supply chains transparent, and inspire others with their alternative practices.

Another repeated strategy to limit production volume is the early involvement of consumers in the design and production phase, with preorder and co-creation processes. Several sufficiency practitioners ask their community to preorder their products before production. The practitioners will only produce the volume of goods that are ordered and hence necessary to fulfill the needs of their consumers. According to the practitioners, the longer waiting time until delivery fosters conscious purchase decisions. The willingness to wait seems to activate consumer reflection about the necessity to purchase a specific product and reduces impulsive consumption decisions. Co-creation aims at designing the products according to consumers' needs. The consideration of wishes concerning the

TABLE 4 Classification of codes according to the three dimensions of sufficiency in business practices.

Dimension of sufficiency business practice	Goal of dimensions	Categories of strategies[a]	Social meanings of sufficiency in business practices	Competence of sufficiency in business practices	Material arrangement of sufficiency in business practice
Rethinking relation to consumption	Answering to basic human needs	Definition of basic human needs Frugal production volumes Avoiding new production	Sufficiency purpose Minimalisms Long-lasting Happiness and joy Fairness **Care** **Patience**	Consumer involvement Variating forms of ownership Transparency Repair skills **Feedback and learning process**	Basic minimalistic products Repairable products and parts Secondhand products Repair tools Repair instructions Care instructions Local repair shops
Rethinking relation to others	Co-creation of local and sufficiency-oriented value	Collaboration for value creation Limiting production space Limiting consumption space	Sufficiency purpose Material attachment Love and appreciation Responsibility and reliability Trust Solidarity Local embeddedness Proximity **Care** **Patience**	Transparency Collaboration Community building Do-it-yourself Compliance with standards and quality Open source **Feedback and learning process**	Communication tools
Rethinking own social meaning of the organization	Redefining growth and organizational meaning	Limiting growth Growth of ecosystem Business structures for sufficiency	Sufficiency purpose Manageable / human-scale Solidarity Inspiration of each other's Independency from growth-oriented investors Love and appreciation Authenticity **Patience** **Care**	Collaboration Knowledge and awareness transfer Transparency Stakeholder involvement **Feedback and learning process**	Financial resources

[a]The list of strategies corresponding to each category of strategies is visible in Tables 5–7.

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TABLE 5 "Rethinking relation to consumption": Relevant questions, strategies, and emerging ambivalences.

Goal	Category of strategies	Questions practitioners ask	List of strategies applied by the practitioners	Ambivalences
Production and consumption answering to basic human needs	Definition of human needs	What are basic human needs? Which product and services are necessary to fulfill the needs?	- Co-design and definition of needs and products with customers and employees - Design product, services for everyone's needs (social justice and inclusion)	Producers and consumers have a lack of knowledge of what their needs are. Evolving needs with trends and technological progress make it difficult to differentiate between needs and wants. The needs of discriminated social groups are not specifically recognized, e.g. clothing size for the one normative body shape or only one gender.
	Frugal production volumes	How much of the product or service is enough?	- Produce less by choice - Avoid animating unnecessary consumption (no-marketing strategies) - Co-creation and design of long-lasting products - Production of long-lasting products with sufficiency by design - Preorder	Unnecessary consumption desires can also be created by involving customers early in the design process or with preorder campaigns. The viability of the business stays essential for all cases, making it difficult to limit the production or avoiding marketing, while generating enough revenues.
	Avoiding new production	How do we fulfill the needs without producing new goods?	- Extend the value and use of existing products - Right to use: sharing new or secondhand products - Right to repair: repair services and infrastructures, selling repair tools, offering repair skills or instruction, lobbying for repair legislation	The function and the nature of the product influence sharing possibilities. Basic hygienic products are more difficult to share than products used for one specific event. Complementarity between sharing and selling is essential, and sharing is not always the most sufficiency-oriented option. Subscription in sharing model might accelerate consumption frequency instead of decelerating it.

functionality, design, material, or use of the products is likely to increase consumers' attachment to the product.

Avoiding new production

The most effective method to restrict production volume to the necessary is to avoid producing new products in the first place. Therefore, many sufficiency practitioners focus on extending the value of existing products. Instead of selling new products, sufficiency practitioners offer access to tools, competences, infrastructures, or services to care and extend the life of existing products. The data reveals that sufficiency practitioners avoid new production by advocating for two consumer rights: right to use (switching from owning to sharing) and right to repair (creating a repair culture).

Sufficiency practitioners introduce sharing offers to the market with the intention to optimize the use of products, especially to avoid unused products from lying in drawers or wardrobes while other users could benefit from them. For sufficiency, it is important that the sharing model is built upon the purpose to limit inflows of new products onto the market. When many consumers share the same objects, less production is necessary. Sufficiency practitioners play with different variants of product ownership to adapt their supply to consumers' needs. Accordingly, consumers do not need to own products which are not frequently used. Sharing is optimal for clothes only worn for special events or to give variety to the wardrobe. Renting is also relevant for one-time use of material or for adapting to rapid technological progress without the need to frequently buy new devices. Furthermore, some sufficiency practitioners value sharing models because of the possibility to try out and test products before purchasing. If the product is proven for everyday practical needs, a purchase for long-term use is worthwhile:

> "The self-evidence of 'I can have what I want now' in a wealthy society is quite common and we see that as problematic. And we are not saying that you should not

TABLE 6 "Rethinking relation to others": Relevant questions, strategies, and emerging ambivalences.

Goal	Processes	Questions practitioners ask	Developed strategies	Ambivalences
Co-creation of sufficiency-oriented value	Collaboration for value creation	What sufficiency-oriented value can be co-created and co-delivered? How can it be produced in a sufficiency-oriented manner?	- Collaboration with stakeholders to co-create a sufficiency-oriented ecosystem - Co-creation of sufficiency-oriented value - Collaboration for the sufficiency purpose - Collaboration to lobby for legislation supporting sufficiency	The most sufficiency-oriented value might not generate any revenues (do-it-yourself, donations, sharing for free). Owing to competition and protectionism norms, sufficiency practitioners are unsure if they should collaborate with non-sustainable partners. They might not take the cause seriously.
	Limiting production space	Where is the sufficiency-oriented value produced or created? With whom?	- Backshoring: relocalization of manufacturing process to home region - Clustering production processes: keeping suppliers and resources nearby each other and reduce transport distances - Employees traveling to work by bike, public transport, or working within walking distance	Backshoring is not always possible, owing to a lack of infrastructure or competences in home countries. To avoid that employees in producing regions abroad lose their jobs, some practitioners prefer to improve working conditions and qualities abroad, instead of relocalizing the manufactures.
	Limiting consumption space	Where are the products and services available for consumption? Who do they serve?	- Defining a limited consumption perimeter: refuse to ship to faraway regions; refuse to translate website, focusing on specific neighborhood, city, language regions, or countries	No ambivalences observed.

> own, but perhaps more consciously. That means that, with the question 'Do I borrow a phone that I don't own?', there is also another question: 'Do I need the phone now effectively?'" (AlderNativ, personal interview, October 14, 2021)

On the other hand, several sufficiency practitioners highlight that not all products are suitable for sharing. They mention, for example, regularly used or essential daily products as inadequate for sharing because of hygienic concerns, as highlighted in the following two excerpts:

> "I think if you are running 20 km every day, I am not sure that after a month, the shoe can be rented again." (Anonymous outdoor brand, interview, September 6, 2021)
>
> "I would never rent, like, a white t-shirt to be honest, or a bra; that is something to consider." (Palanta, personal interview, August 28, 2021)

Sufficiency, in practice, thus varies between ownership of essential daily used materials and renting of single-used products. The two modes are complementary and reduce the number of bad or superfluous purchases. Ownership is revealed as a useful variable within sufficiency-oriented business practices to keep unused goods in circulation and avoid unnecessary production.

Additionally, sufficiency practitioners advocate for a universal right to repair. They provide access to a variety of repair facilities, so that all products from any brand can be repaired by anybody, independently of the consumers' repair competences or economic situation. The repair possibilities vary according to the products and the materials. In the case of modular and repairable electronic devices that are designed to be repaired, sufficiency practitioners encourage and support their consumers to repair the products themselves. Tools and instructions are often automatically provided with the products. For electronic products that are not designed to be repaired, sufficiency practitioners engage in spreading instructions, tips, and tools for self-repair practices at home. In other cases, especially for clothes, repairing requires expensive technologies such as industrial sewing machines and professional sewing expertise. Learning to repair clothes necessitates time and a financial budget that many consumers might not have. Local repair shops and facilities are thus another important sufficiency practice for the right to repair.

TABLE 7 "Rethinking social meaning of the own organization": Relevant questions, strategies, and emerging ambivalences.

Goal	Processes	Questions practitioners ask	Developed strategies	Ambivalences
Redefining growth and organizational meaning	Limiting growth	How much material or organizational growth is enough?	- Projecting an end to organizational, sales, or production growth - Reaching a legitimated size to inspire and influence the industry - Limiting activities to the essential - Limiting the number of employees in the organization - Aggressive growth or low growth until legitimated size of organization is reached	The legitimated size, when growth can be stopped, is not clearly defined. Practitioners do not have criteria for when this level of growth is reached. Practitioners still have revenues and profits as main success indicators, making the definition of limitation to growth insecure.
	Growth of ecosystem	How do we grow and diffuse the sufficiency-oriented practices within the market/ecosystem?	- Pursuing the growth of the sufficiency-oriented ecosystem - Diffusing sufficiency-oriented practices: transfer of knowledge and ideas, transparency of information, processes, or innovation, or financial support for new sufficiency-oriented projects	No ambivalences observed.
	Business structure for sufficiency	Which organizational form, financial means, or governing rules are driving sufficiency?	- Funding from independent investors valuing long-term social and environmental impact - Forms of organization supporting sufficiency, e.g. family-owned, limited liability, non-profit association - Control mechanism to integrate purpose in organizational structure: involving employees and customers in decision making or vetoing right of investors - Reinvesting revenues in other sufficiency-oriented projects	Desires to change organizational forms to, for example, co-operation or purpose-stewardship is currently not implemented. Lack of time or investments is hindering practitioners to change the organizational form of their business.

The application of these strategies—from organic marketing, preordering, and co-creation to sharing and repairing—do not systematically implicate sufficiency. For example, with the early involvement of consumers in co-creation activities or preordering, the business still risks inciting consumption desires that are superfluous. Co-creation and preordering may turn out to be intensive early marketing, even without an important marketing budget. A subscription model making consumers pay a monthly contribution to rent products could provoke an acceleration of consumption instead of a deceleration, because consumers have the incentive to pay off the cost of subscription. Only frequent consumption makes subscription worthwhile. This seems to go against the willingness of sufficiency practitioners to promote long-term use of products and reduce the frequency of consumption. Some practitioners, moreover, offer monetary vouchers if the consumers bring back old products for reuse. While the goal to recuperate unused clothes contributes to sufficiency, the voucher still encourages the consumer to buy a new product. In all cases, those strategies can only be sufficiency-oriented with the aspiration to match basic human needs and to limit production volume to the necessary. Without the quest for basic human needs, these strategies can lead to more material consumption instead of sufficiency.

Rethinking relation to others

Co-creating sufficiency-oriented value

Sufficiency practitioners mention the limitation of a single company to transform the practices of the industry. They all engage in collaboration with like-minded, purpose-oriented

organizations, because they are critical toward the dominant logic of competition:

> "At the beginning, they were trying to put us in competition with others, and it was keeping me up at night. I mean, I don't like this tension… I met all the young French textile brands, we all get along well, we do things together sometimes, we call each other, we help each other. I don't need to be in a competitive world because I don't need to be the first, I don't need to win all the market shares." (Loom, personal interview, June 11, 2021)

The collaborations have various forms and goals. Some practitioners offer consulting and support services for other organizations to help them on their sustainability transformation path. Others form partnerships to cover a need or an activity in the supply chain that they are not specialized in, or that one company cannot cover alone. For instance, the outdoor brand reached out to a start-up to manage its renting project. Fairphone partnered with a French company for the take-back, reuse and recycling of smartphones. Overall, sufficiency practitioners support each other with the goal to create a sufficiency-oriented ecosystem and enable social change together. Or, in the words of the founder of Ifixit:

> "We invest time, energy, and money because we are concerned with initiating a process of change. It's a kind of social commitment where you can go a long way." (Ifixit, personal interview, October 11, 2021)

These processes of change are reinforced by collaborative lobby activities that the practitioners engage in. While individual companies fall short in transforming structural and institutional practices, the sufficiency-oriented businesses join forces to advocate for legislations that support sufficiency-oriented practices. For example, following a call from Loom, 400 French fashion companies joined forces to lobby for legislation to encourage a reduction of production volumes, support reuse, and enable the decarbonization of production processes (En Mode Climat, 2022). Bis es mir vom Leibe fällt, Ifixit, and R.U.S.Z engage with associations that advocate, for example, for a value-added tax exemption for repair services, or for financial repair bonuses that would make repairs financially accessible to everyone.

The value co-created in the ecosystem goes beyond the sum of the product and services offered by each practitioner. The efforts and collaboration of the practitioners extend the intrinsic value of existing products or obsolete material. For example, encouraging consumers to repair or take care of their products reinforces the attachment that individuals have to their personal objects or materials. Sufficiency practitioners deliver to users a feeling of appreciation for existing material and resources. Appreciation is delivered to consumers with the transfer of creative ideas, skills, or instructions for the repair or reuse of unused products. Additionally, a key process to extend use and value of products is open source, allowing everybody to improve existing technologies (especially hardware and software). Fairphone, with its open-source community, succeeded in updating the seven-year-old operating system for the Fairphone 2, which was no longer supported by the chipset provider (Fairphone, 2022).

Besides collaboration, local embeddedness and proximity to both suppliers and consumers are central to the ssufficiency practitioners, who do not perceive globalized markets as unlimited expansion and growth opportunities. Rather, most of the practitioners try to concentrate their production and consumption activities to defined regional perimeters. According to sufficiency practitioners, the limited operating perimeters improve the transparency of the supply chain and the compliance of suppliers with social and environmental standards. Proximity enables partnerships with local organizations and communities. Consumers benefit from direct access to repair and reuse services and employees can walk or cycle to their offices. Strategies to reduce both production and consumption perimeters are observed.

Reducing production perimeters

In the fashion sector, producing sufficiency practitioners have relocated their supply chains entirely to European countries. Backshoring of fashion supply chains represents, for many practitioners, a gain in trust and control of environmental and social impacts in the value chains. The practitioners quote several benefits from production relocalization: stricter environmental and employment laws in Europe; fewer intermediaries in the supply chain; shorter transport distances; use of local and sustainable resources; and trusted collaboration with strong sustainable partners. However, there are significant differences between the sectors. Backshoring in the fashion sector is possible because the manufacturing infrastructures, as well as the producing knowledge and competences, are still available in Europe despite globalization and de-localization trends. In comparison, backshoring in the electronics sector is more complicated and cost intensive, because the infrastructure and competences to produce specific components of electronic devices are concentrated in few regions; for example, chips and batteries in China. In consequence, the goal of reducing production space is transferred to minimizing transport distances during the entire production process, by keeping suppliers and manufacturers close to each other, rather than an obligation to locate the entire manufacturing process near the consumption regions. According to sufficiency practitioners, consumption and production do not necessarily occur in the same geographical regions.

Reducing consumption perimeters

On the consumption side, sufficiency practitioners intend to provide comprehensive, reactive, and qualitatively high services for sufficiency-oriented lifestyles, such as sharing, repairing, reusing, or upcycling. For fast and reliable customer services, some sufficiency practitioners decide to limit their consumption and delivery perimeters to European countries, specific language regions, cities, or, with regard to practitioners with local shops, neighborhoods. For instance, two practitioners decided not to translate their online shops and websites. Restricting communication to the native language indirectly leads to a limitation of the delivery perimeters. This strategy is motivated by the desire to develop close relationships with the consumers. Sufficiency practitioners cultivate their consumer relationship because they rely on high consumer involvement and feedback to improve their sufficiency-oriented practices.

Rethinking social meaning of the own organization

Enacting limits to material growth

The sufficiency practitioners describe alternative understandings of growth. It is notable from the data analysis that most sufficiency practitioners are critical of exponential economic growth. They all project an endpoint to their own growth, be it in organizational size, sales, or revenues. In many cases, they aspire to reach an organizational size that gives them enough market legitimation to influence market structures and inspire other organizations with their sufficiency practices:

> "We don't envision to become the new Apple. Rather that the big companies that produce phones go step by step down the road that we prove to be possible" (Fairphone, personal interview, June 15, 2021)

Some practitioners, having reached a satisfactory business size, do not aspire to growth further organizationally. For instance, they build an effective set of practices based on the current numbers of employees and activities. With a small number of employees, the practitioners can nurture a sufficiency-oriented work culture, with fewer working hours and more time for care work and leisure activities. A limited number of activities allows the practitioners to keep the processes and operations within a manageable frame.

Even though some practitioners try to stay within their current organizational size, it must be noted that most cases continue to experience material and production growth. Only Patagonia has communicated its wish to stop growing its production volumes and to switch to secondhand and sharing services instead (Kaufmann, 2021). Currently, one section of the practitioners adopts an active and assertive growth strategy to rapidly gain market legitimation and, simultaneously, to grow in environmental and social impact, as described by this practitioner:

> "The more our modular phones circulate in Switzerland, the better, of course, because then fewer unsustainable phones will be in circulation." (AlderNative, personal interview, October 14, 2021)

The second set of sufficiency practitioners adopts an agnostic attitude toward sales growth. The quality of products and services ranks above the sold quantity. Sales continue to grow because the demand for sustainable products and services increases. However, the sufficiency practitioners do not invest in marketing and sales strategies to increase their growth rates. Growth can occur, but it is not the main driver of each company's activities.

Growth of sufficiency-oriented ecosystems

In all cases, societal and environmental impact is prioritized over the growth of revenues and profits. Sufficiency practitioners understand growth as the diffusion of sufficiency-oriented production and consumption practices. They aspire to the proliferation of sufficiency-oriented initiatives and organizations on the market. Collective growth of sufficiency-oriented ecosystems prevails over individual growth. Ecosystem growth implies the transfer of ideas and knowledge to other practitioners. Inspiration and transparency play an important role in the diffusion process. Although the sufficiency practitioners were often the first to develop their fair, local, and slow practices, many sufficiency practitioners list their entire supply chain, activities, and partnerships on their websites. Technological innovations are also not protected by patents and openly available to others. Sufficiency practitioners connect with partners in different regions to transfer their practices, encourage enterprises with the same ideas, or financially support the development of new sufficiency-oriented projects. Often, the practitioners do not financially profit from franchising or transfer of practices, because they aim for a diffusion of their practices, not for the company's prosperity.

Even though sufficiency practitioners are not primarily oriented toward profit maximization, it does not mean that sufficiency does not generate revenues. Most of the investigated cases are profitable. The profits are reinvested for the purpose of sufficiency. Either the profits are reinvested in the own company, for future development and to improve business practices, or the profits are distributed to other sufficiency-oriented projects to enable ecosystem growth. For example, cross-financing of projects with a sufficiency purpose is a common procedure for the sufficiency practitioners.

Business structures for sufficiency

Besides redefining the meaning of growth, sufficiency practitioners also rethink their business roles. They choose legal organizational forms that best fit their sufficiency purpose. For example, the businesses included in this study are limited liability companies, family-owned businesses, or non-profit associations. These legal forms are selected because they allow the practitioners to keep their independence from external shareholders. Sufficiency practitioners wish to conserve their decisional responsibility and avoid their decisions being influenced or driven by external profit-oriented investors.

The question of financial ownership seems essential for sufficiency-oriented businesses. Sufficiency practitioners select investors that value long-term societal impact and wish to encourage the sufficiency purpose. The capital of sufficiency practitioners all comes from purpose-oriented financial investments: foundations, crowdfunding, cross-financing from other sufficiency-oriented projects, personal investment, or a mix of these. Financial ownership stays in the hands of like-minded share- or stakeholders that do not focus mainly on investment returns. In some cases, the investment does not have any promise of returns, which resembles private donations. Appreciation of the project and its sufficiency-oriented purpose is the main investment concern.

Sufficiency practitioners desire to institutionalize the purpose of sufficiency further in their organizational structure, for example, by involving employees and consumers in the decision-making processes with democratic structures or with fair revenue distribution. Loom, for example, aspires to a more co-operative form of organization to counter trends of market concentration and the establishment of monopolies. Those structures, however, are not yet implemented by the sufficiency practitioners included within the study. Only a projection of future forms of organization that best serve sufficiency is observable, as explained by this practitioner:

> "No, we are not a co-op at all, we're a normal company. And right now, it's all based on our beliefs with my partner. But one day we'll have to change that... for the moment, we have other things to worry about, but it's a subject that we'll keep in mind and that we'll explore." (Loom, personal interview, June 11, 2021)

Elements characterizing sufficiency in business practices

While, in each sufficiency dimension, a variety of different sufficiency-oriented strategies were observed, the study identified three practice elements that influence the design and development of all sufficiency-oriented strategies. Care, patience, and learning processes as elements of social meanings and competences shape sufficiency in all business practices, from sourcing and production to distribution and consumption services, without ignoring supporting activities such as human resources or marketing and communication. Thus, the ability of a business to contribute to the reduction of production and consumption volumes is influenced by the value ascribed to and competence shown in caring for humans, nature, and the material world; by competence in slowing down all processes, to accept to wait and take more time in the performance of practices; and, finally, by the competence in honestly accepting and learning from mistakes, while reaching for feedback and constant improvement for the purpose of sufficiency.

Care

Profit maximization and rapid returns on investment, as well as steady sales and revenue growth, are usually the norms for successful businesses in the dominant capitalist system (Donaldson and Walsh, 2015). From the data, it is observable that it is difficult and inconvenient for both producers and consumers to oppose these standards. Efforts to reduce production and consumption volume necessitate time, reflection, creativity for alternative solutions, and, often, financial investments without security for returns. Sufficiency practitioners take these efforts into account because they care for the environment and social justice. For sufficiency practitioners, the capacity to care for humans and their needs, the protection of the environment, and the longevity of materials and products occur as factors of resistance to the growth imperative and affluence of consumption.

Sufficiency practitioners describe sufficiency in production and consumption practices as care work along the entire supply chain. Care work takes the form of efforts to improve working conditions and sustain fairness in the supply chain. It is care for employees' wellbeing and possibility to reduce working hours so that they can, in turn, have more time for personal care work as well as leisure activities. If sufficiency requires consumers to invest time and energy in repairing and caring for the long-lasting use and reuse of materials, sufficiency practitioners like Loom or Hopaal start by offering this time outside of working hours to their own employees. The sufficiency practitioners also care about long-term relations with their consumers, especially to guarantee support for long-lasting use of their products even years after purchase. Patagonia, for example, offers a lifelong guarantee for repair and Loom stays in contact and gathers feedback on the condition of and consumers' relation to their products as long as three years after purchase. Besides caring about fair relations with others, sufficiency practitioners are also concerned about the quality and careful usage of the products and materials they produce or distribute. All producing practitioners in the study pay attention to ensure the highest quality for long-lasting and multifunctional usage of their products. Testing product prototypes and refusing to market

products before they reach the expected quality is usual practice for sufficiency practitioners. Instructions, infrastructures, tools, and the transfer of skills to consumers to ensure a careful usage of material is also a common goal of the practitioners, especially in sharing models, as the products undergo several use phases by different consumers.

Patience

Despite positive communications about caring for a more sustainable world or, for example, the feeling of joy and happiness often related to repair activities or to less materialistic consumption practices, the results show that care in sufficiency-oriented practices is time intensive. It influences the temporalities and notion of time in business practices. While current economic activities are increasingly oriented toward efficiency and time reduction, sufficiency practitioners in the study rely on patience and long-term planning.

Sufficiency practitioners take time to produce, to comply with social and environmental standards, and to ensure quality for long-lasting products. A slowing down of production processes, for instance, emerges from the attention that sufficiency practitioners pay to the health and wellbeing of employees and workers along the supply chain. Pressuring suppliers with short delivery deadlines is out of order for every producing sufficiency practitioner. On the consumption side, patience is mirrored in the willingness to wait for the products and services, sometimes several months between preorder and product delivery. Moreover, because products ought to be used for a longer period, this requires time in daily life for care activities, such as repair or reuse. Finally, patience affects the time horizon of the business, switching from short-term to long-term thinking and planning. Short- or middle-term results and impacts of sufficiency in society might not be visible. Sufficiency practitioners mention that sufficiency-oriented transformation processes necessitate time and thus long-term vision and plans. According to some practitioners, even if results are not visible in their lifetime in the organization, every action toward sufficiency-oriented impact is worthwhile and necessary.

Learning process

Closely related to care and patience are the learning processes that are mentioned with great consistency by the practitioners in the study. Sufficiency practitioners describe themselves as pioneers in their industry, because they were the first to introduce sufficiency-oriented products or services in their local markets or to fundamentally change practices in the supply chains. Being pioneers for sufficiency necessitates an acceptance of mistakes and having space for trial and error. Sufficiency practitioners value honesty and transparent communication of their learnings and potential failures. Mistakes and the strategies to improve them are often openly communicated on their websites. Several practitioners removed products from their assortments or stopped making specific products because of identified shortcomings. With care and patience, sufficiency practitioners rework their products and services, improving them until they reach an expected quality to be put back on the market. Several practitioners mention that the competence to accept and recognize mistakes and shortcomings is necessary to stay authentic to their sufficiency values and goals.

The learning process of sufficiency practitioners is based on regular feedback loops and the involvement of stakeholders, especially consumers and employees. For instance, Patagonia's decision to stop its production growth resulted from a survey filled out by employees of the company after the Covid-19 pandemic. In the words of the CEO:

> "We asked all of the employees everywhere in the world to answer four questions (…) in essence, they were: What are the things you're learning through this period? What would you like to see us change? (…) And I think one of the things that came back with incredible consistency from our employees was we should make less product, we just make too much product." (Patagonia, publicly available podcast, February 2, 2021)

The ability to listen to the feedback of employees or consumers and react to it seems essential for focusing on the real needs of the consumers, ensuring long-lasting quality of products and services, or strengthening sufficiency-oriented strategies and practices. Moreover, sufficiency practitioners often collaborate with research institutions to develop scientifically based solutions or to support their existing practices with scientific facts. Overall, the experience gained from the learning processes serves the stabilization and diffusion of sufficiency-oriented practices in markets and society.

Discussion

By observing sufficiency in business practices as a change of social practices, the findings of the study show that doing sufficiency consists of the rethinking of three dimensions of current business doings. Sufficiency practitioners change their relation to consumption, their relation to others as well as the social meanings of their own organization. Behind a manifold of sufficiency-oriented strategies that are being applied in these rethinking dimensions, specific elements of social meanings, competences, and material arrangement shape sufficiency in business practices. Practitioners not only implement sufficiency-oriented strategies, but they also discover and develop new values, norms, competences, and processes. They identify relevant values and describe the emotions that emerge in the process, or invent rules and structures that reinforce these

values. Materials and infrastructure are also designed to serve the sufficiency purpose. At the same time, the findings show the emergence of ambivalences and difficult-to-avoid rebound effects despite the desire to be sufficiency-oriented. Beyond their own business boundaries, practitioners must collaborate with other like-minded organizations to lobby for structural and political change. In the following sections, we discuss the contribution of the study to theoretical understandings of sufficiency and the practical implications for economic and political actors. We reflect on the limitations of the study and suggest further research paths.

Theoretical implications

A growing research field contributes to the understanding of sufficiency in production and consumption practices. The foundational work to define sufficiency-oriented business models has roots in conceptual studies based on literature and practice reviews (Schneidewind and Palzkill-Vorbeck, 2011; Bocken and Short, 2016; Reichel, 2018; Freudenreich and Schaltegger, 2020). While conceptual frameworks of sufficiency-oriented businesses and relevant strategies have been empirically tested (Niessen and Bocken, 2021), and completed with evidence from several case studies (Bocken and Short, 2016; Bocken et al., 2018, 2020), empirically grounded knowledge about the operationalization of sufficiency in business practices is still missing. This study contributes to the understanding of sufficiency in business practices by offering insights about the daily realities of sufficiency practitioners. Beyond the implementation of strategies defined in the literature as sufficiency-oriented, such as sharing, preordering, or frugal design, this study investigated what it means for practitioners to be sufficiency-oriented organizations and which elements of their practices (social meanings, competences, and materials) are essential for their sufficiency orientation. In consequence, it is possible to compare the practitioners' experiences with strategies and recommendations from existing sufficiency literature and observe which aspects have been adopted, or which might have been rejected or are still missing application in praxis.

Basic human needs

The fulfillment of basic human needs is inherent to the definition of sufficiency (Spengler, 2018; Jungell-Michelsson and Heikkurinen, 2022). Scholars advocate for consumption adjusted to basic needs instead of wants (Gorge et al., 2014; Yan and Spangenberg, 2018; Spangenberg and Lorek, 2019) or for need-oriented policies centered on the satisfaction of the population's basic needs (Schneidewind and Zahrnt, 2014; Callmer and Bradley, 2021). Beyond these concepts lies the premise that all systems of provision should be built upon a theory of needs (Upward and Jones, 2016; Creutzig et al., 2018; O'Neill et al., 2018; Gough, 2020). For example, Ramos-Mejía et al. (2021) place the notion of universal human needs at the core of any economic activity of a postgrowth era.

The results of this study confirm the link between sufficiency and the fulfillment of basic human needs, as sufficiency practitioners attempt to answer basic human needs with their offerings. The satisfaction of human needs is operationalized in practice by various strategies. Sufficiency practitioners pay especial heed to limiting their production to the necessary or avoiding production of new goods. The involvement of consumers in early stages of production, or in the design of services, helps practitioners identify the needs of their consumers. However, despite practitioners' desire to implement a theory of needs, their definition of needs is arbitrary and relies on the capacity of consumers to differentiate between their needs and preferences—a task revealed to be difficult for consumers, who are not sovereign in a cultural and economic context that worships individual desires and wants (Gough, 2015). Hence, sufficiency practitioners and their consumers lack knowledge and political support in defining what basic human needs are. Participative processes—which combine expert knowledge, scientific advances, and the individual experiences of local consumers and communities—seem necessary to collectively identify human needs (Gough, 2017; Guillen-Royo, 2020). The definition of human needs on a societal level could additionally be added to political agendas to guide sufficiency-oriented businesses (Gough, 2017; Di Giulio and Defila, 2019).

Co-creation of sufficiency-oriented value

The co-creation of sufficiency-oriented value observed in the data is also reflected in previous studies on sustainable business practices. Collaboration is, for example, a key factor in advancing the circular economy (Hofmann, 2019; Konietzko et al., 2020); stakeholder collaboration has also been described as an important component in sufficiency-driven businesses (Reichel, 2013; Griese et al., 2016; Bocken et al., 2022). Recent studies revealed the relevance of regional embeddedness and local production and consumption systems for sufficiency-oriented business practices. Offering quality local products (Bocken et al., 2020), local and co-manufacturing systems (Dewberry et al., 2017), or strengthening local take-back and reuse services (Freudenreich and Schaltegger, 2020) are examples of sufficiency-oriented strategies that were successfully implemented by the practitioners in the study. The strategies applied by practitioners to limit the consumption space are consistent with findings from Niessen and Bocken (2021), which described them as short-distance promotion strategies. However, the findings of this study indicate that limiting consumption perimeters is not only linked to promoting more local consumption practices; sufficiency in action also involves actively avoiding and refusing both material consumption and production, for

example, by refusing to translate online shops or to sell specific products because they do not answer to human needs, or by avoiding making new products and, instead, switching to secondhand goods or repair services. The possibilities to interrupt material consumption and fulfill needs outside of current market logics remain unexplored in sufficiency research. Free peer-to-peer exchange, support for do-it-yourself, large-scale exnovation of unsustainable practices or technologies, and established companies intentionally disrupting production and sales spirals are examples of sufficiency practices that require better attention in research. These practices potentially could engender greater reduction of material dependencies.

Limitation to growth

Rethinking the notion of growth in a business context is a central aspect of sufficiency (Liesen et al., 2013; Reichel, 2013, 2016; Bocken et al., 2020). Degrowth scholars have also been investigating the form and role businesses play in a postgrowth society (Khmara and Kronenberg, 2018; Wells, 2018; Nesterova, 2020; Robra et al., 2020). The findings of this study are, for instance, consistent with the principle of degrowth businesses from Hankammer et al. (2021). The sufficiency purpose of the businesses, the sharing possibilities and alternative forms of ownership, the dedication to improve the work–life balance of employees, or the local embeddedness of the sufficiency practitioners are all characteristics of degrowth businesses. The deviation from profit maximization imperative described by Nesterova (2020) is an aspect that is reflected in the sufficiency practitioners' understanding of growth. Sufficiency practitioners value co-operation over competition, focus on quality over quantity, and are willing to operate on smaller organizational scales. With these alternative meanings of organizational and material growth, the findings also mirror prior studies describing low-growth strategies (Reichel, 2013) or advocating for an agnostic attitude toward growth (Raworth, 2017). New to the understanding of growth in business practices is the finding that sufficiency practitioners envision an end to their material and organizational growth. This limitation enables practitioners to define how much growth is enough and, from that point on, to focus on the diffusion of sufficiency practices and the collective growth of their ecosystem. However, sufficiency practitioners encounter difficulties in defining the "ideal" organizational size. They lack criteria and indicators to concretely determine a limit to material growth. It seems that no practitioner knows when a steady state could be reached, which allows sufficiency practitioners to continuously postpone their end to material growth. More research should be done to better assess when a company owns enough market legitimation and influence to stop production and organizational growth.

Elements characterizing sufficiency

The systematic review on sufficiency by Jungell-Michelsson and Heikkurinen (2022) reveals that altruism is a central premise of sufficiency. In contrast to prevalent egoistic interest, sufficiency requires people to care for others and nature. Caring for and sustaining long-lasting relations with others, nature, and the material world are also an essential finding of this study. Sufficiency practice can be described as care work along the entire supply chain. The ability to care is key in the practitioners' quest to unlock growth-oriented path dependencies. Instead of profit-oriented product and service design, sufficiency practitioners care for long-lasting use of materials. Instead of low producing costs and ignorance of working conditions, sufficiency practitioners care for the wellbeing of all employees and workers. Meißner (2021) observed the influence of care on the repairing practices in repair cafés. Care does not only affect the decision to deal with obsolete objects, but it also influences how individuals interact with their neighborhood, how they pay attention to the inclusion of people, or how they save resources in daily life. Similarly, care in sufficiency-oriented business practices drives sufficiency practitioners to resist against current norms of business-as-usual and to invest efforts in all business activities so that a reduction of consumption and production becomes feasible.

Care, patience, and learning processes have the capacity to minimize sufficiency- rebound effects because they create a business practice that is aware of the risks and limitations of sufficiency-oriented strategies. The quality and feasibility of products, services, or business processes are tested and improved with care and patience. Once these are implemented, the culture of learning prevailing in sufficiency-oriented businesses enables adequate reaction and improvement in case of shortcomings or emerging rebound effects. From a practice theory perspective, the findings of this study call for research in sufficiency-oriented business practices to look beyond mere strategies and to search for characteristics supporting, shaping, and connecting strategies and business models; that is, elements that could be key for practitioners in diffusing sufficiency practices in future.

Practical implications

Changing practices toward sufficiency requires practitioners to reflect on specific questions. The findings of this study encourage business practitioners to ask specific questions for the development and orientation of their strategies and practices, for example, concerning basic human needs and needs satisfiers (*What are basic human needs? Which product, services, or practice elements are essential to serve these needs?*), the created value (*What sufficiency-oriented value can be co-created and co-delivered?*), or the growth and diffusion of sufficiency-oriented practices (*How much growth is enough? How do we spread and diffuse sufficiency-oriented value and practices?*). The

transformation toward sufficiency-oriented businesses implies that all business processes and strategies need to strive for a state of enough. According to the findings of the study, practitioners willing to integrate sufficiency need to ask how much is enough and what is necessary for a good life before implementing any new products, services, strategies, or processes in the business. Similarly, Bocken et al. (2022) suggest seven core elements of a sufficiency-based circular economy with specific questions that guide businesses toward sufficiency. Their framework confirms the findings of this study by calling sufficiency practitioners to consider sufficiency in all business practices, for example, in their purpose, network, internal governance, or finances.

Asking relevant questions, however, does not resolve the ambivalences and rebound effects of sufficiency. Despite the good sufficiency practices that the cases in the study represent, they all face shortcomings. Sufficiency practitioners fall short in defining human needs and setting the limitation for the end of material growth. Despite all efforts to avoid stimulating unnecessary consumption, the availability of products on the market, their online presence, the early involvement of consumers in the design, or a sharing subscription might accelerate, instead of decelerating, consumption. Several practitioners are confronted with financial insecurity, especially when consumers do not adopt the practices of sharing and repair. Amid these difficulties, sufficiency practitioners turn to their peers to collaborate for a sufficiency-oriented ecosystem and lobby for legislation that supports sufficiency practices. The findings of the study thus also advocate for policy makers and governments to enact policies and provide financial means that strengthen sufficiency-oriented production and consumption practice, and create the setting for a sufficiency-oriented economy (Schneidewind and Zahrnt, 2014).

Conclusion

Drawing from empirical data of sufficiency-oriented businesses, this study identified three rethinking processes in which the practitioners change the practices of doing business. Sufficiency practitioners rethink (1) the relation to consumption; (2) the relation to others; and (3) the social meaning of their own organization. All the sufficiency-oriented strategies that implemented by the practitioners are influenced by the ability to care for others and nature, by a high amount of patience in all business practices, and by transparent learning and feedback loops. These elements are key to the development and implementation of sufficiency-oriented strategies in business practices and can minimize the risks of rebound effects.

Because of the limited number of cases and sectors, the generalizability of the results is subject to limitations. The results are bound to the cases in the sample and are not necessarily universally applicable. However, the exploratory design of this study offers first insights into the operationalization of sufficiency in practice. The findings can serve as a starting point for further research to observe and analyze the implementation of sufficiency in business practices on a larger scale. The transfer of the findings to other sectors such as mobility, energy, or food is also limited. The practices active in these other sectors might be different to the production and consumption practices of the fashion and electronics sectors. A further limitation is the comparability of the practices of businesses from different sizes. The cases in the study were mainly small and medium-size enterprises and three were larger businesses with more than 500 employees. Change in practices might have different dynamics as well as different paths or barriers due to the complexity of larger business constellations. Further empirical research is necessary to identify differences and similarities between sectors, size of the businesses or between established and newly founded organizations. Characteristics of sufficiency could vary depending on these various settings.

Additionally, as all the businesses included in the study are in Europe, the results of the study are limited to one specific regional context. Sufficiency practitioners in the European context mainly advocate for a reduction of consumption affluence. However, in other regions, for example, the Global South, other aspects of sufficiency such as overcoming social inequalities might be more relevant. Moreover, not every citizen in affluent societies has access to the abundance of consumption options. For them, a reduction of an already limited material consumption might be inadequate. Further research is necessary to understand and acknowledge the needs of all different social groups, especially considering the societal inequalities and structural discriminations that specific groups experience. An understanding of sufficiency outside the European context would also be a rich contribution to the research field.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethics review and approval/written informed consent was not required as per local legislation and institutional requirements.

Author contributions

LB conducted the data collection and analysis, built the theoretical conception, and wrote the manuscript. MJ-E participated in the analysis and conceptualization of the data and

revised the manuscript. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Appendix

Appendix 1 Example of interview guidelines for producing companies.

1. **Journey of the company:** Would you like to tell me your journey, from the first idea/reflection to the current situation?	- What challenges did you or your company face on that journey? - How did you overcome those challenges? Did you do some consulting or training? - What role did your personal network, your education, or your experience play in the journey of founding your company? - What is important for your company, for your brand? What is the optimal culture for your company?
2. **Production and consumption process:** Could you explain to me the creation process from sourcing to consumption of your products/your service?	- How do you decide how many items to produce? What are your decision criteria? - Which characteristics does an optimal product have? - What challenges would you face if you could rent out your products instead of selling them? - How do you promote your collections? What is important for the pricing of your products? - Where do you produce? Where do you ship your products to? Where are your consumers (e.g. not selling beyond 1000km)? - How do you ensure that your consumers carefully use your products for the longest time possible? Do you have services for repairability or reuse? How do they work? - How is your relationship with your consumers and your suppliers? - Would you see yourself as an activist company? How important is it for you to influence policies and the political system? What is your perception of your country's policy efforts to promote the circular economy or the European Green New Deal?
3. **Governance:** Would you like to explain to me a typical work week in your company?	- What is the organizational culture for your company? - What is your opinion on flexible working hours? - Where does your capital come from? What are specific challenges and strengths related to the source of your capital investment and your shareholders?
4. **Growth:** How/where do you see your company in 5 or 10 years from now? Which aspects are important for the evolution of your company?	- What does growth mean for you? - How do you wish your company to grow? - How would do like your innovative business practices to be spread in society or in the economy?

Follow-up questions were adapted according to the cases and their main sufficiency-oriented activities (producing, sharing, or offering repair services) and according to hypotheses and categories that emerged during the iterative research process.

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Connecting sufficiency, materialism and the good life? Christian, Muslim and Hindu-based perspectives on EU-level

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This article analyzes Christian, Muslim, and Hindu-based discourses and practices in relation to sufficiency, materialism, and the good life in the context of the European Union. The current political and scholarly debate emphasizes the need for a sustainability transformation and, more specifically, for reductions in resource use by the global consumer class. Within this discussion, the different approaches to and interpretations of the various facets of ecology and materialism, and the links between them, have become the primary focus. Questions about what a "good life", as opposed to a consumerist lifestyle, means and the need to focus on sufficiency rather than efficiency are being (re-)considered. Given that religions and faith-based actors (FBAs) play an essential role as interpreters of norms and values in societies, especially when societies are facing particular challenges, it is important to understand how they communicate information about relevant ideas and actions. What do FBAs say about sustainable lifestyles, sufficiency, and the role of materialism vis-à-vis those two ideas? How do they relate it all to questions of faith? Do they use faith-based or secular idioms to address the ideas? How do FBAs relate the ideas to practices? To begin answering these questions, we here present a content analysis of relevant texts and supplement the finding thereof with an analysis of expert interviews. The results come mainly from faith-based actors active on the EU level. Nevertheless, some of the actors also operate globally, which is why a clear, sharp regional separation is not entirely possible. This article identifies and explores the role of faith-based ideas and practices in maneuvering toward one of the most substantial societal challenges in this period of late capitalism and its materialist dimension. The regional focus imposes limitations on the scope of the religions in our sample, which is most evident in the case of Hinduism: here, it was only possible to include one organization in particular (Brahma Kumaris) in the empirical analysis. These practical limitations must therefore be taken into account when considering the scope of the results of this analysis.

KEYWORDS

sufficiency, good life, religion, consumption, spirituality, materialism, faith

Introduction

Recently, sustainable transformations and lifestyle changes geared toward reducing consuming behavior have become a primary focus of discussions about how we could and should live given the current climate crisis. High-consumption societies, such as those commonly (but not exclusively) found in the global North, are confronted with the question of what lifestyle choices are appropriate and fair when it comes to providing a good quality of life for every human being today and into the future. Activists and scholars have proposed the concept of sufficiency, which includes the limitation of essential consumption, as the solution. In doing so, they are opposing the materialism that emerged after industrialization.

This study analyzes the relationship between materialism, sufficiency, and the good life in the discourses of European religious actors, who are referred to herein using the more inclusive term "faith-based actors" (FBAs). Following Pollack's (1995) definition of religiosity, we understand religion and religious behavior as a transcendental mechanism to counter the challenges of contingency (the inherent insecurity that arises because many things in life may happen but will not necessarily happen). As climate change and environmental pollution are contemporary challenges that lead to insecurities in life, religions should offer mechanisms to counter this contingency. Thus, it is interesting to consider how FBAs position themselves in relation to sufficiency. While we find criticism on excessive materialism in all major religious texts and traditions (Belk, 1985, p. 265; Sachs, 1993), it is not clear how this criticism applies to the sustainability discourse and modern concept of sufficiency. The research undertaken thus far has already demonstrated that there is a particular relationship between religion and materialism that focuses on consumption. From this perspective, both researchers and FBAs seem to question whether current consumerist lifestyles are in line with religious values. The literature also demonstrates that the understandings and definitions of sustainable consumption, sufficiency, and what constitutes a good life are diverse and blurred. To better understand this imprecise relationship, this study empirically investigates how FBAs position themselves in relation to sufficiency and the related theme of the good life. Do the FBAs have a practical approach toward a sufficient lifestyle and do they combine it with their criticism of materialism? We provide insight into the empirical findings, including internet content from and interviews with Christian, Islamic, and Hindu-based FBAs that engage with the themes of sufficiency, materialism, consumption, and the good life. These three religions are, by membership, the largest in the world. While Christianity and Islam are the two most common religions in Europe, Hinduism provides a non-Abrahamic and minority perspective on our research question. Due to the cultural heritage in Europe, the findings offer a broader perspective on Christian perspectives, while Islam and particularly Hinduism are restricted to only a few active organizations, f.e, Brahma Kumaris.

This article presents the concepts of sufficiency and the good life identified in the literature and discusses the current research into the narratives each religion offers about these two concepts. We acknowledge that theological narratives do not necessarily lead to implementation, therefore, this article also summarizes if faith-based practices with a connection to sufficiency or the good life can be identified through our literature review. We then continue by presenting our empirical dataset and methodological framework. Our empirical findings show that FBAs in all three religions disparage consumerist and materialist lifestyles, though with different consequences for the associated responsibilities and practices. This article first presents the empirical findings for each religion individually and then second, discusses the results for each religion in relation to our theoretical findings and each other.

Sufficiency, materialism, and the good life

By way of a short and general definition, the concept of sufficiency can be explained as a perspective on how much is enough for a good life (Schneidewind and Zahrnt, 2014, p. 13). The concept is about respecting the boundaries set by the planet and the needs of the global community and consequently runs counter to the current cultures of consumerism and materialism. Although the term was established in the early 1990's by Sachs (1993), sufficiency (and the research into it) is only slowly gaining attention and still lacks a systematic global outreach. Consequently, there are not only many different understandings of the concept, there are also many different names for and translations of the idea of sufficiency. The literature on sufficiency touches on various topics including human needs vs. wants, justice and equality, and the critical assessment of current consumerist lifestyles (Kanschik, 2016, p. 556). Hence, we find a broad range of literature discussing the key features of the concept without using the term, features such as degrowth, *buen vivir,* and other postcolonial development theories that are not yet automatically associated with the sufficiency debate (Toulouse et al., 2019, p. 332). Keeping this ambiguity in the literature in mind, we approach sufficiency by discussing it from four perspectives. First, we elaborate on the relations between materialism, consumption, and sufficiency. Second, we discuss sufficiency with regard to the related concepts of efficiency and consistency. Third, we broaden the perspective on sufficiency by exploring the two sides of "enough" (Spengler, 2018, p. 132). Fourth, we follow on from this by focusing on a broader understanding of sufficiency when discussing the good life, which leads to the questioning of existing norms and values.

While the concepts of materialism and consumerism currently go hand in hand, sufficiency—as discussed above—stands against the values and habits associated with materialism and consumerism. In general, materialism refers to the "importance a consumer attaches to worldly possessions" (Belk, 1984, p. 291) and there is a debate about whether it is necessarily a negative character trait (Belk, 1985). Nevertheless, in combination with the cultural phenomena of consumerism, we consider materialism to be a negative trait. Materialistic values and consumerism have become a global phenomenon (for a historical overview of consumerism culture, see Stengel, 2011) that transgresses planetary boundaries, thereby contributes to the current ecological crisis. In contrast, sufficiency is a critical assessment of this contemporary lifestyle and a guiding principle for a sustainable transformation. It refers to living (and thus also consuming) in line with natural (planetary and societal) boundaries and the limits required to ensure a good life for all current and future generations (Hayden, 2019, p. 152). This definition already reflects the interdependencies between materialism and sufficiency. While the current materialistic lifestyle exploits social and planetary boundaries, sufficiency raises awareness of the same boundaries.

The current sustainability discourse discusses three ways sustainable transformation can be achieved: efficiency, consistency, and sufficiency. All three represent a particular perspective on how to live and deal with the challenges of the climate crisis. Efficiency[1] aims to achieve technical optimization in the cost-benefit ratio (Spengler, 2018, p. 104), that is to achieve the same performance (of action, energy, etc.) while using fewer resources. Consistency proposes integrating resource consumption in natural flows to close material cycles and thus decrease harmful exploitation (Spengler, 2018, p. 112). These two strategies focus primarily on technical innovation geared toward either using less or reusing. In contrast, sufficiency aims to effect behavioral changes which prevent unsustainable actions (Stengel, 2011, p. 129–130). To illustrate with a simple example, one can think about the plastic food packaging in supermarkets. An efficient way to sustainably transform this practice would be to modify the plastic so that less petroleum is used and less CO_2 is created during its production. A consistent reform would find ways to reuse or upcycle the plastic. A sufficient method would be to stop using plastic packaging.

The three concepts – efficiency, sufficiency, and consistency – are closely linked to each other and are even interdependent in certain cases, with the result that it is not always easy to differentiate between them. Thus, continuing with our example of plastic packaging, one could ask whether the efficient change of production technology is also a sufficient usage of fewer resources. They could also ask whether the upcycling of plastic wrappers is purely a consistent usage of resources or also a sufficient change in behavior, as we are actively using upcycled plastic rather than new products. The lines between the three concepts are blurred, but the heuristic distinction is necessary if we are to understand the options we have for transforming our lifestyles. Notably, as the strategies face different levels of acceptance in the current economic system: consistency and, in particular, efficiency are solutions that integrate easily into the current economic system, even increasing its innovative potential. However, as the concept of sufficiency considers less production and consumption as inevitable, there is the possibility that it could ultimately limit economic growth and individual freedom in lifestyle choices (Toulouse et al., 2019, p. 333). For this reason, sufficiency is perceived as being critical of growth and liberty and it, therefore, has a less popular image. However, this focus on limitation is one-sided and runs the risk of misunderstanding sufficiency as a concept based on sacrifice and prohibition. Such an understanding loses sight of the fact there is also a lower limit placed on consumption (Spengler, 2018, p. 133; Toulouse et al., 2019, p. 334) that ensures that sufficiency does not aim to restrict but to ensure a good life for all (Schneidewind and Zahrnt, 2014).

Given this single-minded conception of sufficiency, it is necessary to discuss the concept from two perspectives, considering both the upper and the lower side of "enough" (Spengler, 2018, p. 132). In addition to the 'upper limit' of sustainable consumption, any debate about sufficiency needs to allow for a level of consumption that stays above a 'lower limit'. This lower limit refers to the minimum every person needs to possess and consume in order to meet the needs of a good life. The development, as well as the positioning of the two sides of enough, are discussed further in the literature on "consumption corridors" (Fuchs et al., 2021). This framework further defines how a good life can be led in recognition of social and planetary limits by imagining a corridor that runs between a minimum and a maximum level of consumption. While the minimum consumption limit ensures access to the resources people need, the maximum consumption limit acts as a restriction, safeguarding the planet from ecological and societal exploitation. The frameworks of the 'two sides of enough' and 'consumption corridors' provide important perspectives on sufficiency as they open up the concept to a broader moral dimension (Toulouse et al., 2019, p. 332). The discussion moves from a simple debate about how we can make consumption ecologically sustainable to a broader debate on the values and norms of our lifestyles. Hence, it enhances the discussion about structural changes in

1 Some literature refers to the concept of efficiency or sufficiency with the prefix 'eco' (eco-efficiency/eco-sufficiency). This prefix denotes that this understanding of efficiency stresses sustainable transformation and the ecological impact of a performance, see for example Kanschik (2016, p. 565); Schneidewind and Zahrnt (2014, p. 18).

our behavior and the underlying needs we are attempting to fulfill through our consumption. When talking about sufficiency, one has to keep in mind this differentiation between a narrow understanding of sufficiency and a broader understanding of sufficiency that implies this moral dimension (Linz, 2002, p. 13; Spengler, 2018, p. 131; Lehtonen and Heikkurinen, 2021, p. 5). It is in the second understanding that sufficiency becomes a question of how society defines a good life for all, today and into the future, and when the discussion begins to share common ground with the discourses of faith-based actors.

As a concept, the 'good life' has a long history in philosophy, religion, and ethics [for an overview, see Di Giulio and Defila (2019) or Voget-Kleschin (2013)]. However, while philosophy and religion have pondered over the normative questions of the good life for centuries, sustainability research has now given this concept a more practical perspective. From this perspective, the good life describes the life we can lead in between these given limits, now and in the future. Hence, the good life should be considered the conceptual goal and sufficiency a method through which this goal can be achieved (Schneidewind and Zahrnt, 2014). In setting the moral dimension of 'good' aside, this approach focuses on the basic material needs and possible policies that enable us to live such a life. However, there are also interdependencies between those two kinds of "good." Societies need to contemplate and deliberate about their upper and lower consumption standards as it is through such deliberative processes that societies define their values and norms and also acknowledge the global restraints and planetary boundaries. Religion can help in this deliberative process in different ways. First and foremost, it can give ethical guidance in the deliberative process and help define the essential needs of a good life. Furthermore, given their function in guiding people's behavior and practices, it can promote the idea that a sufficient lifestyle is a good lifestyle.

In conclusion, we can say that the concept of sufficiency is necessary for a sustainable transformation that presses for more than the current endeavors in efficiency and consistency. The question of "How much is enough?" raises further questions about how we want to live and where we can set these limits. The good life has, therefore, become an important goal in designing our sustainable future and even though the focus lies on basic human needs, one cannot deny the underlying dependency on values and norms. How do values and norms make us think about our basic needs? How do we set the priorities? Faith-based actors have been offering answers to these questions for centuries. Thus, it is important to be aware of what they are saying about the concept of sufficiency and how they are defining a good life. To this end, we first provide a review of the relevant literature and then proceed to present our empirical research.

Religion, sufficiency, and the good life in Christianity, Islam, and Hinduism

While research into the nexus of religion and ecology has been increasing since the 1990's (for example, see Barnhill and Gottlieb, 2001; Bergmann and Gerten, 2010; Hitzhusen and Tucker, 2013; Grim and Tucker, 2014), research focusing on the terms of sufficiency and the good life in relation to religion and faith-based actors is still less common. This can possibly be explained by the still very recent research focus on concepts such as sufficiency and the good life in relation to a sustainable transformation (Toulouse et al., 2019, p. 332). Thus, there may already be relevant research out there using alternative terms that are essentially the same as sufficiency and the good life. Consequently, we have not only explored research into sufficiency and the good life, but also related concepts such as materialism and sustainable consumption and the adjoining concepts such as degrowth and post-growth. After briefly presenting the main themes and findings of the literature review, the chapter analyzes the relationship between sufficiency and the good life within three specific religions: Christianity, Islam, and Hinduism.

As already noted at the beginning of this article, all major religions are critical of excessive materialism (Belk, 1985, p. 265), though they differ in their evaluation of what constitutes 'excessive' (Voget-Kleschin, 2013, p. 78–79). Given this connection, research on sustainable consumption has attempted to determine whether there is a causal relationship between religiosity and sustainable consumption. The attempts to understand this relationship are not only found in the field of religious and cultural studies, but also in business and marketing studies. However, each main field offers a different perspective on the issue. Religious and cultural studies focus more on the normative understandings of what the religion, as an institution or belief system, says (or can say, from an interpretative perspective) concerning sustainable consumption. These studies are often based on qualitative methods. In contrast, business and marketing studies look at the topic from an alternative perspective and attempt to understand how religious people consume. They also usually use a quantitative approach to establish causal relations between the two variables. A common premise of these studies is that religious people are more sustainable consumers because of their religious values. To date, such studies have produced varying results, suggesting that religion and religiosity sometimes have, and sometimes don't have, an effect on sustainable consumption (Minton et al., 2018, p. 656). When evaluating these results we must consider the background variables used (or not used) (Pepper et al., 2011, p. 277) and, therefore, cannot draw a firm conclusion as to whether there is a positive or negative relationship between consumption and religion.

The following paragraphs present the research on Christianity, Islam, and Hinduism and their relations to sufficiency – though this term itself is not used by the FBAs – and the good life. We first discuss the possible interpretations of the scriptures and religious traditions, then describe those practices that are linked to the concepts of sufficiency and the good life.

Christianity

The literature review on Christianity and sufficiency reveals both negative and interconnections between the values and practices of the good life and sufficiency. The influential work of Lynn White (1967) prescribes that Christian values be embedded in our current capitalist lifestyles. From this perspective, Protestant values in particular, are linked to the development of the capitalist lifestyle and are considered to be one of several factors that led to the ecological crisis we are now facing (White, 1967). Although current research is also critical of the nexus between Christianity and sustainable behavior, especially in relation to U.S. evangelicalism and forms of prosperity gospel (McCammack, 2007; Carr et al., 2012; Wilson and Steger, 2013). For instance, Wilson and Steger demonstrate the similarity between prosperity gospel and neoliberal values, such as a strong emphasis on the individual and market forces. This form of Christianity views material wealth as a blessing from God.

Nevertheless, it is an oversimplification to say that Protestant values led to the materialistic lifestyle that exploits planetary boundaries. Christian scripts denounce excessive materialistic values including greed and avarice. Indeed, such values are even condemned as idolatry as the believer's devotion is directed not toward God, but toward material goods (Frunzaru and Frunzaru, 2017, p. 38; Porter, 2013).

Current examples combine the Christian standpoint on materialism and the challenges of a sustainable transformation. For example, the German Protestant Church published a paper where they clearly position themselves in support of sufficiency with their concept of "ethics of enough" (Evangelische Kirche in Deutschland, 2018). On the Catholic side, the papal encyclic "Laudato Si" from 2015 offers several ideas similar to sufficiency, as shown by Puggioni's work on degrowth understandings (Puggioni, 2017). In the encyclic, Pope Francis expresses the same criticism of consumerism that is associated with the concepts of degrowth and sufficiency. For Pope Francis, material wealth and free time need to be shared fairly, a notion that is very similar to the good life envisioned by consumption corridors (Puggioni, 2017, p. 31). Furthermore, Pope Francis points out that the Christian tradition does not consider private property to be an inviolable right (Puggioni, 2017, p. 19), rather it is humanity's task to build up a healthy living environment that integrates all people (Puggioni, 2017, p. 23). This focus on the integration of all people as an alternative to focusing on material goods shows similarities to sufficiency as a lifestyle that, by endorsing both lower and upper limits, aims at including all current and future generations.

In relation to practices, we again find both negative and positive interconnections between Christianity and sufficiency. On the one hand, several religious practices such as Christmas have become highly commercialized and are, thus, in opposition to a sufficient lifestyle (Porter, 2013). On the other hand, there are several denominations that – both historically and currently – cherish a simplistic lifestyle, e.g., Puritans, the Quakers, and the Amish (Voget-Kleschin, 2013, p. 80). Furthermore, the Christian virtues of a monastic life illustrate that a life of abundance, without limits, is not the way to God (Linz, 2002, p. 8). In addition to such "extreme" abstinence from materialism, there is the common practice of fasting, particularly during Lent. In the last few years, this practice has started to be integrated with a perspective on sustainable lifestyles through the introduction of the concept of *Klimafasten*[2] (Institut für Kirche und Gesellschaft der EKvW, 2022). This practice takes the tradition of fasting and focuses it on climate-harming practices that one should cease.

In this short overview, we see that Christianity, in several of its teaching and lifestyles, includes a perspective on sufficiency as a good way of life. The concept was only referred to a few times in the literature we found but similarities show that this modern concept is built upon long-established values that Christianity shares. Nevertheless, the question arises about how strong the commitment to sufficiency can be as long as these values are shared but not explicitly pronounced or followed (Koehrsen, 2015). On this basis, the Christian perspective on sufficiency remains blurry. Even though the values are there and have a definite influence on practices, as a call for action, it is not clear how well this translates into practice for the average believer.

Islam

The literature on Islam reviewed here demonstrates little usage of the term sufficiency. However, there are references to similar concepts and understandings and the idea of a good life that are primarily based on Muslim mysticism. This discussion is grounded in the relationship to consumption and consumerism, on which the literature is rising (Rush, 2018). Consumption is first and foremost considered an essential human need. Even enjoyment and a certain level of wealth are normal traits of human life. Nevertheless, it is important to acknowledge that such consumption should never lead to exploitation, as a lack of moderation is related to undesirable character traits such as greed (Ghandour, 2019, p. 111; Kowanda-Yassin, 2018, p. 143). This renunciation of consumption does not mean that one needs to live an ascetic life, but that a materialistic overvaluation

2 Own translation: Fasting for the climate.

of goods is seen as difficult (Rush, 2018, p. 6). In the Sufi tradition, there is even a concept (*tagarrud*) for feeling free and independent of material goods (Ghandour, 2019, p. 113).

In addition to the concepts related to sufficiency, there are also similarities between our understanding of the good life and Islamic concepts. First of all, there is the concept of a simple life called *Zuhd*, though it also refers to an ascetic life (Rush, 2018, p. 6). Second, one can make out similarities between the good life and the Islamic concepts of growth and care: The term *az-zakā?* not only describes growth, it also includes a more holistic approach to caring for the whole of creation by considering the long-term consequences of one's actions (Ghandour, 2019, p. 109). There is even a concept known as *wara?* in the Sufi tradition that describes a careful growth, which expands its semantic meaning from pure devoutness to a careful treatment of possessions by considering long-term consequences (Ghandour, 2019, p. 112–113). Both concepts relate to the good life through their acknowledgment that short-term consumption can only be maintained if it considers future costs (Al Jaafari and Zimprich, 2019).

Nevertheless, even though we find this clear conception of a sufficient lifestyle and a good life in Islamic teachings, we still need to understand how it is implemented (Khorchide, 2019, p. 39–40). The literature states a strong value-action gap, but this is also the case in many other religions. Further to this, Muslim societies often face challenges in relation to their economic security and political stability. This reality is regularly given as an explanation for why Muslim values are often not reflected in Muslim people's lives. Although we must acknowledge that other studies have demonstrated that economic stability does not lead directly to a more ecological lifestyle, less economic stability undoubtedly does not help decrease the value-action gap (Dizri, 2019, p. 63–64). However, there is also a growing awareness about materialism in Western Muslim societies that leads to a critical perspective on consumerism (Kowanda-Yassin, 2018, p. 19).

Given the often-stronger connection between religion and polity in some predominantly Muslim states, we can observe, albeit rarely, an interesting intertwining of religious values and policies that aim to generate a sufficient lifestyle. In this instance, there is a connection between the scientific evidence, Islamic law, and Muslim values, especially in relation to policies governing water consumption, a prominent challenge in the climate of many Muslim societies (Binay and Yunis Al-Zoubi, 2019, p. 214). In proclaiming water *fatwas*, for example, in Jordan and Indonesia, the Qur'an quotes and examples from the Prophet's life contribute to greater awareness of water consumption (Zbidi, 2015; Al Jaafari and Zimprich, 2019). However, there has also been a revival of the concept of the *hima*, that is "a traditional Islamic legal device for setting aside land as a reserve" (Rush, 2018, p. 6), in, for example, Kuwait and Lebanon. This practice is facilitating a more sustainable way of life by integrating cultural and religious understandings and environmental protection (Zbidi, 2015). Both examples show that faith-based frameworks help to limit the consumption and exploitation of natural resources, leading to a life lived in between an upper and lower limit.

Hinduism

As the third-largest religion globally, Hinduism sets itself apart from Christianity and Islam by not having a single institution or holy script and by being polytheistic (Tharoor, 2020, p. 13). Its different schools, continuous reinterpretation and reevaluation of sacred texts, and sheer diversity of followers make the analysis of Hindu actors and their understandings far more complex. Nevertheless, the following chapter introduces the most common Hindu concepts discussed in the research on sustainable consumption, while keeping in mind that these are merely guiding principles for a very diverse religious practice (Narayanan, 1997, p. 298). The discourse on religion and sustainability often assumes that Hinduism, along with other Eastern religions, has a closer connection to nature and that sustainable behaviors are therefore intrinsic to their believers (Minton, 2014, p. 76), a contrast to Christianity in particular (White, 1967). The assumption that Hinduism has a strong connection with nature is based on the concept of *ātman*, the true spiritual self of all beings. Particularly in the orthodox understanding of the *Advaita Vedanta* school of non-dualism, this all-encompassing idea of *ātman* leads to a belief in the sacredness of the surrounding nature (Nelson, 2018). Nevertheless, this often-cited connection to nature is not predominant in all Hindu perspectives and some schools react differently to the idea of the sacredness of nature. On the one hand, the belief in the holiness of everything may result in greater respect for nature and animals, with the result that material things are carefully managed [a perspective that is also in line with the concept of *ahimsa*, non-violence (Jacobsen, 2018)]. In addition to this, achieving *mok?a* (the term for becoming one with *ātman*) goes hand in hand with freeing oneself from worldly matters and consequently decreases one's interest in consumerism and an unsustainable lifestyle. On the other hand, seeking *mok?a* can lead to a total disinterest in worldly matters. In a very blunt way, that could mean that environmental problems, climate change, and consumerism become issues that one does not need to care about because the focus should be on leaving the world behind (Narayanan, 1997, p. 298; Chapple, 2000)[3]. These two perspectives (and surely there are several perspectives in between) highlight that the connection between Hinduism and nature is not as clear

3 We want to note that this disengagement with worldly matters is not particular to Hinduism, it is a general challenge for an ascetic lifestyle as practiced in other religions and faiths as well.

as expected. Keeping this in mind, from here on we focus only on concepts that do promote sufficiency, a good life, and sustainable transformation.

Considering the established relationship to nature, what relationship is there between Hinduism, sufficiency, and the good life? First of all, as described above, one needs to acknowledge the sustainable perspective of *mok?a*. In addition, there is the concept of *tapas*, mostly translated as asceticism and austerity (Carpenter, 2018). This supports the existence of a positive relationship based on the idea that a 'simple' life is thought to be the way to salvation. In conclusion, a sufficient lifestyle, in the sense that one only consumes as much as needed, is part of Hinduism even though its goal is salvation rather than a sustainable transformation. Nevertheless, the question remains whether the concept of a good life (opposed to the un-worldly *mok?a*) also features in Hinduism. The ethical perspective that comes closest to the concept of a good life is the *Puru?-arthas*, which includes *artha* (wealth), *kama* (pleasure), and *dharma*, which roughly translates to the right path (or life) (Doniger, 2010, p. 199–211; Strauch, 2018). All three aspects of the *Puru?-arthas* coexist interdependentently, but it is *dharma* that most research currently refers to when describing Hinduism's concept of a good life in relation to a sustainable transformation (Narayanan, 1997, 2010; Jain, 2011).

In addition to this more philosophical perspective on how Hinduism relates to sufficiency, it remains to be asked how these beliefs are translated into practice. We can find analysis of the concept of *dharma* and environmental practices, but this research is restricted to very particular Indian communities like the Swadhyaya or the Bishnoi (Jain, 2011). In a global perspective, there has been research on the increasingly consumerist religious practices such as Diwali (Porter, 2013) and some literature has questioned the sustainable activism in Hindu communities in Europe (Das et al., 2014). This European activism focuses on sustainable lifestyles, such as vegetarianism, to some extent but it does not focus exclusively on sufficient lifestyles and, most importantly, still seems to be reliant on a small number of activists.

All in all, one can say that Hinduism's connection to sustainability might not be as self-evident as is sometimes thought, but it still incorporates several concepts that relate to sufficiency and the good life. As was the case in Christianity and Islam, these concepts must be seen as possible frameworks that could support a sustainable transformation despite the consistent challenge of the value-action gap.

The following analysis aims to broaden the understanding of how faith-based actors use these frames in political discourses. As our review of the literature has revealed, there are only few specific concepts that relate to sufficiency and the good life in relation to a sustainable transformation in the three religions. Nevertheless, materialism, consumption, and the aim of living a good life are paramount ideas in each religion. We, therefore, expect that faith-based actors connect these with the concepts of sufficiency and a good life during their environmental engagement work.

Materials and methods

To examine how FBAs articulate their ideas about sufficiency and the good life, we conducted a computer-assisted qualitative content analysis based on the rule-bound procedure from Mayring (2014). For our research, we used the corpus of texts generated for the project "Religion as a Resource in European Climate Politics"[4] and expert interviews with representatives from faith-based organizations.

The corpus consists of internet content published on the websites of FBAs active in EU climate politics (e.g., newsletter or blog articles, descriptions of the FBA's work and motivations, reports from events, and prayers)[5]. Hence, the empirical focus of this paper is on conceptions of sufficiency and the good life in connection with environmental issues and is limited to only those FBAs who are active on the EU level. We filtered the corpus to include only Christian, Muslim, and Hindu texts in our investigation. At this point, our corpus consisted of 55 Islamic texts, 150 Hindu texts, and 2,764 Christian texts. It is important to note that for the specific context of the corpus (EU climate policy, organized and registered actors in the EU Transparency Register, thematic texts on environmental issues on the actors' website), we could only identify Brahma Kumaris as the only FBA that can be counted to the Hindu tradition. Our research focuses on the European context, where Christianity is the primary religion, and this partially explains the high imbalance in the number of religious texts available. As the corpus was still too large, we applied further filtering by extracting a list of keywords related to sufficiency and the good life from our theory and the literature (for the lists of keywords, see Table 1 in the appendix). As we were specifically interested in investigating whether the FBAs use specific terms and theoretical concepts, this procedure proved to be most effective. During preprocessing, we removed stop words from the texts (ubiquitous words that do not convey meaning like

4 https://www.uni-muenster.de/Religion-und-Politik/en/forschung/projekte/B3-31.shtml

5 The corpus is the result of a web scraping procedure undertaken by the project "Religion as a Resource in European Climate Politics". In that project, we selected actors with a faith-based affiliation in their organizational name or who reported having an interest in the topic "climate action" in the European transparency register. We applied a keyword list driven web crawler to identify which of the FBAs' specific internet content covered climate related topics. After the automated extraction of that content, we inspected the results manually and eliminated the irrelevant texts (i.e., any texts that did not focus on climate related topics).

"and," "or," and "the"). We then classified the texts by calculating the relative frequency of keywords in the remaining content. We identified the 16 texts containing the highest number of keywords from each religion. Thus, we used the rate of keywords that appeared in the texts to measure the extent to which each text deals with the topics of sufficiency and the good life. We do acknowledge that our approach favored the concepts of sufficiency and the good life that are consistent with our theoretical findings and, therefore, other readings of those concepts could be disadvantaged in the sampling of the texts. However, checking how well this keyword method worked for one religion, Islam, confirmed that the unselected texts only rarely, if at all, dealt with sufficiency as a topic.

For further validation, we complemented our data set with expert interviews. This is an excellent method for investigating the special knowledge of the people involved (Gläser and Laudel, 2006). We conducted nine interviews with representatives from faith-based organizations using open questions to extract the particular understanding of sufficiency found within their religious tradition and practice (for the collection of questions of the interviews, see Table 2 in the appendix). The nine interviewees consisted of three Hindu-related, four Christian, and two Islamic representatives. We contacted representatives of FBAs that are active in the context of EU climate policy. Most of the responses came from Germany[6]. As we anonymized the interviews in the case of the online survey, it is not always possible to assign the interviewees to specific organizations (except for voluntary statements). In the case of the analysis of Hinduism, the validation of the textual findings through the interviews benefits from the broader contextualization of Hindu traditions other than Brahma Kumaris. Given the restrictions associated with the Covid-19 pandemic, we decided to use an online survey format. After building up our sample and conducting the interviews, we did a close reading of the texts and developed a coding scheme for our specific purposes (see Table 4 in the appendix). We deductively determined the starting categories based on our theoretical analysis and subsequently derived specific subcodes inductively from the material. We carried out the coding process in three rounds with four coders and implemented a qualitative validation process through repeated discussion and adaptation.

Findings

Overall, the analysis of the material confirmed our initial assumption: we found understandings of sufficiency and the good life in the texts of all three religions, even though the specific terms are not or only rarely used. The FBAs most often discuss aspects of the theoretical concepts of sufficiency and the good life in conjunction with a critique of over-consumption and the promotion of sustainable lifestyles. Furthermore, they partially connect those ideas with aspects of spirituality and divine commandments, thus contributing their specific articulation of the theoretical approaches. In the interviews that we conducted to validate our findings, all the representatives from the faith-based organizations evaluated current consumption patterns very negatively and called for appropriate lifestyle changes. For them, faith and spirituality can provide important guidance toward a qualitatively better life that draws fulfillment not from consumption but from faith itself and from an appreciation of related values such as charity, solidarity, responsibility, and balance.

For a more detailed analysis, we present our findings for each religion individually in order to identify the various frames used for a sufficient approach to sustainable transformation and the good life. It is also interesting to highlight the slightly different target groups of each religion. Finally, we identify the common ground shared by each religion as well as differences in the FBAs' positions and provide a critical evaluation of the results.

Elements of sufficiency and the good life in Christian texts

In the analysis of the Christian texts and interviews, the themes of sufficiency, consumption, and other related topics are particularly salient and discussed in relation to individual behavior and the structural and systemic level. Consumption and production patterns are critically examined in relation to individuals, society, and politics. This systemic view of the interplay between consumption and production is especially interesting as we do not find this aspect discussed in the texts and interviews of the other two religions in such a decisive manner. The Christian texts and interviews display a negative assessment of individual consumption, as is reflected in statements such as "Consumer behavior still predominantly means "a lot" at a "low price" (Interview ID 22). Thus, the representatives have perceived that a change of mindset is required if we are to overcome our negative consumption habits. However, the Christian FBAs also criticize the current economic system with its "linear economic model, which is based on extracting materials, using them, and then discarding them" (QCEA – Quaker Council for European Affairs)[7]. The external costs are often not recognizable or are actively suppressed (Interview ID 22). To challenge this model, they call for a shift toward more sustainable alternatives and demand a "paradigm shift that replaces the current model of a growth- and consumption-oriented prosperity that needs a continuous supply of fossil fuels

6 For more context information about the used material, we append a list of the organizations' and interviewees' local background (see Table 3 in the appendix).

7 http://www.qcea.org/wp-content/uploads/2011/02/CE-basics.pdf

and CO_2 emissions" (CIDSE – International Alliance of Catholic development agencies)[8].

Several Christian FBAs frame their call for change in production and consumption in relation to the values of fairness, solidarity, and the divine mandate to care for nature and people. It is suggested that current consumption styles reflect a lack of integrity and responsibility for God's creation and future generations. Moreover, the Christian FBAs regard human rights as of fundamental importance in production and consumption patterns. They question the significance of affluence, instead highlighting rights, justice, and sustainability as more important aspects of life (CIDSE)[9]. In this matter, the Catholic FBAs often refer to the encyclic appeal written by Pope Francis in 2015 to respond to the "cry of the earth and the cry of the poor" (Laudato Si 49). At the same time, other Christian FBAs have connected their calls for change and moral frameworks to the planet's limitations, thereby highlighting an aspect that is central to the theoretical concepts of sufficiency and the good life:

> As Quakers we believe that "we do not own the world, and its riches are not ours to dispose of at will." (BYM Advices & Queries 42) We are called instead to show a loving consideration for all life, and to act as its careful stewards, particularly as many resources are finite, and dwindling (QCEA)[10].

Interestingly, we also find that Christian FBAs question what defines a good life, or in their words, a better quality of life, wellbeing, and good living. Some texts analyzed here reference a conception of the good life that is similar to that identified in the theory, namely an understanding of a good life that incorporates other humans as well as nature:

> How can we design an economy that provides a better quality of life for all within the ecological limits of the planet? [. . .] The controversial debate [. . .] is not only a controversy about the best methods to promote human wellbeing and environmental sustainability. It raises profound questions with regards to what we regard as "wellbeing" and "good living," what it means to be human and how we relate to those around us and to nature (WCC - World Council of Churches)[11].

To achieve a good life, the WCC recommends the Latin American concept of "buen vivir," which underlines the interconnected aspects of a global human community and harmonious coexistence with nature. The CIDSE also defines the good life in a similar way, connecting it to happiness and wellbeing:

> Happiness can be seen as a form of prosperity that meets the most urgent needs and does not cost others anything. It is a form of prosperity that accepts planetary boundaries and gives us freedom to live within those borders. We do not want to tell others how to live, however, there are and must be limits to excess that ensure the survival and wellbeing of others (CIDSE)[12].

Thus, their concept of "happiness" relates to the theoretical concept of the two sides of enough (Spengler, 2018, p. 132). It describes a consumption that fulfills basic needs but does not harm other people's ability to have a good life. As suggested by both FBAs cited (WCC and CIDSE), limitations in consumption should enable a good life for all.

The interviews confirm this reading of the good life as connected to the understanding of the good life with an "ethic of enough" (Evangelische Kirche in Deutschland, 2018), which means that the poor have enough to live a decent life and the rich set limits in their lifestyle choices (Interview ID 20). Yet above all, there is a stronger emphasis on the role of faith in this nexus between consumption and the good life in the interviews: the good life is seen as the core message of Christianity and the faith itself as a source of the strength needed to realize self-limitation, given that material consumption should not play a central role in life (Interview ID 18 and 20). The good life is defined as a "[. . .] life of fullness and in the fullness of the Christian faith is a life that rests in faith in God the Savior and does not 'restlessly' strive for the satisfaction of the next need in consumption, whose fullness is thus the opposite of material fullness" (Interview ID 22). The respondents emphasized the importance of Christian (and other religious) values in motivating a cultural change in consumption (Interview ID 20 and 22). At the same time, however, they also acknowledged that the values have not yet led to sufficient corresponding action (Interview ID 18). It is this missing link to practice that will be the focus of the next sub-chapter.

Sufficiency in practice

In the texts of the Christian FBAs selected, we discovered a questioning of current economic paradigms in relation to a good life for all that led to a discussion of the three approaches of sufficiency, consistency, and efficiency in practice. The FBAs contemplate, among other things, how food production could reduce hunger around the world and how energy production and supply can be made compatible with a sustainable lifestyle. To respond to all such requirements, the Christian FBAs demand actions on several levels, including sufficiency,

8 https://www.cidse.org/2014/06/10/headlines-from-the-future/

9 https://www.cidse.org/2014/06/10/headlines-from-the-future/

10 http://www.qcea.org/wp-content/uploads/2011/02/CE-basics.pdf

11 https://www.oikoumene.org/resources/documents/seven-weeks-for-water-2012-week-6-buen-vivir-good-living

12 https://www.cidse.org/2014/06/10/headlines-from-the-future/

consistency, and efficiency. In regard to sufficiency, the Catholic FBAs of our text sample in particular call for a change in individual lifestyle:

> At the core of the event, a call on Catholics and all people of goodwill to carry out a lifestyle conversion to answer to "the cry of the earth and the cry of the poor" (COMECE Secretariat - Commission of the Episcopates of the European Union)[13].

Here, conversion – the Christian term for a change of life toward Christian confession – explicitly includes ecological and social sustainability. The Christian FBAs state that there is a rising awareness of the impact of individual consumption habits on others and nature. This awareness is leading more and more people to make a commitment to changing those habits. Possible practices suggested by our text sample and interviews relate to the reduction of natural resource use, energy, and meat consumption, as well as sharing instead of individual ownership. In more detail, these practices include using renewable energy, buying sustainably-produced local food, riding a bike instead of a car, reusing, repairing, redistributing, and upgrading to ensure products and materials last for as long as possible (QCEA) [14]. All these practices combine sufficiency and consistency. However, they also recommend measures that are in line with the concept of efficiency, particularly in relation to energy consumption (e.g., using energy-saving bulbs) (CIDSE)[15].

Furthermore, the interviews reinforce the community aspect of implementing more sustainable lifestyles. A lifestyle change that increases sufficiency needs role models, mutual encouragement, and remembrance. Thus, the churches see themselves as having a role in establishing group services such as repair cafés (Interview ID 18 and 22).

Our sample demonstrated that the churches' role as an engaging actor is ambiguous. On the one hand, the churches are described as actors that organize and implement various campaigns, such as an anti-fast-fashion campaign, meat-free food, climate pilgrimages, and climate fasts (Interview ID 14, 18 and 22). From this perspective, the churches have a positive role model function. On the other hand, we found critical voices that assess the churches' commitment to sufficiency as not strong enough.

One further and very interesting observation is that Christian FBAs not only focus on sufficient or sustainable lifestyles but also on the power structures that enable those lifestyles implementing consumption restrictions can be difficult in everyday life (COMECE Secretariat)[16]. They connect lifestyles to political action in order to enable their vision of what can be defined under the label of "a good life for all." External changes can help make those lifestyle transitions easier. Therefore, it is, on the one hand, necessary to show political commitment ("the private becomes political") and demand that governments create conditions that enable a sufficiency lifestyle (Interview ID 22). We also find this point in the Christian online texts from our sample:

> The changes that we envision toward a just and sustainable world, the kind of transition for society that history usually attributes to politicians or leaders, cannot happen without the personal commitment of the many. There are ways we can all engage in creating the kind of world we want to see, and our actions can be the seeds of a new way of life and the driver for policy makers to move from words to actions. By practicing and promoting sustainable consumption and production patterns, we send a message to our decision makers that we want sustainable alternatives to be made the norm with policies that make them more accessible for all, safer and more affordable (CIDSE)[17].

On the other hand, other respondents say that it is the role of religion to tackle the challenge individual responsibility presents. They suggest that Christian values have greater potential to motivate people to focus on spirituality and personal change rather than being too politically demanding (Interview ID 18).

Elements of sufficiency and the good life in Islam

We find similar aspects of sufficiency and the good life in the Islamic texts and interviews. They also discuss consumption patterns and promote sufficient lifestyles. Nevertheless, we detect differences in their line of reasoning and recommendations. For example, we find little regarding production patterns and calls for systemic change and political action[18]. Indeed, there is only one text, the *Islamic Declaration on Global Climate Change*, that also involves political discussion. Instead, the Islamic FBAs focus on individual or group action and religious considerations, which in turn may spill over to the societal level. Here, the Islamic FBAs emphasize the interplay between the ecological and social dimensions.

13 http://www.comece.eu/second-european-laudato-si-reflection-day-towards-a-life-style-conversion

14 http://www.qcea.org/wp-content/uploads/2011/02/CE-basics.pdf

15 https://www.cidse.org/2015/08/03/lifestyle-challenges-campaign-change-for-the-planet-care-for-the-people/

16 http://www.comece.eu/second-european-laudato-si-reflection-day-towards-a-life-style-conversionandInterview22

17 https://www.cidse.org/areas-of-work/sustainable-lifestyles?sf_paged=8

18 However, we know from our other research that some Islamic FBAs do also include the systemic level in their actions and demands.

In comparison to both other religions in our analysis, it is striking that the Islamic texts contain the most religious references. There are a lot of Qur'an quotes and links to a way of life that follows the example of the Prophet Mohammed cited in relation to a sustainable or even sufficient lifestyle. Our sampling might have partially affected this finding, which predominantly features one specific Islamic FBA [The Islamic Foundation for Ecology and Environmental Science (IFEES)]. Nevertheless, we did also identify relevant Qur'an quotes in the few other texts from Islamic FBAs that were in our sample. Furthermore, we identified a similar observation in our literature reviews (Binay and Yunis Al-Zoubi, 2019). Similarly, we also found a call to follow the example of Muhammad among the Islamic respondents:

> From the teachings and way of life of the Prophet Muhammad (peace and blessings upon him) comes an always mindful and particularly frugal use of resources, whether in food or water consumption (including for ritual cleansing). This mindful way of life is for all Muslims to take as an example (Interview ID 17).

The content of the religious references and instructions resembles, in part, the religious frameworks we detect in the Christian texts. The value of justice in relation to consumption seems to be the most significant identified in the Islamic texts and responses. These texts refer to aspects of justice toward God's creation and mankind's responsibility as the stewards of it:

> The Qur'an asks us to be just to our natural surroundings, "We did not create the heavens and earth and everything between them, except with truth" ([Qur'an] 15:85). Thus, a Muslim's behavior toward the environment is based on the imperatives laid down in the Qur'an (IFEES)[19].

Thus, one's consumption should do as much good as possible and cause as little harm as possible. Furthermore, as in the Christian texts, the Islamic texts also disapprove of materialism with reference to planetary boundaries:

> [...] We take our wealth for granted and use up resources as if they will go on forever. But they are finite and our extravagance in using them is causing pollution and damage to the lives of other people and creatures, and even to ourselves (IFEES)[20].

In addition, the Islamic texts add further frameworks to the field. They trace unsustainable and insufficient lifestyles to aspects of the human soul and its development during modern progress. In a text from the Representative Office of the Islamic Community in Bosnia and Herzegovina (IZBIH), they say that progress, like education, wealth, communication etc., has not led to wisdom and ethical acting but to ruthlessness in human behavior.

> The pollution of the human soul with lies and immorality is no less harmful than the pollution of nature with poisonous gases and garbage. Moreover, it is not possible to cleanse nature as long as human soul remains polluted with wickedness and irresponsibility toward life on earth (IZBIH)[21].

Similarly, IFEES discusses mankinds' attitudes and modernity observing that "the construct of what we have now come to describe as modernity is deeply hostile to the natural world" (IFEES)[22]. While we also find negative evaluations of the current levels of consumption in the Christian texts, this connection between mankind's attitudes and modernity is not made in the Christian texts. The explicit statement that negative human character traits cause environmental destruction and damage to other people's lives, is something we only detected in the Islamic and Hindu texts in statements such as: "What sort of actions corrupt the earth? Look into the Qur'an: Arrogance, wastefulness, greed, hoarding wealth, miserliness" (IFEES)[23]. This finding again supports the trend we identified in the literature (Ghandour, 2019).

Like the Christian FBAs, the Islamic FBAs also refer to concepts similar to the good life. In the *Islamic Declaration on Climate Change*, they promote a new "model of wellbeing, based on an alternative to the current financial model, which depletes resources, degrades the environment, and deepens inequality" (IFEES)[24]. Indeed, in another text, they state that living within limits contributes to a good life for all (for oneself, the environment, and other people): "We understand that caring for the environment is an important part of our vision for a better, fairer world for all" (Muslim Hands)[25]. However, overall, in our sample at least, the relationship between the good life and sufficiency seems to be even less of a thematic focus in the Islamic texts and interviews than in the Christian and Hindu texts and interviews.

19 https://www.ifees.org.uk/about/charter/

20 https://www.ifees.org.uk/wp-content/uploads/2019/12/khutbah-notes-1-sustainable-living.pdf

21 https://english.islamskazajednica.ba/news/248-spiritual-revolution-the-challenge-for-the-21st-century

22 https://www.ifees.org.uk/about/charter/

23 https://www.ifees.org.uk/wp-content/uploads/2019/12/khutbah-notes-1-sustainable-living.pdf

24 https://www.ifees.org.uk/wp-content/uploads/2020/01/climate_declarationmmwb.pdf

25 https://muslimhands.org.uk/latest/2015/12/our-policy-on-paper

Sufficiency in practice

The conclusion the Islamic FBAs draw is the same that we find in the Christian texts and interviews: there needs to be a change in our lifestyles. Again, we see a mixture of sufficiency, consistency, and efficiency in the recommended approaches. They suggest using green electricity and biodegradable tools. Initially, they begin promoting these ideas by implementing them in their own organization, for example by developing a recycling policy for themselves (Muslim Hands)[26].

It is also notable that, in the Islamic texts in our sample, a sufficient lifestyle best meets many of the commands made in the Qur'an, for example, "Eat and drink but DO NOT BE WASTEFUL: God does not like wasteful people (Qur'an 7:31)" (IFEES)[27]. Thus, IFEEs calls for a moderate lifestyle that limits consumption to the essential:

> If you had to grow your own food, would you eat as much as you do? If you had to raise and slaughter your own animals, would you eat as much meat? The Prophet's wife Aishah (RA) said, 'A complete month would pass by during which we would not make a fire (for cooking), and our food used to be only dates and water unless we were given a present of some meat.' (Hadith: Muslim). If we all lived as simply as this, the earth would be better able to sustain us. We would eat only what we grew, not waste energy and food transporting it around the world. (Ibid.)

The Islamic FBAs also link a sufficient lifestyle to specific religious practices, for example, when they promote *Iftar* (breaking fast). Fasting helps people become aware of their own consumption behavior and consciously do without. Nevertheless, it is important to maintain mindful, responsible behavior outside of fasting times as well, by eating healthy, regional, seasonal, and often meat-free food (Interview ID 17). Furthermore, the Islamic FBAs in our sample condemn the waste of food and plastic during Ramadan and advise Muslims to reduce their reliance on single-use plastics (IFEES)[28].

The Islamic FBAs promote another practice, *Zakah* and *Sadaqah* (donation), which also fits well within a sufficiency-oriented lifestyle.

> For those of us who have more than we need, Allah showed us the way to use up our surpluses. They ask you what they should give: say, 'Give what you can spare.' In this way, God makes His messages clear to you, so that you may reflect on this world and the next ([Qur'an] 2:219-20). Instead of wasting our money on buying food and other goods we don't need, or even on indulging in haram activities, we could be giving it as Zakah and Sadaqah, just as some of us send money back home to our families (IFEES)[29].

Donating, as a pillar of Islam, means giving away a portion of one's possessions, which cannot then be spent on excessive consumption. Thus, although it is not explicitly labeled as such, this approach corresponds with the concept of the two sides of sufficiency. Poorer people should be allowed to consume enough to live while avoiding unnecessary consumption themselves. A lifestyle based on the Prophet's model should move between these boundaries and be responsible, mindful, and moderate (Interview ID 17). We also found passages where the Islamic FBAs linked a reasonable lifestyle with divine rewards: "The simpler our lifestyle, the more we can spare, and the more rewards we store up for the next life" (IFEES)[30].

Elements of sufficiency and the good life in Hinduism (particularly Brahma Kumaris)

Our data selection for Hinduism ultimately contained texts predominantly from one FBA, Brahma Kumaris. This FBA defines itself as a spiritual organization rather than one directly linked to Hinduism. Nevertheless, several of their rituals and beliefs are drawn from Hinduism's beliefs (e.g., the belief in reincarnation and karma) (Arweck, 2018). Focusing on these similarities, our sample primarily demonstrates what this specific school of Hinduism says about sufficiency and the good life. However, we could compare these results with two other Hindu-based environmental activists in our interviews. Other schools may well have different perspectives, though this is an inherent challenge in studying Hinduism and not only an issue for this particular study.

As in the Christian and Islamic texts, we also find aspects of sufficiency and the good life discussed in our sample texts and interviews from Hindu FBAs and Brahma Kumaris. They also paint the current lifestyles and materialism in an unfavorable light, but their line of reasoning differs from the other two religions. In contrast to the other faiths in our investigation, the moral frames of the Hindu FBAs and Brahma Kumaris are only rarely directly connected to religious authority or holy scriptures. For example, only one respondent cites the *Bhagavad Gita* (Interview ID 13). As in the other texts and interviews, consumerism, especially in the global North, is seen very negatively. The Hindu texts and interviews justify this

26 https://muslimhands.org.uk/latest/2015/12/our-policy-on-paper

27 https://www.ifees.org.uk/wp-content/uploads/2019/12/khutbah-notes-2-recycling.pdf

28 https://www.ifees.org.uk/projects/plastic-free-iftar/

29 https://www.ifees.org.uk/wp-content/uploads/2019/12/khutbah-notes-5-food.pdf

30 https://www.ifees.org.uk/wp-content/uploads/2019/12/khutbah-notes-2-recycling.pdf

in a way that is comparable to the Islamic rationale, as they attribute consumption primarily to undesirable human qualities and describe it, for example, as an addiction:

> Although it seems to offer satisfaction it must never do so. It only works if – whilst believing that the next purchase will satisfy our need, and having made the purchase – we remain dis-satisfied and once more in need. Despite the promise of satisfaction, we must always feel we need more (Brahma Kumaris)[31].

Thus, a consumerist lifestyle is considered a negative but influential role model for less developed countries (see Brahma Kumaris)[32]. In this context, greed is described as a great vice. The widespread desire for external consumer goods and the focus on physical comforts stand in the way of a truly fulfilled life. Instead, the focus should be on peaceful thoughts, spiritual aspirations, awareness of mindfulness, inner contentment, and joy in life (Interview ID 13 and 24). Frugality is considered an ethical cornerstone of Hinduism that is necessary to allow all living beings on this planet their due space (Interview ID 13).

While Brahma Kumaris frames the topic of consumption in relation to the moral goal to take care of the planet, they link problems such as poverty and climate change to concepts of peace, harmony, contentment, and empathy toward other people. The current consumerism is seen as the obstacle to a good life as it hinders the rekindling of the connection to our inner self. This inner self is never referred to specifically as *ātman*, nevertheless, their concept of the inner self (with which people are trying to reconnect) closely aligns with the idea of *ātman*:

> We are living in a technological age which is increasingly out of step with the natural world and its cycles. In the busy-ness of daily life, it is easy to get disconnected from ourselves with consequences for our wellbeing & health on all levels (Brahma Kumaris)[33].

Hence, and in accordance with the goal of *mok?a,* Brahma Kumaris view the good life as achieved through a reconnection to our inner self:

> To get this [happiness] you have to go inside, this is very different from what the world is asking you to do. The world would tell you that you want more, more, and more and this is exactly how we have found ourselves in the situation we are now – we are already consuming one and a half times the resources we have. When I eat more, drink more, consume more – do I become happy? No. It is time to challenge the messages we are receiving from the advertisers – money cannot buy happiness, money cannot buy love! (Brahma Kumaris)[34].

As we predicted in our theorizing, from the Hindu perspective the good life equates to a simple life: as little consumption as possible, as much consumption as necessary (Interview ID 13). Hence, there is a strong affiliation with a less materialistic lifestyle. Moreover, Brahma Kumaris asks how much is enough with regards to our needs. With this thought, they acknowledge that everybody has different needs that must be fulfilled if they are to have a good and satisfying life:

> How much is enough? [...] How many pairs of shoes are enough? How many clothes do we need in our wardrobe to dress us? How much food in our pantry is enough to feed us? How do we gauge this balance between need and greed? In fact, everything can be enough when the heart is big and generous and when it's not, then nothing is enough. Waste is a relative term. What is waste to one may be a necessity to another! [...] Therefore, it is important not to judge another for what their 'needs' maybe (Brahma Kumaris)[35].

Thus, although it is not specifically named as a concept again, sufficiency is often indirectly referred to by the Brahma Kumaris when they express the desire for lifestyle changes and greater awareness of how much is enough.

Interestingly, Brahma Kumaris does broach the issue of a connection between a good life and religion or religious people directly. It concludes that while religion is one possible source of values, it is not the only one and that atheists can also facilitate a good life:

> Would this require a religious revival perhaps? Well religion alone does not necessarily lead to greater empathy and being concerned about the wellbeing of others not connected to us. We can see that some individuals and communities feel driven by their religious dogma to act out violence and hatred to their ideological 'enemies'. And religion does not have a monopoly on caring and empathy - there are many atheists who live extremely humanitarian and ethical lives (Brahma Kumaris)[36].

31 http://www.brahmakumaris.org/es/descubrir/articulos-blog/articulos?view=article&option=com_alfresco&~articleId=b63aae49-87fb-4d2f-b305-60ecf163bb6d

32 https://eco.brahmakumaris.org/empathy-and-the-environmental-crises/

33 https://eco.brahmakumaris.org/healing-the-self-restoring-the-earth/

34 https://eco.brahmakumaris.org/6th-and-7th-day-climate-change-conference-saturday-and-sunday-4th-and-5th-december/

35 https://eco.brahmakumaris.org/enough/

36 https://eco.brahmakumaris.org/empathy-and-the-environmental-crises/

Sufficiency in practice

As already indicated, our Hindu-related sample suggests that sufficiency relates to inner contentment and the reestablishment of a connection to our inner self or soul. If one succeeds in this endeavor, their wastefulness and abuse of resources will decrease automatically:

> Suffice it to say, one needs to look within, at themselves, and check where they are wasting their time, money and other resources. What is the excess in my life that I can trim or put to a better use? (Ibid).

Brahma Kumaris proposes meditation and a vegetarian lifestyle. A vegetarian diet is linked to a healthy life and our survival on Earth as it incorporates the protection of the planet and a way to stop climate change. However, meditation is considered the preferred way to awaken empathy with nature and our fellow humans, leading to a good life for all. This lifestyle could be supported by living in a community (Interview ID 24).

It is noteworthy that in comparison to the other two religions, efficiency is considered a less salient way to achieve a sustainable transformation. Although modern technologies such as solar energy are positively evaluated, there is also a clear criticism of strictly refraining from anything else than efficient lifestyles. According to Brahma Kumaris, efficiency is not enough to fight climate change, rather, it is a worthy addition to a less materialistic lifestyle:

> The link between this form of economy and resource depletion, global warming and climate change might seem self-evident, but there are still those who suggest that we can "decouple" them; that by ingenuity and technical innovation we can continue to grow our economies and raise global levels of consumption without having an adverse impact upon our environment. I doubt that this is true (Brahma Kumaris)[37].

We also find critical comments in the interviews regarding the implementation of sufficient lifestyles in practice. In addition to attitudes (or the lack of connection to the inner self), both air travel and the desire for ever-better technology stand out as obstacles to sustainable living. In particular, interviewees critically questioned regular air travel (for example to India) (Interview ID 01, 13 and 24).

Given this the strong focus on individual mindsets, the statements made by Brahma Kumaris only address people as individuals. Political actors, institutions, and society en masse are not directly addressed. Furthermore, legislation and political institutions are depicted as less important because people need to find more compassion and empathy in their inner self:

> It is not so easy to get governments to change, there are so many factors involved, but we don't have to wait for governments to make the policies we can to something today! (Brahma Kumaris)[38].

Discussion

As previously discussed, we identified references to the concept of sufficiency and the good life in relation to living sustainably in between limits in the material of all three religions. As the concept of sufficiency is still relatively new (Toulouse et al., 2019, p. 334), it is interesting to observe how compatible it is with the understandings and frameworks of climate activism used within these three religions. Furthermore, the values detected related to an understanding of a good life, which implies a sustainable future as the ultimate goal of a better life and, in some cases, even means a life lived between limits as recommended in theoretical concepts such as the consumption corridors. It is notable that, in our sample, the sufficiency approaches were not limited to elitist asceticism either. Rather, the faith-based actors addressed every (religious) individual and linked them to their respective communities. Hence, we found references to the positive effect communities have when implementing sufficient lifestyles in the sample texts for each of the three religions. Thus, encouraging each other could have an important function in the establishment of sustainable lifestyles. In particular, the common reinforcement of religious values and practices could strengthen the community and its sustainable lifestyle.

Nevertheless, there are still differences between the frameworks that became visible in the description of our results. Although each religion evaluated our current consumer culture negatively, they offered different strategies for changing the situation, each based on their individual religious tradition. In our corpus, we found that the Hindu-based school of Brahma Kumaris advocates for changing our consumption through meditation and a vegetarian diet, while Muslims offer advice on how to conduct a sustainable Iftar. Christians discuss the possibilities more broadly by more openly including the political sphere in the discussion of the topic. However, our sample contained less advice on how to conduct Christian traditions more sustainably. For example, there is no mention of Christmas, currently one of the most commercial and consumption-driven holidays. Also, the other two religions only focus on certain elements of sustainable lifestyles, leaving other, maybe harder to implement, aspects of lifestyle changes unsaid.

37 http://www.brahmakumaris.org/es/descubrir/articulos-blog/articulos?view=article&option=com_alfresco&~articleId=b63aae49-87fb-4d2f-b305-60ecf163bb6d

38 https://eco.brahmakumaris.org/6th-and-7th-day-climate-change-conference-saturday-and-sunday-4th-and-5th-december/

While a vegetarian diet and meditation are relatively simple lifestyle actions for Hindus, restricting one's long-distance journeys (mainly between the place of residence and India), for example, would be a much harder limitation to one's lifestyle. This critical assessment of flights was expressed during the interviews but was not mentioned in any of the texts from the Hindu sample. Furthermore, although theory discussed, if also only rarely, the growing consumerism during Hindu festivals like *Diwali* (Porter, 2013), this theme was not identified in our sample texts. As the Hindu sample did not include discussion on the systemic and political level, we can assume that the recurse to *moksha* can restrain the action only to meditation, leaving otherworldly matters and possible actions out of sight. However, it should again be noted that our empirical sample is primarily limited to a specific Hindu orientation and does not reflect the full diversity of Hindu schools. Even though the interviews include other orientations, we cannot make generalized statements here about Hinduism as a whole. In regard to Islam, a sustainable *Iftar* is undoubtedly a good advancement, but it only promotes living a sustainable life for 1 month a year. As the lines of production and systemic difficulties of changing a consumption system are rarely discussed in the Islam and Hindu documents in our sample, it seems like all of the responsibility lies in the hands of the faithful consumers – even though it is evident from our other research that some Islamic FBAs do also include the systemic level in their actions and demands[39]. Nevertheless, this engagement with the climate policy of the EU does not seem to be as pronounced in the Muslim context as it does in the Christian one. Of course, this imbalance between Christianity, the majority religion, and the Islamic and Hindu minority religions may well lie in the different level to which they are embedded in European culture and their position in the political system. Furthermore, the absence of evidence is not evidence of absence: our small sample cannot generalize to the sustainability activism of all religions. However, it is noteworthy and important to highlight that the frameworks discovered here can nurture a broader awareness and activism among consumers. This could lead to a broader acceptance of sufficiency as a concept that demands a critical reassessment of how we lead our lives and how much of our consumption is really necessary for all aspects of our lives.

Conclusion

This article analyzed how FBAs from three religions, Christianity, Islam, and Hinduism, engage with the concepts of sufficiency and the good life. These two concepts are becoming more and more important in the face of advancing climate change as they are possible guiding principles for a sustainable future. Although all three are interdependent, sufficiency, as opposed to efficiency or consistency, is the key to a sustainable transformation as it takes into account the question of how much is enough. Furthermore, it considers what is enough in relation to both a lower and upper threshold and, therefore, provides the foundation for what researchers consider the good life in relation to sustainability. This corridor facilitates a good life that can be enjoyed by everyone, now and in the future. We have demonstrated that this good life focuses on a needs-based perspective by leaving the moral definition of the good within the consumption corridor open to individual interpretation and desire. It is in this determination that religious institutions, as generators of values and norms, could be an important asset when promoting such a shift in lifestyle. Moral reasoning through faith-based values could also benefit the promotion of sufficiency as a policy by broadening the acceptance of such values and policies.

Our analysis of web-based documents and online interviews from FBAs engaging with climate action at the level of the EU has shown that religious moral reasoning is already occurring, though the FBAs are not using the specific terms sufficiency or good life. All three religions evaluate our current consumerist lifestyles negatively, citing it as one of the reasons for the current climate crisis. Therefore, the FBAs are united in their effort to raise awareness on a more simplistic life, reducing one's consumption and, as a result, leading a better life. Nevertheless, our research has also shown that Muslim and Hindu FBAs address the structural level less than the individual faithful consumer. Christian FBAs, in contrast, criticize the systemic unfairness but lack detailed concepts of change. All three religions lack a broad and comprehensive assessment of their own traditions and lifestyles in relation to sustainability, however, we did find critical evaluations of certain aspects within our sample. Furthermore, the engagement with climate policy of Islamic and Hindu actors on the social and political level could be much stronger in the locations where the majority of their followers live. For example, the literature review has already given us a glimpse of other faith-based sufficiency frameworks that are possible in Muslim countries, but which were not found in this European sample. Future research could investigate this further. Nonetheless, this analysis has provided the first assessment of sufficiency in the work of FBAs and showed that they are engaging with similar concepts and emphasizing the importance of living within limits in our sustainable future.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

39 https://www.uni-muenster.de/Religion-und-Politik/en/forschung/projekte/B3-31.shtml

Ethics statement

Ethics review and approval/written informed consent was not required as per local legislation and institutional requirements.

Author contributions

HK and AR contributed to conception and design of the study and wrote sections of the manuscript. AR organized the literature review. HK organized the empirical material. All authors contributed to manuscript revision, read, and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

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Sufficiency and the state: A prospective project

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Sufficiency as a social organizing principle can be applied to individuals, organizations, and economies. But if the encompassing social structure, namely, the state, is still organized around expansionist principles like efficiency and growth, the outcome will be the same—excess, the exceeding of regenerative capacities biophysical and social, local to global. A prospective project of effecting fundamental social change argues that sufficiency must be applied to the state. From a natural resources perspective defining features of the state form are concentration and surplus both of which tend to excess and require endless frontiers. Re-organizing to counter this tendency and institutionalizing sufficiency requires imaginative politics. A long multicultural human history of reorganizing to adapt to environmental conditions bodes well. Resistance, though, even as the contradictions play out, is to be expected.

KEYWORDS

sufficiency, sustainability, the state, surplus, growth, transition, social change, politics

Introduction

Humans are creative, adaptive, innovative creatures. They explore and experiment, trying out this or that adaptation. They adapt to their biophysical environment and to their social environment, keeping what works (or is appealing or distinguishing in some way) and discarding that which does not. Among the things they create and discard is the very form of their social organization. If a chiefdom worked under one set of conditions—favorable rainfall and an enlightened leader, for instance—then, when those conditions change, they adopt a tribal form, say. Some adaptations are practical, solving a problem of food or shelter, or defense. Others are playful, just trying out things. In the end, the species keeps experimenting, adapting, and changing.

In modern times we moderns champion creativity in technology, the arts, leading-edge science, and finance. Curiously, we do not champion it in social organization. In fact, to be modern is to ascribe to one superior form of organization, call it the state, and dismiss other forms as backward or primitive or ancient, as ways of organizing that do not appreciate technologies and markets, efficiencies, and consumer choice, and above all, growth[1].

1 To be clear, I am using mostly an anthropological definition of the state. I do not mean the modern state, except where so noted, nor the central or national or federal government where the state is set in opposition to civil society or "the people." The state here is the *form* of social organization, just as is a chiefdom or tribe, neither of which refers to rulers or government. Also, by "modern" I mean the industrial era through to the present.

It is a comforting stance we moderns take, putting our own form of social organization—now industrial, consumerist, financialized—on a pinnacle, at the height of a historical, evolutionary progression of stages of development. It is a stance that justifies patterns of natural resource use that in recent decades have been shown without a doubt to be unsustainable and unjust. It justifies material flows that are exploitative of forests and fisheries, local communities, and "essential" workers. It disregards toxins, the permanent depletion of topsoil and groundwater, and greenhouse gasses. It treats resources and wastes sinks as infinitely regenerative, as mere inputs for which substitutes can always be found. And all along it concentrates wealth and power. In short, the modern state form is organized to extract, exploit, externalize and expand, which adds up to one thing—*excess*.

By excess I mean, in the first instance, on the biophysical side, the exceeding of regenerative capacities of natural resources and the assimilative capacities of waste sinks. The evidence is abundant (MacNeil and Engelke, 2016; International Energy Agency, 2021; IPCC, 2022). On the human side, the excess is the exceeding of social organizing capacities, especially as power concentrates and complexity increases. And it is the exceeding of psychological capacities, whether from mind-numbing work or inundation of information.

In this essay, I argue that modern, industrial, consumerist, growth-centric societies are extensions of a social system most generally known as the state. States are organized for *surplus* where the goal of that organization is the *concentration of wealth and power* (for which capitalism is only a recent manifestation)[2]. The pattern of the state's 6,000 history is a never-ending search for surplus which manifests as wealth and power which, in turn, leads to excess. The social organizing principles, explicit or implicit, are might-is-right, divine inspiration, and expansion. The expansion principle has geographic and economic dimensions—colonization and growth. To organize under other principles, including a contrary principle of enough and too much, sufficiency, is anathema to the state form. Sufficiency, along with other principles that embody biophysical and social limits may, however, be essential to creating a social organizational form that conforms to the system goals of ecosystems, nutrient and hydrologic cycles, and the climate.

Before proceeding, I make three notes on theoretical and normative commitment, what I put under the rubric of a prospective project. One, if, as I argue shortly, sufficiency is most usefully constructed as a social organizing principle, as opposed to a social outcome (e.g., level of income), then the current organizational form, namely, the state should be a focus of inquiry. A focus on outcomes tends to accept the current social structure and to call for marginal changes (e.g., redistribute income). A focus on social organizing principle and hence structure tends to get to the root of the problem, here, excess. It opens the possibility of fundamental reorganization, or transformation, whether through reform or devising wholesale a new social form. Reorganization should thus be a part of the inquiry, not to mention a direction of experimentation in practice. This, anyway, is my theoretical commitment, at once future-oriented and normative. I project trends, in the first instance, biophysical, and assume tipping points and limits. I presume a desirable direction, namely, using resources without using them up, that is, sustainably. I further presume that no single organizing principle can meet all objectives and that, ideally, we who have the privilege to work on such matters (drawing on state surplus) should strive to create a suite of principles that address, say, sustainability, peace, prosperity, democracy, and human dignity.

Two, the issue here is not equity or inequality, or poverty alleviation. Those have long been topics of debate and conceptual development and, I presume, are well covered. Rather, the construction of a principle of sufficiency is ultimately, at the most encompassing structural level, about the state. The issue is the state's propensity toward excess, that is, exceeding regenerative capacities both biophysical and social. No one can say if an entirely new form of social organization is necessary to address 21st-century excess. Maybe reform will be enough. What is clear, however, is that the 6,000-year history of expansionism, especially as it has played out geographically and biophysically, is no longer tenable. In the past, release valves for endless expansion were collapse and migration. Collapse (not to be equated with chaos and misery for everyone) was to demographic dispersion and some kind of decentralized form (Sale, 1980; Tainter, 1988; Scott, 2017). Migration was to habitable yet uninhabited lands. Both options are highly constrained now, if not impossible on a planet of eight billion people where productive lands are fully occupied and exploited.

Three, for many anthropologists, archaeologists, historians, political scientists, and others who examine the state, the

2 I posit the goal of the system to be the *concentration* of wealth and power rather than the accumulation or increase in wealth and power. The implication is that elites organize a state to enhance their wealth and power which, as two sides of the coin of influence, are both relative: more influence for elites arises not when the entire population is wealthier, let alone has more power (whatever that would be), but when elites are relatively wealthier or have relatively more sources of power than the masses. But elites cannot say so explicitly; they must sell wealth and power to their underlings and the masses as increase or accumulation or growth or just "greatness," implying that everyone benefits. Increased wealth and power, or growth, then, is a rhetorical device to obscure and justify the concentration of wealth and power among the few.

My best read of the literature indicates that in the 6,000 history of the state a broad distribution was never the goal of those who organized states until, arguably, the last couple centuries. Even then, democracy and economic redistribution is a constant struggle. A broad distribution was, by contrast, a goal of other social forms such as the tribe and clan because such distribution enhanced production and reproduction, survival and intergenerational persistence. On this latter point, see Merchant (1989).

project is to (1) deconstruct the standard narrative, namely that, in one place, Mesopotamia, humans invented agriculture, settled down, built cities and monuments, which then evolved, or progressed, to modern society with other peoples trying to catch up; and (2) construct a counter-narrative that is more nuanced, contingent, variable, fluid and political and less socially evolutionary and self-congratulatory. The project is backward-looking with occasional nods to contemporary relevance[3]. For me, the project is to use those histories and that theorizing to aid in the 21st-century transition from a degrading world of humans dominating nature to a sustainable world of humans living with nature. Put differently, it is to find congruence between biophysical, ecological organization, and human social organization (Princen, 2014).

State surplus: A 6,000 year experiment

Considering the 4,000 year 6,000 year history of the state as a social form and grounding it in natural resources, three structural features distinguish the state from tribal and other forms. One is *concentration*—of people in cities, of livestock nearby, and, probably most consequentially early on, of staple crops, especially grains. A second is an *administration* and an administrative elite required by concentration. And the third, enabled by concentration and elite management, is *surplus*, assets beyond subsistence. Now, millenniums after the first experiments with the state form, the surplus may be the most consequential and most problematic. A key process is extraction, both from natural resources and from the non-managerial population. The state is thus composed of two subpopulations, the *support population* that generates surplus and the *extractive population* that uses the surplus to organize, build, defend, raid, explore, subjugate, study, worship, and expand.

Students of the state—archaeologists, anthropologists, and political scientists—focus on the practices and organizational dynamics within and between states and concomitant inequities and human exploitation[4]. Here I focus on surplus, the locus of power in surplus seeking, and the imperative to expand. For the purpose of imagining a sustainable and just future, my prospective agenda, it is surplus and especially surplus seeking which is most implicated in the modern project of endless material expansion on a finite planet as well as the resistance to something like sufficiency[5].

Nonstate peoples have long generated surpluses, that is, more than is needed to subsist. They extend the hunt, collect extra fiber and stone, and grow more crops than what they can consume immediately or trade or store for the winter. But the evidence indicates that they would spend that surplus quickly on a feast or potlatch or offerings to the gods. They would not accumulate it. Holders of surplus may gain influence but only temporarily, only in the ability to spend the surplus (Graeber and Wengrow, 2021, p. 43, 52). Otherwise, the surplus would either hamper nomadic peoples or disrupt social relations.

State formation, by contrast, allowed or enabled accumulation. Wheat or rice or corn is stored in closely managed, dutifully measured granaries. Pigs and cattle are herded and penned and bred to grow quickly. Forests are cut and grasses are collected and stored. All this requires management which requires yet more surplus. And more surplus can always be justified, even deemed essential, to maintain functions, buffer against future downturns (especially in food), reward innovation, suppress uprisings, defend against raiders. Moreover, the more that is done—more extraction, more workers, more organization—the more is required—that is, more surplus—to keep it all going. With the state form, self-reinforcing, amplifying, so-called "positive" feedback loops are built in. As well, the security dilemma arises almost unavoidably: the greater a state's wealth the more attractive it is to others and the more it raises its defenses; the more it raises its defenses the more it threatens others the more they raise their defenses. One side's defense becomes the other side's threat. Defense and the requisite surplus ratchet up.

3 To be sure, some analysts who focus on explaining the past occasionally invoke the current human predicament and point to the future. For example, Graeber and Wengrow (2021) posit that, "if, as many are suggesting, our species' future now hinges on our capacity to create something different (say, a system in which people are not told their needs are unimportant, or that their lives have no intrinsic worth), then what ultimately matters is whether we can rediscover the freedoms that make us human in the first place" (8). It is noteworthy that the authors' normative goals for the future are buried in parentheses and barely revisited in their 692 pages of text and notes.

4 If this is not a fair one-sentence summary of the focus of vast amounts of various literatures, consider this assertion instead: Students of the state describe in exquisite detail the features of a state and its peoples and sometimes generalize to other states and peoples. Often they will claim that it is important to understand the historical and cultural nuances and patterns. But rare is it that they will then apply such understandings to the contemporary, 21st century human-ecological predicament. Rarer still is it that they will venture to say what actors *should* do given, say, the goal of a sustainable and just transition. It is precisely such prospective, normative theorizing that I am venturing here. On normative political theorizing, see Wapner (2000).

5 My focus on surplus is in contrast to what in anthropology and other fields seems to be an aversion to the very concept of surplus: one group's surplus is another's necessity; who are we outside observers to judge? For my purposes—understanding how state structure compels expansion and how the state is threatened by principles like sufficiency—this debate is beside the point, that is, the 21st century point of globally excessive throughput of material and energy.

With the state form, then, temporary or annual surplus seeking gives way to permanent or perennial surplus seeking. What is more, surplus seeking has no bounds. In fact, it engenders a more-is-better behavioral pattern and organizational imperative that offers great rewards (for some) and great risks, namely collapse (which all systems dominated by positive feedback loops eventually do). As a result, satiety or enoughness is an alien notion in the state structure. And this has been so historically, for millenniums, well prior to capitalism and consumerism (Heilbroner, 1985). By implication, and to preview my prospective argument, a notion of sufficiency is not just anathema to the state, but a threat to the state.

Surplus seeking also engenders structural differentiation and associated power imbalance. As noted, from a natural resource perspective, the state is composed of two subpopulations, the *support population* that generates surplus and the *elite population* that uses the surplus to organize, defend, and expand. Because elite managers do not themselves generate a surplus (they don't grow the wheat or tend the pigs) the elites' first task is building and maintaining the support population. Evidence suggests that rarely did nonstate peoples in the early millenniums of state experimentation voluntarily choose to join the support population (Scott, 2017). Thus coercion, including enslavement, further defines the state[6].

In short, the perennial surplus-seeking of elites confers power upon themselves as it disempowers others. The more surplus they seek the more the surplus itself must be managed and the more the support population needs expansion and management. Elite power accumulates and concentrates, right along with the surpluses. At some point, something must give. If, for instance, the source of the surplus is wood then as more and more trees are cut deforestation is a likely, and well-documented, result. Deforestation increases erosion and flooding, decreases ecosystem integrity, and changes local climate. Coping requires yet more surplus and hence more deforestation and more ecological degradation. In general, regarding early states, James Scott writes: "Given the unprecedented concentration of crops, people, livestock, and urban economic activity fostered by states, a whole series of effects—soil exhaustion, siltation, floods, salinization, epidemics, fire, malaria, none of which existed at anything like such levels before the state and any of which could gradually or suddenly empty a city and destroy a state—were more common [with state formation]" (Scott, 2017, p. 212). So a system, whether biological, physical or social, driven by self-reinforcing "positive" feedback loops of concentrated subsystems eventually collapses. Socially, that may be primarily the collapse of the elite structure, that which requires support and endless accumulation, which is to say, the state form and its surplus imperative. The rest of the social system, the support system, re-organizes and continues. I return to this crucial point shortly.

At the core of the state form, at least with respect to natural resources, then, is surplus—continuous, accumulating, self-reinforcing. That, in turn, creates the seemingly inexorable need to expand—to extract natural resources for dwellings and monuments, to capture neighboring and distant peoples, to marshal armies for defense and raiding. The expansion is geographic, demographic, ecological, and cultural. In modern times it is also economic. In all of its manifestations, in the logic of surplus, there is no endpoint, never enough and never too much, only more.

Re-organization

When the logic of surplus plays out and the system collapses of its own weight, its own contradictions (e.g., the exploitation of humans and natural resources reach a breaking point), it is because the capacities of its world have been exceeded. There is no more river bottom to claim, no more forest to clear, no more populations to raid (or they organize and resist). For much of the early history of the state, those "worlds" were, from a modern perspective, local—the rich riparian zones along major rivers like the Tigris and Euphrates, the Yellow, the Nile, the Mississippi, the Colorado, with forests nearby. With horses, elephants, and seafaring vessels states extended those worlds which in turn offered up seemingly endless frontiers (Crosby, 2004; Trautmann, 2015). Now, in the 20th and 21st centuries, the many worlds of expansion and colonization and tribute are occupied, the frontiers are closed locally and globally. The final contradiction, energetic and ecological (especially regarding waste sinks) is taking shape: endless material expansion on a materially finite planet is impossible (Daly, 1996). A social form designed for and dependent on endless expansion will end, or it will fundamentally reorganize. I leave it to future scholars (should there be enough surplus to support them) to decide whether the successor to the state is a qualitatively different form or a substantially reorganized state (see below).

The important point for scholars today and for policymakers and activists and journalists who draw on their work is to recognize that the state as we have known it for millenniums has operated under "empty world" conditions. That is until recently, human action and impact have been minuscule relative to available land and resources. What is more, exploitable

6 That societies need not be structured through coercion is evidenced by what anthropologists Graeber and Wengrow call the indigenous critique. For example, in the 17th century writings of Wendat intellectual, Kandiaronk they write that "the whole apparatus of trying to force people to behave well would be unnecessary if France did not also maintain a contrary apparatus that encourages people to behave badly. That apparatus consisted of money, property rights and the resultant pursuit of material self-interest." (Graeber and Wengrow, 2021, p. 54). A different apparatus, Graeber and Wengrow imply, or I infer, is possible not just then but now.

peoples were widely available, could be overcome by brute force, and struggled to resist state expansion. Those conditions are ending. With 8 billion people, depleted natural resources, overfilling waste sinks, and new forms of resistance politics (Martin, 2011; Nixon, 2011; Broad and Cavanagh, 2021), there are few exploitable worlds, if any. The task for the public everywhere is to begin imagining and constructing a social form in which people thrive under "full world" conditions. To aid in that imaginative endeavor, consider that the state form, for its purpose, namely, to concentrate wealth and power, and its means, perennial surplus, is supremely well-adapted to a world of endless resources and waste sinks. But the implicit condition, good for some 6,000 years, is endless frontiers and, in the last some 600 years, endless facsimiles of frontiers, namely technologies and abstractions such as money. With real-world, biophysical frontiers fast closing, local to global, a longstanding question in political theory arises again, only this time with biophysical grounding: Whither the state? From a natural resources perspective, I see three possibilities.

One, the current full-world conditions (humans occupy all habitable places and extract at and beyond regenerative capacities) will be overcome by technologies and new markets. Efficiencies will be taken to drastically reduce overall consumption and markets will mitigate overall growth. Seeing no significant precedents in the last century or two, in fact, just the opposite, I move to the second possibility.

Two, the state, being fatally flawed with its endless expansion imperative, will collapse as a social form. A long period of social experimentation will follow before a wholly new form, or perhaps a multitude of forms emerges. Historical accounts of such collapses abound but there is little on the rebuilding that follows. James Scott, however, argues that, with collapse, it is "likely that the culture will survive—and be developed—in smaller centers no longer in thrall to the center. One must never confound culture with state centers or the apex of a court culture with its broader foundations." What is more, in the past if collapse occurred because subjects rejected centralized rule they "may well have avoided labor and grain taxes, escaped an epidemic, traded oppressive serfdom for greater freedom and physical mobility, and perhaps avoided death in combat. The abandonment of the state may, in such cases, be experienced as emancipation" (Scott, 2017, p. 210–211). Finally, making the ecological case—that is, emphasizing the relation of humans to their biophysical and social environments—Scott argues that "what may seem to many to be a regression and civilizational heresy may on closer examination be nothing more than a prudent and long-practiced adaptation to environmental variability." (Scott, 2017, p. 212). The task now for social theorists, historians and futurists may well be to engage in a bit of "civilizational heresy." It will be to highlight social forms dismissed by modernists as "primitive" or "traditional" or "backward," not to mention imagine wholly new forms, at once more adaptive and less exploitative.

Three, the state form will be fundamentally restructured, its missing pieces identified and filled in. On the biophysical side (perhaps social side, too) the most consequential missing piece is a mechanism of restraint (Princen, 1997). From a systems perspective, it would be built-in dampening ("negative") feedback loops. From a cultural perspective it would be a social norm that legitimizes, even makes normal or routine, a question of the sort, Is it enough and not too much? From a social organizing or political perspective, it would be a social organizing principle that institutionalizes mechanisms of restraint.

Sufficiency

So what might that principle be? Elsewhere I have elaborated sufficiency as an idea, an organizational principle, and an ethic (Princen, 1997, 2003, 2005, 2010, in press-a). Suffice it to say that at a personal level sufficiency is that sense of enoughness and too-muchness. I know when I've drunk enough coffee and when too much. At an organizational level, it is establishing a goal of using a resource, a space, a workforce, or a set of community relations without using them up and constructing organizational mechanisms to restrain extraction and consumption. At the level of an economy, it is designing for enough growth but not too much, even for an economic steady-state or contraction.

Why sufficiency? Why now? Why construct a concept in contradistinction to, e.g., efficiency and growth that have served the industrial world so well? The short answer, grounded in the biophysical, is that this historical moment is one of ecological contradiction: the primary relation of humans to their environment has been that of extraction and expansion, the r-strategy of species that move in fast to a new territory, reproduce rapidly, then, when all is exhausted or more stable forms take over, move on (Gadgil and Guha, 1992). If the 19th century was one of colonization and the 20th of economic growth, then the 21st is of adaptation, fit, living within means, of organizing as if ecological, psychological, and planetary boundaries must translate to organizational boundaries. If sufficiency had meaning in the 20th century it was primarily among those of us who felt that, aside from ultimate limits, modern life, its speed, its flood of information, its dominating geographies and conquering of time, its disregard for large subpopulations, was a poor definition of the good life (Arendt, 1948; Sachs, 1992). Now, while all that continues, ultimate biophysical limits, possibly organizational and psychological limits, are being realized. For all the aversion to the very notion of limits in the dominant political economy, maybe especially among elites, those who have done so well in the 20th century, limits can no longer be ignored. This is self-evidently true in the biophysical dimension. But they seem to be

coming increasingly true on the personal and social dimensions: structures, boundaries, rules, and ethics are the conditions in which true freedom and thriving occur, not their negation. Surplus seeking, for all its benefits over a 6,000-year history has met its match—biophysical capacity, and likely social organizing and psychological capacity as well. Like other impulses, its constraint has become imperative, unavoidable, logical, and sensible (Dryzek, 1987).

So sufficiency, as constructed here, is a 21st-century concept. It has the advantage that, far from being a novel idea, it is in fact intuitive, age-old, and rather commonplace, just not as a social organizing principle. Constructing that principle is among the critical tasks of this historical moment. Imagining a direction of social development that respects nature's capacities and people's capacities is the challenge. How it manifests, where the road leads, is a matter of discovery, not determination. Again, the direction—living within our means, routinely asking when is enough and not too much—is the focus. The project is thus at once prospective (moving into an uncertain future) and historical (drawing on extant behaviors of the past), descriptive (humans actually do better with well-defined boundaries), and normative (to be sustainable and just societies must live within their means).

The construction of sufficiency, then, is a response to a desperate social need—figuring out how to live in a set of ecosystems, on one planet and how to live well, how, in the first instance, to use natural resources and waste sinks without using them up. Because the present industrial, consumerist, expansionist, fossil-fueled order is demonstrably unable to do this, a set of social organizing principles of a qualitatively different sort from the dominant principles of consumer sovereignty, efficiency, and growth (see below) is needed. Sufficiency is one possibility (Alexander and Ussher, 2012; Spangenberg and Lorek, 2019; Fuchs et al., 2021; Jungell-Michelsson and Heikkurinen, 2022).

To begin imagining a sufficiency-inflected society and prospecting for intervention points, a central question is where to locate social change. Should the analytic focus and, for that matter, the interventionist leverage be with the individual, with specific organizations, with the government, or with civil society? Here I assert that the primary locus of social change, *under the biophysical and social conditions of the 21st century*, is the state.

Social change

When it is the very structure of the state that drives endless material expansion, social change must occur at the level of the state. Tweaking markets, cleaning up factories, and nudging individuals will not add up to a societal shift if the prevailing system compels subsystems to expand indefinitely. And it is system change that is necessary when parts of the system must adopt the system's dominant organizing principles—in the industrial case, efficiency, consumer sovereignty, and, above all, growth (see below)—to survive. This is certainly the case now in the 21st century regarding businesses. But even so-called non-profit companies such as cooperatives, universities, and foundations seem compelled to grow. If expansionism is as hegemonic in the current industrial, consumerist order as I claim it is, resistance to its containment will come from many quarters, industry and its political enablers in the lead. That is, if social change at the level of the state is logical, resistance, probably fierce resistance, can be expected. So just as an industry can embrace recycling (to produce more) but block attempts to generate less waste (by consuming less), it can be expected to fight tooth and nail attempts to undermine the growth norm.

Resistance to system-level social change would also come from those who claim, however implicitly, that there is One Right Way to Organize society. I take the position that this is little more than a claim. In fact, it is a rhetorical device for maintaining a distribution of power and wealth that serves some actors very well. It is not, however, historically, institutionally, or behaviorally grounded (Sale, 1980; Gadgil and Guha, 1992; Moore et al., 2007; Scott, 2017; Graeber and Wengrow, 2021). So I make a series of counter-claims that question the permanence of the state as we know it, especially under 21st-century conditions, and that opens political space for social change. This then begins to lay out an imaginative politics for fundamental social change, a politics of articulating features of a just and sustainable transition.

One, societies *organize themselves in a multitude of ways*. And they have reorganized themselves over and over. Sometimes they increase size and complexity, which gains the attention of subsequent scholars and leaders (think the rise of empires). Sometimes they find their society collapsing of internal contradictions (think the fall of empires). But sometimes they deliberately decrease their size and complexity (which gains little attention). Sometimes they concentrate power on one leader or cabal. Sometimes they choose to disperse power across clans and individuals. Sometimes they exploit people and land to the point of degradation and then move to the next frontier. Sometimes they use people and land without using them up and sustain themselves in place (what, again, gains little attention).

Two, how societies organize themselves is a function of i. the *biophysical* environment; ii. the *social* environment (including cultural history and the need to differentiate groups); iii. *chance*, experimentation, play. Some societies are well-adapted to their environments, moving seasonally to find food and avoid extreme weather, for instance. Others extract and move on, effectively counting on frontiers and compliant peoples to support their practices.

Three, there is *no one superior way* to organize a society. The modern, industrial, consumerist, capitalist state is not the epitome of social organization. Rather, it is just one way to organize, one institutional adaptation to the biophysical and

social environments, all with a lot of chance and luck and misfortune thrown in. From an adaptiveness perspective, it is a supremely well-structured organizational form for exploiting hugely abundant, easy to obtain, densely packed energy sources. For most of the history of the state energy was concentrated in the muscle power of livestock, laborers, and slaves and the vegetative power of wood, and for the last couple of centuries, in coal, oil, and natural gas (Smil, 2011). And the state is well structured for converting that physical power to economic and political power, the result being concentrated wealth and decision-making, the overarching purpose of the state form (Yergin, 1991). It is not well structured for a decline of such abundance, however, let alone paying for its true costs delayed for generations across time and displaced spatially across ecosystems.

Four, some societies are *well-adapted over the long term*, others are not. Reading the signals of maladaptation is difficult amid the noise of conquest and colonization, great technological innovation, and in recent modern times, the creation of financial instruments, distanced trade, and digital worlds. Extreme events such as wildfires and floods, heat waves, and droughts help cut through the noise, at least for those who listen (Princen, in press-b). When the signals are clear or get louder, and when they are heard, they make evident the imperative to reorganize and construct principles of social organization that fit the conditions of these 21st century times and discard the principles that have served so well the ambitions and desires of 20th century times and earlier.

So the 21st century is a time of major re-organization, of discontinuous shift on the order of moving from feudal to modern, from agrarian to industrial, from tribal to state. Such fundamental social change does not follow a plan. No one orchestrates it, there is no one right way, and there is no one evolutionary path. As Graber and Wengrow put it, "the course of history may be less set in stone, and more full of playful possibilities than we tend to assume" (Graeber and Wengrow, 2021, p. 25). People and peoples do make choices, though, they organize themselves in one form or another, they pick a direction and reject other directions. The normative claim here is that a language of sufficiency helps establish that direction under 21st-century conditions where *excess* is the overarching problem. Given that modern industrial, consumerist, fossil-fueled, growth-centric societies are organized as states for extraction, exploitation, externalization, and expansion, the four "exs" of which add up to excess, then re-organization is the name of the game, the 21st-century game. A new organizational form is not only desirable but inevitable given the exceeding of regenerative capacities. What is not inevitable is how we get there.

The excess of modern industrial states owes more than anything to the state choice to adapt to one environmental factor above all else—fossil fuels. Cheap and abundant, readily extracted and processed and distributed, fossil fuels are readily converted to economic wealth, economic power, and ultimately political power. That power is both domestic (labor, taxes, conscription) and external (colonizing, expropriating). From this resource perspective, the modern industrial state is less defined by its markets and technologies than by its thorough assimilation, albeit often invisible, of fossil fuels (Princen, 2015). If industrialization had proceeded with biofuels (fossil fuels became dominant worldwide only in the 1890s) and forests and grasslands set natural limits on energy throughput, it is hard to imagine a similar course of development. Rather, it is much easier to imagine that practices would have emerged to build in those natural limits to restrain extraction and consumption, and along with them principles and norms, rules, and procedures. That, arguably, would have been a different social form, perhaps a restructured state, perhaps a wholly different form. That, as a thought experiment, is now a plausible direction for social change. Those who choose to steer society in such a direction will have to do more than develop technologies and create markets. They will have to construct social organizing principles, principles that build in the constraints of a single planet, and corresponding behavioral and institutional capacities for *restraint* (Princen, 1997). Sufficiency is one such principle. That construction establishes its own politics (see below) and its own power, the power of an idea, an idea at once intuitive and transformational, personal and collective.

Will transformational social change require the complete dissolution of the state form? The literature, to my read, offers little on how states changed course when they exceeded capacities, emphasizing instead the rise and fall of empires and the causes thereof, not deliberate reorganization. Whether modern industrial consumerist societies can reorganize without collapse is an open question. But as many have observed, historically "collapse" is generally what elites experience, not necessarily the broader society, not the broader foundations of culture. Collapse events "do not necessarily mean a decline in regional population," writes Scott. "They do not necessarily mean a decline in human health, wellbeing, or nutrition, and … may represent an improvement. Finally, a 'collapse' at the center is less likely to mean a dissolution of a culture than its reformulation and decentralization" (Scott, 2017, p. 186).

The fact that peoples and cultures did carry on after collapse, maybe even thrived, suggests they did indeed reformulate their culture and reorganize their social structure. They just didn't build monuments to their efforts and leave written records. Reorganization is, after all, what creative, adaptive social creatures do. Importantly, in that organizing, they employ social organizing principles, consciously and explicitly or inadvertently and implicitly. They may use the old stand-byes, might-is-right, and divine inspiration, but they are likely to also use, or devise, principles that build in restraint in resource use. A contemporary variant I submit is sufficiency.

But resistance, once again, is to be expected. It is indeed hard to imagine the state form of social organization withering

or inverting or, say, simply becoming a subordinate form. One reason is that a successor is not obvious. A major myth of modernity is progress. Applied to social organization it says the current form is the best imaginable and it will only improve. To even consider some other form is to negate progress (Lasch, 1991; Greer, 2012). Even without the myth of progress, it is reasonable to assume that those living in, and doing well by, previous longstanding social forms—bands, tribes, chiefdoms, early states—would have also found it hard to imagine a new form. And yet, taking a millennial time scale, recent understandings in archaeology, anthropology, and history suggest that our various ancestors did indeed experiment with multiple new forms, even alternating between forms. As Graeber and Wengrow write, "the capacity to experiment with different forms of social organization [is] a quintessential part of what makes us humans" (Graeber and Wengrow, 2021, p. 8)[7].

At the time of a given historical instance of social reorganization, it was probably hard to imagine a new form. But when circumstances changed—drought, disease, incursion, or a new idea or desire to experiment arises—at some point a new form was sought. Whatever the proximate driver, the challenge of the time was less devising the new form than getting over the hurdle of presumed permanence of the current order. The worldwide political tumult of the 2020s may be such a time.

So if the current social form, that is, the state broadly construed (not just the modern state, and certainly not just government) is inherently expansionist and if one limit after another, biophysical and social, has been exceeded in the 20th and 21st centuries then re-organization will happen, ready or not, like it or not. Better to get ready, hence an imaginative politics, a part of which would be a prospective project on sufficiency, along with other social organizing principles directed at the state form. Put differently, if excess (exceeding regenerative capacities) is the logical outcome of an expansionist social order, then that order necessarily will change when capacities have been exceeded, if not before. Societies that do so with minimal suffering will be those that (1) are far from exceeding their local capacities and (2) not only anticipate the excess but imagine the desirability of re-organization. Countries wedded to the expansionist order and in a habit of denying biophysical realities (from the end of cheap energy to climate change to pandemic disease) will suffer the most. Other people, far from the centers of state power (financial, corporate, governmental, academic, medical) may not be able to single-handedly devise an entirely new social form, but they can chart a direction. Among the tools are social organizing principles attuned to excess, sufficiency being one.

7 For a psychological approach to experimentation, see De Young and Kaplan (2012).

Toward an imaginative politics of sufficiency

In positing sufficiency as a major social organizing principle for, say, a post-industrial, post-expansionist state, or a post-state social form, a premise is that all societies organize to extract natural resources, process and consume the products, and dispose of the wastes. In so organizing they at least implicitly employ social organizing principles. For much of the history of the state, major principles have included might-is-right, divine guidance, and expansion. In the industrial era, they have been efficiency, consumer sovereignty, and growth. While each of these principles warrants historical and cultural explication, suffice it to say they emerged and played out, much like the state itself, under *empty-world* conditions. That is, the multiple experiments in state formation proceeded on a stage of vast habitable places, rich in resources and where there was always an "away" for wastes. For the sake of argument, I concede that these principles made good sense in their time, at least for elites and dominant states. Now, under full-world conditions, in the 21st century, they do not. I briefly take up each "20th century" principle and contrast them with sufficiency to suggest an imaginative politics of sufficiency.

The consumer sovereignty principle has it that consumers must be pleased; they must have abundant goods at low, low prices (Princen et al., 2002). There is probably a no better illustration of the power of this principle than the initial reluctance of the European Union and North America to sanction energy supplies from Russia when it invaded Ukraine in 2022. The sovereign consumer could not voluntarily sacrifice (in the positive sense) for the greater cause of weakening the aggressor state.

The efficiency principle has it that an improvement in the ratio of output (goods) to input (work) is beneficial. It has been honored through decades of industrial development resulting in huge efficiencies in factories, on landscapes, and among workers. While efficiency gains can, in theory, be taken to reduce overall throughput and stress on ecosystems (the implicit promise in the claim that efficiencies are "good for the environment"), the evidence is that they are mostly taken to increase economic growth and returns on investment, which is to say, to enhance the wealth and power of the elite stratum (Princen, 2005).

The growth principle has it that goods are good so more goods are better. It hardly needs to be said that growth reigns supreme in modern societies, and not just among economists, industrialists, and their enabling policymakers. My best evidence, anecdotal though it be, is my employer, a graduate school of environment and sustainability at a leading American research university. Here all programs must grow, both in lean financial times (to generate more revenues) and flush times (to generate more programs and initiatives and course offerings). More students, more faculty, more grants, and more donations

are taken as given. Woe to those who question the sanctity of the growth principle so applied (again, I have convincing anecdotal evidence).

So the growth principle, supported by the efficiency and consumer sovereignty principles, effectively defines the modern, industrial, consumerist state. In fact, from a millennial perspective of the state, economic growth is only the most recent variant of expansion. It has been monetized and financialized but is fundamentally the same as expansion, an extension of the state's imperative to seek surplus—and yet more surplus to manage and defend the surplus. So, because, on a material basis alone, endless expansion within finite biophysical systems is impossible, alternative principles are in order. This is the logical imperative and is straightforward. The political imperative is another matter, requiring imagining a post-industrial, post-expansionist society.

One step in that direction is to accept, at multiple scales and in various contexts, that, because industrial consumerist societies cannot continue business-as-usual, however clever they are at delaying the day of reckoning, *they will re-organize*. Human societies always have. Humans, once again, are creative, adaptive creatures and not just in technological and artistic realms. As they re-organize they will devise and experiment with alternative principles, not necessarily novel principles but principles that in some realms, even just the personal, already exist. So another step is to accept that, because sufficiency exists at the personal and organizational levels, even in hypercommercialist and growth-centric societies such as the United States, sufficiency is a candidate for an alternative principle. Whether it modifies growth or subordinates it or supplants it can be known only through experimentation which, to repeat, is what humans are adept at. As noted, sufficiency already makes perfectly good sense, including ecological sense, at the individual and organizational levels. At the planetary and individual levels, it is self-evident: a biosphere or an organism that continuously rearranges its thin skin of life can not last. At the same time, however, at the level of an economy, it is an alien notion: an economy must grow, even if the evidence is clear that such growth is undermining that very economy.

Finally, then, because the modern economy is coterminous with the modern state (recall that the goal of the state as a system is to concentrate wealth and power), sufficiency would be anathema to state structure; if implemented, it would threaten the very form itself. But because the state form with its surplus-seeking imperative and its resulting fixation on expansion is incompatible with the limits of ecosystems, hydrologic systems, and climate systems, and, more and more it seems, the cognitive and affective capacities of individuals, it will change. It may disappear entirely or reorganize but, as constituted, it cannot function on a single planet, one full of state-driven, self-destructive human activity. Adaptive people within these societies will innovate social forms. For insights, they will reach back into the distant past and they will explore contemporary patterns of living and organizing that do not require endless expansion (Litfin, 2013). They will endure objection and ridicule, maybe worse. But figuring out how to live on one planet, and how to use resources without using them up is the project of our time. Such figuring and experimenting and enduring are the politics of our time. What is more, rather than being strictly resistance politics they are affirmative politics (Litfin, 2013). One source of direction in those affirmative politics is that implicit in a practice of sufficiency.

Conclusion

At this historical juncture when growth, efficiency, and consumer sovereignty are preeminent social organizing principles, yet steering industrial consumerist societies toward an ecological cliff, one can only speculate about the potential of sufficiency. At the core of sufficiency is its ability to make legitimate the question, Is it enough and not too much? The "it" can be a new house, a housing project, or housing policy, an irrigation scheme, an investment, a financial instrument, an industry, or an economy. To ask such a question in the contemporary context where "more" and "faster," "anything goes" and "move fast and break things" prevail, would put sufficiency in the realm of transformational, if not revolutionary. It would prompt investigation of costs, irreversibilities, and injustices of current practices and do so *all the way up and down*, to water sources and waste sinks like oceans, for example. It would prompt investigation of physical and temporal scale, and of the concentration of wealth and power. Asking such questions might even redirect attention from consuming, advertising, and entertaining to provisioning, connecting, and caring (Berry, 1987; Van Horn et al., 2021).

But no one, not the theorist, not the practitioner, not the policymaker can will or manage such effects. It is pointless to try to predict the social form that will emerge as biophysical and social contradictions play themselves out. I can only presume that, in most cases (and the variability across cultures is probably huge), the transformation will be more evolutionary than revolutionary. That is, societies will eventually come to accept that experimentation in the social form is legitimate, maybe because it is historically, culturally, and psychologically what humans do as I've argued here, maybe because they have no choice. Then each experiment will be incremental, and unique. But, like biological evolution, there will also be punctuations, discontinuous, and even dramatic changes along the way. Ultimately, fit to the biophysical and social environments

will exert selective pressure, including fit to a much-diminished environment, given the fossil fuel legacies we are currently bequeathing.

What theorists and others can do, however, is call out the contradictions and suggest the nature of re-organization and the direction of social change. James Scott found that "the early state was radically unstable for internal structural, epidemiological, and political reasons." (Scott, 2017, p. 222). I find the same for the modern, industrial, hypercommercialist, consumerist, fossil-fueled, debt-laden, disease-denying, growth-centric, expansionist state. The difference, though, is that for the first five or six millenniums of experimentation with the state form, there was always a frontier to acquire more natural resources and a release valve for discontented state subjects. "With respect to population," Scott observes, "the vast majority throughout this period (and arguably up until at least 1600 CE) were still nonstate peoples: hunters and gatherers, marine collectors, horticulturalists, swiddeners, pastoralists, and a good many farmers who were not effectively governed or taxed by any state. The frontier, even in the Old World, was still sufficiently capacious to beckon those who wished to keep the state at arm's length" (Scott, 2017, p. 219–220). That release valve and those frontiers no longer exist. Space travel fantasies aside, the biophysical and social context of state building has fundamentally, qualitatively, and irreversibly changed. So will the state form, like it or not, ready or not.

A premise here is that state structure matters immensely on questions of resource use and distribution, let alone self-determination, peace, and thriving, and that integral to any organizational structure are principles however explicit or implicit. If social change is continuous and incremental then incremental improvements under existing principles may be enough. But if a social change occurs in response to discontinuous biophysical changes, then a qualitative shift to a new state of affairs, most notably from endless growth to a steady state or contraction, is needed requiring wholly new principles. And these will be needed promptly, given the trends. Resilient societies will be those that lay the groundwork, that anticipate discontinuous shifts. For that, conventional principles of organization—efficiency, consumer sovereignty, growth—will not be up to the task. Principles that build in restraint such as sufficiency are more likely to enhance adaptiveness and resilience. And, as I've argued, because they exist at the personal and, in some cases, organizational levels such principles are not novel. Paraphrasing ecological economist Kenneth Boulding, if they exist, they're possible.

As it stands now when the environmental community of scientists, activists, theorists, and policymakers all seem to conclude that behavior change is necessary, there is almost a reflexive turn to the individual, not the structural: if only people used less plastic, drove fewer miles, bought electric cars, rode a bike, planted a tree, ate less meat, voted for the right candidates, etc., we could reverse the trends (Maniates, 2002). Alternatively, those who follow the biophysical trends, especially the dire ones (think tundra and fossil methane, Antarctic ice sheets, the Atlantic current, back-to-back pandemics), ascribe the problematic behavior to "human nature": humans are greedy, short term, competitive. Lacking an institutional, cultural, or power lens, these observers tend not to see human behavior as one of the dual propensities whereby people are both greedy *and* altruistic, short term *and* long term, competitive *and* cooperative. The real question is not how to suppress the destructive tendencies (reward good behavior, call for farsightedness, lament the lack of solidarity) but rather to identify the conditions, especially social structures, that lean a society toward, say, greed and short-termness. In a highly individualistic, expansionist society like the one I live in, those conditions, I submit, include social organizing principles like efficiency, consumer sovereignty, and growth. To lean a society toward the altruistic and long term, let alone sustainable, alternative principles like sufficiency are in order. In short, fundamentally, qualitatively new, structural change is needed at this moment, not marginal tinkering with new laws and regulations, new taxes and subsidies, or the nudging of consumer choice.

The fact that the adoption of new social organizing principles is daunting or seemingly impossible is the understandable position of those who only see greed and short-sightedness in human behavior and cannot imagine guiding principles other than the dominant ones. The urgency of the current situation calls for imagination, and not just for catastrophic outcomes; there is plenty of that coming from the scientific community, the media, and the entertainment industry. To those who cannot imagine a qualitatively different social structure, or presume that this is the best of all possible structures, I pose this question: How is it that business-as-usual in energy, transportation, construction, and other realms is deemed impossible by the scientific community and their follower's given current trends and yet business-as-usual in social structure, especially economic structure, is deemed entirely possible? I take my cue from the notion that you can't solve a problem with the very thinking that created the problem. My political variant is you can't organize a society for sustainable and just outcomes with the very organizing principles that have created unsustainable and unjust outcomes.

So urgency calls for imagining new social forms, new guiding principles, and new behaviors (or, better put, new emphases on existing behaviors). I have argued here that our ancestors seem to have imagined, and enacted, new structures and, by implication, new principles and behaviors, almost as a matter of course in their social development. We moderns ought to be able to do so too.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

Author contributions

The author confirms being the sole contributor of this work and has approved it for publication.

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Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Sufficiency in social practices: An underestimated potential for the transformation to a circular economy

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To date, the circular economy has fallen short of its promise to reduce our resource demand and transform our production and consumption system. One key problem is the lack of understanding that highly promising strategies such as refuse, rethink, and reduce can be properly addressed using research on sufficiency. This article argues that a shift in focus is required in research and policy development from consumers who buy and handle circularly designed products to consumption patterns that follow the logic of sufficiency and explain how sufficiency-oriented concepts can be incorporated into existing social practices. The authors show that sufficiency is not necessarily as radical and unattractive as is often claimed, making it a suitable yet underrated strategy for sustainability and the transition to an effective circular economy. The case of urban gardening shows that small interventions can have far-reaching effects and transform consumption patterns as the logic of availability is contested by newly developed concepts of "enoughness" and opposition to "über-availability." The authors propose utilizing comprehensive state-of-the-art theories of consumption and human action when developing strategies and policies to make the circular economy sustainable while being more critical of utilitarian approaches. Using social practice theories that have proven to be beneficial allows human actions to be comprehensively analyzed by recognizing their embeddedness in social and material frameworks; addressing the meaning, competences, and materials of routinized human behavior; and examining indirect effects.

KEYWORDS

circular economy, sufficiency, theories of social practice, sustainability transition, sustainable consumption, urban garden

1. Introduction

One of the currently most popular and widely discussed strategies for achieving sustainability is the transformation of our linear make-use-dispose economy to a circular economy (CE) in which the resource base operates in a circular manner within a society (abiotic materials) or in sustainable exchange with the biosphere (biotic materials). This is sorely needed as several planetary boundaries are being crossed at once due to our high resource extraction and emissions, making it essential to rethink and reorganize our production and consumption systems (Steffen et al., 2015). For most industrialized countries, lifestyles are associated with average resource demand of 40 to 50 tons per capita per year (Bringezu and Bleischwitz, 2009). In this context, Lettenmeier (2018) advocates for a sustainable material footprint of eight tons per capita per year by 2050. To successfully transition to a sustainable circular economy that is truly within planetary boundaries, it is therefore absolutely essential that resource consumption be reduced. At the same time, a decent living standard for all should be achieved, meaning that a minimum level of consumption that allows every individual to live a good life must be ensured (Fuchs et al., 2021).

It is often said that the CE is based on the consistency strategy and hence follows a different logic than many other environmental protection approaches that rely exclusively on efficiency (Brinken et al., 2022). Consistency refers to the circularity of materials, using them correctly instead of efficiently so that no waste occurs (Brinken et al., 2022; Speck et al., 2022). Some even think that this idea of effective resource handling will be enough to achieve absolute sustainability (McDonough and Braungart, 2002). This reductionist view is certainly easy to criticize as perfect material cycles are not technologically achievable in the foreseeable future in many cases.[1] More fundamentally, consistency alone is not sufficient, either, as every material potentially entering the cycle must originate from nature, and so absolute consumption levels must be taken into account to limit environmental degradation (Bringezu and Bleischwitz, 2009; Lettenmeier et al., 2014).

More comprehensive approaches to the CE go even further and describe several sub-strategies that are not limited to the consistency strategy and are open to sufficiency. The Ellen MacArthur Foundation (2014) distinguishes between four different kinds of circles, describing the "power of the inner circle" as the potential to reduce harm to the environment and society by keeping materials in use for longer to decrease efforts to repair, remanufacture, and recycle. While this does not necessarily have to be interpreted as a call for sufficiency, it already points to the problem of circular material flows being energy- and labor-intensive, leading to further environmental degradation due to our current energy provision system as well as the degradation of material quality. Morseletto (2020) shows that, in contrast to the problem of high material throughput within a CE, most CE targets do not consider an overall reduction of materials but rather focus on recovery rates, resource efficiency, recycling targets, and waste reduction. In their critical discussion of the failed promises of CE, pointing out dissipative losses, energy demand, and complex global value chains, Corvellec et al. (2022, p. 426) state: "It is therefore important to dispel the myth that circular systems are necessarily more environmentally sustainable than linear systems."

Several strategies that come under the umbrella of CE are now discussed in academia regarding their environmental potential and, e.g., the art of innovation (Potting et al., 2017; Reike et al., 2018). What started as the reduce, reuse, and recycle hierarchy (which still essentially forms the basis of the waste hierarchy in many countries, including the European Union) can now be further distinguished as more comprehensive sets of resource value retention options (Ros; see Reike et al., 2018 for a critical literature review on the conceptualizations of CE and the various RO strategies). What Potting et al. (2017) and Reike et al. (2018) have in common is the idea that the refuse RO offers the greatest environmental potential. However, while Potting et al. (2017) focus exclusively on production and product design, Reike et al. also emphasize the role of consumption and even stress post-materialist lifestyles. While they do not make explicit connections to the sufficiency debate, they invite researchers to work out the connections between CE and sustainability concepts.

On the one hand, great hope is placed in the concept of sufficiency as a true all-rounder that aims at a total reduction of resource consumption by shifting the focus from economic growth to a good life (Schneidewind and Zahrnt, 2014; Wynes and Nicholas, 2017; Hüttel et al., 2018). On the other hand, sufficiency is often excluded from current debates on CE (Bocken et al., 2022). This has created a paradoxical situation in that the necessity of a radical transformation of our production and consumption system has finally been acknowledged by all stakeholders working on CE (Welch et al., 2017; European Commission, 2020), but when it comes to implementing policies, comprehensive sufficiency strategies are off the table as they are too radical (paradoxical because it is difficult to achieve radical results without radical measures). It is far more often the case that sufficiency and its counterpart overconsumption are presented as consumer issues in that consumption science of the last 20 years is entirely neglected (Warde, 2005; Røpke, 2009; Shove, 2010; Camacho-Otero et al., 2018; Bocken et al., 2022). As a result, the environmental potential of sufficiency is often disregarded as its "radicality," which means it cannot have a truly large-scale impact on society. It is therefore only implemented within small niches that have no or only minor systemic impact (Speck, 2016; Gossen and Kropfeld, 2022).

1 See Reuter et al. (2019) for an in-depth discussion on metallurgical, thermodynamical and infrastructural issues.

This becomes a self-fulfilling prophecy that has been increasingly criticized in recent years as research demonstrates that CE concepts struggle to deliver on their promises (Welch et al., 2017; Morseletto, 2020; Zwiers et al., 2020; Jaeger-Erben et al., 2021; Corvellec et al., 2022).

Thus, a clear sense of ambivalence toward the debates on sufficiency can be identified at this point. Sufficiency is seen as a form of renunciation, but if we take the strategy of sufficiency seriously, it, in fact, operates according to a very different logic. It stands in contrast to the dominant market logic that shapes production and consumption globally. This different logic of renunciation is often only found in niches. Nevertheless, some sufficiency-related social practices are also quite widespread (e.g., cycling) or even considered socially desirable (e.g., reducing food waste).

Research on sustainable transitions emphasizes the importance of protected spaces for sustainable niche innovations (Kemp et al., 1998; Raven, 2005; Schot and Geels, 2008). Niches are characterized by alternative and proactive actions and the development of alternative ideas and innovations in the respective fields, for example, community-supported agriculture which also supports non-processed and plant-based food. Thus, niches provide an opportunity to do something different. Niches are shielded from current logics and can define themselves as different (Fuenfschilling and Truffer, 2014). Niches, therefore, emerge precisely where actors try out alternatives that differ from the dominant logic and the rules and routines of the regime and where safe spaces are created for alternative actions (Geels and Schot, 2007). This not only involves technological innovations but also "novel ways of doing (practices), thinking (narratives, imagination) and organizing (structure)" (Ehnert et al., 2018, p. 2) that break with dominant, often unsustainable logic (which is why they are novel or different in the first place), and need to be scaled up to achieve a systemic change (Ehnert et al., 2018; Von Wirth et al., 2019; Loorbach et al., 2020).

Sufficiency can in fact be located precisely in such niches of alternative logics and in the doing, thinking, and organizing of a new or alterative way of doing something that could potentially be scaled up. For example, plant-based diets using community-grown vegetables represent just such an alternative way of doing things and are currently still a (growing) niche. These may well differ from the incumbent agri-food systems based on an animal- and machine-intensive, conventional, industrial system, and its associated rules and logic (El Bilali, 2019). The level of sufficiency depends heavily on how well it fits into existing logic and, of course, on what exactly is understood by sufficiency. As Sandberg (2021) shows, sufficiency is possible at different stages: the current animal- and plant-based diet with its (overly) high intake of meat and meat products could be substituted by an entirely vegan diet. However, this still seems very radical. Alternatively, it could be changed to a plant-based diet with a very low intake of meat and meat products, which would be less radical and potentially more realistic, not least because it is linked to the logic of the current food system.

When looked at from a transition perspective, the ambivalence of sufficiency becomes apparent. It can usually be assumed that niches need to find points of contact with the dominant logic of the current system to scale up and transform the system itself (Augenstein et al., 2020). This can work very well in conjunction with a CE that is often based on dominant logic (optimization of resource use). Thus, depending on the degree of connection to the CE, it would appear that sufficiency can do both: find points of connection to the existing system and be extremely radical. From the perspective of transitioning to a CE, sufficiency is thus ambivalent in the best sense.

This article aims to explore how sufficiency can spread in our consumption system by providing a low-threshold entry point. The authors have approached this task from the perspective of social practice theories. A theoretical discussion on how sufficiency can be identified using social practice theories is followed by an empirical study that illustrates how sufficiency spreads within consumption systems. This is demonstrated by analyzing a specific form of urban gardening, namely an aquaponic system called "Farmbox."

2. Theoretical background: What makes social practices sufficiency-oriented?

Over the last few decades, we have missed out on a great deal of potential to reduce environmental impacts by reducing our energy demand as much of the academia and most political institutions have relied on either the homo economicus or the effectiveness of behavioral economics, such as nudging (Shove, 2010; Hampton and Adams, 2018). The same mistakes should be avoided when discussing CE again (Zwiers et al., 2020). Research on (sustainable) consumption instead suggests shifting the focus from consumers and their behavior to routinized types of behavior itself using social practice theories (Shove, 2010; Huber, 2017; Welch et al., 2017; Hampton and Adams, 2018; Suski et al., 2021).

In a literature review on consumption in the context of CE, Camacho-Otero et al. (2018) show that most scientific papers use utilitarian approaches, such as the theory of planned behavior, and economic approaches, such as rational choice (both focusing on "the consumer"), while studies that rely on social practice theories (focusing on consumption) are in minority. Studying this situation, Welch et al. (2017, p. 6) concluded that "[t]he imagined futures of Circular Economy often elide everyday life, even while acknowledging the centrality of consumption to the model" and that even concepts that put special emphasis on aspects such as collaborative consumption are "offering little by way of projected context as to how such changes will come about, and a simplistic understanding of

consumption." The fundamental problem is clear: how are we to achieve the much-needed, fundamental transformation of our consumption system when we do not really understand consumption or transformation? Is this going to happen by chance or wishful thinking? Rabiu and Jaeger-Erben (2022) just recently provided a model to address the appropriation and routinization of circular consumer practices with the help of social practice.

To gain a better understanding of what sufficiency-oriented social practices are and how they can be identified, social practice theories are introduced along with a brief overview of the research on sufficiency itself.

2.1. Social practice theories

Social practice is a routinized type of behavior that incorporates a bundle of things, such as knowledge, skills, ideas, meanings, etc. (Reckwitz, 2002). The closely linked elements of a social practice make specific behavior somewhat complex as multiple aspects have to come together (e.g., driving includes the car, the road, knowing how to shift gears, and the masculine urge to burn oil; Shove et al., 2012). However, as all these aspects of a given social practice, such as driving, seem to fit together so naturally, we perceive them as one entity, one social practice, which helps to reduce complexity, enabling orientation and easing communication. If I tell my colleague that I am going to drive home now, they have a very clear understanding of what I am about to do even though my actions are as complex as driving, and they might not know anything about the specific route, the car, or my personal driving skills.

The meanings, materials, and competences of social practices (Shove et al., 2012) are shared within or located in social and material contexts. Therefore, social practices do not describe individual behaviors but rather behaviors that exist as entities in themselves within society. A practice "provides a template in terms of which actions are adjusted and calibrated [...] [but] not all enactments of practice are consistent or faithful and that each performance is situated and, in some respect, unique" (Shove et al., 2012, p. 122). Individuals participate in social practices (and hence are the carriers of social practices), and social practices can only be observed as they are performed by them. Lifestyles can therefore be described by the combination of social practices involved in everyday life (Suski et al., 2021; Kropfeld, 2022). However, we are not totally free in choosing social practices as they are themselves linked in an infinite network of social practices within our social-material contexts (Røpke and Christensen, 2012). Eating is connected to cooking (or driving to a restaurant) and cooking is connected to grocery shopping, which is connected to going to work, which is connected to paying attention in school, etc. While these connections are not necessarily definitive necessities on an individual level (one can drop out of school, steal food, and still be able to eat), it is difficult to break free from many path dependencies. When discussing strategies to reduce environmental impacts, keeping this network characteristic in mind is crucial to address the unintended side effects of a given intervention (Suski et al., 2021).

Shove et al. (2012) observed that social practices emerge, exist, and cease to exist over time by building and losing connections between the dimensions that constitute the practice. Emerging social practices, also called proto-practices, are often found in niches where the connections between the various elements are only in the making and more prone to change within shorter periods of time.

As some sort of material base is crucial in all social practices, which we also consider to be actual physical entities rather than just symbols (Warde, 2005; Shove, 2017), we are able to address consumption by analyzing the materials that are being transformed into waste by utilizing them as part of the participation in social practices (Røpke, 2009; Suski et al., 2021). Products and infrastructure are used within social practices, and once they are used up, they become waste (in the form of emissions, municipal solid waste, etc.).

2.2. Sufficiency

Sufficiency is, in some regards, similar to CE. There has been an increasing amount of research in recent years as well as high hopes for sustainable transformations, but no coherent definition as scholars from very different disciplines are working on it with different agendas (Jungell-Michelsson and Heikkurinen, 2022). In principle, sufficiency or somewhat similar concepts (e.g., voluntary simplicity, simplification; Alexander and Ussher, 2012) aim to achieve a good life by reducing the material wants in our lives (Spangenberg and Lorek, 2019). This means that the consumption levels of many will decrease as the focus shifts to alternative measures and cultures of wellbeing and wealth (Schneidewind and Zahrnt, 2014). The goal is to reduce the pressure society puts on the environment by reducing resource demand (Speck and Hasselkuss, 2015). Typical examples include a vegan diet, avoiding flights and other elaborate long-distance travel, reducing individual car use, or moving to a smaller suburban house or flat. A sample calculation by Speck (2016) demonstrates that sufficiency lifestyles reduce resource demand by 30–70%.

As sufficiency provides a fundamentally different approach to living compared to the growth and efficiency-oriented society of the past 250 years, the research field is multi- and inter-disciplinary, ranging from economics and marketing (Gossen et al., 2019; Kropfeld and Reichel, 2021; Bocken

et al., 2022) to political sciences (Spangenberg and Lorek, 2019) and environmental modeling (Speck and Hasselkuss, 2015), to name but a few. See also Santarius et al. (2022) for a truly multi-disciplinary approach to addressing digital sufficiency.

Depending on one's scholarly background and goals, sufficiency is defined in various ways: from a radical concept of non-consumption (Princen, 2005; Stengel, 2011) and systemic change to a low-threshold option that fits into our daily lives, such as cycling daily commutes (Speck, 2016). Furthermore, several degrees of sufficiency are defined by Fischer et al. (2013). They argue that a low level of sufficiency can be found in many lifestyles, e.g., lowering the interior temperature by 1°C (from 20 to 19°C) or not using a car.

Sufficiency in the field of nutrition is associated with diets, whereby a plant-based diet with no food waste is often the starting point toward greater intellectual engagement with the production and consumption of food and the general field of sufficiency (Speck, 2016).

Recently, Bocken et al. (2022) defined sufficiency as having enough to live well without excess, satisfying essential needs to live and function comfortably, while prioritizing quality of life in work, education, and leisure, but not needlessly striving to satisfy infinite human material wants. "Enoughness" was coined as a central description of what is enough for the individual while also leaving enough for everyone else (Fuchs et al., 2021). Similarly, Speck (2016) defines sufficiency in private households as implementing modified cultural techniques in the form of social practices in as many household-related consumption areas as possible. What is important here is that everything is done under the premise of reducing negative ecological and social impacts, thus underlining the idea that even though the ecological impact is not always a leading aspect, ecological reduction often occurs. This idea is also taken up by Sandberg (2021), who identifies several types of pathways to sufficiency: absolute reductions, i.e., reducing the amount of consumption; modal shifts, i.e., shifting to a consumption mode that is less resource-intensive; product longevity, i.e., extending product lifespans; and sharing practices, i.e., sharing products among individuals, and notes that several sufficiency practices have an environmental benefit.

Sufficiency is connected to the circular economy by its shared goal of reducing dependencies on raw material extraction and the associated environmental impacts. However, in contrast to strategies of consistency (e.g., reuse and recycle), there are no actual material cycles as the goal of sufficiency is the absence of material throughput.

Whereas an extensive body of literature addresses a definition of sufficiency, only a few go into the discourse on social practices (Lahusen et al., 2016; Speck, 2016; Kropfeld, 2022). A clear description (or even a broad discussion) of how sufficiency can be identified from the social practice perspective is lacking.

2.3. Sufficiency in social practices

Adopting the perspective of social practices, sufficiency is a set of daily practices that avoid the demand for energy, materials, land, water, and other natural resources while delivering wellbeing for all within planetary boundaries. Sufficiency bridges the inequality gap by setting clear consumption limits to ensure fair access to space and resources (Saheb, 2021).

In the investigation of routines and practices, a variety of examples of more or less sufficient practices in everyday life are available (Sandberg, 2021). Many social practices and (social) initiatives such as neighborhood gardening, bicycle lanes, and corporate calls for less consumption are associated with sufficiency (Gossen et al., 2019; Suski et al., 2021). However, focusing exclusively on decreasing the use of material through social practices is not enough to identify sufficiency. Efficiency also aims at quantitatively reducing the materials used. In sufficiency, one could argue that the quality of the material base is different (a car is not replaced by a lighter car but rather by a bicycle). This, however, would require a specific situational analysis as aspects such as poverty should not be confused with sufficiency. A bicycle can also be ridden for sport and to compensate for sedentary work to increase productivity, not just to get from A to B. One would not necessarily refer to exercise as sufficiency. Hence, the meanings of practices are important to identify sufficiency.

What meanings associated with sufficiency require a prior definition of sufficiency? Environmental concerns? Yes. Stress reduction? Maybe. Positive self-image? No. This article argues that there is a broad gray area of meaning that may indicate sufficiency, but not necessarily. To the authors' knowledge, there is no coherent list of meanings of practices associated with sufficiency. Furthermore, their qualitative nature prohibits a definitive list. In her literature review on sufficient social practices, Kropfeld (2022) compiled a list of meanings (as well as competences, materials, and rules) that are found in the literature on social practices referred to as sufficiency-related. However, this does not mean that every meaning (or material/competence) is in itself related to sufficiency. For instance, one could examine the social practice of renting goods and the identified meaning of "access to a greater variety of goods" (Kropfeld, 2022, p. 13; based on Retamal, 2019). This is the complete opposite of sufficiency as it promotes the ideas of materialism and growth. Depending on what one aims for in a study, it can be argued that a social practice with no characteristics of sufficiency in its meaning cannot be considered a sufficiency-oriented social practice (as is the case with renting goods in Kropfeld, 2022).

In addition to sufficiency-oriented meanings, access to specific sets of competences is necessary to reduce the material demand for social practices or one's lifestyle by participating in new social practices. Growing your own vegetables requires knowledge of sowing, watering, pest control, etc., while repairing

things requires manual skills. Not driving a car to get from A to B requires skills such as riding and maintaining a bike or understanding the rules of public transport. However, in many cases, these competences can be acquired over time by attempting them (learning by participating) as sufficiency is often rather low-tech and low-cost. The first time one repairs a flat tire will take the most effort, but by the fourth time, it will become routine.

Just as competences are relevant to performing specific social practices, so too is access to materials such as tools for repairing things or land for growing plants. Hence, materials can have two characteristics, namely becoming obsolete and being necessary. Again, the question arises as to when can a social practice really be considered sufficiency-oriented. Is this when the materials required have a lower environmental impact than the materials saved? This is a very quantitative understanding, but it is in line with the definition of reducing the use of resources and environmental impacts. This net saving result is often not as easy to estimate as one might assume. For example, Lahusen et al. (2016) analyzed the drying of washed clothes and argued that using a drying rack is a sufficiency-related social practice whereas using a tumble dryer is not as it consumes additional energy. This analysis fails to consider the additional energy consumption for the heating necessary to dry clothes on racks (if clothes are dried indoors during the colder months). Rüdenauer et al. (2008) conducted a life cycle assessment in this case and showed that using a tumble dryer might be an environmentally friendly alternative in cold months depending on specific drying, airing, and heating practices. This example can be taken further by saying that what might have been correctly referred to as sufficiency in the past (drying cloths on racks) is not sufficiency anymore due to the increased energy efficiency of tumble dryers and reduced carbon intensity of our electricity grid (while room heating is mostly still fuelled by oil or natural gas).

Figure 1 provides an overview of sufficiency aspects within several dimensions of social practices. This demonstrates that identifying and scaling up sufficiency-oriented social practices is a complex endeavor with several potential pitfalls as explained above (renting goods, using drying racks). However, it also provides a framework for comprehensive analysis. Furthermore, by giving serious consideration to the connections, it also allows researchers to ask new questions, e.g., how does meaning x correspond to the materiality of social practice y?

Many examples evolve around the idea of abandoning existing social practices, such as driving, while recruiting carriers for other or newly evolving social practices, such as riding a bicycle. However, social practices themselves are also under pressure and able to change over time, as Shove et al. (2012) discuss regarding the history of driving, and Shove (2003) notes regarding cleanliness practices. For sufficiency, this means that connections between the meanings, materials, and competences might loosen in part, but the overall social practice remains. Ways of eating dinner may change in that animal-based food (material) is replaced by plant-based food, but the practice of "having dinner" itself does not change. This remains true even when additional meanings become part of the social practice (environmentalism and animal ethics) and competences change (there is no longer any need to know how to cook a rare steak as there is no blood involved). However, in the infinite network of social practices, one can find abandoned social practices over time when sufficiency prevails, at least in the production realm. When the material of meat becomes detached from the social practice of cooking, there will no longer be a connection to the social practice of slaughtering animals, which will (rightfully) lead to the practice becoming extinct.

The transition from a conventional to a sufficiency-oriented social practice is therefore fluid and often cannot be determined by just one factor.

Another important feature in the context of sufficiency also warrants consideration: non-action. Instead of using a bicycle to get from A to B, one can just stay at A. Or one could go to C instead, which is much closer (a nearby forest instead of a pacific island). In the context of sufficiency, we often underline renunciation as sufficiency is always associated with non-consumption. Empirically, this is a problem as not engaging in a social practice cannot be observed. The practice-as-a-performance perspective is missing. To analyze non-participation (narrative), interviews can be utilized to specifically address social practices that are known to be environmentally intensive but are not identified in surveys or observations, e.g., flying or eating animal products. Here, the authors can find out whether the research participants choose not to fly because of environmental concerns or because they are just scared of flying. To make this manageable (interviewees cannot be asked about every social practice they have not mentioned in a survey), quantitative knowledge of the material world of consumption is necessary to focus on environmentally relevant social practices (Lettenmeier et al., 2014; IGES, 2019).

When placing the research focus on non-action, one must keep in mind that it is not possible to follow the dynamics in social practices to the point where a specific social practice ceases to exist. Research that analyses the dynamics of social practices does so by looking at the past (Shove, 2003; Shove et al., 2012). Instead, one is more likely to examine smaller groups of people not participating in specific social practices, e.g., flying, which does not mean that the social practice itself is already non-existent. Rather, one is searching for the first signs of the disintegration of social practices.

When investigating transition pathways for sufficiency-oriented social practices or assessing the sustainability potential of such practices, it is recommended that a given case be analyzed not as a singular social practice but as part of a network of practices to address side effects (Røpke and Christensen, 2012; Speck and Hasselkuss, 2015; Suski et al., 2021).

In the interim, taking the social practice perspective, it can be concluded that deciding whether or not a social practice

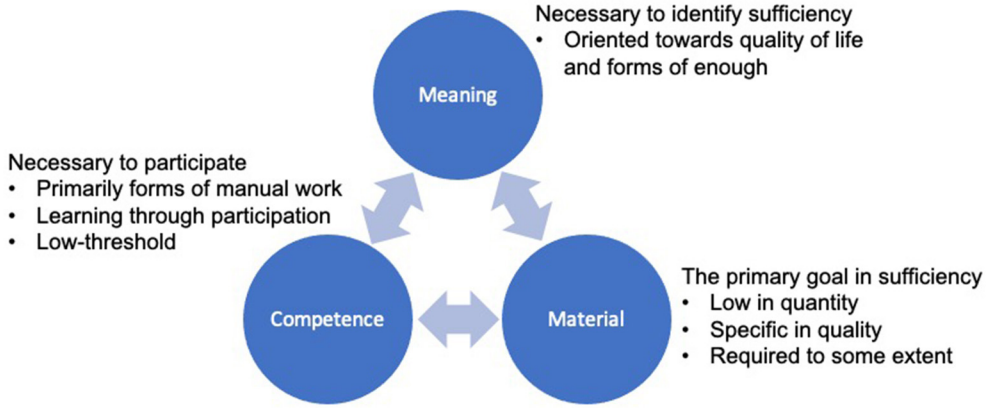

FIGURE 1
Locations of sufficiency in social practices (own depiction).

can be called sufficiency-oriented is quite complicated. However, this should be understood as a worthwhile analytical process when aiming for the sustainable and circular transition of our consumption and production system, as this allows us to focus on social practices that:

1) Have environmental potential in themselves by actually reducing the material base rather than just hoping to do so,
2) Share meanings that are relevant for consumption transitions, e.g. slowness, environmentalism, anti-consumerism, and hence have the potential for positive network effects, and
3) Build a knowledge and skill base that enables practitioners to participate in other sufficiency-oriented practices, which in turn can have positive network effects.

3. Methodology

3.1. Choice of case

To control for the above-mentioned theoretical postulations on how to identify sufficiency in social practices and further explore the phenomenon of sufficiency through the lens of social practice theory, the authors analyze the case of urban gardening (Hacking, 1992). The focus is on a single case as the research design itself is being tested. However, further studies might want to compare multiple cases or perform analyses in combination with longitudinal or retrospective studies, depending on the specific interests (Flick, 2021).

The case focused on is the Farmbox,[2] a more technically sophisticated urban garden involving hydroponic farming and aquafarming in symbiosis (an aquaponic system). This case was chosen as the result of a longer process as a part of the authors' work on a transdisciplinary project in the real-world laboratory of Wuppertal, a large city in Germany (Schneidewind et al., 2018).

First, the authors talked to the organizers of the "Aufbruch am Arrenberg" ("Departure on the Arrenberg") neighborhood association. The civic initiative is extremely active in the field of bottom-up collaborative urban development and neighborhood activities that focus on sharing, sustainability, and achieving a good life. Arrenberg is the name of the city district. As the initiative was already a project partner, the authors wanted to find a common interest for a study to boost urban sustainable initiatives. The Aufbruch am Arrenberg initiative is organized into three thematic fields: energy, mobility, and food. They also have some smaller projects categorized under "miscellaneous." As there was no mobility project with a current, real impact on everyday life, we disregarded that field. An energy-related project was discussed but later discarded when the funding was canceled. Food and other projects were more promising as they focus more on short-term, real-life actions rather than long-term, political engagements. This is in line with Lettenmeier (2018), who discussed the high potential for environmental savings and upscaling in the food sector because dietary choices can be made again every day.

The authors then organized an online workshop, inviting people involved in any food-related or other projects within the Arrenberg initiative. Table 1 provides an overview of the projects represented. One goal of the workshop was to gain a better understanding of each project and how they are organized to select one for in-depth analysis.

We chose the Farmbox project for further analysis as this was one of only two activities that was attended by several people. The other group was soon disregarded as everything had to be organized online (due to the COVID-19 pandemic), and they were an elderly, tech-averse group who already struggled with attending the online workshop and failed to complete the

2 https://arrenberg.app/projekte/die-farmbox/

TABLE 1 Projects represented at the online workshop.

Project	Description	Number of participants	Sustainability focus
Food sharing	Saving food from grocery stores and bakeries and sharing it with the public	4	Environment and society
Farmbox	Aquaponic system to grow food	4	Environment
Open restaurant day	People opening their private kitchens to the public for one day to meet and eat	1	Society
The taste of my childhood	Mainly migrants serving traditional food to the general public	1	Society
Free barber shop	Providing free shaves, fun and food to destitute people	1	Society
Clothes swap	Quarterly shop to donate or get clothes for free	1	Environment

surveys. The workshop took place in December 2020, followed by interviews in the Fall of 2021.

The Farmbox project was primarily managed by four people and was located next to a busy bike lane and café. The Farmbox is quite small (a trailer), so it is more of a test facility and place to learn about alternative ways of farming (teaching passers-by, too) and not a means of producing significant amounts of food (in a later project, some of the group scaled up this urban farming idea and provided proof of concept to build an aquafarm on an economically feasible level in the city). This special kind of garden attracted various people from different backgrounds. Three of the participants were men and one woman, all in their thirties. One participant, a biology student, who the others called the "walking biology encyclopedia," was already an experienced gardener, active in several gardening projects. For others, gardening was a new experience.

3.2. Data collection and analysis

The data collection was based on the principle of zooming in on and zooming out from social practices (Nicolini, 2009). The objective was to learn about the social (proto-) practices themselves (zooming in) to determine what was necessary for participation, what meanings the social practices had, and whether they inherited sufficiency principles, etc., as well as how they are integrated into the seamless web of social practices in daily life (zooming out, see Suski et al., 2021 for a framework on how to use this zooming duality in environmental assessments). A range of data collection methods was used for various dimensions of social practices (material, competence, and meaning) and at different points in time (current vs. at the beginning). In addition to this, the authors had intended to conduct group work for collective narratives and individual data collection as a contrasting, more personal form of narration. Table 2 provides an overview of the data collection methods used and what they each covered. The data collection was intended not only to provide data for this article but also for the work of others (focusing on social cohesion and social capital as well as a quantitative environmental assessment). Here, the focus was on the parts crucial for this article, but other parts were also mentioned to provide a full picture of what actually happened.

TABLE 2 Overview of data collection methods used and what they covered.

Method of data collections	Time	Dimensions of social practices covered	Zoom
Survey 1	Late 2020	Meaning and material	In (meaning) Out (material)
Online workshop	Late 2020	Competences	In
Survey 2 (timetables)	Late 2020	Material	Out
Interviews	Late 2021	Meaning	In and out

First, the authors conducted an online workshop with eleven participants in late 2020, which was accompanied by two surveys, one at the beginning to capture socio-demographic information and general information regarding the participants' personal lifestyles and one afterward to learn about the structure of their daily lives. The first survey asked the participants for:

- Socio-economic data (age, gender, income, profession/job, and education),
- Their role in the "Aufbruch am Arrenberg" initiative (the social practices they participated in, their motivation for participating in the project), and
- General information on private consumption (dietary information and hobbies).

The rationale behind this initial brief survey, which took around 5 min, was to gather some hard facts efficiently without interference. The motivation to participate was of the utmost importance for this article so that the authors could compare the responses with those from the interviews conducted later on where the interviewees described how they became involved in the project. This allowed the authors to make comparisons regarding different times in their engagement. The decision was taken to conduct this survey at the beginning because longer

TABLE 3 Overview of interviewees involved in the Farmbox.

Interviewee background	Main role	Length of interview
Biology student	Everything biology-related	40 min
Gastronomy manager	Artificial light	62 min
Designer	Public relations	64 min
Emergency paramedic	Handyman	54 min

group discussions on environmental protection, inclusive of living in the neighborhood, gentrification, etc., may have altered some of the responses.

The workshop aimed at gaining a broad picture of Arrenberg itself, its people, and the organized activities; in other words, the setting. The skills and materials of the social (proto-) practices were also captured.

The workshop was organized using the zoom online video call platform and online whiteboards (Google Jamboard), which were prepared beforehand. This not only allowed the participants to talk to and see each other but also to work collaboratively as in offline meetings. The whole session took 90 min. The participants captured the results themselves on the whiteboards in the form of text boxes, sticky notes, and drawings. The process was divided into three parts consisting of the following tasks:

1) Explain what you do in the Farmbox/food sharing etc. in such a way that someone else could do the same work afterward. This zoomed in on the skills, knowledge, and materials needed to perform the social practice.
2) Draw a map of how you are connected to each other (less relevant for this article) and the kind of people you are looking for to participate.
3) Show (on a shared map of the district) and describe important places in your daily lives. This zooming-out activity aimed to generate a general picture of how important the Arrenberg quarter is to the participants, which may imply sufficiency in mobility and satisfaction with their living environment. It was shown that this was less relevant for the Farmbox project because for some reason they were the only group who mainly lived outside the Arrenberg quarter.

A further online survey regarding social practices structured according to time and space (Røpke and Christensen, 2012) was conducted afterward by filling out timetables for an ordinary week and travel activities over the last year. This aimed at capturing material consumption, but it was less relevant for this article.

The semi-structured interviews conducted in late 2021 with the four Farmbox practitioners were most relevant for this article. The interviews were conducted during online video calls and were recorded. Table 3 provides the specifics of the interviews and interviewees. Each interview was structured into three main parts. The objectives and some sample questions can be seen in Table 4.

TABLE 4 Structure and goals of the semi-structured interviews.

Thematic topic	Objective	Questions (examples)
Description of what they personally do at the Farmbox and why.	Personal motivation and background for participation. The meaning of "Farmboxing" (zooming in).	Tell me again what you do here in Arrenberg and how you came to be here. What do you tell your friends about why you do this? What keeps you motivated when you are annoyed or face barriers?
Life in the Arrenberg quarter and, if they lived somewhere else, how this relates to their own living environment.	Exploring the setting in which the daily social practices occurred.	Tell me about life in Arrenberg. When friends from other cities visit, do you show them around Arrenberg? What do you do here then? Can you take something from life in Arrenberg back to your living environment or are these two completely separate worlds?
Consumption in everyday life (food, mobility, leisure, travel).	Meanings of other social practices in order to look for similarities with Farmboxing (zooming out).	What role does nutrition play in your everyday life? How do you source your food? Tell me how you get around in everyday life. Where will your next holiday be after Covid-19? What else do you like to do in your spare time besides the Farmbox? What do you consider important to have or achieve in your free time?

While the second survey already provided data on what the participants did and how often, this part of the interview was intended to provide information on the meaning of their consumption patterns. This is important as the meanings of social practices are always in competition with individual meanings. For example, the authors wanted to know why the interviewees avoided flying to go on holiday. This allowed the

social practice of "Farmboxing" to be connected to other social practices through shared meanings. This requires a level of self-awareness or reflective thinking and articulation. This presented certain challenges when it came to regional farming of products the interviewees bought at markets as they often could not articulate why regional production was so important to them, but rather just repeated that it was.

Prior to the interviews, the authors did not state that they are especially interested in the environmental aspects of what they were doing, just that they were interested in what the interviewees were doing. However, as the authors' names can easily be linked to environmental topics by doing a quick Internet search, they asked if the interviewees knew what we were working on, especially if the authors felt that the interviewees were really pushing environmental topics. None of them knew and they were interested to hear what it was all about. However, it is widely known in Wuppertal that the Wuppertal Institute works on various topics relating to sustainability, so the authors suspect that the participants had some idea of their areas of interest. This was also suggested by the fact that the interviews were very casual in style, implying familiarity and trust, perhaps based on a mutual interest in the topics of sustainability and environmentalism. Several cooperation projects have already been conducted between the Wuppertal Institute and the University of Wuppertal on the one side, and the Aufbruch am Arrenberg initiative on the other. Even though the interviewer had no previous history of involvement in such projects, this might have helped indirectly. This level of trust and openness was further supported during the interviews, helping to gain insightful answers on the interviewees' individual meanings and the meanings of the social practices they participated in. Here, it was helpful that the interviewer also grew food in her garden.

All these research activities were conducted during COVID lockdowns, so the authors tried to address irregularities in their routines, e.g., by asking what their first holiday after the COVID restrictions would be like. The interviews were conducted online, recorded, and transcribed.

The interviews were transcribed (clean read) and analyzed by conducting a qualitative content analysis (Mayring, 2014). As the authors were interested in the meanings of social practices and individual motivations to identify sufficiency and how it connects various social practices, the focus was exclusively on content that discussed such aspects. This means that the authors gathered all the meanings expressed by the interviewees and only later tried to identify the ones that were sufficiency-related. As there was no prior set of expected meanings of social practices in everyday life, a category system was developed inductively. As the category system grew with each interview, two runs were conducted with two different authors of this article to analyze the material. As the meanings are contextualized (meanings of specific social practices), the coding unit was a phrase.

4. Results and discussion

4.1. Zooming in on Farmboxing

At first glance, urban gardening, especially taking care of hydroponic and aquaponic systems, does not necessarily appear to be a sufficiency-oriented social practice. It is more directly linked to CE strategies such as reuse and recycling as nutrients and water run in circles between the two systems. From a technical perspective, sufficiency comes into play as hydroponic farming avoids using soil as the medium in which plants are grown and substitutes this with water. Data from the online workshop provided quite a broad picture of what the Farmbox project was all about. The authors summarized three general themes in terms of meanings that can be associated with "Farmboxing": *environmentalism*, *teaching and learning*, and *community*.

4.1.1. Environmentalism

While listing the requirements to participate in the Farmbox during the workshop, several people stated that motivation was necessary, though without clarifying what motivated them exactly ("Don't forget why you are doing this," "Motivation is important, be there regularly, no other basic requirement," or "The main requirement: be up for it, be interested."). However, they also vaguely stated that doing the work paid off. For instance, one participant explained: "Go the extra mile and you soon notice the benefit."

From the interviews, the authors learned that this vagueness of meaning could be linked to very different initial, individual motivations. While the biologist saw the environmental potential ("Using the same amount of effort, we can work in a more nature-friendly and environmentally friendly way that is also more effective and more efficient."), others reported an initial economic interest or just an interest in doing manual work in their free time. However, this initial motivation quickly grew to include the idea of environmental protection.

One person stated that, until recently, they had no connection whatsoever to topics regarding sustainability, but that this had changed since they started gardening in the Farmbox project. The reason for getting into urban farming was economic interest, as the participant saw, working in gastronomy, an opportunity to reduce the price of basil through hydroponic farming.

The participant explained: "But there, too, I saw the economic factor quite blatantly. So, I knew we had a problem, the curve in the price of basil. I want to make a flat line out of it. And that's how I sort of got into sustainability and Close the Loop and the circular economy. And so, I fell in love with shock." (Close the Loop refers to a project where the participants conducted a proof of concept to scale up the Farmbox.).

This growth into the sphere of environmentalism was also shared by another interviewee, jumping abruptly from a description of quality free time to environmentalism:

> "Everything is very technical, high-tech, a lot of things can be computer-controlled and IoT monitored. And that, for example, is actually what attracts me so much about it, this technical playfulness. We men turn seven, and after that we just grow, and we are children until the end, and that's a very big point I have to say, and simply because of that we dealt with sustainability a little bit at the beginning; you knew about it, you knew what was behind it, a little bit, but not so exactly yet either. And of course, this has been deepened by the Aufbruch am Arrenberg initiative and especially by the Farmbox project, and meanwhile, it has also become part of our everyday life."

This development toward more idealistic meanings can also be seen in the answers to the survey question asking participants to complete the sentence "Motivation: I participate in the activity because…." They all sounded very ambitiously sustainable, stating an interest in bottom-up urban development, local sustainability, climate neutrality, and collaborative engagement. However, when describing how they got into gardening in the interviews, they sounded very different. One stated that they always liked working manually with and on technical equipment but did not have a workshop at home to do so. The student reported that they were looking for a place to complete a mandatory internship (later it was made clear that the university would not accept the Farmbox as an internship, but this did not stop the student from participating). The participant who worked in gastronomy reported that they were not allowed to try hydroponic basil farming in the restaurant, so they had looked for another place to play around with the concept and test the technical aspects of it, taking a deep dive into the physics of light and its role in growing plants. The fourth participant came into contact with urban gardening and the Farmbox project during a project for their master's degree course.

4.1.2. Teaching and learning

Another aspect of the Farmbox project was the setting and its integration into city life. In the description of the Farmbox during the online workshop and in the interviews, it was mentioned several times that explaining their activities to passers-by, teaching science to ordinary people, and seeing that the project was considered an important task, was very rewarding ("As soon as somebody enters the Farmbox, they leave everything behind," "And we really used it to take people by the hand and walk them through the Farmbox to show them how it works. [..] And that was extremely enjoyable, because I'm here and I really like explaining things," "So, on the one hand, we want to gain a bit of experience, but also to inform on the other hand, to look at the whole thing as an extracurricular place of learning. And yes, in principle it is a learning and communication object.").

In addition to reaching out to other people external to the Farmbox and teaching them, learning things themselves was pointed out as well ("The knowledge that we have generated there, the practical experience that we have gained, I think we will also take much of that with us to Gut Einern." [Gut Einern is a newly-developed sustainable neighborhood project at a different location in Wuppertal founded by people from the Arrenberg area, one aspect being sustainable urban farming. Some of the people from the Farmbox project subsequently got involved in Gut Einern], "And also the learning, so X has really dug into the topic of plants, especially artificial light and things like that. […] that's why I think that personal learning and all the aspects I mentioned are definitely present in all of us," "[…] where everyone really benefited was the know-how and no, no real monetary amount").

It is hard to tell, but there is often no clear distinction between learning and teaching as they both involved the excitement of newly-gained knowledge. That is why these are summarized as one central meaning of "Farmboxing,"

4.1.3. Community

Finally, the aspect of community was pointed out by the participants. This can be traced back to its origin in the Aufbruch am Arrenberg project, which is based on an open neighborhood community. When asked about their motivation to continue working on the Farmbox project, they replied: "And just to stay in contact with the people and also to somehow work together with the Farmbox group," or "On the one hand, of course, the people, and because somehow everything has developed in such a sustainable, yes, it is a bubble sometimes, sustainable direction, which is extremely, extremely exciting," or "I am a very social person. I really, really like being around people, but also looking for common ground with people." The community aspect, however, was discussed less often compared to environmentalism and teaching and learning. The reason for this was unclear, and the authors cannot conclude that community was less important. It is probably just less present as an articulated topic.

In summary, it can be stated that the Farmbox project was a time-consuming social proto-practice that focused on piling up and sharing intangible assets such as knowledge of environmental food production and the pure joy of collaborative work. The material products aimed for were simply basic food, hopefully, produced in a resource-saving manner. There was no high competence threshold to participate in the Farmboxing practice as the only requirement was motivation. Expertise was gained over time and the yield was of secondary importance. As the Farmbox concept is a high-tech version of urban gardening, the necessary material base for implementing a

project similar to the Farmboxing project would be quite high (a container, pumps, photovoltaic panels, etc.), especially in relation to the low yield. The authors did not conduct a full environmental assessment comparing the Farmboxing concept to regular farming. Therefore, the conclusion can probably be drawn that, in this state of technological development, the Farmboxing concept is more resource-consuming. However, if the Farmboxing approach is seen as a specific aspect of living in an urban neighborhood focusing on the environment, community, and sharing knowledge, as is the case within the whole Aufbruch am Arrenberg project, a broader picture of how such a life evolves around "Farmboxing" is needed. This can be obtained by zooming out to see the whole potential.

4.2. Zooming out of Farmboxing

While zooming out of Farmboxing, a distinction has to be made between food-related and other social practices as Farmboxing is in itself food-related and, hence, has higher impacts in this consumption area.

4.2.1. Food-related social practices

The interviews showed that growing some food made the participants far more aware of seasonal and regional food production and the energy demand for vegetables that require external heating or transportation. In this way, the Farmboxing project is connected to food shopping. All four participants reported that they had stopped or reduced buying fruits and vegetables from faraway regions due to environmental concerns. In doing so, they fundamentally questioned the idea of all fruits and vegetables being available all year round (which leads to high energy demands for storage and to heat greenhouses), all day long (which leads to food waste in the evening), and from all over the globe (which leads to high transportation requirements). This negatively associated meaning of "über-availability," the availability of everything at all times without the fear of missing anything, was primarily linked to the social practice of shopping for food, as one interviewee said quite clearly:

> "I am simply of the opinion that a coconut that grows in North Africa cannot be flown to Central Africa to be removed from its shell, packed in plastic packaging and flown to Germany. I am simply of the opinion that this does not have to be."

Further stating:

> "So yes, if you think you have to have a coconut at all times, OK, then pay for it so that it shows up in some balance sheet somewhere. You can probably tell me a little bit more about that, but as long as that is the case, how can renunciation take place when everything is available and affordable in the supermarket? At the expense of some cross-subsidisation financing."

Another interviewee proved this point using their broader knowledge and experience of the topic of different seasons in Spain:

> "Absolutely right, but they will be heated. Yes, so even these greenhouses, houses in Spain will be heated at some point. And I don't think that's quite so justifiable in terms of energy. If you look at the half white cabbage, it probably wasn't heated, it's still standing until probably the middle of the month, can it be harvested, or was it harvested, or palm kale or green kale or something. Yes, it does relatively well without heating, in the fertiliser balance too. Whereas you have to supply the tomatoes and peppers with endless nutrients and energy."

Furthermore, the interviewee made clear how his own farming activities (not just the Farmbox project) were directly connected to shopping in supermarkets:

> "Yes, well, by seeing what's in my field and by seeing what's on offer in the supermarket, I can discriminate a bit and say okay, I haven't had peppers for 3 months now. Why should I buy them at Aldi?"

This seasonality of vegetables makes this sufficiency behavior easier for the interviewee, as it is always a temporal renunciation.

> "When I'm in the shop and I see a red pepper and I feel like eating a red pepper, but at the same time I know that if I eat this red pepper now, it's really not ecologically justifiable at all, I can put myself off by telling myself: okay, come on, then you'll just eat red peppers again from June."

Here we see a strong meaning of "enoughness" associated with farming and food shopping as the direct counterpart to the dominant über-availability.

4.2.2. Other social practices (mobility, leisure, and travel)

The meanings of environmentalism and enoughness were not as strong in other consumption areas. However, several social practices were reported after internal reflection. The following two quotes from different interviewees exemplify this:

> "But I just notice that when I tell people that I think it's totally cool to drive such a fast car and allow myself this luxury, but on the other hand I stand in front of the coconut shelves in the supermarket and say 'Oh, but that doesn't have to be there now', then I find myself thinking that somewhere the finger has to point in the other direction."

> "That really is schizophrenia. So, you really save your peppers here in winter and then still have the nerve to say, 'Ah well, we're going on a week's skiing holiday to Austria and we're all going there by car."

This demonstrates the tension inherent to connections of meanings between social practices. What is remarkable in the second quote above is that driving fully packed cars from Germany to Austria for one's main holiday is regarded as insane compared with other sufficiency-oriented social practices engaged in by the participants. Surprisingly, none of them were planning to take flights in the foreseeable future or had taken them in the last couple of years. One even said that they planned to take a flight but decided not to when they saw how cheap the tickets were and realized that something is fundamentally wrong when faraway places are too available.

Another participant said that they had only left Europe once for a business trip to Istanbul and struggled to find good reasons for such long flights:

> "Exactly, but never before actually leaving Europe. So, all the time I think of Asia once. [..] And I was such a big Lord of the Rings fan at the time and I thought the landscape was so great, but then I went to Norway [..], and you can compare the landscape there quite well at least with the New Zealand landscape I am familiar with from pictures. And that's just it, there are so many countries besides Spain, Italy, and France that I think are also very, yes, worth exploring in Europe."

Luckily, these observations are in opposition to other research, where it has been observed that even environmentally aware people forget all about the environment on their holiday trips (Anciaux, 2019). While we have no data that can explain why our sample is more environmentally aware when it comes to traveling, we hypothesize that regional aspects of environmentalism learned through the Farmboxing practice led to this specific sufficiency-oriented mindset of "the whole world is not accessible to everyone, neither for coconuts nor for holidays." Figure 2 gives a rough and abbreviated overview of the newly emerging network of social practices due to the emergence of Farmboxing. As Farmboxing is not yet fully established, many links within Farmboxing and to other social practices are still considered weak.

Upon closer examination of the reports on social practices referred to simply as sufficiency-oriented, in this chapter, some difficulties arise in the field of food purchasing. Here, sufficiency can be found in the meanings (über-availability, regionality, and environmentalism), the competences (knowledge of global value chains in the food sector and what to look for in the supermarket), and in the materials, as some products are excluded from the act of purchasing. However, it is not quite clear if overall, life-cycle-wide, material demand is really reduced. Transport distances are not necessarily that environmentally relevant. A study has shown that apples from Germany can have a higher environmental impact when purchased in Germany than apples from New Zealand, depending on the season (this is due to the energy demand of cooling apples for many months, Wuppertal Institute, 2016). Additionally, when intercontinental vegetables are replaced by regional meat, nothing is gained (Poore and Nemecek, 2018). However, our study did not go deep enough to observe food purchasing over a longer period of time. Seasonality was reported by some interviewees as a factor in their grocery shopping, but further insight was lacking. It was only observed that the two participants with longer histories of environmental lifestyles and broader competences in this regard were more committed to sufficiency as they were vegan and pescetarian. However, the other two also reported a reduction in the consumption of animal products in recent years.

The case of sufficiency is surprisingly clear for the reported holiday trips. The travel plans consisted of the image of beauty at closer proximity and the idea of enough (Norway is sufficient, no need to go to New Zealand as a European), the skills to individually plan holiday trips that meet personal needs and reduce the material base through shorter distances. Here, it must be pointed out that sufficiency is relative since traveling to Norway (from Germany) as a substitute for New Zealand landscapes is a reduction, but with the potential for even further reduction. At least refusing to fly for private activities was very well developed.

In summary, the authors observed that sufficiency-oriented social practices can emerge, develop, or be successful in recruiting carriers as a result of participating in social practices that inherit sufficiency-oriented meanings but are not necessarily sufficient in terms of material (due to the high material demand of the Farmbox project).

5. Conclusion

The authors provided a novel approach to address CE strategies with high environmental potential that evolved around the concept of refusing, rethinking, and reducing by shifting the perspective from the consumer to social practices. In doing so, the concept of sufficiency was introduced as a key concept in the CE discourse, which is necessary if environmental pressure is to be substantially reduced by CE and the transformation of our production and consumption system is to be taken seriously. To be very clear, the authors state that there will be no sustainable circular economy without sufficiency as a central principle. In this way, refusal, rethinking, and reduction must be understood as sufficiency strategies and not limited to product design concepts.

We were confronted with an interesting case where there was no high threshold preventing contact with radical new logic, but where such radicality quickly evolved, the concept of über-availability was brought into question and replaced

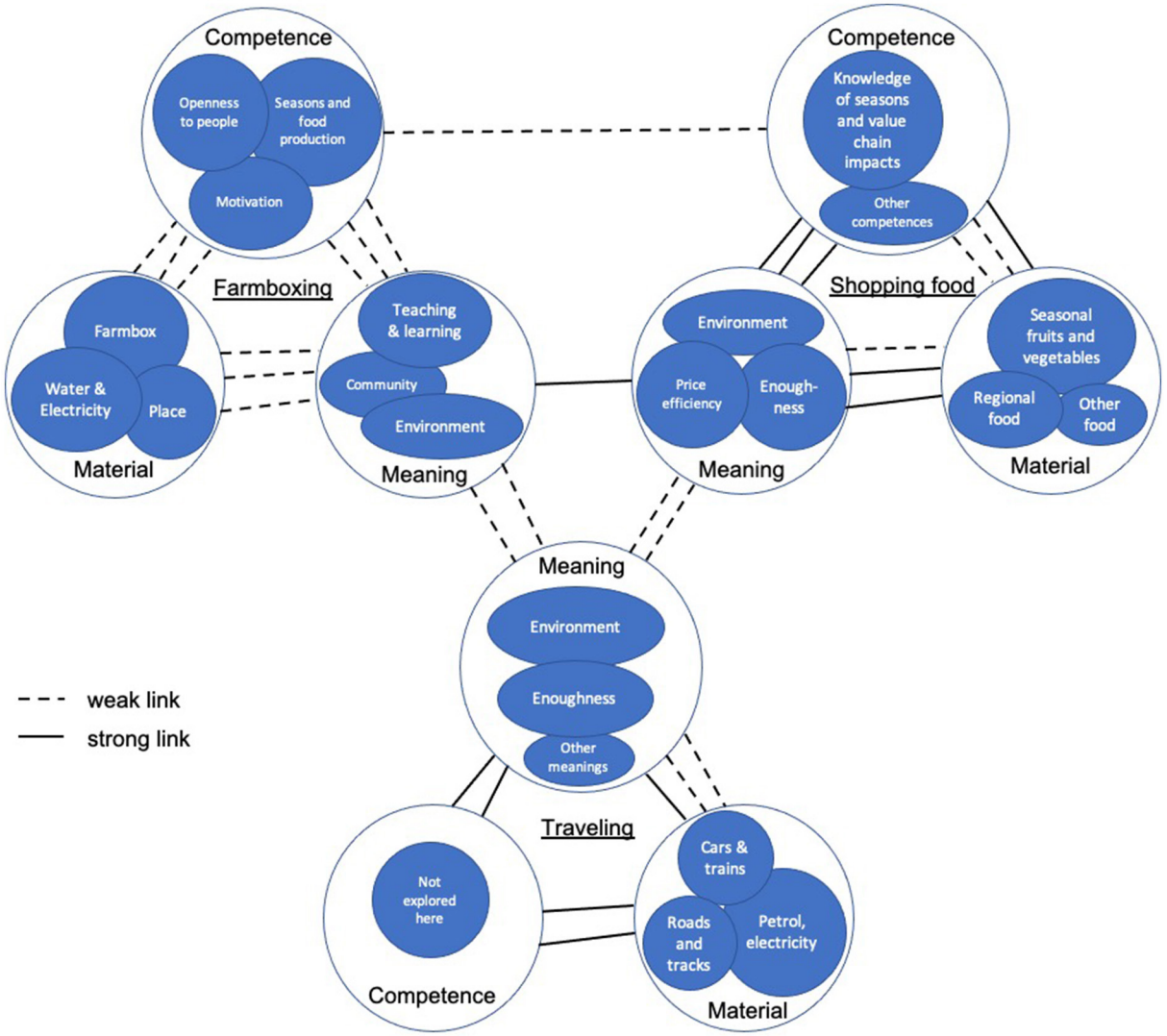

FIGURE 2
Extract from a network of social practices linked to Farmboxing through shared meanings and competences. Weak links are newly developed or contested, strong links are more established and less contested. The number of links is exemplary and materials, competences, and meanings are not exhaustive.

with enoughness. This is what makes the explicit consideration of sufficiency so interesting for CE approaches from a transition perspective: there are intersections with alternative and existing logic. The authors observed that sufficiency found its way into the lifestyles of the participants, even though it was questionable whether the Farmboxing approach studied actually reduces overall material demand and, hence, counts as sufficiency. This shows the importance of zooming out from social practices. The study showed that introducing sufficiency in a low-threshold manner simply by providing a public space for gardening activities can be successful as its radicality is tamed and it can be linked to the dominant logic (there is a long history of allotments in Germany). The upscaling potential of the Farmboxing concept is then that it still challenges the dominant logic and thus brings them into tension.

All this, however, was a very small case, and generalization would be inappropriate. There are many aspects that this study was unable to address. While the authors were able to identify some relevant factors, it was unclear how they worked together. For example, the importance of the social setting is unclear: how interchangeable is the presence of the "walking biology encyclopedia" who brought much environmental knowledge into the group? How would sufficiency spread into the lifestyles of the participants if the case had not concerned agriculture, which has strict rules of seasonal availability, but rather mobility or food waste? What sufficiency-oriented meanings show high potential to connect to other social practices? Here, more

empirical work is needed. The time to conduct such research seems right as the war in Ukraine, rising energy and food prices, and stressed supply chains overall have led to even greater demand for strategies and policies to reduce our resource dependencies. As this is congruent with the proposed goals of CE advocates, both topics, sufficiency and CE, should finally be merged.

As a life-cycle-wide environmental assessment was not conducted and the lifestyles described therefore could not be quantitatively evaluated, especially when it came to groceries, this presented problems in the analysis. Therefore, the authors have already planned a follow-up study that combines qualitative and quantitative analyses of different bottom-up neighborhood activities by utilizing social practice theories and life cycle assessments. Comparative and longitudinal studies might help to further explore the impact of interventions.

The authors also propose future research that delves deeper into social practice theories to understand and describe how opposite meanings are connected. What is referred to in this article as "über-availability" and what other studies have already called "enoughness" seem to be counterparts.

In this article, the authors have avoided coining clear, new definitions of reuse, rethink, and reduce, but they think that this should be done in the future by providing empirical data on the logic of such strategies and exemplifying this with meanings in observed social practices.

Finally, researchers are also welcome to explore the potential of social practice theories for other CE strategies as social practices are not limited to private consumption.

Data availability statement

The original contributions presented in the study are included in the article, further inquiries can be directed to the corresponding author.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

Author contributions

PS, AP, and MS developed the idea for the article. PS performed the empirical analysis, data collection, wrote most of the original draft, and the revised manuscript. AP contributed to the idea of sufficiency as a transition strategy. MS supervised the writing process. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The induction effect: why the rebound effect is only half the story of technology's failure to achieve sustainability

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The concept of the rebound effect is important in understanding the limits to how much technological efficiency improvements can reduce energy and resource consumption. However, due to the concept's focus on efficiency, it neglects other environmental implications of technological change. We use the term "induction effect" to grasp additional important mechanisms stemming from new technologies. We define an induction effect as an increase in the level of energy or resource consumption that was caused or enabled by the emergence of "new options" arising from technological change. Our investigation of three cases of new technologies - online consumption, smart homes, and pace of life - shows how including both rebound and induction effects into the analysis helps in understanding the relationship between technological change and energy and resource consumption. Integrating induction effects into the analysis underpins the importance of sufficiency as a strategy for sustainability and helps to develop comprehensive policy measures.

KEYWORDS

rebound effect, technological change, sustainability, induction effect, online consumption, smart home, acceleration

1. Introduction

There is consensus in science that the increase in global environmental throughput needs to come to a halt and eventually decline if further transgression of planetary boundaries are to be avoided (Steffen et al., 2015; Rockström et al., 2023). One of the key challenges is to achieve sufficient absolute decoupling of economic activity, i.e., economic growth, from natural resource use and emissions (Parrique et al., 2019; Wiedenhofer et al., 2020). Prominent hope for such decoupling is placed in technological change in order to improve environmental efficiencies and realize circular economy patterns. Currently, particular hope is placed in the potential of digital technologies, including artificial intelligence, to further advance environmentally sound technological change (Lange et al., 2020; Kaack et al., 2022).

However, albeit continuous technological change, including widespread digitalization, key indicators of global resource use and emissions have still increased during the past years and decades (IPCC., 2021; Wolf et al., 2022). There is no evidence for sufficient absolute decoupling (Haberl et al., 2020). One of the reasons discussed in the literature are so-called rebound effects (Herring and Sorrell, 2009; Santarius et al., 2016). Rebound effects

are unintended side effects from technological efficiency improvements that spur growth in demand or supply, which cancels out parts or all of the technological savings potential. The argument is that the efficiency improvements of new technologies are partly or even entirely countervailed by additional consumption and/or production of goods and services, shifts in the composition of goods and services, changes in the production methods applied, and behavioral changes of consumers, among others (Lange et al., 2021). Sufficiency is discussed as an effective strategy to prevent rebound effects because it ultimately aims to reduce the resource demands and emissions of individual consumers, organizations, and companies by trying to satisfy needs with less production and consumption (Herring, 2009; Best et al., 2022).

In this article, we develop the concept of the "induction effect" to grasp important mechanisms stemming from introducing new technologies. Efficiency improvements are not the only implication of technological change, and opinion is currently divided on the extent to which mechanisms stemming from efficiency improvements, or rather other mechanisms happening in the wake of technological change, can explain the failure in sufficient absolute decoupling.

We argue that – next to efficiency improvements - new technologies often introduce "new options" regarding production methods, product usage and changed behavior of individuals and firms. These inductions help explain another part of the increase in demand, which has so far countervailed reducing environmental throughput. Introducing the concept of the induction effect further underpins the role of sufficiency in achieving environmental sustainability. We show that sufficiency is an appropriate response not only to ever-increasing efficiencies (to rebound effects) but also to the continuous rise of new options (to induction effects).

The term induction effect has been used occasionally in the literature on the environmental impacts of new technologies, in particular regarding digital technologies (Hilty, 2008; Rattle, 2010). However, as we show in the literature review of this article, the term has never been clearly defined, nor has anyone developed a clear concept of the mechanisms leading to the effect. The first aim of this article, hence, is to develop a definition of the induction effect and of induction mechanisms. Given the body of literature that has used the term so far, and based on observations from our own empirical research on environmental effects of digitalization for absolute decoupling in three consumption domains, we do this by focusing on induction effects from digital technologies.

The second aim of this article is to highlight the relationship of the induction effect to the rebound effect and thereby improve the demarcation of rebound mechanisms from other mechanisms. More specifically, we start the analysis of this article by revisiting definitions of rebound effects and describing various rebound mechanisms arising from digitalization and then, detecting additional induction effects that we empirically observed. This leads us to set the induction effect as a phenomenon of technological change that functions complementary to the rebound effect. This clear definition and conceptualization of the induction effect contributes to rebound research, as it helps disentangle the energy and resource consumption debate on what is a rebound and what is not and helps sharpen the definition and understanding of mechanisms generating rebound effects. And it contributes to sufficiency research, as it helps specify the conditions of frugal consumption, including potential countervailing mechanisms.

Given these two aims, the article is structured as follows. In Section 2, we present our methodological approach before analyzing the literature on the rebound effect in Section 3. We point out that, within different strands of this literature, a debate is evident on whether the concept of the rebound effect should focus narrowly on mechanisms directly following efficiency improvements, or also include mechanisms beyond efficiency. In Section 4, we then introduce the concept of the induction effect. We analyze the few existing references to it in the literature, discuss its relation to the rebound effect and eventually, provide a clear definition of the induction effect. In Section 5, we underscore our conceptual work by use of empirical examples. We discuss environmental implications of digital technologies in three cases – online consumption, smart homes, and pace of life – to show how induction effects emerge, and how rebound and induction mechanisms are to be distinguished. We find that including both effects helps achieve a more comprehensive analysis of the environmental implications of technological change. In the discussion in Section 6, we develop a typology of different induction mechanisms and point out how considering the induction effect helps to improve the analytical basis for sufficiency-oriented policies. We conclude this article with a brief conclusion.

2. Method

This article is an outcome of the interdisciplinary research group "Digitalization and Sustainability." We are a group of six researchers who have investigated the relationship between digital technologies and sustainability over a phase of 6 years. We have worked on the relationship between the rebound effect and technologies, using empirical investigations and conceptual and theoretical analyses. In our work, we experienced the strengths but also the limitations of the concept of the rebound effect in understanding how technologies spur energy and resource consumption.

The method of this article combines conceptual work with empirical work in three cases. It follows a two step approach. In the first step of the approach, we combine an analysis of the literature on rebound effects with a nascent stream of literature on induction effects to develop a clear definition of the induction effect and inductions mechanisms that provides a complementary concept to the rebound effect and rebound mechanisms.

In the second step, we put the usefulness of this definition to a test by use of three cases: online-consumption, smart homes and pace of life. The authors of this article have conducted empirical investigations on the sustainability implications of technological change in these three cases. The insights from these empirical investigations are used to indicate rebound and induction mechanisms for these three cases and develop a typology of induction mechanisms.

3. The rebound effect

The literature on the rebound effect and rebound mechanisms contains a controversial debate about which effects of technological

change should be considered rebound effects and which are other effects of technology on the environment (Turner, 2013; Madlener and Turner, 2016). The modern debate on the rebound effect has a long tradition, reaching back to the 1970s. The literature started with a focus on economic mechanisms (covered in Sub-section 3.1). It then broadened in various directions. Two important extensions were to take psychological aspects into account (Sub-section 3.2) and to include rebound mechanisms stemming from time efficiency improvements (Sub-section 3.3). We conclude with discussion on what we consider is a rebound effect and what is not (Sub-section 3.4).

3.1. Economic rebound effects

We follow Lange et al. (2021) in differentiating between rebound effects and rebound mechanisms: "A rebound effect relates to the quantitative size of a (measurable) impact on energy consumption while a rebound mechanism is a qualitative relation, e.g., a cause-and-effect chain from an energy efficiency improvement to energy consumption" (p. 1). Rebound effects are often divided into direct and indirect rebound effects. Direct effects stem from mechanisms that raise the demand for the goods or services that experienced an efficiency improvement. Indirect effects relate to increases in the consumption of other goods and services. In Sorrell (2007), the sum of the direct and indirect effects makes up the economy-wide effect. Another classification is into rebound effects and mechanisms at the micro, meso, and macro level (Santarius, 2016). In Lange et al. (2021), microeconomic mechanisms refer to those in households and firms, mesoeconomic ones to those in markets and business sectors, macroeconomic ones to mechanisms on the country level. They added a fourth level of global mechanisms between at least two countries.

Most of the rebound mechanisms listed in relevant publications are related to energy efficiency improvements. The literature has indicated numerous such rebound mechanisms (van den Bergh, 2011). Lange et al. (2021) list 18 rebound mechanisms, limiting the list to mechanisms relating to economics. For example, for household appliances, the income mechanism describes how people use money saved by energy efficiency improvements to buy more of the same good or service or others. The substitution mechanism refers to how the consumer is using more of the good or service that experienced the energy efficiency improvement because it becomes relatively cheaper than other goods and services. On the firm side, money saved from energy efficiency improvements can be used to expand production. These initial mechanisms at the household or firm level work their way through the economy, via various additional mechanisms. For example, when many firms experience energy efficiency improvements, this can lead to lower prices of the goods or services they supply, leading to more sales, or higher energy efficiency can lead to lower demand for energy, lowering the price of energy, which in turn induces additional energy consumption elsewhere in the economy.

The debate on what is considered to be a rebound effect or a rebound mechanism and what is not is controversial (Gillingham et al., 2013; Turner, 2013). The central question is whether only such mechanisms that directly and causally follow from an efficiency improvement should be considered rebound mechanisms, or also any associated mechanisms. The literature contains diverse understandings about "the extent to which energy efficiency improvements should be considered independently of any associated improvements in the productivity of labor and capital" (Sorrell and Dimitropoulos, 2007, p. 131). New technologies often go hand-in-hand with energy efficiency improvements, increased labor, capital productivity, or the ability to produce new products. For instance, Holm and Englund (2009) used the term "gross rebound effect" to include such broad effects when comparing energy intensity of GDP and demand at the macro-economic level.

3.2. Psychological rebound effects

Although the study of rebound effects and mechanisms commenced in the domain of energy economics, rebound research has been extended to other disciplines for more than a decade (Santarius et al., 2016). These studies have resulted in additional rebound mechanisms being identified at the consumer level. A systematic categorization and ordering of interdisciplinary rebound mechanisms are still lacking (Font Vivanco et al., 2022), yet a review on indirect rebound effects at the consumer level contributed insights on psychological mechanisms (Reimers et al., 2021).

Psychological rebound effects - also called "motivational rebound effects" (Santarius and Soland, 2018) or "mental rebound effects" (Girod and de Haan, 2009) rest on the assumption that energy efficiency improvements do not only have a "price content" (Khazzoom, 1980; Girod and de Haan, 2009) but may also have symbolic and behavioral content (Santarius, 2015). Santarius and Soland (2018, p. 415) define a psychological rebound effect as "an increase in energy service demand due to a change in consumer preferences that can be attributed to an increase in technological energy efficiency." Reimers et al. (2021) delimit psychological mechanisms from economic mechanisms in rebound effects: whereas the economic mechanism describes income and substitution mechanisms that do not require active reflection of one's moral goals, psychological mechanisms include psychological rationalization processes reflecting on the morality or sustainability of one's own behavior.

One such mechanism is referred to as moral licensing: the purchase or use of a more efficient technology is perceived as a good deed that licenses increased preferences for the purchase or use of that technology, or of other technologies. For example, a person that bought a very efficient car or electric vehicle might feel that driving it more than the previous conventional car is morally legitimate. This licensing mechanism is also described under the terms of mental accounting (Hahnel et al., 2020) or negative spillover effects (Truelove et al., 2014; Nilsson et al., 2017).

Additionally, the diffusion of responsibility is a psychological rebound mechanism (Santarius and Soland, 2018). Due to the purchase or use of efficient technologies, consumers may perceive that the responsibility for protecting the environment diffuses to other agents, such as to the engineers, policy makers, or other consumers as potential adopters of those efficient technologies.

This diffusion of responsibility, in turn, can give way to a more intensive use of that technology. Another psychological mechanism can stem from consumers' perception that behavioral costs, i.e., the monetary, social, or emotional consequences of using an inefficient technology, shrink when that technology becomes more efficient. Accordingly, taking a ride with a very efficient car or an electric car simply to get bread rolls at the next corner might be perceived as less costly and less frowned upon by neighbors, and may feel better compared to doing so with a dirty combustion engine.

However, it can be controversially debated what part of that demand increase stems from the technological efficiency improvement, i.e., the reduction of behavioral costs, and is therefore to be considered a rebound effect. There may be other (psychological) explanatory mechanisms, for instance, additional rides might be triggered simply by the new design of the car (a "feel good factor") or by additional functionalities such as driver assistance (new consumption options).

3.3. Time rebound effects

A further distinct research strain investigates time rebound effects. These rebound effects rest on the assumption that technological efficiency improvements may also bring about changes in the time available for consumption. Hence, compared to economic and psychological rebound effects, the input factor considered is not energy or resources, but time.

The aspect of time was introduced by Binswanger (2001) and Jalas (2002). Building on those foundations, Brenčič and Young (2009), Druckman et al. (2012), and Buhl and Acosta (2016) analyze how time efficiency improvements impact energy service demand. For instance, Buhl and Acosta (2016) show that time gains are reinvested in resource-intensive leisure activities and hobbies such as various sports activities or eating out. With a broader scope, Buhl (2016) and Geiger et al. (2021) discuss how time efficiency improvements impact the general pace of life. In that sense, a time rebound effect can be defined as an increase of actions per unit of time that has been caused or at least enabled by an improvement in time efficiency (Santarius and Bergener, 2020).

Four time rebound mechanisms have been identified [see Bergener and Santarius (2021)]. These mechanisms build on explanatory factors found in sociological theories of social acceleration - which is the global phenomenon of an increase in the number of actions per unit of time (Rosa, 2013). First, technologies may be applied to multitasking, i.e. to doing several things at the same time. For instance, media technologies from radio over TV to today's video streaming can be done in parallel to cleaning the house or meeting friends. Second, technologies can be applied to perform activities faster. For instance, the invention of the washing machine most likely led to large rebound effects (backfire) due not only to reductions in energy demand and costs but also to savings in time (see also Davis et al., 2012). Third, technologies can be used to productively fill transfer and waiting times. For instance, the smartphone can be used to do job-related work while being in the bus or metro. And fourth, technologies can be used to replace time-intensive activities with time-saving ones. For instance, time efficiency gains achieved by taking the plane instead of the car or train may result in more trips overall.

However, as with the other two group of rebound effects, the debate continues on whether those four basic mechanisms necessarily all rest on time efficiency improvements and should therefore be considered as rebound mechanisms. If an efficiency improvement is generally understood as optimizing an input-output-ratio, then filling waiting times or multitasking might not result from needing less time to complete an action (i.e. time efficiency) but rather from using time more flexibly to perform such actions. Moreover, media technologies in particular open up new options for flexible time use, such as communicating asynchronously with other people or shopping or watching videos and news anytime, anywhere, rather than complying to infrastructures such as opening hours or a set TV program.

3.4. What is a rebound and what is not?

Within the debate on rebound effects and mechanisms, two aspects should be noted. First, the borders of argumentation between economic, psychological, and time rebound mechanisms and effects are blurred. For instance, with reference to Becker (1965), time can be considered an input factor in (household) production functions that is interlinked with, if not substitutable by other inputs such as capital (Jalas, 2002). And Frick (2022) points to the psychological construct of "behavioral costs," which include not only financial expenses but also the perception of physical, mental, and temporal effort to perform a given behavior (Verhallen and Pieters, 1984).

Second, hotly contested is whether aspects such as time rebound mechanisms should actually be regarded as part of the rebound debate or the term "rebound" should be restricted to energy and resource efficiency improvements. This debate is closely related to the question of whether additional energy consumption due to labor productivity increases, which accompany new technologies that increase energy efficiency, should be counted as part of the rebound effect (Sorrell and Dimitropoulos, 2007).

The important aspect for this article is that there are controversial debates on what to include as the rebound effect. Some scholars keep a narrower focus to clearly define the rebound effect as the increase in energy and resource consumption directly related to efficiency improvements. Others, however, take a wider definition, probably to grasp more of the relevant mechanisms stemming from new technologies. We propose to follow the first option - to restrict the rebound effect to mechanisms stemming from efficiency improvements.

Following a definition of the rebound effect that is limited to mechanisms from increases in efficiency facilitates analytical clarity. But with such a narrower definition, several mechanisms that are important in explaining the limitations of technological change to improve environmental sustainability, are left out. We introduce the term induction in addition to the term rebound in order to achieve a clear and restricted understanding of the rebound effect while at the same time taking into account the major impacts of technological change on energy and resource demand. The next section develops the concept of the induction effect.

4. The induction effect

The induction effect has been used occasionally in the literature on the environmental impacts of new technologies, in particular regarding digital technologies. The term is often not clearly defined, and its relation to the rebound effects is described differently across articles. In the following, we analyze existing use of the term and descriptions of its relation to rebound effects. We then argue for a definition of the induction effect that focuses on new options brought about by technologies and that sets the induction effect as a phenomenon complementary to the rebound effect.

4.1. Origins of the induction effect

Early descriptions of the induction effect mainly give examples, while not clearly defining the term. Hilty (2008) is the first to describe the induction effect as increased demand for existing products and goods due to the introduction of digital technologies. As an example, he cites the introduction of (efficient) printers, which resulted in an increase in paper consumption: "[...] today's PC and printer technology enables the user to print out hundreds of pages with just a few mouse clicks" (Hilty, 2008, p. 38). He puts forward a second example regarding more traffic arising from the introduction of digital technologies: "People who get to know each other via the Internet may want to meet some day in person" (Hilty, 2008, p. 133). While Hilty does not clearly define the induction effect, Mickoleit (2010) does provide a definition, referring to an example similar to that of Hilty: "Induction effects can occur if ICT products help to increase demand for other products, e.g., efficient printers may stimulate demand for paper" (p. 9). This definition is broad and does not explain the mechanism behind the induction effect.

Rattle (2010) developed a categorization with two additional effects next to the induction effect. He defines induction effects as "greater use of an existing product, process, or activity" (chapter 6). As an example, he cites "a satellite dish resulting in an increased availability of content [that] might induce increased television viewing" (chapter 6). This description follows the same logic as that of the direct rebound effect, as the use of a technologically changed good or service is increased. Rattle also introduces two further effects: the supplementation effect and the creation effect. In contrast to induction effects, supplementation effects stem from new products related to information and communication technologies (ICT) that complement existing products or services, for example, "a printer [...] would supplement a computer or Internet access, providing an outlet for their increased use" (Chapter 6). Rattle hence distinguishes between the induction effect and the supplementation effect in terms of the product whose consumption is enhanced (an existing product vs. a, for the consumer, new ICT-based product). This distinction is similar to that between the direct and the indirect rebound effect (see Sub-section 2.1). The third effect he identifies is the creation effect, which results from new ICT products being applied in new fields created by ICT. Recent examples of the creation effect include machine learning as an application of artificial intelligence, or cryptocurrencies as an application of blockchain technology. Hence, this third category focuses on the application of a certain product type (ICT products) in the rest of the economy and is therefore only helpful when focusing on the specific set of ICT technologies.

Røpke (2012) gives a first idea of what the mechanism might be that defines an induction effect - convenience and making things easier. She argues that "ICT application stimulates increased use of a product or service" (p. 1634) and provides possible explanations of how the additional demand for other goods and services arises, namely that technologies improve convenience and make it easier for people to consume. Our definition builds on a similar understanding.

4.2. Relation between rebound and induction effects

The relationship between rebound and induction effects is (often implicitly) displayed differently. Several authors argue that the induction effect is a more general response to technological change than the rebound effect. According to Gossart (2015), the difference between rebound and induction effects lies in the different underlying mechanisms of "pure energy efficiency improvements [i.e. drivers of rebound effects] and technological changes that include energy efficiency improvements [i.e. drivers of induction effects]" (p. 5). Røpke (2012) also describes the induction effect as "more general than the rebound effect" (p. 1634).

In contrast, Rattle (2010) and Aebischer and Hilty (2014) see the induction effect as part of the rebound effect. For Rattle (2010), the rebound effect encompasses all three effects (induction effect, supplementation effect, creation effect) as described above. Aebischer and Hilty (2014) see the induction effect taking place on the micro level, while the rebound effect occurs on the macro level. These understandings of Rattle as well as Hilty and Aebischer are however both unsatisfactory. Rattle's understanding includes the possibility that all mechanisms stemming from technological change could be regarded as rebound effects. Hilty's and Aebischer's view contradicts the literature on the rebound effect, as rebound mechanisms have long been understood to (also) occur at the micro level (Khazzoom, 1980, 1987) and work their way through the economy (Lange et al., 2021).

4.3. Definition of the induction effect

We propose using an understanding of the concept "induction effect" that can be combined with the concept "rebound effect." This understanding necessitates that the two effects originate from different types of mechanisms and that one can distinguish and delimit their impact on energy and resource heuristically.

We follow the main line of reasoning in the rebound literature that any rebound mechanism rests on the explanatory factor of changing input-output-ratios; rebound mechanisms stem from technologically facilitated **efficiency improvements**. As already described, there are controversial debates on whether the rebound effect should be understood in relation to only energy and resource efficiency or also to other efficiencies, such as time, effort, or other

types of inputs. We show that, even when a broad understanding is applied, many important impacts of technological change on increased energy or resource consumption cannot be captured by the concept of the rebound effect. And, thus, including the induction effect is expedient.

In contrast to rebound mechanisms, induction mechanisms stem from **new options**. Several authors highlight the importance of new options leading to consumption increases while not calling the result the induction effect. Walnum and Andrae (2016) argue that, with the introduction of cloud computing, "new consumption (and production) *options* [emphasis added] that were not available earlier" (p. 237) appeared, ultimately leading to increased energy consumption (the authors do not call this phenomenon the induction effect). This mechanism of increased choice of options leading to increases in electricity consumption is also described by Røpke et al. (2010): "[...] the introduction of the internet [...] opened up a whole new range of possibilities. With the development of laptops, other mobile devices and mobile access to the internet, the number of applications is escalating" (p. 1767).

Several authors have used similar understandings of the induction effect referring to options: Hilty (2008), for example, describes how ICT infrastructure induces "[...] globalization of markets and distributed forms of production [...]" (p. 38). Following this logic, the creation effect described by Rattle (2010) as "a new niche or application for a new ICT product" can also be designated as an induction effect. This can be seen, for example, in the wide range of new application options in various areas such as the home, in production or in the transport sector that have arisen as a result of the introduction of machine to machine communication. Pohl et al. (2019), following Walnum and Andrae (2016), similarly define the induction effect as" changes in user behavior that can be attributed to an increased choice of options" (p. 700).

We build on such understandings and suggest a definition that may serve as a guideline to further investigate the induction effect and related mechanisms both in production and consumption: **An induction effect refers to an increase in the level of energy or resource consumption that was caused or enabled by the emergence of new options arising from technological change**.

Our understanding of the induction effect is based on investigations on three cases, which we conducted over 6 years. These studies and our results are described in the next section.

5. Three cases

We have investigated the relationship between technological change and energy and resource consumption for three cases: online consumption, smart homes and the pace of life. We found that efficiency improvements and the rebound effect were limited in their ability to explain the effects we observed. We ascertain that including the aspect of new options and the induction effect allows a much wider range of mechanisms to be considered and, thereby, improves understanding the interplay between technological change and energy and resource consumption.

5.1. Online consumption

Online shopping is becoming increasingly popular. For instance, more than 75% of the population in France, Germany, and Finland ordered or bought goods or services over the internet in 2021, and this share reached at least 80% in Luxembourg, Sweden, Ireland, the Netherlands, and 91% in Denmark (Eurostat, 2022).

Improving the sustainability record of the online/e-commerce sector is a complex process. Most of the sector's CO_2 emissions originate from the last mile, shipping, and from returns and the increase in packaging waste, whereas warehouses and distribution centers usually only contribute a small part to the total greenhouse gas emissions of online purchases (Zimmermann et al., 2020). Whether e-commerce is indeed more efficient than in-store commerce depends on a number of factors: the means of transport used to get the product from the seller to the customer (e.g., last-mile delivery), the ICT infrastructures of online shops, the size of shopping baskets, the share of return rates, and the type and quantity of packaging (Zimmermann et al., 2020). Of these factors, transport is the most decisive in any comparison of greenhouse gas emissions from e-commerce or in-store shopping, i.e. whether transport associated with online shopping actually replaces transport for in-store shopping or comes on top. The e-commerce sector's hopes to win in this comparison mainly revolve around the sector's capacity to lower environmental impact by optimizing the shipping process.

In our research (see Box 1), we have found that several mechanisms are involved in how online consumption leads to overall more consumption and, thereby, to more energy and resource use. E-commerce allows users to purchase almost any product or service, from anywhere in the world, at any time. Online shopping means that opening hours, choice restrictions, or product characteristics such as size and weight are no longer a barrier to consumption. This breadth of choice increases the efficiency of purchase behavior (Voropanova, 2015), but it also increases the number of product options and opens up new possibilities for purchasing. Accordingly, some of the associated mechanisms are rebound and some are induction mechanisms.

5.1.1. Rebound mechanisms

On the rebound mechanism side, the fear is that online environments make consumption so effortless that they stimulate excessive and unsustainable consumption. For most people, the behavioral costs of online shopping are perceived to be lower than behavioral costs of shopping in-store (Frick and Matthies, 2020). In some cases, the decrease of behavioral costs is also linked to higher consumption levels (Frick and Matthies, 2020). Decreased behavioral costs for shopping online may also lead to more purchases in other areas. For example, even if e-commerce decreased the number of shopping trips [although research by Buldeo Rai (2021) suggests that these trips do not decrease], other passenger trips may increase due to additional time for alternative activities (Smidfelt Rosqvist and Hiselius, 2016). Such decreases in behavioral costs can be covered by the concept of the rebound effect, as they relate to changes in the ratio between effort/time/money and the good or service purchased.

BOX 1 Our studies on online consumption.

In a cross-sectional three-study design, we measured self-reported consumption levels of clothing ($N = 883$), digital devices ($N = 860$), and leisure travel ($N = 976$), purchase intentions and perceived behavioral efficiency gains of online-shopping (Frick and Matthies, 2020). Moderation analyses tested whether purchase intentions and efficiency gains predicted higher consumption levels: Online shopping was perceived to have lower behavioral costs than in-store purchasing, except in searches for transport alternatives (e.g., bus, train). Perceived behavioral efficiency gains of online shopping were not linked to higher clothing consumption levels, but they were linked to higher consumption levels in case of digital devices and travels.

Frick et al. (2020): Another study based on the same sample examined how perception of consumption-promoting online content influences individual consumption levels of clothing, digital devices, and leisure air travel, as mediated by individual aspiration levels and personal and social norms. Structural equation modeling confirmed relationships between perceived consumption-promoting online content and consumption levels, fully mediated through aspiration levels. Sufficiency-promoting online content is associated with higher social and personal norms for sufficiency, but neither of the latter are linked to aspiration or consumption levels.

5.1.2. Induction mechanisms

In addition to the rebound mechanisms, online consumption also involves various induction mechanisms. Digital consumption options provide consumers with a **wider product collection**. New consumer worlds and sales platforms appear, many of which offer almost unlimited product catalogs. If such larger product catalogs lead to more consumption, an **induction effect** has arisen, an effect due to new options - in this case, the option to buy products that were not available before.

Another mechanism is related to the increasing use of mobile phones for shopping. Mobile phones allow consumers to buy at **any time and from anywhere** (Lange and Santarius, 2020; Li et al., 2020). In an empirical study, individuals changing from a stationary to a mobile device increased their online shopping level and frequency (Wang et al., 2015). As online purchasing in the middle of the night or while waiting for a bus is a new consumption option, this option can be considered an **induction effect**. However, this example shows that it is sometimes ambiguous whether a phenomenon is due to efficiency - and hence a rebound - or new options - and hence an induction effect. Does shopping at any time make the shopping process more efficient or is it a new option? In this case, we argue for the new option because the central aspect is not to save time but to consume at a moment in which consumption would otherwise not have been an option.

Further, **online marketing** strategies can increase consumption levels and accelerate consumption cycles. Retailers are increasingly making use of online marketing. In 2021, 455.30 billion US dollars were spent on digital advertising, 61% of total media advertising spending (Cramer-Flood, 2021), leading to a ubiquity of commercialized messages and high daily exposure to advertising for the average internet user. As a result, not only online sales but also over-the-counter retail sales of clothing were positively linked to online advertising expenditures, bringing greater returns than traditional advertising (Dinner et al., 2014). Additionally, authors of the present article showed in Frick et al. (2020) and Frick et al. (2022) that perceiving online advertising was correlated with individuals' consumption desires and actual consumption levels. The impacts of online advertising by online retailers on increased consumption levels are induction mechanisms, as the internet offers new marketing options that attempt to increase consumption desires and levels.

An increasingly important reason why online marketing may be extremely potent in increasing consumption is personalization, enabled by new data analytics: Advertising can be personalized by showing certain groups of people advertising that fits their sociodemographic and/or psychometric profile, or advertising from retailers located in a viewer's geographic vicinity. It can also be personalized by retargeting (advertising products or shops people recently visited online), a method shown to receive more clicks than non-personalized banner ads (Bleier and Eisenbeiss, 2015). Accordingly, evidence has shown that the perception of personalized advertising is associated with an increased desire to buy (Frick et al., 2022). Personalization is considered to be an induction mechanism as it has arisen from new options to target commercials.

Another increasingly important mechanism is **influencer marketing**, which is only possible due to social media: The influencers with the strongest reach on social media channels mainly advertise fashion trends, status consumption, and luxurious lifestyles, while sustainable products, ideas, or lifestyles are hardly discussed (Werg et al., 2021). Not surprisingly, this new type of marketing has been shown to stimulate purchase intentions (Jiménez-Castillo and Sánchez-Fernández, 2019). These examples show that new technologies have not only increased the amount of money being spent on commercials but also changed the quality of advertising, leading to more consumption. In addition to the personalization of advertising and influencer marketing, digital advertising strategies such as search engine optimization (SEO), big data, and tracking can also encourage impulsive buying, another main cause of excessive consumption (Zafar et al., 2021).

Overall, the case of online consumption shows that including aspects of additional options and, hence, induction mechanisms allows a much larger set of mechanisms to be incorporated in empirical investigations. The induction mechanisms we encountered - a wider product collection, consumption at any time from anywhere, and various new online marketing possibilities - deliver key explanations for how online consumption can lead to more energy and resource demand.

5.2. Smart homes

The second case regarding the relationship between rebound effects, inductions effects, and energy consumption is smart homes. Smart homes contain a variety of networked devices in the home, such as radiator thermostats, windows sensors, smart plugs, smart TV, voice command devices, cameras, smart washing machines, and many more (Berry et al., 2007).

The question of how smart homes may contribute to reducing energy and resource consumption in the house has been discussed in various research disciplines (Marikyan et al., 2019; Sovacool and Furszyfer Del Rio, 2020). The results are ambiguous in terms of absolute energy and resource savings (van Dam et al.,

2013; Tirado Herrero et al., 2018). This ambiguity arises from the idea of the automated and connected smart home serving several purposes at the same time, e.g., the potential technical approach to lowering households' energy demands (Balta-Ozkan et al., 2014) and related greenhouse gas emissions (Sintov and Schultz, 2017; Riekstin et al., 2020) while also providing consumer needs such as comfort and convenience (Strengers et al., 2020). Our research shows that smart home users in Germany do not prioritize the overarching goal of environmental and climate protection (Quitzow and Rohde, 2021). This finding is related to our findings that, to justify the appropriateness of smart home technologies, politicians highlight the environmental benefits while the smart home industry emphasizes notions of comfort, convenience, and control (Rohde and Santarius, 2023). And a social media discourse analysis shows that, while critical actors dominate the public online discourse, they do not focus on environmental aspects but rather on issues such as surveillance, privacy and data protection, and cyber security (Rohde et al., under review).

The hope related to smart homes is - as for online consumption - one of efficiency. Most importantly, smart home systems have the potential to save energy by optimizing energy-consuming processes through sensors and intelligent (learning) algorithms (van Dam et al., 2013; Habibi, 2017). These smart applications include regulation of room temperature, e.g., by smart thermostats or smart window control; lighting control depending on room occupancy, e.g., by occupancy based lighting or smart lighting; recommendations for energy savings through visual feedback, e.g., home energy monitoring. Furthermore, the optimization of overall energy consumption by combining different smart home technologies in the smart home is expected to contribute to energy savings (IEA 4E., 2018). Smart home research has found an average heating energy reduction of 4% with smart heating control (Rehm et al., 2018). While some users in the field test achieved energy savings of up to 30%, others had an increase in energy demand of more than 25% (Rehm et al., 2018). Other results from agent-based modeling showed smart energy feedback information could help users reduce their electricity consumption by up to 2% (Walzberg et al., 2017).

In empirical studies (see Box 2), we found that several mechanisms can potentially diminish the energy savings from smart homes. From an environmental perspective, the drivers include the energy and resources from producing smart home technologies (Pohl et al., 2021). From a socio-technical perspective, they include changing lifestyle expectations on comfort, convenience or cleanliness, and related changes in user behavior (Tirado Herrero et al., 2018; Nicholls et al., 2020) due to digital technologies in the home. These mechanisms can again be captured to be either rebound or induction mechanisms.

5.2.1. Rebound mechanisms

If smart homes lead to savings in heating energy, people also save on money. This saving can be linked to a rebound mechanism: the **income mechanism**. People can use the saved money either on heating more or on consuming other goods and services.

The fear that the use of smart homes may lead to people making rooms warmer, or may increase the number of heated rooms in the household, can also be grounded on a psychological rebound mechanism, e.g., on **moral licensing** or **diffusion of responsibility**: As smart heating is supposedly energy saving, people might be inclined to heat more, as they think to have done their contribution by buying an automated heating already. And indeed, qualitative results of authors of this article suggest psychological rebound effects, such as pre-heating rooms or turning on heating in rooms that respondents said they would otherwise not heat (Rohde and Santarius, 2023).

However, a quantitative smart home survey did not reveal these rebound effects. It did not reveal any significant differences in heating behavior, with an average room temperature of 19.43 °C for the smart home sample and 19.45 °C for the control group (Pohl et al., 2021). Smart homes did not seem to entice users to increase room temperature.

BOX 2 Our studies on smart homes.

We conducted an interdisciplinary smart home study, which integrated concepts and methods from the fields of environmental assessment, environmental psychology, sociology, and science and technology studies. Our empirical insights are based on a quantitative survey with smart home owners in Germany with a smart heating system ($N = 375$), 12 user interviews, and a life cycle assessment that accounted for differences in user behavior. In addition, we conducted a twitter data analysis and a document analysis (Frick and Nguyen, 2021; Pohl et al., 2021; Rohde and Santarius, 2023).

Major findings are that the energy consumption due to the production and use of smart heating would necessitate at least a 6% reduction in energy consumption in heating in order for it to be environmentally beneficial. But smart home households purchase and use additional smart devices so that the reduction in energy consumption from heating would have to be even bigger. The quantitative survey shows that aspects such as safety, making everyday life easier, practical operation, convenience and financial savings are important motives for using smart home systems (Frick and Nguyen, 2021), which is one explanation for the large number of smart home devices that do not aim to reduce energy demand but to increase controllability and comfort (Strengers et al., 2020; Quitzow and Rohde, 2021). The findings show that four smart home user groups can be identified: enthusiasts, pragmatists, energy savers, and skeptics (Frick and Nguyen, 2021). Through a combination of quantitative network analysis and qualitative content analysis, we were able to reveal five discourse coalitions that form around certain storylines, namely "Threat"," Hackable", "Useless", "Fixable", and "Opportunity". It became evident that the most influential actors in the German online discourse were taking a critical stance toward the smart home (Rohde et al., under review).

5.2.2. Induction mechanisms

Instead, a major effect on the environmental impact of smart homes stems from the use of **additional smart home devices**, new options that do not contribute to energy savings in the home but instead provide other smart home services, such as comfort, security, or control. Based on our definition, these are induction mechanisms, as the application of these devices is due to new technological options not previously available. In our online survey, we found that smart home users with smart heating have, on average, eight additional smart home components, such as smoke detectors, humidity sensors, or cameras (Pohl et al., 2021). We estimated how much heating energy needs to be saved to offset the additional energy consumption due to additional devices in a smart home. The results showed that smart heating can only contribute

to overall savings of greenhouse gas emissions and primary energy demand when the associated devices can help save at least 6% of a household's annual heating energy. Hence, the potential overall energy savings due to smart heating are significantly reduced by the environmental impact of producing and operating additional smart home devices that serve other goals.

These induction mechanisms can be rooted in raising expectations and new consumer needs, such as energy-intensive ideas of cleanliness and wellbeing that exacerbate householder anxiety about cleanliness and increase energy consumption (Shove, 2003; Nicholls and Strengers, 2019). Research found that robotic vacuums, for example, could act as a "gateway" appliance to the adoption of other automated home cleaning appliances introduced to the smart home market (Nicholls and Strengers, 2019). With the increasing availability of automated devices in the home (such as shutters, light switches, windows), smart home devices may supplement rather than substitute "manual" household appliances (Nicholls and Strengers, 2019) and thus raise energy demand.

The smart home case shows - as did the online consumption case - that including induction mechanisms helps explain the relation between technological change and energy and resource demand. Indeed, the most important aspect that increases energy and resource demand - i.e., additional smart home devices - cannot be explained by efficiency increases alone but only by taking into account how technologies provide new consumption options.

5.3. Pace of life

Technologies can be time-savers. For instance, digital technologies can save time by providing services that might otherwise involve time-consuming journeys – obvious examples being online shopping vs. in-store shopping (see above), or replacing a trip to the cinema by video streaming at home. However, despite the introduction of new technologies, including digital ones, the pace of social life is accelerating (Levine and Norenzayan, 1999). An acceleration of the pace of life is understood as an increasing number of activities performed during a given day (Rosa, 2013). Does a higher "degree of digitalization" (e.g., more digital devices, an intensive use of apps, longer hours on the internet, etc.) lead to a faster pace of life - and thereby also increase energy and resource consumption?

Interestingly, debates around the speeding up of the pace of life have revealed a paradox, i.e., a counter-intuitive driver of social acceleration: "time-saving technology" (Wajcman, 2015). For instance, the introduction of the railroad in the nineteenth century has been identified as a driving force that greatly sped up the pace of life - although the railroad had started out as a time-saving endeavor in comparison to previous modes of transportation, such as walking, horses, carriages, or sailing ships (Schivelbusch, 2014). Against this background, it is interesting to investigate whether it is actually technologies' time-saving nature that increases the pace of life, in other words, whether time rebound mechanisms are a driving force of social acceleration. If this is the case, time-saving technologies are also likely to increase energy and resource consumption, as social acceleration includes more activities per given time frame. In our research (see Box 3) we found not only time rebound mechanisms but also inductions mechanisms.

BOX 3 Our studies on the pace of life.

To empirically investigate the relation between digital technologies and the pace of life, we conducted a representative online survey ($n = 1{,}393$) in 2019 in Germany (Santarius and Bergener, 2020; Bergener and Santarius, 2021). For the independent variable, we focused on information and communication technologies (ICT), assuming that many ICT applications either intend to or, de facto, serve to "save time."

Our study finds that any time efficiency improvements arising from applying ICT lead to spending the "saved time" in additional activities. The "degree of digitalization" among participants clearly correlated with the overall number of activities reported, and it was moderated by the time-saving nature of those technologies. Specifically, our data shows that individuals have a denser schedule partially because they use digital technology to (i) eliminate breaks, (ii) engage in increased multitasking, and (iii) replace time-intensive with time-saving activities. Note that our results suggest that time rebound mechanisms are not the only reason, and maybe not the main reason, for the phenomenon of an accelerated pace of life.

5.3.1. Rebound mechanisms

The application of digital technologies allows individuals to save time and thereby to conduct additional activities that are accompanied by some type of energy and resource consumption. This mechanism can be defined as a **time rebound mechanism**. In our empirical study, we do not find evidence for what may be called "direct time rebound effects," i.e., that the time-saving nature of digital technologies is a causal predictor of longer hours spent on digital devices, or on the internet (Santarius and Bergener, 2020). Yet our analysis suggests an empirical proof of what may be called an "indirect time rebound effect," i.e., that the time-saving nature of digital technologies is a causal predictor of more overall activities being performed during a day.

5.3.2. Induction mechanisms

Another mechanism at play in the process of digital technologies leading to a faster pace of life is asynchronicity, which is due to several new options for time use. For instance, email, short message sending, and other forms of social media engagement allow quick and asynchronous interpersonal communication; e-commerce allows shopping irrespective of opening hours; and streaming TV allows news and movies to be watched at times different to those of the official broadcasting program. Hassan (2003) argues that time in the light of the internet should be conceptualized as "digitally compressed clock time" that enables "connected asynchronicity."

Digital technologies bring about new options for asynchronous time use in two manners: First, activities can be performed whenever an individual wants; they become time-independent, e.g., shopping, communicating with friends, or watching news/movies becomes possible at nighttime. And second, individuals can more easily perform activities in parallel, which means they can improve on **multitasking**; e.g., shopping, communicating with friends, or watching news/movies all become possible at the same time. Note

that such tendency toward multitasking is not a sole feature of digital technologies but could already be observed with the rise of previous media technologies, e.g., watching TV while doing the dishes or meeting friends etc. However, digital technologies, and in particular applications based on mobile internet, have both qualitatively and quantitatively increased the multitasking circumstances and fields of application.

In a similar manner, new options for time use arising from digital technologies enable forms of fragmentation. For instance, the act of shopping can be split into several phases, as each phase of the "consumer journey" (researching information, considering product alternatives, the actual purchasing, retention, etc.) can be conducted separately. Likewise, an interpersonal communication to discuss an issue, which may have taken 10 min face-to-face or via the phone, can be split into multiple short messages over an undefined period of time. Again, digital technologies open up two new options for fragmentation with regard to time use. First, they allow for **instantaneity** as certain "parts" of previously one activity can be conducted quicker and anytime. As Southerton (2020) states, the constant connectivity and instantaneity of the network society offer new opportunities and freedoms for individuals to form their own network-based times of interaction. Second, fragmentation of time use again allows **multitasking** to be improved as it allows activities to be squeezed into down times, waiting times, or transfer times. For example, one can research a product on the way to work, check on price alternatives on the way home, and conclude the online purchase later in the evening while watching TV.

To sum up, digital technologies bring about new options that allow for both asynchronicity and fragmentation in time use and, hence, allow individuals to increase the number of activities performed in a given day. Yet note that such an acceleration of the pace of life, as well as fragmenting activities or doing them in parallel to other activities, may also lead to feelings of time stress, as well as to alienation. These mechanisms may generate countervailing mechanisms, including a deceleration of the pace of life. More severe impacts of an overwhelming number of options may lead to depression or even burn-out, again decelerating rather than accelerating the pace of life (Rosa, 2013).

Accordingly, as far as a faster pace of life is concerned, increasing time-efficiency and time rebound effects are not the only outcomes of digital technologies. New options due to using digital technologies can lead to induction effects, e.g., by way of asynchronous and fragmented behavior, which also leads to more activities per day. In turn, it can be argued (but yet remains to be empirically investigated) that more activities per day may entail more energy and resource consumption.

6. Discussion

The literature on the rebound effect has faced a serious trade-off. In some instances, the rebound effect is conceptualized relatively narrowly so that it can be clearly defined, a definition that places technological efficiency improvements as the premise of any rebound mechanism. But in that definition, important aspects of how technological change increases energy and resource consumption are left unconsidered. Alternatively, the rebound effect is defined broadly, with any development related to technologies' impacts on energy and resource demand efficiency being part of the rebound effect. In that definition, the concept of the rebound effect becomes fuzzy and of little use in the analysis of underlying mechanisms, their empirical investigation, and related policy recommendations on how to reduce the magnitude of rebound effects.

To solve this trade-off, we propose using the concept of the induction effect in order to keep a meaningful definition of the rebound effect while at the same capturing important mechanisms relating to technological change and energy and resource consumption. We suggest placing the emergence of new options as the premise of any induction mechanism. A specific technological change can either include both - efficiency improvements and new options - or only one of these two aspects and thereby also lead to either only one or both of the effects - rebound and induction.

The case studies described in the previous section indicate that a combined analysis of rebound mechanisms and induction mechanisms allows many more technology-related impacts on energy and resource demand to be captured. In fact, in the three cases, induction mechanisms appear to be more important than rebound mechanisms. For the e-commerce case, it remains unclear whether rebound mechanisms take place as the literature is ambiguous on whether online consumption actually increases efficiency. In contrast, induction mechanisms such as a wider product collection, being able to consume at any time and from anywhere, or the consumption-stimulating nature of online marketing clearly tend to raise consumption levels. For the smart home case, energy and resource consumption is increased most by additional digital household devices - which open up new options for action and consumption that would not be available if the home was not smart; in contrast, the empirical evidence on rebound mechanisms related to smart homes is inconclusive. For social acceleration, the increasing pace of life, both time rebound mechanisms and induction mechanisms, such as multitasking or conducting activities at times in the day that were formerly impossible, play important roles.

The case studies also indicate that there are different types of induction mechanisms. We propose differentiating induction mechanisms on two dimensions. First, the dimension related to what the new options are used for: whether they are used to buy, sell or do more of the same (quantity mechanisms - see Table 1) or to buy or sell new products or services or to do new activities (novelty mechanisms). Second, we differentiate whether these mechanisms take place on the production side or the consumption side; with a view to policy recommendations, this may allow to better identify which actors cause these mechanisms, e.g., firms or households/individuals. Table 1 gives an overview of the examples stemming from the cases discussed and some additional examples from digital technologies.

By way of these differentiations, we do not claim to provide an exhaustive collection of induction mechanisms. Rather we intend to spark further debate and scientific analysis on the phenomenon of the induction effect and anticipate that additional induction mechanisms will be identified in the future.

Taking induction mechanisms into account further strengthens the argument that sufficiency is needed, rather than focusing solely on efficiency. The reason is that induction mechanisms lead to more

TABLE 1 The induction effect: quantity and novelty mechanisms.

Dimension	Production side	Consumption side
Quantity mechanisms: Using new options to sell or buy do more of the same	• Online marketing • Personalized advertisements • Influencer marketing	• Buying products anytime and anywhere • Multitasking • Instantaneity
Novelty mechanisms: Using new options to sell new goods or services or to conduct new activities	• Production of personalized goods and services • Selling new products such as smart home devices	• Purchasing from a wider product collection • Buying newly available products such as smart home devices • Conducting new consumption practices, such as watching movies in the train

(quantity) and new (novelty) types of production and consumption, which may cause additional energy and resource consumption. The concept of sufficiency is well equipped for responding to both mechanisms as sufficiency takes a holistic view of how to live and produce within environmental limits while satisfying human needs. Implicit in this view is that neither efficiency gains nor new technological options should be used for generating additional consumption desires or activities, which may increase energy and resource use.

Including induction mechanisms also changes the analysis of necessary policy responses. A common policy recommendation from the rebound literature is that the savings from efficiency improvements need to be "taxed away or otherwise removed from further economic circulation" (Wackernagel and Rees, 1997). The idea is that, when the prices of energy and resources increase at the same speed as energy and resource efficiency improvements, the costs for firms and households stay the same and rebound effects can be prevented (von Weizsäcker et al., 2009).

If the induction effect is taken into account, it does not suffice to increase the price of energy and resources in line with efficiency improvements, as this response does not prevent firms from using new technological options to persuade consumers to buy more or from inventing new products that will be bought. Neither would it prevent households from using new options to conduct more or new activities. More appropriate in the induction case would be to think about politically inducing a reduction in the number of options. For instance, as digitalization in the transport sector has enlarged the number of options of how to get from one place to the other, e.g., by way of new forms of ride sharing, free-floating bike sharing or car sharing, e-scooters etc., politicians may find it easier to introduce legislation that reduces the number of options to use the private car, e.g., by way of restraining parking areas or establishing pedestrian zones. Or, for social acceleration, as digital tools now make it possible to work and be reachable anywhere and at any time, some firms have introduced policies that do not deliver emails outside working hours and restrict or prevent the reachability of employees via mobile phones after hours.

On the macroeconomic level, including induction effects into the analysis strengthens the argument for certain sufficiency-oriented policies. According to Callmer and Bradley (2021), a sufficiency orientation in policies for Global North economies and societies could be implemented through a policy of limits, a policy of less, a policy of slower and closer, and a policy of wellbeing. A concrete measure at the macroeconomic level is a reduction in working hours and thus also income (assuming that increases in hourly wages do not entirely compensate for the reduced working hours). Such reductions in income restrict the abilities of households to buy and conduct new options that go along with consumption. Hence, working hours reductions are a reasonable response to induction mechanisms. However, while reduced working hours may lead to a reduction in overall spending, it may not achieve a proportional reduction in energy use and emissions due to the associated changes in spending patterns. This is because households with more time and less money may allocate their financial and time resources differently (Sorrell et al., 2020). A shift toward more energy intensive activities can be addressed by increasing the price of such activities.

Therefore, a combination of policies geared toward addressing efficiency improvements (e.g., increasing prices of energy and resource consumption) and addressing new options (e.g., reduced average working hours) seems most effective in gearing the effects of technological change toward environmental sustainability.

7. Conclusion

The debate on efficiency, economic growth, environmental sustainability, and the rebound effect today is more timely than ever. The concept of the rebound effect is important in understanding the limitations of efficiency improvements to reduce energy and resource consumption. However, it leaves out important mechanisms via which technological change increases such consumption. Technological change brings with it several mechanisms that arise from the emergence of continuously new options, leading to additional production and consumption. We term the additional energy and resource consumption related to such mechanisms the induction effect.

Including the induction effect facilitates a better understanding of the relation between technological change and environmental sustainability. It broadens the view on necessary steps to reconcile technologies and the environment. It underpins the argument for sufficiency measures and opens up new debates on relevant policies. In this manner, the concept of the induction effect is one step to improving our conceptual toolkit on how to achieve sustainability.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

SL wrote the first draft and finalized the manuscript. VF, MG, JP, FR, and TS wrote specific sections to the manuscript. SL and TS conceptualized the article. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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