



Talkin' bout a revolution: an expert interview study exploring barriers and keys to engender change towards societal sufficiency orientation

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Abstract

Representative studies report high levels of acceptance of environmental protection and approval for stricter political measures to ensure a liveable future. However, in the last years, climate-damaging emissions did not decrease in accordance with the Paris Agreement, and important societal actors failed to implement effective strategies that could promote a socio-ecological transformation. Sufficiency with its underlying 'mind-set' can be seen as leverage point for transformation and thus is targeted within our qualitative study. To explore barriers that prevent the implementation of knowledge about the sufficiency approach and ways to encourage sufficiency orientation on a societal level, we conducted interviews with experts from science, politics and economy ($N=21$). Using qualitative content analysis, we identified keys for change, i.e., narratives, rewards and recognition, time structures and responsibilities that could have a leveraging effect towards system transformation. We propose an exploratory framework that points out main barriers, keys in terms of levers and experts' visions towards a sufficiency-oriented society. Furthermore, we outline that the sufficiency discourse contains ambiguities and varieties concerning the experts' perceptions regarding effective levers for a transformation. Through brief discourse pattern analysis, we highlight different perceptions regarding the role of technology, social responsibility and the societal change and time. The proposed framework can inspire future research and policy-making on sufficiency.

Keywords Sufficiency orientation · Leverage points · Intention-behaviour gap · Behaviour change · Collective action · Future narratives

Introduction

Climate change and biodiversity loss urge humanity to radically decrease CO₂ emissions (IPCC 2018; Steffen et al. 2015). Before the Corona pandemic, global emissions were still rising (Le Quéré 2020). In Germany, the consumption of plastics (UBA 2019a) and motorized individual mobility patterns increased over the last years (Nobis and Kuhnimhof 2018). At the same time, representative surveys

conducted across Europe report high levels of acceptance for environmental protection through political measures (European Commission 2019; UBA 2019b). Thus, it would seem that various barriers prevent people and societies from engaging in sustainable action. In this paper, we focus on sufficiency as a sustainability strategy, whose main target is to substantially lower climate-damaging emissions. As such, sufficiency can be seen as a leverage point in itself as it is a contrasting mind-set to the current growth-oriented mind-set. We explore sustainability experts' arguments and ideas about how to achieve a sufficiency-oriented society. Based on the experts' perspectives from their fields of work, we identify central barriers that prevent transformation and extract key factors that would work as leverage points within the current system and contribute to the great mind-shift towards societal sufficiency orientation. We also analyse discourse patterns that experts use within in their argumentation to better understand on which ground ambiguities and

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conflicts may arise in the discourse about change and the implementation of certain measures.

Sufficiency orientation: a leverage point towards a sustainable society?

Sufficiency, in terms of ‘enoughness’, seeks to substantially change lifestyles into more sustainable ones by producing and using less resources. In the past this ‘having enough’ was discussed from both maximum and minimum thresholds. Sustainability research, however, is more concerned with the upper limits of consumption based on the premise that resources are limited and a fair distribution within the ecological limits should be the goal to ensure a liveable future. The lower limits of consumption are rather considered from abstract philosophical viewpoints and consider various need theories (Spengler 2016). In our analysis, we mainly address ‘having enough’ in terms of maximum thresholds for consumption.

In the sustainability debate, sufficiency was originally introduced together with efficiency and consistency as part of a strategic bundle for reaching sustainable development (Alcott 2008; Linz 2004; Sachs 1999). Meanwhile, the sufficiency approach counts as part of the global degrowth movement having a centre in the European and German sustainability discourse (Schmelzer and Vetter 2019; Toulouse et al. 2019). It shares common goals with the global degrowth movement that seeks to (a) accomplish an ecologically just societal structure through democratic processes, (b) reinforce social justice and self-determination through the change of the societal metabolism and (c) reshape institutions and infrastructures to be independent of (economic) growth (Schmelzer and Vetter 2019, p. 158). Over the past 30 years, however, the global sustainability debate has concentrated on efficiency and consistency approaches to solve the climate crisis. Sufficiency in terms of “Doing less was and is simply not in the cards, anywhere or for anybody” (Göpel 2016, p. 40). Climate change was framed as a ‘physical problem’ that is judged to be solved by technical and market-ready solutions in its foreground (Bauriedl 2016; Lakoff 2010). As a consequence, total emission rates did not decrease and potential savings were eaten up by different, alternative or increased consumption patterns described as rebound effects (Santarius and Soland 2018; Schmelzer and Vetter 2019; Wilhite and Norgard 2004). The associated idea of decoupling environmental and material consumption from economic growth that accompanied the efficiency approach proved ineffective to solve the climate crisis (Parrique et al. 2019).

Nowadays, the sufficiency approach receives increasing attention from various disciplines. A Europe-wide network was established (ENOUGH-Network, see Toulouse et al. 2019), where multidisciplinary perspectives were brought

together and practical implications discussed (Rijnhout and Mastini 2018). What is still missing, however, is a systematic analysis of psychological barriers that prevent implementation of sufficiency on both individual and collective levels and an understanding of how behaviour might be changed on a larger scale (Spangenberg and Lorek 2019).

Sufficiency-oriented lifestyles already emerged in niches (Speck and Hasselkuss 2015), but many social contexts prevent adapting sufficiency-oriented everyday practises. Sufficiency orientation stays widely unattractive or even aversive because of negative labelling effects (Drews and Reese 2018; Reese et al. 2019). Spangenberg and Lorek (2019) even argue sufficiency to be “the antithesis to the ‘faster, further, more’ orientation of the consumer society” (ibid., p.1071), and to our common social practises that continuously conflict with the socio-economic system people are embedded in. We argue that a larger scope on the intention-behaviour gap is necessary to understand societal barriers that prevent collective behavioural shifts towards sufficiency.

The intention-behaviour gap in light of the leverage points concept

The relationship between pro-environmental intentions and actual impact-oriented behaviour is one main research field in environmental psychology (Bamberg and Möser 2007; Kollmuss and Agyman 2002). Various models highlight the relevance of individual intentions towards ecological behaviour change and have been well supported empirically across various types of pro-environmental behaviour (e.g., Harland et al. 1999; Heath and Gifford 2002; Tonglet et al. 2004). Within a comprehensive model by Klöckner (2013), intentions, perceived behaviour control and habit strength are the most relevant components to explain behaviour. The latter two factors depend on infrastructures and societal structures making it more or less easy to establish habits or give the perceived sense of having control over one’s behaviours. Especially, when it comes to high impact behaviour, intentions do not predict behaviour to a substantial extent. Moser and Kleinhüchelkotten (2018) found income to be a stronger predictor of impact relevant behaviour, compared to pro-environmental intentions and identity scores, which, on the contrary, correlated slightly positive with impact. This result is less surprising given that people are embedded in social contexts that make pro-environmental action very hard and costly. Such contexts can be ‘material’ like different transportation systems and structures within a city. For instance, in the case of lacking infrastructures for bike mobility, fewer people will use their bike to commute (Rayaprolu et al. 2018). Infrastructural barriers prevent people from choosing climate-friendly alternatives, because they are not designed along the criteria of strong sustainability (for instance Yuriev et al. 2018). Barriers can also be more immaterial

and implicitly guiding impact-relevant decisions. Social norms or values shared within (international) communities guide people's perceptions regarding available decision options (e.g., air travelling as part of a scientific community norm to attend meetings).

To achieve societal change towards sustainability, Donella Meadows identified twelve leverage points as “places within a complex system (a corporation, an economy, a living body, a city, an ecosystem), where a small shift in one thing can produce big changes in everything” (Meadows 1999, p. 1). Intervening into a social, natural or technological system would be challenging and not intuitive, as the outcome of a specific intervention would be hard to anticipate due to system complexities. According to Meadows, physical structures are leverage points that work on the surface, but the more human interaction is needed, the deeper and more influential the leverage might unfold its effects. Most important are the goals of the system as well as the mind-set or paradigms out of which the system arises.

In our understanding, intentions are a part of people's mind-set, yet they arise and depend strongly on group influences (Göpel 2016; Fritsche et al. 2018). In the context of transition research, mind-sets are understood in a more overarching and general sense than psychological research generally outlines.¹ Mind-sets are “[t]he shared idea in the minds of society, the great big unstated assumptions—unstated because unnecessary to state; everyone already knows them—constitute that society's paradigm, or deepest set of beliefs about how the world works” (Meadows 1999, p. 17). They capture whole mental models, which in turn reflect the beliefs, values and assumptions that we (or a certain group or a much larger system such as the western society) hold, and they strongly influence our reasons for doing things the way we do (Kim 1999; Maani and Cavana 2007). Thus, we argue sufficiency orientation to serve as a leverage point as it formulates a goal and captures a paradigm itself that would help to bridge intentions to according behaviour. Taking this as a tenet, we explored sufficiency experts' argumentations and identified key factors for the transformation towards a sufficiency-oriented society.

Methodology

We conducted semi-structured interviews with experts from the German sufficiency community, coming from various backgrounds in the field of sufficiency practise and research.

¹ For instance, regarding individual volition and successful behaviour performance mind-sets are “phase-typical cognitive orientation that promotes task completion” within certain action phases (Gollwitzer 1990, p. 63).

This very specific group of people researching this topic or people having established a sufficiency-oriented business are, by definition, highly personally involved in the debate.

After conducting the interview, the material was transcribed and analysed using content-oriented analysis (Mayring 2010). Two people conducted coding in consultation. Our scientific interest was to explore subjective viewpoints and meanings within the process of change and to detect more informal and implicit knowledge from the experts' viewpoints.

Participants

Interviewees were recruited through snowball method, i.e., personal contact, desktop research and recommendations by other interviewees. Potential participants were pre-screened by profession, age and institutional background or field of work. All of them were German native speakers and worked in Germany. Our aim was to categorize and list people into three different expertise-clusters: (a) science and education, (b) politics and administration, and (c) economy and business. We included experts in our list if they had already realised a scientific or practical project that addressed sufficiency orientation and social-ecological transformation.

Our total list of experts contained 57 people. They were all contacted via email, in which we announced that we sought to obtain detailed information about their views on sufficiency, its barriers and key factors for change. In total, we conducted 21 semi-structured interviews. Of these interview partners, 12 were female and 9 were male. We had 12 interview partners from the scientific sector (4 male), 4 from the economic sector (2 male) and 5 from the politics and administration sector (3 male). Ages ranged from 27 to 65 years.

Interviews were conducted via telephone between February and June 2018; however, four interviews were conducted in written format. Albeit knowing that this option somehow conflicts with the idea of in-depth interviewing, we accepted this drawback for the benefit of receiving these experts' perspectives on sufficiency.

Procedure and interview guideline

The interviews followed a general structure of bottom-up, open-ended questions about different aspects of sufficiency orientation, including an introductory question about the relation of sufficiency and efficiency, followed by perceived barriers and enablers of change and ideas for change towards a stronger sufficiency orientation and structurally embedding this in society. The questions were formulated in a way that general concepts, personal ideas and visions could be made; we provided no pre-defined definitions on sufficiency. The interviews took between 40 and 60 min including

explanations, signing the consent form and debriefing. All interviews were audio-recorded, anonymised, fully transcribed, cross-checked with the audio recording, and analysed using MAXQDA 2018 (VERBI Software 2017).

Data analysis

We chose a content oriented analysis method for analysing the data, since it provides the opportunity to run exploration-oriented research. It is a flexible method that allows both inductive (data-driven) and deductive (theory-driven) analysis and helps to identify discourse patterns (Braun and Clarke 2006; Mayring 2010). It also supports research that is linked to phenomenological approaches by concentrating on people's subjective experiences and meaning. Content oriented analysis is an appropriate way to find codes and develop themes based on the raw data of the interviews. Important parts can be found, for instance, by analysing the frequencies of themes people brought up during the interviews, finding co-occurrences with other topics, or statements that show the broad variety of meaning within the data set (Fugard and Potts 2015). If a code occurs in several interviews, a category, which can explain a certain aspect of transformation towards sufficiency orientation, is created. The concept of content oriented analysis has been developed to transfer data into theories that are grounded within this specific data (Guest et al. 2014) allowing the presentation of plausible theoretical and empirical founded modes as well as types of sufficiency orientation and discourse patterns. This procedure helps to highlight important categories that allow us to make significant statements in that specific case.

Findings

Relationship between sufficiency and efficiency

In the opening part of the interview, we asked interview partners about their definitions of sufficiency and efficiency. By contrasting both terms, we wanted to see if we could outline differences on how the experts described the terms and how they were interrelated to each other. We assumed this could already be 'symptomatic' for why sufficiency remains unattractive for practise and communication up to now.

In the experts' descriptions efficiency contains a narrower and clearer definition. The following definition of efficiency characterizes the overall responses:

It is defined as the optimization of the input–output ratio of material consumption. A process is labelled as 'efficient' when you get more output from the same input or the same output from less material input. (Interview 04SIWI—scientific expert)

This statement shows that the definition remains in a technical sphere. The input–output formula of material resources serves as the basis of the definition and is cited by every interviewee. Reflecting on how to monitor this process of efficiency, for most experts the efficiency-strategy relies on two points: (a) the use of innovation and technology to increase the efficiency effect and (b) to develop technological-oriented management processes to measure, monitor and operate efficiency outcome. Following this, the idea of efficiency in most of the cases contains the mind-set of growth, incorporating the idea that spared resources are used to produce more goods and services. The absolute saving of resources for the sake of producing less and stopping extractivism is not part of the efficiency approach by definition. This, in turn, may result in rebound effects:

Efficiency measures often have the problem in the personal consumption area that they lead to rebound effects, [...] that people tend to use the saved money to buy even more stuff. (Interview 08VOWI—scientific expert)

For sufficiency, there were no such clear definitions, but rather loosely connected descriptions and examples of appropriate behaviour. Among the experts, definition attempts varied between "nudging people to consume less" and reaching "other ways" of consumption behaviour. Experts exemplified sufficiency *practises*, such as gardening or repairing things to keep them long in use. Furthermore, there is the notion that people very consciously use fewer products and services by individual renunciation and thus live a more "qualitatively good life". The first two variations have been described as more "indirect sufficiency"-pathways by one respondent. Therefore, the last one could be described as 'true or direct sufficiency' by implication.

Through analysing the relationship between sufficiency and efficiency, both terms gain sharpness. For some of the respondents, the concepts are complementary to each other. This view tackles the rebound effect by underlining that an efficiency strategy can only save resources when it contains a sufficiency-oriented approach likewise.

[...] Reducing lifestyle to a mandatory level of resource consumption without forgoing a certain level of prosperity. (Interview 04SIWI—scientific expert)

This quote shows the central argument of the complementary approach that the necessary reduction of material consumption will not significantly change the way of life. Some interviewees judge prosperity to go hand in hand with sufficiency and those respondents prefer technological solutions that enable people to consume less:

[...] [I]t cannot mean that politics withdraws from such questions [of responsibility] and says, 'Yes it is

completely up to the consumer [...]’. What we need are enabling policies and enabling technologies that make sufficiency easier. In addition, one has to make it much harder not to live sustainably at all by accordingly designed material and non-material infrastructures. (Interview 29PAPO—political expert)

Enabling technologies in this sense are those technologies that support people in finding new ways to solve current problems in society, like computers or the internet. In a broader sense, they are cultural technologies based on social interactions. These interactions are a complex process whose primary goal is to anchor and evolve within society. They consist of a multitude of group dynamic processes that are mostly often self-organised and supported by a specific technology (Guest et al. 2014).

Other respondents saw the relationship between efficiency and sufficiency more in opposition to another. They emphasised that sufficiency is, first of all, a question of lifestyle and the mode of reflexivity:

While regarding efficiency you ask [...], for example, about the most efficient way to get to Barcelona for vacation considering questions like costs or perhaps environmental impact. But following the idea of sufficiency, there’s a complete other starting point one needs to think about: Do I even have to go to Barcelona to fulfil my need for a vacation? (Interview 29PAPO—political expert)

From that view, efficiency and sufficiency are two different ways to look at the situation. Respondents in favour of this approach saw sufficiency increasingly associated with individual decisions and actions.

Framework for transition towards sufficiency orientation

In the second step, we analysed possible pathways towards a sufficiency-oriented society and aimed to synthesize relevant factors for system change within a framework. We focused on relevant themes that were commonly articulated by the experts. We structured them in accordance with our preliminary category scheme given by the interview guideline consisting of visions for sufficiency orientation, followed by status-quo descriptions and barriers, followed by key factors and drivers. We also listed conflicts that were mentioned by our interview partners and might influence the transition in a non-linear trend. While describing the status quo, experts immediately stated what they judge as core barriers or pathways to change the status quo. Structuring these answers, we derived categories that were compatible to build a summarizing framework of their statements (see Fig. 1).

Barriers

Speaking about the status quo, experts commonly mentioned four core barriers: (1) economic norms and rules, (2) infrastructural barriers in terms of default structures for decision-making processes, (3) capacities and path dependencies and (4) the narrow focus on individuals in analysis and solutions for transition.

1. A crucial barrier can be summarised under the category economic norms and rules that mainly refers to the dominant economic model of market orientation and neoliberal capitalism, like monetary welfare measurements or growth-dependency. This barrier is also mentioned as ideological ‘mind-set’, which is deeply internalised in peoples’ thinking and behaviour on small but also on larger-scales. It shapes perceptions of many people in our society and, therefore, prevents from thinking and acting outside the box. Experts from the economic and business sectors, for instance, struggle with the question on how to establish sufficiency practices within a competition based and consumption growth-oriented market environment.

In my opinion, it would be a cultural revolution. I think it would mean another logic within our society.[...] These growth-oriented lifestyles that are based on the idea of more, faster, higher, need to be changed completely. (Interview 12BAWI—scientific expert)

2. Infrastructures often hinder individuals to act environmentally friendly. For example, technological devices offer ecological functions as an extra option, but not as a default option. Mobility was named as one of the biggest challenges in this sense. The current system structure is based on fossil fuels and its usage. All respondents highlighted that ecological mobility needs to be prioritised over fossil-based mobility concepts. Ecologically friendly investments into bicycle lanes and infrastructure, alongside other green mobility concepts, would give people incentives to change mobility behaviour patterns and support cleaner cities and healthier lives.
3. Experts judged capacities in terms of time restrictions and related path dependencies such as the lack of availability of ecological alternatives in situations of restricted capacities as central barriers. It is a question of time and flexibility to produce one’s own vegetables at home, and there are only a few people who would or are able to reduce their working hours to reallocate time resources. These path dependencies

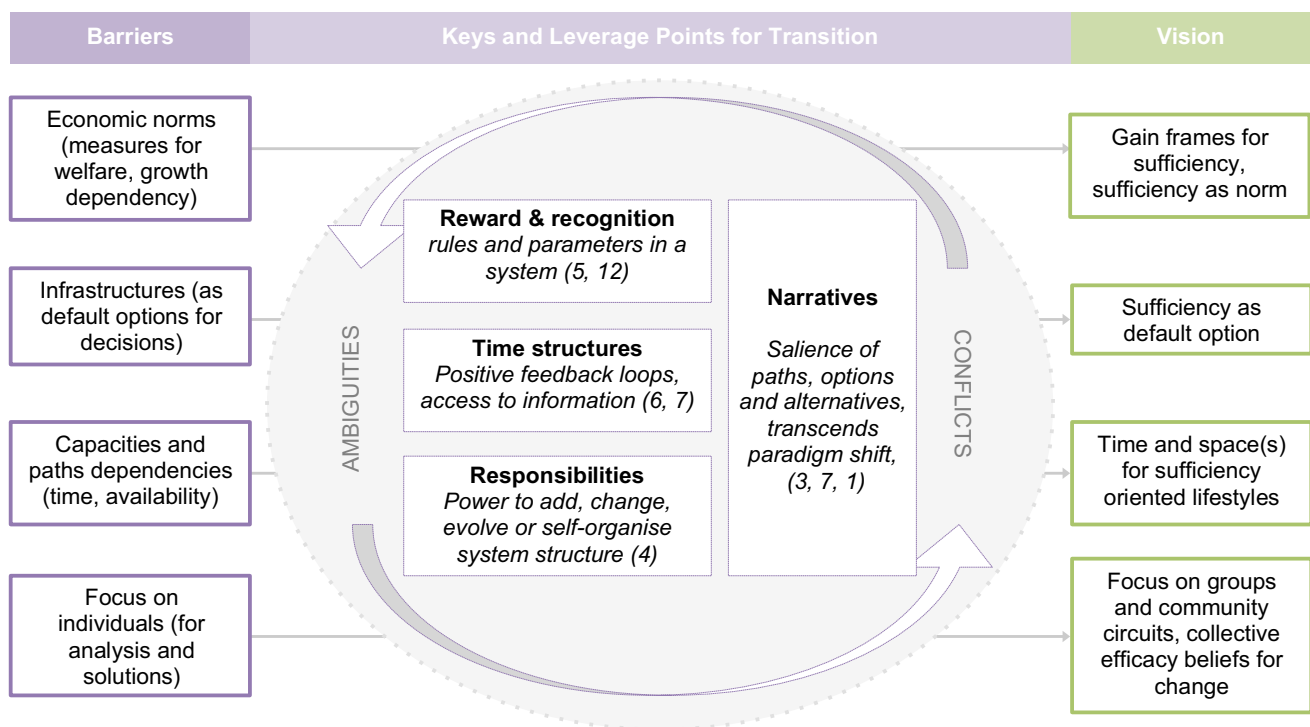


Fig. 1 Illustration of a framework for transition towards societal sufficiency orientation derived from the expert interviews. Key points are supposed to engender transformation and can be applied to the original leverage point's model. Numbers in brackets refer to the original leverage point's concept by Donella Meadows (1999), i.e. the lower

the number the higher the power to change the system. Ambiguities and cognitions disturb transition and produce backlashes. They need to be considered in general when looking at the pathways from the status quo and the barriers towards realizing a sufficiency-oriented society

limit the perceived ability to change lifestyles from 1 day to another.

- Furthermore, the experts perceived a focus on individual activities and behaviours as a target in discussing environmental consumption and behaviour in different fields of society. This is judged as a narrow view about how to enable change.

Costs of behaviour are very much less for environmentally unfriendly behaviour. As we see in the case of flying: it is cheap, it is fast, and it is possible! Even the eco-concerned people choose this option. This is a psychological intervention—but the other way around and with the wrong target behaviour. Self-efficacy for flying increased extremely. (Interview 14FRWI—scientific expert)

In the discourse, and also in many research areas on how to tackle climate change, individuals are seen as decisive. However, their embeddedness into societal and collective structures is neither considered enough nor well integrated in modelling how future prospects look like in a sustainable world. Such individualized perspectives work also as

guiding principles for designing alternatives or communicating pro-environmental change, but probably prevent collective changes and restrict views for new solutions. Group dynamics and the influence of (peer) groups on individuals are only marginally considered in the public environmental protection debate. Only recently, perspectives on how groups and group processes shape responses to environmental crises have begun to emerge (see for instance Fielding and Hornsey 2016; Fritsche et al. 2018; Reese et al. 2020).

Key factors as leverage points for transition

We derived four key factors from the interview material and summarized them in the following manner: (a) narratives, (b) reward and recognition, (c) time structures, and (d) responsibilities. These keys were seen as such points having the power to overcome aforementioned barriers and to get closer towards experts' visions. They capture areas of the society, where people work within their professions and which can be addressed through instruments, tools and by certain actors in itself (see Fig. 1).

(a) Experts agree that changing growth-oriented narratives into degrowth-oriented ones and evolving narratives on good life without material prosperity would be a powerful

key above all. Ways of communicating about climate change as well as setting the right frames towards sufficiency orientation are necessary to increase salience and acceptance of new norms and paths towards change. Current lifestyles that are communicated to people need to be reframed, for instance:

Travelling makes you smarter and educates you. This is a counterproductive narrative. (Interview 14FRWI—scientific background)

In this regard, transparency and honesty were named as important characteristics of such communication that would make sufficiency more comprehensible and practicable at all. As related drivers for this key factor, experts mentioned classic public communication through media instruments but also private and personal communication as important. Additionally, narratives serve to communicate all other leverage points and monitor system change to establish positive feedback loops.

In the case of (b) reward and recognition, experts emphasize that ecological choices need to automatically be seen and strengthened by the system itself, i.e., by certain powerful actors within the community, by important groups and the norm itself. Economic incentives need to be given clearly for the ecological option, for instance by implementing carbon pricing, which would support ecologically friendly choices and sanction ecologically unfriendly behaviour automatically (see also Maestre-Andrés et al. 2019). In fact, the experts mainly mentioned such policy instruments as effective means.

(c) Time structures were seen as a key factor, because they highly affect how people organise their lives. Time structures determine which path dependencies manifest in everyday life and how people could use their own power to break free of established structures. Some experts mentioned that a sufficiency mind-shift needs time to reflect, to try out, and to break out of the everyday structures. As appropriate enablers, experts referred to changes in general working time reduction (i.e., by policy-making) and also pioneers of change that serve as role models.

(d) As a fourth key factor, experts mentioned the allocation of responsibilities within a system. These responsibilities refer to who is made responsible for what and who is explicitly addressed when talking, for example, about changes in consumption patterns. Second, also political measures that need implementation do need taking over of responsibility by the denominated actors within our democratic structure, for instance, when people vote for getting out of coal mining, political actors should also seek to implement it. Thus, processes of participation play a significant role to engender change. Furthermore, experts mentioned regional circuits of production and consumption to work in

favour of increasing ‘shared responsibilities’. As a leverage point, responsibilities capture the lever of who has the power to add, change and reorganise the system. In the case of shared responsibilities, people are much more integrated into the change itself and could feel as agents within the transformation process.

Vision

For most experts, the future narrative of a sufficiency-oriented society has to tackle the barriers of the present. When economic norms constitute barriers, an appropriate alternative to an economic gain-frame, namely, an alternative that supports sufficiency, would be the appropriate vision. Likewise, if available time is strongly restricted and prevents from spending time for sufficient production or consumption patterns, then policies need to promote ways of living that free spaces for self-determined time usage. Working time reduction models were mentioned as important triggers to increase people’s engagement in sufficiency practises. In the experts’ visions, ecological sufficiency works as a guiding principle when transforming infrastructures for services or production.

Furthermore, the role of collectives and communities has changed in the experts’ visions towards increased participation (e.g., through solidarity-based agriculture projects) and regionalization regarding production and consumption processes (e.g., regional food, local renewable energy production and consumption).

Conflicts and ambiguities

Some experts also mentioned more general and psychologically important conflicts and ambiguities that prevent transition processes. Emotional states were regarded as such. For example, some experts mentioned that people might have the feeling of being unable to cope with actual crises in a pro-active manner as they feel themselves not capable to shift a whole system. Furthermore, various uncertainties exist about the processes of change. Which future lifestyles are desirable was not clear at all. One expert stated: “We don’t want back to the caves”. Moreover, it was mentioned that societal change needs time and will come with disadvantages and conflicts: “Disruption may come independently of what we do”. It was also argued that the assigned role of technologies in the change process might arise conflicts. It was argued that “technophobia of sufficiency supporters” often contradict to the “technical enthusiasm” by efficiency supporters and thus integration of both perspectives becomes harder.

Deepening the analysis: discourse patterns for sufficiency transformation

In addition to the presented barriers and key factors that may serve as leverage points towards system change, we have also found patterns of how these keys may unfold within the discourse on sufficiency that became apparent within our sample. We examined patterns that allow an actor and argumentative oriented discourse analysis (Benford and Snow 2000; Hajer 1995). We looked for semantic and argumentative patterns, frames, references that have been made, or justifications with which the interviewees position themselves in the discourse. It is not only important what the interviewees said, but also the order in which they built up their own storyline (Hajer 1995) regarding sufficiency-oriented transformation. This makes it possible, for example, to understand the dynamics and developments the interviewees refer to and which negative scenarios they may omit. By doing this, further structures within the argumentation became apparent and differences in the meaning of these can be shown using the experts' lines of argumentation. This can be used to understand which structures of meaning in the sense of motives underlie certain keys and barriers (Hajer 1995). Furthermore, the analysis shows which argumentative conditions for certain identified keys are necessary to implement them effectively and on which argumentative basis the experts respond to the barriers and keys for transformation. By doing this, the discourse strategies (*ibid.*) and the positioning of the interviewees can be better understood. Based on these identified discourse patterns, the locations for possible interventions can be identified and the chain of effects of the intervention can be anticipated.

We extracted the following categories that were helpful to define different discourse patterns in the experts' argumentation regarding the transformation. These categories are (1) technology-orientations, defined as the role technology plays to support or prevent a societal shift, (2) the level of responsibility by individuals and/or societal actors, and (3) the perception of societal dynamics towards social change. These types exemplify also the ambiguity of the different sufficiency-oriented debates and positions within the discourse that were captured by the experts.

Role of technology

Technology plays a major part in discussions about socio-ecological transformations. All experts mentioned technology as a key element to sustainable development. However, they did have a broad range of interpretations of technology's role in a sufficiency-oriented society and for changing the system. For a broad group of nine participants, technology became the main role for a transformation process. They see environmental problems solvable by green and efficient

technologies that will reduce emissions of carbon dioxide significantly. Talking about their visions of a future state of society, they refer to technological-oriented pictures, where people use renewable energies, electrified mobility systems and smart digital technologies, to name a few. These visions seem to be determined mainly by technological developments.

In this [sufficiency-oriented] society, there is no or only very little unusable waste, food production takes place [or is possible] by [the help of] new technologies. The energy supply is exclusively renewable; all products are durable and repairable. Transport takes place exclusively by electrically operated by public transport systems, supplemented by a fleet of self-driven and electric vehicles. Air travelling by planes is fossil-free. (Interview 29WAWTX—economic background)

In this technology-driven scenario, the future society is above all an efficiency-oriented society and is in contrast to a strong sufficiency orientation, since people would be able to continue their way of life without constraints or major shifts.

As a sharp counterpart, another group of eight respondents presented a more critical view on technology. For them, technological solutions for environmental problems would not solve them; instead, they could cause new and unforeseeable side effects that could create new environmental problems.

New technologies always bring side-effects no one can know. I do not say they cannot solve problems. But often new problems occur together with new technologies. (Interview 13FIWT—economic expert)

This discourse can be related to the Risk Society by Ulrich Beck (1992), who states that late-modern societies (re)create their own negative side-effects and societal risks by new technological developments (e.g., nuclear energy). Furthermore, technologies that lead to efficiency savings will likely suffer from the rebound effect. Future visions of this expert group are, therefore, framed by changes in people's everyday routines and practices as well as means of production and social cohesion. Locally embedded, based on a subsistence economy, lower need for lifestyle consumption and the overcoming of capitalism's inherent need for economic growth, it showed another model of society compared to today. Concepts of post-growth/degrowth and a solidarity-based economy were mentioned among this group. When technology is mentioned, it plays a supporting role, i.e., where new technologies could support a sufficiency-oriented lifestyle, it is seen as a tool, but it is not an end in itself.

A third group of five respondents took an intermediate position when it came to technology. They tried to combine efficiency improvements by new technologies and a sufficiency approach with new lifestyles (i.e., a complementary

approach). Technology played the role of a catalyst for lower consumption and new sustainable lifestyles. For example, new developments of autonomous and digital technologies that could be used for production and routine tasks are able to reduce the number of working hours people have to spend daily. Technology is used to change infrastructures to support sufficiency-oriented lives. Because the respondents also saw the risk of rebound effects caused by efficiency improvements, they emphasized the role of behavioural changes to compensate or prevent possible negative side effects, bringing together efficiency and sufficiency orientation.

In these discourse patterns about the role of technology, it becomes visible that experts from political and economic background strongly tended to be part of the first group, while scientific experts mainly emphasized the critical views on technology, as part of the second group. The third group included experts from every background alike.

Level of responsibility

Another discourse pattern we found to be significant is the level of responsibility: Who is or should be responsible for concrete actions towards a sufficiency-oriented society? On the one hand this could be political or societal actors as concrete ascriptions, where a responsible institution or third actor is mentioned (like political parties or actors, companies etc.). On the other hand, it could be vague and indirectly ascribed responsibility (like ‘the society’). This category is separated into two dimensions, which occurred from the interview data.

The first group of 14 participants sees a strong responsibility for actors that are able to change societal frames and conditions on a broader scale. Political actors (like government, political decision makers) or economical players (like big industrial companies) are mainly named here. These actors were perceived as having substantial power to alter and transform existing frames and patterns in society; referring to the “power to transcend paradigms” (Meadows 1999, p. 19) is the most important leverage point in her hierarchy. Therefore, we described this dimension as a top-down approach. Respondents of this approach demanded economic framework conditions set by politics to create incentives for people and firms to act environmentally friendly, like CO₂ pricing or trading, investments into renewable energy and new forms of mobility as well as subsidies for research for new innovative technologies and products. People were still free to choose their way of life, but the state should increase the price to sanction polluting behaviour.

And that can only be avoided by having rules. Be it economic or cultural or legal rules that ensure that just the bad and negative behaviour is sanctioned. At the

moment it is rewarded. And that’s why it’s hard to do the right thing. Because those who do not do the right thing will somehow be rewarded for it. I think that is a very significant obstacle. (Interview 03ESWI—scientific expert)

An orientation towards technological approaches as shown before occurred very strongly within this group. Changing economic conditions would accelerate technological innovation and simplify the switchover to greener technologies.

I think if the technology develops, I do not need to win the customer in that sense, I do not need to re-educate him and I do not have to impose somehow that somehow he has to behave ecologically, but he can no longer behave un-ecologically. (Interview 14WAWT—economic expert)

This approach sees people embedded in a market economy and does not question general economic functionalities or principles. New technologies have to be marketable, meaning that they compete with other old and non-environmentally friendly products. Consumers were seen as price-driven and not willing to change their behaviour for the greater good not knowing whether others would follow them or not.

The interviewees from this group present a very vague idea of social responsibility. They did not believe that people will change their behaviour or companies their business models fast enough on their own.

Ultimately, a shared understanding of how much responsibility the individual has and how much society has to take. And you cannot, so I would say in any case, you cannot change from today to tomorrow or through any advertising campaigns and something like that. But something is only possible in the longer term. (Interview 27COWI—scientific expert)

On the one hand they did not reject the idea of personal responsibility but saw it as unrealistic for effective and short-term changes towards a sufficiency-oriented society. On the other hand, they formulate a general problem that responsibilities remain abstract and are allocated to an anonymous ‘third person’ or institution like ‘the state’, ‘the market’ or ‘the politicians’.

Some people can only insult the state, they are so fixated on the fact that this must be directed from someone above, just anyone who has to do something. (Interview 23ROWT—economic expert)

In comparison to this, the second group of 6 interviewees showed a stronger attitude towards individualistic approaches of responsibility and emphasize personal

behaviour as a main source of change towards sufficiency. Focusing on the individual, they saw a personal change in attitudes and consumption patterns as an effective and primary way. Where the first group was vague on concrete attributions of responsibility, this group saw a clear principle of action for every member of society to act for the greater good of a sustainable future. Where individual approaches attempt to fail, they preferred the state to intervene and to set clear rules and incentives for pro-environmental behaviour. Therefore, one could call this group—in comparison to the first one—as bottom-up oriented.

[It is a] neoliberal strategy and is also communicated by politics as such, to say you are individually responsible for the world rescue [...] political action and political strategies focus only on this individual consumption, then I believe that there is a great danger, so to speak, that the political component will be left out. (04SIWI—scientific expert)

Nevertheless, there was a strong ambiguity in this group. On the one hand, they believed in the good of people and that radical change is possible by the very own self-interest of the people for a sustainable environment. In addition, they saw pro-environmental attitudes and corresponding value-shifts as well as the reflexive capacity to change behaviour. On the other hand, they saw the individual imprisoned into the constraints of a market economy that continuously sets wrong incentives, with people staying unable to break out of their habitual performances regarding (re)production and consumption, often in a fatalistic way. The market economy, as it is today, is perceived as controlled by powerful companies, which will not give up their place and are able to dominate and influence political and legislative processes (lobbying). Politicians who are not willing enough to face these structures of power, may it be because of their own interest or political weakness, are no ally in this context.

And then, at the same time, we have a policy that thinks in legislative terms. And think about re-election. Nobody can make the decision we need to make us fit for harvest in twenty years.[...] It is a general political dilemma, shifting responsibility backwards, economic power structures. And what we need are, of course, responsible politicians with visions. (Interview 07AHPO—political expert)

Therefore, this group looked for sufficiency-oriented solutions outside of a market-economy system. These solutions were found in local and community-based projects, like local sharing groups, urban gardening or new forms of living and working. Individual responsibility, commitment and reflexivity are important categories that were mentioned during the interviews. Relationships and social ties between people are described by reciprocity and redistribution depending on

one's personal needs and the possibility to participate and contribute.

Towards new technologies, they showed a critical attitude. While they did see advantages that may be brought by new technologies, they were always objects to a reservation of unforeseeable side effects, in particular the rebound effect. However, where technology and political solutions were perceived as positive, the respondents emphasized positive aspects of these when it comes to empowering people to live sufficiency-oriented more easily.

Within this discourse pattern, experts from the field of economics tend to the top-down approach, while the bottom-up approach is emphasised by scientific experts. Interviewees with a political background are much divided in this question.

Perception of societal dynamics towards social change

The last category is characterized by a combination of the perception of societal change and time perspectives. It refers to how the experts, on the one hand, speak and perceive the way the society changes, and on the other hand, how their visions enrol on a time scale. The first point contains an analysis of the verbal language that was used during the interviews, while the second dimension shows, where on a time scale these changes are located.

One group of 11 participants showed a very active use of language describing societal change. They strongly used first-person related words to emphasize their personal relationship and relatedness to sufficiency as well as action-oriented words and statements that demanded actions and decisions in the present. For them, social change is currently happening in a way that one can say that they have a strong tendency to an optimistic view of society. Even so, they stress and reflect their own role. They also refer to society as a higher good for everyone. When it came to their visions of the future, they verbally concentrated on an immediate future. Thereby, their goals and visions were more concrete and reachable, full and rich with details when it came to planning or decision-making and strategically adaptable to the present. Their future narrative is for them a functional motivation and a legitimization for their own values and actions towards sufficiency.

Then one talks about the splitting of the landscape with wind energy, but nobody speaks of a picture of how the future looks after the energy turnaround. [...] And then when I think about lifestyles, of sufficiency, then it is more about designing [and communicating] a picture that represents a better life. (Interview 07AHPO—political background)

On the contrary, nine of the respondents showed quite the opposite tendency. Their use of language is much more

passive when it came to societal change. Instead of using first-person expressions, they referred to no specific target group who will stand for social change, mentioned non-personal subjects like society, politicians and ‘the system’ in general or just ‘somebody’ who has to do ‘something’. This results in a pessimistic and sometimes fatalistic view whether a sufficiency-oriented society will ever occur or not. Change often seemed almost unreachable due to ‘higher powers’ that are stronger in enforcing their interests because of financial or political power. They also did not believe that people will change on their own, whether fast enough or by intention, so that they have to be nudged by economic incentives and frames.

Their plans and visions were very broad and universal, often only mentioned as buzzwords (e.g., ‘more renewable energies’ or ‘less pollution by industry’) that were not backed with concrete ideas or actions. Furthermore, their future narratives were very far located in time, so that they neither serve a personal motivational function in the present nor as a guiding principle for the society as a whole. They often emphasized their visions of a better future, but miss a concretization of them that demonstrate that real change is possible. They envisioned a better societal system; however, at the same time, they feel overwhelmed and suppressed by the actual system.

I think the majority of society is again aware that the survival strategy for our planet is to live sufficiently. [...] One also needs more green energy, more environmentally friendly things. I don’t know what this looks like.[...]. But this is all against the power and profit interests of the chemical industry [...] and other players. (Interview 16GRPOX—political background)

Experts with scientific background tend to be stronger represented in the first group, as well as most of the political experts. The second group slightly tends to be consisted by economic experts. However, we find all expert groups in both categories.

Discussion

In this paper, we argued that sufficiency orientation can serve as a leverage point for societal transformation. It needs to be assisted by further strategies and instruments that touch deep as well as shallow leverage points (Abson et al. 2017). To explore such places to intervene, we explored barriers and key factors of such a mind-shift. We conducted expert interviews and analysed them using qualitative content analysis. As barriers, we identified rules and norms, the setup of current infrastructures, capacities in terms of time and availability and the focus on individuals as actors, each preventing in a certain degree from spreading sufficiency-orientation

within our society. These findings underline that crucial barriers (such as the growth dependency in our economy) do not change easily. We, furthermore, derived important keys that could be implemented to release change: narratives, rewards and recognition, time structures and responsibilities. Addressing these by political strategies or measures would be very powerful as they target both deep and shallow leverage points within the Meadows’ hierarchy (cp. Fig. 1). Targeting these keys has the potential to change the system more fundamentally (Abson et al. 2017) and would make future visions on sufficiency orientation more likely.

We analysed how experts defined sufficiency versus efficiency and confirmed that sufficiency (independently of the experts’ background) remains fuzzy in contrast to the technical definition of efficiency. Talking about sufficiency, however, has produced vivid and emotional statements by the experts as they described behaviours and exemplified how to live sufficiency-oriented in terms of future perspectives. We argue that the openness of the concept is valuable, because it frees creativity for solutions and new approaches. But as we have seen in the interviews as well, a clear differentiation between sufficiency and efficiency gets harder when it comes to sufficiency as practise. This is also a common view in current research. Especially when talking about energy sufficiency, elements of (socio-technical) efficiency are automatically captured and must be discussed interrelated (e.g., Samadi et al. 2017). Furthermore, the sufficiency perspective has to deal with the criticism of running the risk of rebound effects as efficiency also has to (Sorrell et al. 2020). It would, therefore, be important to better understand the differences between the academic and the practical or activist discourse as well as their insights into concrete projects and best practise examples. Future research should extend the research to experts who are less involved in the academic sufficiency debate and/or who take an activist viewpoint. These insights would help to explore mechanisms that are important in everyday life to maintain sufficiency-oriented practises (for example such as the role of basic psychological needs, see Kasser 2017). Also, conducting a study on a sample of researchers that work on efficiency and who are more sceptical about sufficiency would be of interest to deeper understand, where the limits of sufficiency are and how rebound effects could be prevented (Sorrell et al. 2020). In any case, if sufficiency is increasingly integrated into the sustainability debate, the definition would become sharper bringing clarity about how sufficiency-oriented life would look like and which role efficiency would play in it.

Our findings connect nicely to current questions of environmental psychology and the attitude-behaviour gap (Reese et al. 2020). Many of the experts in our sample pointed out that to understand how a sufficiency-oriented society could look like, we need to address societal and infrastructural barriers increasingly to shift behaviours and mind-sets. These,

however, are sometimes hard to define and not generalizable. Technological inventions for one stakeholder group may reflect barriers for another relevant group (for a case study on sufficiency business model see Bocken et al. 2020; Sovacool et al. 2018). To us, it seems important to understand the interfaces between barriers and keys in different societal groups and areas to gain a better understanding, where effective levers could be set and by which concrete measure. There are well-established and manifold received connections between technological development and a responsible political sphere and their ability to set incentives and change frames to progress transition towards sustainability (Spangenberg and Lorek 2019). What all experts and discourse patterns share was the conviction that it needs a political and societal supported possibility for enabling other lifestyles, may it be through “enabler technologies” or frameworks for carbon reduced and environmentally friendly behaviour. A sound ‘principle to enable’ could be a guiding maxim for (political) decision-makers that considers the intention-behaviour gap and works on closing it.

An important question is which role psychological research and practise play within the sufficiency and transformation debate. Psychological insights help to examine how individual sufficiency orientation actually drives low-impact behaviour (Verfuerth et al. 2019; Frick et al. 2020). It can also explore peoples’ visions about how a sufficiency-oriented society could be achieved, and offer deeper understandings of how such vision work in favour of a socio-ecological transformation.

Conclusion

Experts formulated central key points that need to be addressed to overcome current barriers and drive the transition towards societal sufficiency orientation. The proposed framework (see Fig. 1) derived from the experts’ statements also points out that inter- and transdisciplinary approaches incorporating both top-down and bottom-up strategies are necessary to address these outlined key factors and fill them with life. In practise, political measures could be valued in the light of these key factors. Any legislative proposal or initiative could be measured by whether it aims to enable individuals and collectives to live sufficiency-oriented and is measured by the power to actually reduce harmful effects on the climate. Of course, the presented framework is still open for development and research. Best practice examples should be discussed regarding their effectiveness to shift behaviour and raise both collective and individual sufficiency orientation. The framework may inspire practitioners, policymakers and scientists alike to explicitly target the elements and implement strategies that address the key factors. We hope

that this study contributes to the debate about the potential of sufficiency orientation as a leverage point, and inspires further research on it.

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