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SUFFICIENCY IN EVERYDAY LIFE

Promising steps towards achieving a low-carbon society



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Swiss Confederation

Innosuisse – Swiss Innovation Agency



SCCER CREST

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This paper presents the results of the project "Sufficiency in Everyday Life", which was financed by the Mercator Foundation Switzerland (2016-2019, project no. 2014-0603).

This work is also part of the activities of SCCER CREST, which is financially supported by Innosuisse.

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Date of publication

December 2019

Acknowledgment

Our thanks go to the Office for Environment and Energy Basel-Stadt, sun21 and all participants of our mid-term conference 2018 as well as the final conference 2019, for the support of the project, the good cooperation and the many inputs regarding the content.

Layout and design

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SUFFICIENCY IN EVERYDAY LIFE

PROMISING STEPS TOWARDS ACHIEVING A LOW-CARBON SOCIETY

In the Energy Act, the Swiss population committed to reducing annual CO₂ emissions from 6 to 1.5 tonnes per capita by 2050 and to cutting energy consumption by 43% by 2035. This was for a variety of reasons such as climate change, biodiversity loss and environmental pollution. However, the efforts required to achieve this have so far concentrated on technology-oriented strategies. These include the consistency strategy, which aims to achieve closed material cycles for products and services, e.g. through a high proportion of renewable energies in the energy mix. Efficiency strategies are also oriented towards technology options, in which the aim is to reduce the input per unit of consumption through technical improvements, e.g. through more energy-efficient household appliances.

However, many studies show that the necessary massive reductions in energy and material consumption cannot be achieved purely on the basis of technology. For example, even buildings with maximum energy optimisation, such as the Hunziker site in Zurich, have a primary energy consumption per person of around 6000 watts (Probst, 2014), which is below the Swiss average of around 8000 watts, but still far above the targeted 2000 watt (Stulz et al., 2011). Nor can the CO₂ targets be achieved by technological

optimisation alone. To transform the energy system towards sustainability, a further strategy is needed: sufficiency. Even if sufficiency is more or less absent as an issue at the national political level, there are numerous initiatives and programmes in cities and municipalities or from NGOs and civil society actors to promote sufficiency (cf. e.g. <https://www.pusch.ch/fuer-gemeinden/suffizienz/>).

What exactly is sufficiency? What are promising approaches to promote sufficiency? Who can do what and how? These questions have been addressed by the project “Sufficiency as an Added Value in Everyday Life”, funded by the Mercator Foundation Switzerland, over the last three years. Examples in the areas of nutrition, housing and mobility were examined (<https://energieimalltag.philhist.uni-bas.ch/de/home/>). We conducted our own research taking into account evidence from other studies. It became clear that there is no lack of ideas and initiatives on sufficiency. On the other hand, there is no overview of the possibilities and obstacles to the implementation of measures aimed at sufficiency. For example, small measured effects of up to 2% savings are often disappointing. However, the savings in many areas add up and contribute to a reduction path. With this contribution which we see as a kind of white paper, we want to collect existing scientific evidence in the context of sufficiency and thus inform and support actors in their initiatives. We have also taken into account feedback from two events organized by the Swiss Sufficiency Network in collaboration with sun21

Basel.

In the following, we will first outline our understanding of sufficiency, then go into the three fields of nutrition, heat/electricity consumption and mobility, and finally examine the question of how sufficiency can be promoted.

WHAT IS SUFFICIENCY?

There are a number of different definitions of sufficiency (Burger, Sohre & Schubert, 2019). It is common, for example, to understand sufficiency as related to an individual change in behaviour, in contrast to technology-oriented strategies (e.g. Schmidt & Weigt, 2015). Others emphasise the aspect of curtailment, reduction or renunciation (e.g. Karlin et al., 2014). From a more societal perspective, sufficiency is also understood as sustainable consumption and changes in lifestyle and economic practices (de-growth, postal growth, etc.) (Linz et al., 2012; Princen, 2005; Lorek & Fuchs, 2013).

Each of these definitions emphasises individual central aspects of sufficiency - it is about changes in the consumption behaviour of individuals that lead to a reduction in energy and material consumption. But the purchase of a more efficient car (efficiency) or the closing of material cycles (consistency) are also based on individual changes in behaviour (Burger et al., 2015). Sufficiency is therefore not about behavioural changes in general, but about a specific type of behavioural change. Buying an efficient car does not necessarily mean that one's own preferences regarding mobility have to change.

In contrast, we understand sufficiency as the area of behavioural changes that involve changing individual expectations of quality of life. It is about changes in what individuals value or what is considered valuable in society. In this context, everyday routines or basic social expectations ("I must own a car") have a special significance. For example, anyone who decides not to own a car, consciously and not out of economic necessity, does not suffer any loss. We explicitly do not understand sufficiency as a renunciation in the sense of a restriction and a possible reduction of individual well-being. Sufficiency aims at changes (dematerialisation) of preferences and also requires changes of context, for example by providing infrastructure that offers the possibility for more resource-light behaviour (Burger et al., 2019). In this sense, sufficiency is not only about individual changes, but rather about a social learning and appropriation process. This assessment was also shared by the participants of the final conference of the project "Sufficiency as Added Value in Everyday Life" (25.10.19 in Basel), who defined sufficiency as added value in the sense of freedom, less stress, time gain, detox, more social interaction, health and a new attitude towards life. These positive images and narratives can promote rethinking or social change, although reinterpretation also reaches its limits (e.g. among the "hard to reach" population, due to a lack of alternatives for mobility in rural areas or for families, or due to limits to de-materialisation in the existing economic system) ("Sufficiency in Everyday Life" final

conference, 25.10.2019).

FIELDS OF SUFFICIENCY IN EVERYDAY LIFE

In the following, we present measures from the areas of nutrition, housing and mobility, the effectiveness of which has been scientifically investigated (where possible). Sufficiency often aims at changing routines. Research shows that when changing routines, the person (individual) must always be considered in his or her living environment (structure). Therefore we present measures here that address both the individual (e.g. attitudes, knowledge) and the structure (e.g. infrastructure, social norms).

NUTRITION

In terms of dietary routines, priority is given to initiatives that reduce or avoid waste and promote local and organic food production and consumption of foods with low environmental impact (Faber et al., 2012; Vermeir & Verbeke, 2006).

Initiatives against food waste

Initiatives that address food waste prevention in households can save up to 18% of food waste (Beretta et al., 2013). Food thrown away in Switzerland contains CO₂ emissions comparable to the emissions of 36% of all cars in Switzerland (WWF Switzerland, 2012). These are wasted emissions.

Various initiatives are trying to reduce food waste by raising awareness of the issue of food waste or through food sharing mea-



A "Fairteiler" food cabinet in Basel. Picture: Ann-Kathrin Hess

asures. The "food sharing" initiative, for example, which is mainly active in Switzerland, Germany and Austria, aims to redistribute food from small shops and households free of charge by means of "Fairteiler" food cabinets that are accessible to all. According to its own information, more than 26 million kilograms of food have been saved from waste so far (Foodsharing, n.d.). The initiative also offers lectures on the subject of food waste. This initiative is supported by companies, NGOs, public authorities and volunteers.

Alternative forms of food production and sale: local markets, package-free shops, food subscriptions and community gardens

Such local initiatives not only extend conventional methods of production, sale and food



The 2000m² Weltacker - an educational project in the Nuglar Gardens. Pictures: Ann-Kathrin Hess

consumption, but also include alternative approaches. These include community gardens, vegetable or meat subscriptions from local farms or weekly markets, and package-free shops. This means that, on average, significantly less CO₂ is released through savings in transport and packaging materials than with conventional distribution (Faber et al., 2012).

These alternative approaches provide added value that goes beyond the mere procurement of food. A weekly market can become a meeting point for the neighbourhood or village community and thus an experience; a village garden (e.g. in Binningen) can enliven public space. The interplay between individual and structure can be seen in the Lecker-Acker project in Basel. Here, school classes, but also other interested persons, groups or families have the opportunity to lease a piece of land and learn how to cultivate vegetables, herbs or berries under expert guidance during a “field consultation”. This means that both the basic conditions (land, tools) and an educational offer are provided, which aims to expand peoples skills and knowledge and ultimately raise awareness. Other examples of an alternative form of

food cultivation and sales are the Birsmattehof in the Baselland and the Nuglar Gardens in the Solothurn region. This consumer/producer agriculture (also known as community supported agriculture) is about consumers taking over part of the risk of the producers. For example, gardens depend on the support of volunteers during harvest and planting times. Research shows that consumer participation and educational opportunities have a positive impact and lead to more sustainable shopping and consumption habits (De Bernardi et al., 2019).

Reduction of meat consumption and healthier nutrition

Reducing meat consumption and enjoying a healthier diet that includes more vegetables and fruit can save 20-50% of greenhouse gases (measured against various reference scenarios) (Faber et al., 2012; Hallström et al., 2015). Beef consumption is the largest dietary source of greenhouse gases in most countries (except Asia) (Chaudhary et al., 2018). Its reduction makes a correspondingly large contribution to achieving CO₂ targets. In parts of Europe and Asia there are movements and trends to restrict meat consump-

How are sufficient, alternative forms of food procurement accepted in the city of Basel?

In a survey we asked 275 people in Basel about existing and possible sufficiency measures.

Foodsharing: 9.1% of respondents said that they do foodsharing regularly and 27% that they do it sometimes.

Packaging-free shops: 12% of those surveyed said that they shop regularly and 32% that they sometimes shop in packaging-free shops.

Local shopping: 19 % of respondents said that they shop regularly and 44% that they sometimes shop at the weekly market.

Reduce meat consumption: 15% of respondents would be willing to eat less meat once a week.

tion for environmental reasons. It is often women and young people who reduce their meat consumption for ecological or animal welfare reasons (Hagmann et al., 2019; Koch et al., 2019; Sanchez-Sabate & Sabaté, 2019). Promotional measures to reduce meat consumption include clear labels that provide information about, for example, husbandry and animal welfare and the exact origin of the meat, financial incentives, education campaigns and the provision of more information, as well as the development of new alternatives to meat. It is most promising if these measures are combined and tailored to specific consumer segments (Apostolidis & McLeay, 2016).

Conclusion

Changing consumer habits and preferences goes hand in hand with new structures & offers:

- Alternative forms of food cultivation and initiatives against food waste or to reduce meat consumption generate new scope for action.

- The exchange of information and sensitisation of consumers are aimed at changing the attitudes of individuals.
- It is rarely about environmental protection or CO₂ alone. Topics such as animal protection and healthy nutrition are just as much a part of this as are further improvements in the range of products on offer for a healthier diet with less meat.

HEAT/ELECTRICITY CONSUMPTION

The focus here is on initiatives to change the use of living spaces and to change routines in the home so that less energy is required for the use of electrical appliances, heating and hot water.

Reduce living space per head

Living space is a major driver of the demand for heating energy and electricity. The average living space per person has increased for both rented and owner-occupied apartments since 1980. The average living space of single-family homes also increases the newer the buildings are (BFS, 2016). This is

countered, for example, by creating forms of housing in which rarely used rooms (e.g. guest rooms) and electrical appliances (e.g. freezers) are shared. Housing cooperatives define occupancy regulations (e.g. at least 3 persons in a 4.5-room apartment on the Hunziker site in Zurich). In Switzerland, two thirds of people over 60 years of age can also imagine living in a multi-generation house (Age Report, 2013: see also Brischke et al. 2016). As part of the project “Safe living in old age” run by Immobilien Basel-Stadt, senior citizens are given the opportunity to move into a smaller apartment.

There are also approaches that aim to keep outdoor spaces in the public domain, i.e. not to build private balconies, terraces and gardens, but instead to provide common outdoor space in a settlement or area. With appropriate architecture and construction methods, a denser and more mixed usage arrangements (shops, restaurants, meeting places) can be achieved so that many potential destinations are within walking distance. This also reduces the need for mobility. An added value of sufficiency could lie in the fact that sufficiency works against individualisation and isolation. One shares experiences, knowledge and things, which in turn can give impetus for new projects.

Change routines: Feedback on energy consumption

Feedback measures inform people about their own energy consumption, either directly following their behaviour or in comparison with previous energy consumption



*Festival on the Hunziker site in Zurich-Leutschenbach.
Picture: Lucas Ziegler*

or the consumption of neighbours or similar households. Feedback can lead to a reduction in energy consumption, especially if it is given regularly and over a longer period of time (Abrahamse et al., 2005; Allcott & Rogers, 2014; Allcott & Kessler, 2019).

A smart meter display can reduce electricity consumption by around 3% (0.2 kWh per household per day), shift the consumption of electricity over time and relieve the peak times in the evening (Degen et al., 2013). However, households with a smart meter cannot better assess which behaviours lead to a reduction in energy consumption (Degen et al., 2013).

Higher savings (around 20%, i.e. 1.2 kWh per household per day) are possible if a behaviour is addressed directly during execution, e.g. via a digital display that clearly communicates the hot water consumption during showering (Tiefenbeck et al., 2016). The display leads to people showering for shorter periods of time and using an average of 20 litres less water per day.

According to a US study, an energy consumption report (sent out regularly) can reduce consumption by 0.2 kWh per household per day (Allcott & Rogers, 2014). The energy consumption of the household is compared with that of 100 neighbours with similar living characteristics. The energy saving tips accompanying the report are specifically tailored to the households.

The “enerjoy” app aims to motivate users to reduce their CO₂ footprint in everyday life in a playful way and with personal tips. The Basel-based energy provider IWB is developing the app and wants to put the fun challenge of improving oneself in the foreground.

Change routines: Transmit information on energy saving using dialogue

If relevant information is provided, the reduction potential amounts to around 2% (Delmas et al., 2013). This can be communicated in two ways, either by actively involving households (e.g. by providing them with energy advice) or by involving them little or not at all (e.g. written, general energy-saving tips). Research shows that the latter strategy is not very effective in changing behaviour. On the other hand, individual energy coun-



A programmable thermostat. Picture: Dan LeFebvre von Unsplash.

selling can help to provide households with the relevant information they need to change their routines. Through social interaction, practices can be reflected and changed. Behaviour is more likely to change when technological elements of a routine are addressed (e.g. programmable thermostats, motion detectors) (Eon et al., 2018). In a street survey conducted in the framework of our project, almost 30% of 275 respondents said that they would be interested in energy advice for their household (20% were undecided and half are not interested in such advice).

Conclusion

Changing living habits and preferences goes hand in hand with new, emerging structures and offers:

- The greatest potential lies in the reduction of living space - but this is also the most difficult to realize, since the decision about where and how to live is a very personal one and tends to be made in the medium to long term. There are, however, new forms of housing and initiatives

Intervention Home Energy Advice

Within the scope of our project we conducted a field experiment which investigated the effects energy counselling can have in households, i.e. whether and to what extent routines are changed by it. The majority of 30 households that received energy advice evaluated it positively; they mentioned the good atmosphere and felt it was positive that the advice was tailored to their situation. However, some households also stated that they had not learnt anything new. Although, some routinized behaviors were adjusted by the participating households (e.g. a short-term reduction of the washing temperature), the results show that routines are difficult to change with a one-off energy advice session. This confirms the findings of other studies, that interventions must be repeated and accompanied by structural changes to change routines.

that aim to reduce the amount of space consumed per resident in a residential unit.

- In addition, household routines can be taken into account. Here too, however, it is clear that housing is a sensitive area. The examples considered (with the exception of the energy savings report) are so-called opt-in measures, i.e. only those who explicitly agree to them are given them. This entails a risk that primarily those who are already making efforts to reduce their footprint will be reached.
- Recent research suggests that in the home, measures of sufficiency and efficiency should go hand in hand, i.e. how appliances are used or how technologies can make it easier to change routines (e.g. programmable thermostats). There is therefore a need for increased cooperation between behavioural scientists, architects and engineers in order to better address the interaction of technology and routines (see e.g. the EU project UTILITee).

MOBILITY

In the mobility sector, CO₂ emissions have not decreased compared to 1990 despite technological developments. In theory, efficient drive technologies may have great potential to reduce CO₂ emissions (Dietz et al., 2009; Faber et al., 2012). However, this potential can only unfold if there are no rebound effects (i.e. if the energy saved by a more efficient drive is not offset elsewhere, e.g. by covering more kilometres than before). The focus here is therefore on measures that *avoid* and *shift* (Profijt, 2018). *Avoidance* means that the distances travelled are shortened and their number reduced. *Shifting* means switching to more resource-saving means of transport.

Expansion of the bicycle network

Research shows that people often do not use bicycles because they are afraid to use them in traffic (Fishman et al., 2012; Hess & Schubert, 2019). One way to counter these fears is to develop the infrastructure for cyclists with safe and comfortable, i.e. well-

marked, direct, continuous and wide cycle paths. Reducing the speed limit to 30 km/h in built-up areas reduces the perceived and actual risk of accidents (Pucher, Gerrard & Greaves, 2011).

Short distances/compaction

The way a city is built has a great influence on the choice of transport for its inhabitants. If many different destinations, such as grocery stores, leisure or work places, are within a reasonable distance, people will more often choose to cycle or walk there (Schwanen et al., 2004). Condensed urban and local development with short distances for working, living and leisure activities can promote behavioural changes.

Car sharing

The shared use of cars, bicycles, e-bikes, cargo bikes and e-scooters helps above all to save the energy generated during production and reduces the space required for parking. A prerequisite for these positive effects, however, is that the shared means of transport are well utilised and people do not buy their own vehicle for it. Shared means of transport are more likely to be used if they are available directly, easily and flexibly. Studies show that bicycle and car sharing services are mostly used by a specific group: young men who are well educated and have a higher income than the average population (Becker et al., 2017; Fishman, 2015). The majority of bike-sharing users are moving away from public transport and walking to shared bikes. Car sharing, on the other hand, can



Parking spaces for cargo bikes. Picture: Ann-Kathrin Hess



Bike parking garage in Copenhagen. Picture: Ann-Kathrin Hess

lead to users separating themselves from their own cars. However, there are also studies that show that car sharing offers are partly seen as a trial balloon with a view to owning a car (Giesel & Nobis, 2016). At the final conference of our project, the participants discussed sharing as a sufficiency measure very controversially. On the one hand, sharing could exclude people without an affinity for apps or even lead to an expansion of the offer and thus potentially to *more traf-*

fic. At present it is not yet clear whether the desired effect of sharing means of transport will occur at all; namely that it will replace a more resource-intensive form of transport and thus save CO₂.

Making the car less attractive

In addition to promoting slow-moving traffic or sharing options, the preference “driving

a car” can also be made less attractive. CO₂ emissions should be appropriately priced (Fillipini et al., 2019). With a view to sufficiency-oriented options, participants at the 2018 sufficiency network meeting in Basel discussed options such as road pricing, increased parking space management, reduction of parking spaces, or experiential use of parking space with so-called “parklets”. In

Carvelo2go Study

Recently, e-cargo bikes have been enjoying great popularity. They have a lot of storage space and their electric drive facilitates the transport of loads weighing up to 100 kg in local traffic. In Switzerland, carvelo2go offers e-cargo bikes for rental. A study has shown that active users frequently ride their bikes in everyday life, often have no car in their household and already use car-sharing offers (Hess & Schubert, 2019). These results show that switching from similar means of transport and forms of use (bicycle, car sharing) to e-cargo bike sharing is easier, whereas a drastic switch to completely different means of transport is less likely. People who cannot even imagine renting a cargo bike are afraid to ride a bike because of the many cars in the city. They also fear the potential speed given by the electric assistance. They primarily use the car and public transport for everyday journeys. E-cargo bike sharing can become even more user-friendly: with more stations, more cargo bikes at well-frequented locations, and a more flexible structure for pick-up and drop-off times. Wider and safer bike paths and special parking spaces for cargo bikes would give this means of transport more space.

In Basel city, training courses are already being offered for the safe handling of cargo bikes. There is also the joint project “Work by Bike” of the Pro Innerstadt association with the Office for Mobility, where Basel companies can test and buy a cargo bike for urban goods transport at a reduced price.



E-Cargo-Bike from carvelo2go. Picture: Ann-Kathrin Hess

this respect, a change in the urban structure or urban planning could help to make car use less attractive.

Conclusion

Changed mobility habits and preferences go hand in hand with new structures and offers:

- In the mobility sector, push and pull measures are needed, i.e. measures that help to avoid and shift, and measures that make the car less attractive.
- The infrastructure sets the framework for people's behaviour and vice versa: cargo bikes were not visible on the streets until a few years ago, but have now become a popular means of transport in many cities, which in turn places new demands on the infrastructure (wider cycle paths, parking spaces).
- An innovation does not necessarily mean that fewer kilometres are actually covered and that people switch to a low-emission means of transport.

SUFFICIENCY GOVERNANCE: HOW CAN SUFFICIENCY BE PROMOTED?

Various examples in the areas of nutrition, housing and mobility show that changing behaviour and preferences is not simply a matter for individuals, but that various levers are needed to achieve this. Appeals to individuals have only limited effect. In this section we want to investigate the question of the conditions for success in promoting sufficiency. We use the term governance, by which we

mean a process in which public and/or private entities work together to achieve common goals (Lange et al., 2013).

STARTING POINTS OF SUFFICIENCY GOVERNANCE

Governance of sufficiency aims to change what people consider important for their quality of life. For example, people switch to alternative means of transport when they experience benefits such as less stress on the road or when looking for a parking space, time gained for reading or resting, exercise in fresh air, etc. as an improvement in their quality of life. Both individual changes and changes in social conditions or infrastructure should be targeted (Burger et al., 2019). In particular, the consideration of different target groups and behaviour patterns is central. For example, target group-specific interventions can address specific lifestyle groups, such as hedonists, home-centred people, etc., or specific values (Bornemann, Sohre & Burger, 2018).

The scope or effects of individual measures are often limited, as can be seen from the effects of energy-saving consultations. The well-known gaps between attitudes and actions and feedback effects that often outweigh at least part of the savings must also be taken into account (Shove, 2017; Alcott, 2008; Alfredsson, 2004; Binswanger, 2001). Nevertheless, the existing diversity of measures and initiatives can develop their own dynamics when the effects cumulate beyond a certain point (Meadows, 1999; Sohre & Schubert, submitted). This can be seen,

for example, in the dynamic development in areas such as vegetarian nutrition or the shared economy.

ACTORS AND INSTRUMENTS (WHO PROMOTES WHAT AND HOW?)

In the governance of sufficiency many different actors with diverse interests and interactions are involved. They operate under different structural and institutional conditions and can draw on a wide range of instruments.

Bottom-up: civil society and business

The above examples make it clear that many measures are implemented by civil society or economic actors such as NGOs, cooperatives, associations or start-ups. They create offers such as package-free shops, sharing offers or community gardens and at the same time try to influence the behaviour of individuals through information, advice or advertising campaigns. To this end, they also use (often IT-supported) newer instruments such as nudging, or gamification (e.g. playful competitions for energy reduction in combination with feedback instruments).

Top-down: politics and administration

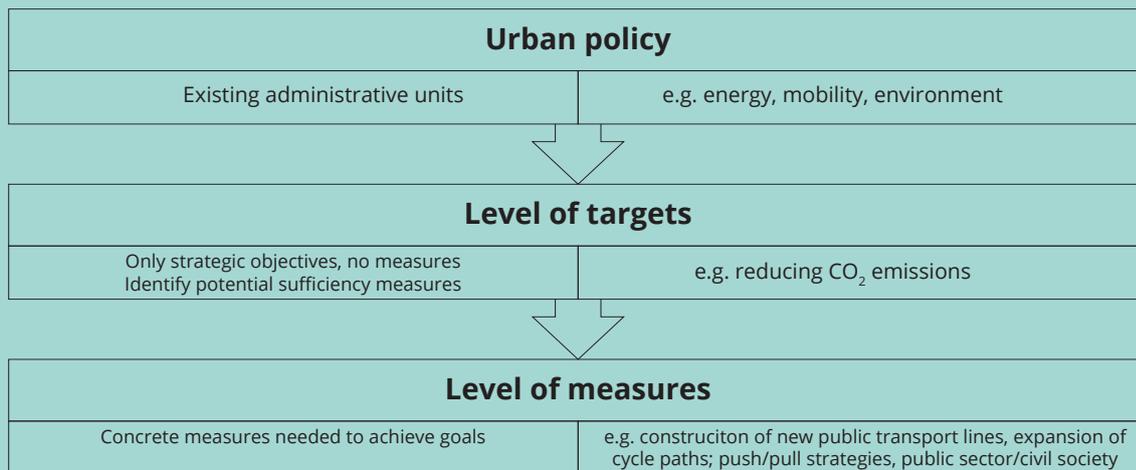
The role the politics and administration of a city (municipality etc.) can or should play when sufficiency governance is aimed at individual behaviour and the associated expectations of quality of life of the individual is not a trivial question. Since individual behaviour or a change towards sufficiency touches on many very sensitive, private ar-

reas (e.g. what people should eat, whether/where/how they travel), the scope of state regulation within a liberal state system is limited with good reasons (Burger et al., 2019; Schubert, Sohre & Ströbel, under review). The state does not have to prescribe what people should value, but Switzerland has committed itself to substantial energy reductions. The Confederation, cantons, cities, etc. have a corresponding obligation. The tasks of politics and administration are primarily in the context of framework conditions and infrastructure, but also, among other things, in the area of information dissemination. In the case of infrastructure, for example, the focus is on transport and urban planning, while framework conditions make it possible to promote individual measures (such as financial support for sufficiency initiatives) or to remove obstacles (as is currently the case with the commercial use of cargo bikes). It is problematic, however, that sufficiency is not yet perceived as a task by political actors or that responsibilities are not distributed ("Sufficiency in Everyday Life" final conference, 25.10.2019).

A second important task falls to state actors as "meta-governors": In the case of projects that are not carried out by the administration itself, but are in line with the city's general development goals, the administration can take on the role of "enabler" or moderator. Examples of such projects are sharing offers or avoiding food-waste, which are usually organised independently of the city administration, but serve the general objectives of sustainable development. The ad-

How can sufficiency be incorporated into the urban development process?

For each objective, the potential for sufficiency should be examined and whether it is taken into account. Targets such as the reduction of CO₂ emissions are political decisions. Controversy often focuses on the level of measures when it comes to the question of how these goals can be achieved. This is where different interests and distributional issues come to the fore, as can be seen, for example, in the discussions on motorised private transport. A social learning and appropriation process is needed to reduce the discrepancy between agreement at the target level and controversy at the measure level.



Scheme of governance approach. Own representation.

ministration can network the various actors from politics, business, civil society and last but not least the citizens and coordinate the cooperation of individual projects and ideas. It can also evaluate whether the measures actually develop the desired sufficiency potential. It is important not to start from the theoretical potential, but to consider how a measure is assumed to work in reality.

Finally, state actors have the task of taking sufficiency into account in politics. This includes, for example, urban development policy at a local level. Sufficiency potentials can be identified at the target level of urban development and taken into account at the measure level with regard to infrastructure

and framework conditions. The definition of the target level is reserved for the elected government for reasons of democratic legitimacy. The measure level, on the other hand, includes measures of the administration as well as citizen projects, projects of civil society organisations and those of the local economy.

Social learning and appropriation process

The scientific literature on sustainable development, a sustainable energy system or sufficiency emphasizes that achieving the ambitious goals requires a learning and appropriation process for individuals and institutions. For such a social process that

broadens the scope of what is possible for sufficiency policy, we see three criteria as central:

Transparency: Transparency about which goals the elected government is pursuing and which measures are being taken to implement them are the indispensable basis for participating in a discourse on urban or community development without expert knowledge, actively or passively. Discourse is the basis of an urban learning and appropriation process.

Coherence: The process of local sustainable development usually requires a combination of different measures. For the stakeholders, it is no longer just a matter of evaluating a single measure, but rather of being able to recognize it holistically (Meadowcroft & Steurer, 2013).

Narrative: For long-term change processes, people need the vision of a city worth living in, which they can work towards together. Motivation for the next steps can be drawn from pride in previous achievements. A consistent narrative of urban development is an important prerequisite for the sustainable urban development process (Shiller, 2017). Digitization opens up new opportunities for these learning and appropriation processes. Both information about the goals of urban development and the associated measures can be clearly accessed online (transparency). Connections can be made more easily visible (coherence). By enabling deliberation processes (i.e. advisory, but not entitled to vote in public projects), including citizens at the measure level, top-down control can be-

come a common form of governance without depriving the target level of its democratic legitimacy. Understanding and support for sufficiency policies can be increased in the long term (narrative, positive vision of urban development). A prototype for such an instrument promoting learning and appropriation processes has been developed as part of the Mercator project.

Conclusion

- In terms of content, sufficiency governance should aim at a combination of push-and-pull measures, both for individual behavior changes that go hand in hand with a change in individual expectations of quality of life, and for a change in the framework conditions.
- Institutionally, a large number of actors are involved in sufficiency governance. The role of politics in relation to sufficiency is:
 - o Consider sufficiency potentials where there is direct responsibility, e.g. at the target level of urban development, in creating and improving the necessary framework conditions and infrastructure
 - o The administration acts as coordinator and facilitator of sufficiency measures.

SUMMARY

This publication aims to provide answers to the following questions: What is sufficiency? What are promising approaches to advance sufficiency? Who can do what and how?

Sufficiency is a strategy to achieve ambitious CO₂ reduction goals. It is about de-materializing people's preferences, i.e. achieve that people value less resource-intensive behaviors more than those that involve high energy and material consumption. These substantial changes require a social learning and appropriation process, so that e.g. owning a car is no longer considered to be "the norm", but rather that a change in individual expectations as well as changes in infrastructure and framework conditions make lower-carbon alternatives the "norm".

There are numerous approaches and initiatives to promote sufficiency. Studies from Switzerland and abroad show e.g. saving potentials in the range of 2%, which can be achieved through feedback and information on changing routines. At first glance, this number may not look like much; however, it can be read as a contribution to a reduction path of energy consumption. In addition, the cost-benefit ratio of each measure must be taken into account. With an energy saving report, savings can be achieved at very low cost. However, the focus should not only be on the kWh saved, but also on the "extended benefit", i.e. further advantages that a measure provides for individuals (e.g. health, quality of life).

Civil society actors, NGOs and the economy can use innovations, e.g. cargo bike sharing, "Fairteiler" food cabinets, smart meters, and alternatives for low-carbon behavior. In addition, they can use awareness-raising campaigns to make people more sensitive and use their sphere of influence to promote measures for sufficiency. The state can set the framework conditions and provide the infrastructure for low-carbon alternatives. It can coordinate and support the numerous bottom-up approaches. For a serious reduction in CO₂ emissions and the equal consideration of push and pull measures, the state should also make full use of its options for top-down measures, e.g. by using price instruments to make low-carbon alternatives more attractive.

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