Handbook of
Peace Psychology

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Climate crisis, colonialism, and socio-ecological transformation

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Abstract

Climate justice now! – The call for climate justice shows that the climate crisis cannot be solved by ecological modernization alone. Criticism of the latter is voiced by climate justice movements that understand climate change not only as an ecological but also as a social crisis. To enable a socio-ecological transformation and a good life for everyone, we argue that the interplay between sociopolitical development and individual educational processes must be considered from a global justice perspective. The focus on changing individual consumption and lifestyles, which has long prevailed in the climate protection debate, has not only led to the depoliticization of sustainability efforts but it also ignores the impact of post-colonial structures in the (re-)production of global inequalities. The climate crisis is the expression and result of capitalist and colonial relationships of exploitation and power as well as racist structures. Climate protection, global justice and peace are interlinked and thus need to be considered together. This chapter aims to introduce some central terms and concepts that contribute to the understanding of the connections between climate crisis, colonialism, and socio-ecological transformation. Against this background, we first introduce the ecological and sociopolitical foundations of the climate crisis. We then present the UN agenda of sustainable development and the Sustainable Development Goals (SDGs). This is followed by criticism of the UN's understanding of sustainable development. We use the example of degrowth and sufficiency to show alternative approaches to economic activities within planetary boundaries. We also discuss the role and importance of education in socio-ecological transformation. To address this need, we present the Global Citizenship Education (GCE) approach, which refers to post- and decolonial theories and makes learning about colonial and racist social conditions the starting point of learning for a socio-ecological transformation. To conclude, we give a brief outlook alongside further research questions and implications for educational practices.

Keywords: climate crisis, sustainable development, SDGs, Global Citizenship Education, socio-ecological transformation, colonialism, capitalism, decolonization, degrowth, sufficiency

Social-ecological transformation as a necessity for the promotion of peace processes

In this introductory contribution, we present central terms, concepts, critiques and empirical findings that shape the current discourse with regard to the causes and consequences of the climate crisis and its management. In particular, we refer to critiques that have emerged in the context of post-, decolonial and capitalism-critical approaches and are increasingly gaining relevance in the sustainability discourse. First, we introduce the concepts of planetary boundaries, tipping points and the Anthropocene. Then, we focus on the social and political dimensions of the climate crisis and explain the meaning of the term climate justice. Subsequently, we introduce the guiding principle of sustainable development and the Sustainable Development Goals (SDGs). This is followed by an introduction to the discourse on post-growth and sufficiency. Furthermore, we discuss the importance of education in a socio-ecological transformation. For this purpose, we present in more detail the educational approach of Global Citizenship Education (GCE), which concerns post- and decolonial theories and makes colonial and racist social relations the starting point of learning for a socio-ecological transformation. Finally, our contribution concludes with an outlook alongside further research questions and implications for educational practices.

Climate change and environmental destruction

Climate change[1] is very well researched with regard to the scientific phenomenon of global warming due to the increase in the concentration of carbon dioxide (CO_2) in the atmosphere. The associated worldwide threat to livelihoods represents one of the greatest challenges for the global community in the 21st century (Rahmstorf & Schellnhuber, 2019). Presently, all humans globally use so many resources that we would require 1.75 Earths per year to permanently inhabit the planet (Steffen et al., 2015). The decisive share of this overuse and the related climate-damaging emissions can be attributed to the wealthy industrialised nations. In particular, the richest 10% of the world's population (approx. 630 million people) are responsible for 52% of cumulative carbon emissions (i.e., the total historical emissions of a country or of population groups; Gore, Alestig & Ratcliff, 2020). As a result, the Earth's natural systems are under severe strain. The decline in biodiversity, the change in climate and the death of forests are evidence that some of the *planetary boundaries* have already been reached and that humanity is about to leave, or has already left, the secure margin of

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[1] We do not use the terms climate change and climate crisis directly synonymously. Climate change initially refers to the physical phenomenon. The use of the term climate crisis emphasizes the social causes of climatic changes that are already taking place and aims to point to social inequalities in their causes and effects. These, in turn, are primarily the effects of ongoing power relations and colonial history, as we will show in the following. Ultimately, however, both terms are used in the discussion about necessary measures for climate protection and the socio-ecological transformation and are sometimes used interchangeably. Both terms are intended to refer equally to the urgency of social transformation processes.

action in relation to key geophysical processes (Folke et al., 2021; Lade et al., 2020; Rockström et al., 2009). As the Earth increasingly warms, *tipping points* in the Earth's system are crossed. Tipping points refer to supra-regional components of the Earth's system that influence its stability. They can be divided into three classes: ice bodies, flow and circulation systems of the oceans and the atmosphere as well as ecosystems (Potsdam Institute for Climate Research, 2017). Crossing these tipping points leads to feedback processes that can trigger a chain reaction so that, in turn, further tipping points in the Earth's system are surpassed. This process is referred to as a tipping cascade and can lead to serious and possibly irreversible global changes in the Earth's system (Schellnhuber, Rahmstorf & Winkelmann, 2016; Steffen et al., 2016; Steffen et al., 2018). Climatic changes affect important areas of human life such as health, food supply, housing, work, and the economy, thereby threatening human livelihoods (Hoffmann, 2021). For this reason, climate scientists also speak of humanity as situated in the geological age of the *Anthropocene*. The term Anthropocene (Greek ánthrōpos = human; kainós = new) illustrates the serious interventions of human activity in nature and simultaneously shows its responsibility for the global future (Crutzen & Schwägerl, 2011). Some scientists even speak of the *Capitalocene* as they see the origins of climate change in a globalised capitalist economic system (e.g., Moore, 2013, 2016a, 2016b). The consequences of an economic system oriented towards growth and monetary profit are by now globally visible: the climate crisis and the progressive destruction of nature are closely linked to a rise in social inequality and social conflicts, which, in turn, are themselves the cause of growth-oriented economic relations. According to the Intergovernmental Panel on Climate Change [IPCC], the average temperature increase of 1.5°C compared to the pre-industrial level will already be reached in the 2030s – even though almost all countries of the world made a legally binding commitment in the 2015 Paris Climate Agreement to change the global economy in a climate-friendly way and to pursue ambitious national climate protection goals (Masson-Delmotte et al., 2021). However, as of yet, efforts to reduce emissions have fallen short of Paris' expectations ("CAT Emissions Gap", 2021; United Nations Environment Programme, 2020). The Corona pandemic alone slightly – but not permanently – reduced global CO_2 emissions (Betts et al., 2020; Le Quéré et al., 2020). In order to limit the destruction of nature and to overcome the increasing global social inequalities caused by climate change, a socio-ecological transformation is needed. At the national level, this was comprehensively described for Germany for the first time in the report of the Scientific Advisory Council on Global Environmental Change of the German Federal Government (in German: Wissenschaftlicher Beirat für Globale Umweltveränderungen der Bundesregierung [WBGU]) (2011). At its centre, the report focuses on a radical restructuring of society. This requires new ideas and concepts of development, social transformations, alternative economic models, ecologically and socially oriented policies, diverse participation opportunities and transformative educational approaches.

Colonialism, social inequality and climate crisis

In the 1980s, US environmental justice movements criticised the lacking link between climate protection and social justice. At the COP26 climate conference in Glasgow, indigenous, anti-racist and feminist climate activists pointed out that a sustainable way of living requires a systemic change that breaks down historically developed geopolitical relations of power and dominance (Sultana, 2022). They refer to the relationships between colonialism, capitalism and climate change. Since the 2010s, there has been an increase in social science research on climate change, aiming to understand the climate crisis, its causes, consequences and strategies of adaptation in their social dimension (e.g., Dryzek, Norgaard & Schlosberg, 2011; Faist & Schmidt, 2020; Sultana, 2022; Williams, 2021). Although climate change is recognised as a societal threat (Rubik, Müller, Harnisch, Holzhauer, Schipperges & Geiger, 2019), socio-political measures to combat it have so far been insufficient to reach the 1.5°C target (Masson-Delmotte et al., 2021). The *imperial way of life* of Western industrialised nations and rising, newly industrializing countries which is characterised by a way of life beyond natural conditions and its accompanying systematic externalisation (i.e., systemic and targeted outsourcing) of (environmental) costs makes a socio-ecological transformation difficult or even impossible (Brand & Wissen, 2017; Lessenich, 2016). This Western imperial way of life is enabled or promoted by a globalised capitalist economy. It is reflected in the norms of production, distribution and consumption. It is difficult to discontinue the imperial way of life because it is anchored in all (Westernised) areas of society: in "political institutions and the economy, culture and mentalities, the orientations and interests of relevant political and societal actors, as well as in everyday practices" (Brand & Wissen, 2017, p. 43; own translation). The imperial way of life reflects colonial continuities and the associated exclusion mechanisms (including racism). These historically evolved power structures also shape climate policy action, in that, for example, international climate governance continues to be largely determined by countries of the Global North (Abimbola, Kweso Aikins, Makhesi-Wilkinson & Roberts, 2021). Therefore, the (re)production of global socio-ecological inequalities in relation to climate change is best understood through an intersectional perspective, which, however, has only been partially developed so far (Anderson, 2021; Backhouse & Tittor, 2019). *Intersectionality* refers to the interaction of different forms of discrimination such as class, sexism and racism. As an example, this can be illustrated by highlighting which groups are (or may get) engaged in combating climate change. The Institute for Protest and Movement Research shows that in Germany predominantly well-educated, White young people and especially women join the climate protests of Fridays for Future (Sommer, Rucht, Haunss & Zajak, 2019). On the other hand, people with a so-called migration background, for example, are underrepresented in the protests and in youth environmental associations (Sommer et al., 2019). Given that the climate protection movement motivates both civil society and political actors to take action (e.g., Holfelder, Singer-Brodowski, Holz & Kminek, 2021; Wallis & Loy, 2021), it is all the more important for the climate protection movement to address and confront themselves with the structural

barriers that prevent diverse social groups from joining the climate protests or otherwise raising their political voices.

The concept of climate justice does not only address the fair distribution of the CO_2 budget and the distribution of burdens in the reduction of global greenhouse gas emissions (e.g., climate debt and responsibility of the Global North). Rather, in addition to ecological and social distributional and procedural justice, a broader understanding of climate justice is concerned with justice between genders and social groups, e.g., with regard to the representation of interests and social and political participation (e.g., Brunnengräber & Dietz, 2016; König, 2021). Climate justice further signifies a democratically shaped climate policy that is oriented towards social justice for present and future generations in the Global North as well as in the Global South. In Germany, the Federal Constitutional Court in a ruling on climate protection and climate neutrality in March 2021 mandated the German government to set more precise reduction targets of greenhouse gas emissions for the period beyond 2030. This historic ruling not only emphasises the political responsibility in addressing the climate crisis in general, but for the first time specifically focuses on justice in the form of a "protection obligation" (in German, "Schutzverpflichtung") between current and future generations with regard to available resources and the associated quality of life. The resolution of 24.03.2021 states:

> "The protection of life and physical integrity under Article 2 Paragraph 2 Sentence 1 of the Constitution [in German, "Grundgesetz"] includes protection against impairments of fundamental rights through environmental impact, regardless of by whom and through which circumstances they are threatened. The state's duty to protect, which follows from Article 2 Paragraph 2 Sentence 1 of the Constitution, also comprises the obligation to protect life and health from the dangers of climate change. It can constitute an objectively legal obligation to protect also in respect of *future generations*."
> (Federal Constitutional Court, 2021, 1st paragraph; own translation)

Looking at climate change from a climate justice perspective sensibilizes for understanding the climate crisis as a social crisis embedded in historically evolved relations of power and dominance. The origins of climate change and its consequences are closely interwoven with colonialism and racism. The European colonisation of the world was heralded by the conquest of America in 1492. It has led to the rapid spread of capitalism and has come to be reflected in ecological and social practices of exploitation. For example, Quijano (2016) illuminates that capitalism as the dominant global power pattern in the 21st century is intertwined with the emergence of racism. The European colonial powers created the idea of race to legitimise domineering practices towards the colonised. This built the foundation of an ethnic classification of the world's population and became the starting point for the organisation of capitalist rule. Indigenous peoples, Black-African slaves and other subjugated populations did the work for the White European colonial powers to systematically set up the accumulation of wealth in the centres of Europe and North America. Latin American

decolonial authors use the term coloniality to describe the effects of the European colonial era that continue to have an impact today, as seen, for example, in today's economic value chains: While many countries of the Global South are dependent on the export of unprocessed raw materials (e.g., oil or rare soils for the production of smartphones), it is predominantly the Global North that benefits from the value creation (Clark, Auerbach & Longo, 2018). In order to protect the individualistic, consumption- and city-oriented development of a global elite that is small in comparison to the rest of the world (Gore, Alestig & Ratcliff, 2020), ecological consequences and social inequalities in the producing countries are accepted, which in turn are further exacerbated by the climate crisis. This can be seen, for example, in relation to gender-specific vulnerability and social exploitation as environmental conflicts increase (Cameron, Hemingway, Cunningham & Jacquin, 2021). The consequences of the climate crisis are felt above all where poverty, conflicts and wars already have a destabilising effect on societies – and thus affect the people who have contributed least to the climate crisis.

The climate crisis threatens to further exacerbate existing colonial and racist relations. This can be seen, for example, in the fact that the effects of climate change disproportionately affect the formerly colonised and BIPoC (Black, Indigenous and People of Colour). For example, many indigenous peoples, who are often highly dependent on income from agriculture, fisheries and other ecosystems, are particularly at risk (United Nations, 2020). However, environmental or climate racism is not only experienced by people in the Global South. The racist effects of environmental and climate racism are also enhanced in Germany by consequences of climate change. Initial studies show that people with a so-called migration background are increasingly exposed to health risks because they live in cities and neighbourhoods that are particularly affected by increasing heat stress and heat waves (e.g., Senate Department for the Environment, Transport and Climate Protection [Senatsverwaltung für Umwelt, Verkehr und Klimaschutz], 2019). Climate change consequences thus contribute to further fuelling already existing conflicts between groups. Conversely, the asymmetric power structures continue to exacerbate the climate crisis: "Racism is an environmental threat because it reinforces and reproduces the dominance of the basic social structures that are behind the generation of the environmental crisis – which are the structures behind its own generation" (Hage, 2017, p. 15). For example, water scarcity due to climate change can threaten drinking water and food supplies in many places in the world and is particularly life-threatening for minorities and socially disadvantaged groups (Anderson & DeLisi, 2011; see chapter "Climate change and environmental conflicts" by J. Schilling & L. Werland). This in turn can lead to flight and migration movements, further fuelling conflicts (Brzoska & Fröhlich, 2016). Studies show that people who are confronted with threatening information about the climate crisis support more authoritarian measures and act more aggressively towards minorities (Fritsche, Cohrs, Kessler & Bauer, 2012). The integrity of groups is threatened by the climate crisis. The obvious as well as subtle effects of the climate crisis pose an existential threat to human security, peace and democratic

cohabitation. Certain worldviews, in particular, and their concrete political and social implementation contribute significantly to whether people support climate policy measures or take action themselves – the more right-wing conservative, the less support for climate protection policy measures (McCright & Dunlap, 2011; McCright, Dunlap & Marquart-Pyatt, 2016; Poortinga, Spence, Whitmarsh, Capstick & Pidgeon, 2011; Stanley & Wilson, 2019). These developments are alarming as social change processes and reformatory climate policies become even more difficult to implement and democratic systems are destabilised.

The guiding principle of sustainable development and the Sustainable Development Goals as a global minimum consensus

The principle of sustainability moved to the centre of international scientific and political debates in the second half of the 20th century. In the report "Our Common Future" by the United Nations Commission on Environment and Development, *sustainable development* is defined as: "[...] development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987, p. 43). The definition points out that future generations will be at risk if social development is not shaped according to sustainable principles. It integrates two perspectives of justice: *inter*generational justice, i.e., society's responsibility towards future generations, and *intra*generational justice, which addresses the equitable distribution of resources in the present. In essence, the promotion of sustainable development is a search, learning and design process for society as a whole, which is associated with numerous conflicting goals, such as: What satisfaction of needs is granted to whom? What conditions are needed so that people can satisfy their needs regardless of origin, age, gender, etc.? What are the characteristics of a "sustainable way of life"? What systemic changes are needed to promote sustainable development?

These questions illustrate that the concept of sustainable development is a normative concept that integrates different notions of prosperity, justice, community and future depending on the context. The concept of sustainable development is criticised for being subject to a Western understanding of development. This understanding posits progress and development as a unilinear process, at the end of which stands an ideal image of a modern, progressive society – a society of enlightened, autonomous and rationally acting individuals who think and act within classical growth narratives (e.g., Burchardt, Peters & Weinmann, 2017; Schöneberg & Ziai, 2021). Such an understanding of development is problematic since it invokes a Eurocentric worldview, which is expressed, for example, in characterising populations as developed versus underdeveloped, progressive versus backward, traditional versus modern (Castro Varela & Dhawan, 2015). It further leads to cultural superiority thinking and thus to racialisation processes (Castro Varela & Dhawan, 2015). Castro Varela and Dhawan (2015) advocate for recognising the ambivalences of the development process and considering the interests of the most vulnerable groups in the Global South.

Inspecting the historical development of the concept of sustainable development, the debate on sustainability was initially dominated by ecological issues. In the course of global industrialisation at the end of the 1960s, the relationship between capitalist economic methods and the destruction of the natural foundations of life was discussed more intensively. An important milestone is the study of the Club of Rome on the "Limits to Growth", which has generated worldwide resonance (D. L. Meadows, D. H. Meadows, Milling & Zahn, 1972). The scientists of the Massachusetts Institute of Technology (MIT) point out the connections between exponential economic growth, the associated production methods and consumption patterns in certain countries of the world and their effects on the natural foundations of life. Thus, they set in motion an international scientific and societal discussion about the Western model of prosperity (D. L. Meadows et al., 1972). In the 1980s, the concept of sustainable development increasingly found its way into international political discourse. The 17 *Sustainable Development Goals* (SDGs) represent an attempt to negotiate a shared understanding of sustainable development in a global participatory process involving different perspectives, actors and interests. The 2030 Agenda "Transforming our World" was adopted by the United Nations General Assembly in New York in September 2015. The associated SDGs outline a transformative and comprehensive action framework for actors on a state, private and civil society level. The SDGs are aimed at countries in the Global North and Global South that have committed to taking measures to promote sustainable development. The SDGs address goals ensuring a sustainable, peaceful, healthy and equitable life for present and future generations. These include poverty (SDG#1) and hunger reduction (#2), health (#3), quality education (#4), gender equality (#5), climate protection (#13), peacekeeping (#16) etc. The SDGs are unique in their design. They have been adopted and formulated as a global agreement by 193 states. However, such an action plan can only represent a minimum consensus that combines many different goals and aspirations. Consequently, there is a great deal of criticism towards the concept. The International Council for Science (ISC), for example, criticises the SDGs as internally inconsistent and thus unsustainable – at least as long as the cross-connections and complex dynamics between individual goals are ignored, such as the conflict between strong ecological sustainability and economic growth (Stevance, Mengel, Young, Glaser & Symon, 2015). Hickel (2019) also argues that these two sides – ecologically sustainable use and economic growth – are incompatible since a positive correlation between economic growth and development in terms of better health, less poverty and hunger can only be observed in countries with low average per capita income. With regard to the perpetuation of colonial continuities, Denk (2021) states that the SDGs remain entrenched in a Eurocentric framework of ideas in important respects, e.g., in that they follow the logic of a Western approach to development and divide states into "developed" and "developing". Furthermore, the SDGs make no concrete reference to colonialism and avoid addressing the causes of global inequalities.

Against this background, it is all the more important to face the question of what kind of education under which conditions can contribute to critical engagement with the SDGs. Educational work can address the conflicting goals and dilemmas of the SDGs and encourage creative action (Rieckmann, 2019). Education itself is emphasised in the SDGs. SDG4, aims to ensure inclusive, equitable and quality education as well as lifelong learning opportunities for all (United Nations, 2015). In particular, sub-goal 4.7 specifies that all learners should acquire the knowledge and skills necessary to promote sustainable development, including through education for sustainable development and sustainable lifestyles, the protection of human rights, the goal of gender equality, a culture of peace and non-violence, global citizenship and appreciation of cultural diversity as well as the contribution of culture to sustainable development.

Post-growth and sufficiency orientation

Economic norms, ideologies and values play a decisive role in understanding and dealing with the climate crisis and, thus, in the search for solutions to questions of justice. The concept of sufficiency can make a crucial contribution here and can be considered a key for transformation processes (Tröger & Reese, 2021). The socio-ecological transformation requires the creation of new framework conditions for social restructuring (WBGU, 2011). In this context, dominant logics, established infrastructures and practices need to be reconsidered and adjusted regarding decarbonisation, i.e., decoupling economic processes from climate-damaging CO_2 emissions and carbon turnover (Göpel, 2016; D. H. Meadows, 1999). Central areas are persistent forms of capital accumulation, the massive expansion of economic activities on a global scale and so-called extractivism. This describes an intensive form of resource extraction, use and export as well as the (over-)exploitation of human labour. Welzer (2011) points out that these activities have fundamentally changed human habits of thinking. In his essay "How growth came into the world and into souls" [in Germany, "Wie das Wachstum in die Welt und in die Seelen kam"], he describes how the notion of growth has permeated all areas of life in Western cultures and dominates decision-making and the handling of the climate crisis itself (Welzer, 2011). These so-called "mental infrastructures", as Welzer calls them, cause climate-damaging consumption practices, persistence in established structures and path dependencies that must be addressed in order to initiate transformative processes. An example is the consideration of today's full-time employment and the associated use of individually available time for more or less CO_2-intensive consumption and care work. People who are employed full-time earn more money and usually use this money to engage in energy-intensive consumption practices – especially in the areas of mobility and housing (Bader, Hanbury, Neubert & Moser, 2020). Structural promotion of part-time models can, for example, provide freedom for more ecological behaviour, such as the use of sharing offers or the renunciation of motorised private transport, by means of a profit in *time prosperity*. In addition, this is accompanied by positive effects on individual and social well-being (Bader et al., 2020).

Such a transformation requires diverse forms and spaces for public engagement in order to enable ideas about future ways of living and doing business within the framework of democratic participation processes. In addition, there is a need for concrete opportunities to try out transformative forms of living and doing business (e.g., solidarity-based agriculture, citizens' climate councils or a 4-day working week). The post-growth movement can also be positioned within such a context and "search process". *Post-growth* (or *degrowth*) is an umbrella term for a wide range of movements that strive for a socio-ecological transformation in various areas of society (Schmelzer & Vetter, 2019). The post-growth movement considers itself a conceptually open critique of current ideas of consumption and lifestyles as well as a space for the development of visionary ideas for a better and more socio-ecological future. Its basic idea is to push back against the primary economic guiding principles of unlimited growth as the main marker of social prosperity. Instead, the focus is set on the satisfaction of basic physical and psychological needs that must – and can – be compatible with planetary resources in order to ensure a good life for all in the long term (O'Neill, Fanning, Lamb & Steinberger, 2018). Thereby, according to Schmelzer and Vetter (2019), a post-growth society is characterised by the fact that "in a process of democratic transformation [it] enables 1. *global ecological justice* [...], 2. *strengthens social justice and self-determination* [...] and strives for a *good life* for all people, and 3. transforms their institutions and infrastructures so that they both enable a good life for all and are *not dependent on growth and increase* for their functioning" (pp. 158-159; own translation). For such a transformation, it is necessary to "re-politicise technological and infrastructural developments" (Schmelzer & Vetter, 2019, p. 172; own translation) and to instead test them in new, solidary forms of living together. This also means taking collective responsibility for production and consumption processes (Schmelzer & Vetter, 2019, p. 167) as well as re-localising essential components of them to achieve independence from growth (Schmelzer & Vetter, 2019, p. 172).

One movement that has by now become established within the post-growth movement, especially in the German-speaking region, is the sufficiency movement (Latin sufficere = to suffice, to be enough) whose goal is to "radically reduce resource consumption" (Schmelzer & Vetter, 2019, p. 153; own translation). This can be achieved, for example, through the creation of local economies that are decoupled from profit maximisation, as well as "do-it-yourself practices", "voluntary simplicity" and the voluntary renunciation of resource-intensive consumption (Schmelzer & Vetter, 2019). Sufficiency focuses on individual behaviour and the power of consumption reduction as contributions to climate protection. This is one of the reasons why sufficiency is close to concepts such as "voluntary simplicity" – a voluntarily simplified and materially reduced lifestyle (Alexander, 2013; Leonard-Barton, 1981) – or frugalism (Alcott, 2008; Goldsmith, Reinecke Flynn & Clark, 2014). Sufficiency, however, has become part of the interdisciplinary sustainability debate and, as one of three prominent sustainability strategies, i.e., together with *efficiency* (= increase in resource productivity) and *consistency* (= economic activity and technological innovations

based on nature's example and the principle of circulation), strives to make a systemic contribution to socio-ecological transformation (Spengler, 2016). Although individual behavioural adjustments are a means to an end, the sufficiency approach by no means wants to pass on responsibility for the transformation to the individual alone but wants to change the systemic conditions for that behaviour, correspondingly. As a strategy, sufficiency means creating political and infrastructural framework conditions in which less consumption and resource usage is made possible (Spangenberg & Lorek, 2019; Toulouse et al., 2019). However, sufficiency is often devalued as a dogma of renunciation due to its explicit reduction logic and marginalised in the political sustainability discourse due to its incompatibility with the current economic model (Göpel, 2016). Yet, the indispensability of sufficiency becomes clear in that a pure focus on efficiency developments has so far led to economic and psychological *rebound effects* (Santarius & Soland, 2018). This means that efficiency-induced saving effects have been cancelled out and expected reduction potentials have fallen short of expectations (Jackson, 2017; Vadén et al., 2020). Psychological rebound effects occur when usage preferences change as a result of more efficient technologies in such a way that they – nevertheless or elsewhere – lead to increased consumption. For example, the purchase of an energy-efficient car can be associated with more kilometres being travelled than before, or people purchasing an e-car although they previously only used public transport. On the production side, rebound effects can also negatively affect the life cycle assessment, for example if a car becomes more efficient in the use of resources and at the same time capable of transporting more mass – and, thus, larger vehicles are built. The sufficiency perspective is therefore necessary to achieve actual savings and decarbonisation by means of efficiency and consistency.

However, the strategy of sufficiency is not only associated with an urgent need for emission reductions but also with the realisation that psychological need satisfaction and well-being are possible independently of resource-intensive consumption and nature use and central to a socio-ecological transformation (O'Neill et al., 2018). At the individual level, less materialism and consumption have been shown to be associated with psychological well-being and environmental protection behaviour (Dittmar, Bond, Hurst & Kasser, 2014; Kasser et al., 2014). People who pursue intrinsic values (e.g., strive for personal development, self-acceptance, belonging and community) instead of extrinsic values (e.g., material success, external rewards or status gain) consume less and have more satisfying relationships, which in turn can lead to environmentally friendly behaviour (Kasser, 2017). Sufficiency aims to pick up precisely here, strengthening intrinsic values and, thus, advancing socio-ecological transformation. Strategies as to how this can be implemented in practice and in different social spheres are being investigated by applied research on time prosperity, among others. Here, for example, the effect of working time reduction on environmental protection and well-being is empirically analysed and its potential for long-term, transformative processes is derived (Bader et al., 2020).

Education for a social-ecological transformation

In the context of socio-ecological transformation, the question of the role and significance of education arises. On the one hand, education has the potential to promote the ability to critique, reflect and act, thus representing a central component of social change (Rieckmann, 2019). On the other hand, education can contribute to the perpetuation of colonial inequality and the reproduction of racist worldviews, for example, if marginalised groups are denied access to education, if colonial knowledge is conveyed by educational institutions, or if Eurocentric notions of "development" and a "good life" are not reflected in sustainability-oriented education (e.g., Danielzik, 2013).

Due to the historically developed colonial and racist structures, practices and discourses, Stein, Andreotti, Suša, Ahenakew and Čajková (2020, p. 2) assume that climate change and the associated crises are not primarily rooted in ignorance or immorality but rather in modern-colonial habits of being. This modern-colonial mode of existence is characterised by a violent and unsustainable human-nature relationship, which is based on capitalist exploitation practices and Western-dominant ways of life. Taking Eurocentric epistemologies and perspectives into account, Mignolo (2012) argues for the decolonisation of subjectivity (i.e., knowledge, thinking and being). Therefore, according to Mignolo (2012), it is necessary to decolonise modern, colonial thinking. What kind of education can support socio-ecological transformation? Stein and colleagues (2020, p. 7) make a plea for an education that prepares learners for the *end of the world as we know it*. In the context of education for socio-ecological transformation, it is central that learners become aware of their own entanglement in colonial relations and confront their own inner resistances that maintain the illusion that "we" are on the right path towards sustainable development (*interrupting our denials*) (Stein et al., 2020, p. 6). Overall, Stein and colleagues (2020, p. 6) identify four key resistances that complicate educational processes – understood as the transformation of world- and self-relations (Koller, 2018): The first resistance is wanting to claim that *systematic colonial violence* in the form of racism, gender inequalities, and economic exploitation is part of and maintains the dominant system but that it does not happen with "us" or, if so, only constituting an exception. Technological progress and development are thus partly legitimised and injustice is accepted as collateral damage. The second resistance is not wanting to admit that we live in an *ecologically unsustainable system* that is based on endless economic growth and consumption and ignores planetary boundaries. Typical responses to this are to delay active climate action by believing that innovative, progressive technologies alone can stop climate change, to justify inaction by shifting responsibility (to individuals, certain actors outside one's sphere of influence or future generations) (Lamb et al., 2020), or to actively and systematically deny climate change (Farrell, McConnell & Brulle, 2019; Harvey et al., 2018). Studies show that climate change-sceptical and -denying attitudes are linked to nationalist, right-wing populist, racist tendencies and male-dominated power structures (Hultman, Björk & Viinikka, 2019; Jylhä & Hellmer, 2020; Krange, Kaltenborn & Hultman, 2019). However, not recognising that we live

in an ecologically unsustainable system is not a phenomenon at the margins of society but one of the broad centre, which tends to favour solutions that operate within the same system (e.g., technological innovations, "green growth"; Lamb et al., 2020). The third resistance is expressed in not wanting to admit that one is *entangled in the modern-colonial system in many, complex ways*. This can lead to a complete rejection of entanglement and simultaneously to the assertion of individual rights, for example, when one's own freedom in owning an SUV is defended and placed above collective, legally binding goals of CO_2 savings in the transport sector. Finally, the fourth resistance to *downplay the severity and profoundness of the challenges* supports the previous three by perpetuating the illusion that we can maintain the current social system with (technological) solutions.

Against the backdrop of the importance of education for socio-ecological transformation, the educational concept of *Global Citizenship Education* (GCE) (for an introduction to GCE, see Sant, Davies, Shultz & Pashby, 2018) can be drawn upon as an example, which has become particularly prominent in the Anglo-American world. Andreotti and the collective "Gesturing Towards Decolonial Futures" (e.g., Andreotti, 2006; Andreotti, 2011a, 2011b; Andreotti & Souza, 2012; Stein et al., 2020) but also other researchers (e.g., Abdi, 2015) have developed an educational approach that makes the confrontation with colonial and racist social relations the starting point for educational processes. Decolonial education within GCE aims less at teaching content and acquiring competences. Rather, it is about dealing creatively and artistically with diversity, plurality, complexities, paradoxes, ambiguities and uncertainties without falling into hopelessness and powerlessness (Andreotti, 2021, pp. 12-13). *Dealing with inequalities* offers the possibility of engaging with the causes and effects of historical, systemic and ongoing violence and to develop ideas for change. The *study of sustainability* aims to develop skills to grasp the complexities of climate change consequences and to act responsibly. The *study of discrimination* should enable diversity and protect against reproducing cultural stereotypes about e.g., migrant minorities and People of Colour, evolutionist ideas of indigenous peoples and linear ideas of development. At the same time, the limits of representation, recognition and redistribution should be questioned. Finally, *responsible participation* is necessary, reflecting on one's own actions and one's own social (power) position. This can help to acknowledge one's own *complicity* and to look for ways of fairer participation. In psychological research, the concept of *global identity* is comparable to the foundations of GCE and has been increasingly studied, especially in the last decade. Identifying as a global citizen (McFarland et al., 2019) is often associated with pro-social, socially just and environmentally protective attitudes as well as behaviours (e.g., Joanes, 2019; Reese & Kohlmann, 2015; Renger & Reese, 2017) – not only in societies of the Global North (Rosenmann, Reese & Cameron, 2016). At the same time, however, there is debate about the extent to which a global identity can be truly "global" – or merely a reproduction of Western notions of individual freedom and justice (Rosenmann et al., 2016).

Conclusion and outlook

The aim of this contribution was to provide an overview of the relationships between the climate crisis, colonialism and socio-ecological transformation. Our – hopefully conveyed – point is: If the global community takes the call for climate justice seriously, it needs alternatives of solidary and ecologically sustainable coexistence, for which we have presented examples in this chapter. Depending on the form taken, socio-ecological transformation and sustainable development offer target perspectives and design options. The climate crisis and its multiple consequences significantly endanger all human and non-human livelihoods and peaceful coexistence on Earth (Masson-Delmotte et al., 2021). Based on broad scientific and societal debates, important approaches to solutions have already been developed, which we have presented rudimentarily. However, it must be stated that the negotiation of solutions to the climate crisis is a conflict-ridden and yet insufficiently transformative process in view of limiting global warming to 1.5°C (Masson-Delmotte et al., 2021). The collectivisation rhetoric repeatedly used within the public climate change discourse suggests that all people have the same future interests and prerequisites in solving the climate crisis. The historical and structural causes of poverty, inequality and unsustainability are thus obscured. This rhetoric is not transparent regarding the responsibility for change and fuels conflicts between different social groups. In respect to concrete measures, a conflict is emerging, in particular, between proponents of continued economic growth and the green growth debate, on the one hand, and proponents of alternative models of prosperity and economics as well as of the post-growth society, on the other hand. Many approaches to sustainable development, such as the SDGs, seek to overcome the climate crisis within the existing political and economic order, while the post-growth movement more provocatively searches for solutions and more strongly integrates the potential of social dynamics. Representative surveys show a great openness among the population for a shift away from the growth paradigm (Rubik et al., 2019) but it is the task of future research and practice to provide perspectives for the implementation of approaches based on post-growth in concrete economic activities and areas of life.

In view of education, different conceptions of the design of an education oriented towards socio-ecological change are under discussion (e.g., Eicker et al., 2020). In particular, the observation that many current educational concepts are dominated by a modern-colonial perspective (Andreotti, 2021) can be understood as a thought-provoking impulse to make further efforts to decolonise the foundations of educational theory as well as common educational practice. This means that educational actors should critically and reflectively engage with their educational approaches in order to avoid the (unconscious) reproduction of violence, power inequalities, racism and Eurocentrism in educational work. Further, it is of importance to become aware of one's own role and positioning in society (e.g., status, skin colour, gender etc.). Dealing with the continuities of colonial power and domination is an essential prerequisite for post- and decolonial education. Global Citizenship Education (GCE) aims to contribute to learners becoming aware of their own coloniality of thought. This

creates a basis for collectively searching for decolonial options on how different ways of relating to the world, of generating knowledge and being in the world can coexist within the framework of ecological boundaries. However, specifically in the German-speaking region, there is a need for further theoretical as well as empirical engagement with post- and decolonial consideration of educational processes and pedagogy (e.g., Akbaba & Heinemann, 2022; Bergold-Caldwell & Georg, 2018; Boger & Castro Varela, 2021; Knobloch, 2019; Knobloch & Drerup, 2022).

This chapter has illuminated that the inclusion of post- and decolonial critique can already lead to shifts in meaning and new directions of attention in scientific and non-scientific climate change discourses. In view of the climate crisis, it will be a matter of questioning and further developing fundamental concepts – such as those we have presented here – as well as developing new concepts for socio-ecological transformation. The socio-ecological transformation of society is and remains a search process with an open result.

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