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The urban Prosumer in Finland – a path to Sustainability

When will less have more appeal than more?

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Abstract

The aim of this study was to enquire information and to analyse how an urban prosumer and prosuming in general can support the path towards sustainability in Finland and in the Global North. What are the reasons for prosuming and what are the obstacles for a prosumer, and how to overcome them?

The research method was narrative enquiry and analysis, using semi-structured interviews to enquire information and use transcripts to analyse narratives told by prosumers. The narratives were enquired by face-to-face interviews, video interviews constructed by others and author's own experience. The theory part consists of material gathered from books, scientific journals and reports, videos and the Internet.

This study found constraints of sustainability and derived solutions from them to conclude that prosuming supports sustainability and can be applied almost instantly. The main reasons for prosuming on individual level were health, overall well-being and saving money and time. The main obstacles were lack of time and difficulties to change habits. These obstacles could be overcome by will-power and by building prosumer activities into enjoyable routines.

The interplay of the studied prosumer activities, namely nutrition, repair and mobility together with housing should be researched further as well as how to persuade high-income earners to consume less.

Language: English. Key words: global justice, urban Prosumer, de-growth, sustainability, sufficiency, subsistence, post-growth economy, transformation design.

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1 Introduction

The bachelor programme “Natural Resources – Sustainable Coastal Management” of NOVIA University of Applied Sciences, which this thesis is part and an outcome of, meant for me time to explore the physical limits of natural resources, consequences and solutions for human doings in urban environment. This thesis is in contrast to my earlier studies of the expanding economy based on fiat money without intrinsic value, debt and compound interest, and the dependency they create.

The historic settlings of human tribes, their concentration at for them favourable coastlines led also to the rise of the magnitude of environmental impact of established cities. Their growth, hand in hand with economical growth, is projected to continue for decades: mega cities with dense human population of millions of people are and will be formed. The needs of these expanding cities in terms of space and human population create a demand, which is difficult to meet locally. This demand influences the society and people’s livelihood, which is the environment and their supply.

Water, air and soil, flora and fauna provide so called natural resources and services without we can not exist. Rules, tools and solutions have been developed to balance the different interests and evaluations of economy, society and the environment. These three pillars of sustainability, still the very same, have not been balanced to reach actual sustainability.

The catchment areas of cities, which are supposed to fulfil human demands, have expanded from the hinterlands to world-wide supply chains. Along them a stream of pollution, waste and sinks - unused resources - are finding their way to the coasts through air, soil and water ending up in aquatic bodies transported to the oceans or evaporated into the air. This forms a destructive cycle that reduces the environmental stock, which should create abundance, of which we humans should live sustainable from. Instead we consume the environmental stock, our future.

It is this stream of natural resources, which needs to be sustainable. The human, its dispersal of population, numbers and excessive exploitation of natural resources is the cause for adverse environmental and social impact. Since the humans have created these

adverse impacts, they therefore should be able but might be even forced to change their unsustainable behaviour. This needs a paradigm shift in human behaviour and lifestyle to secure humans survival.

What is the right question to reach sustainability? What is good life? How can a good life be reached with smallest environmental, social and economical expenditures within sustainable means? It might be a good start to define with your own terms what is needed for a good life.

The welfare and the consumption of households are the ultimate aim of economic activities (Smith, 2010). The amount of household consumption is still growing on a global level (Defila, Guilio and Kaufmann-Hayoz, 2011). The way households are living and consuming is the basic driver of the overconsumption of natural resources caused by human technology system (Baedeker *et al.*, 2008; Welfens, Liedtke and Nordmann, 2010). However, households are not the only actors that can affect sustainable resource use. In order to reduce the resource use from household consumption, also production and consumption patterns need to be changed together with infrastructures and politics that are provided by governments. (Lettenmeier, Liedtke and Rohn, 2014)

The target and proposed actions for consumption have already been defined for Finnish households in 2014 and can be seen as a representative for the Global North, see Table 1 below. To reach sustainable consumption a suggested material footprint of eight tons per person in a year should be reached. This means 80% (factor 5) reduction from the present Finnish average of 40 tons of material footprint. (Kotakorpi, Lähteenoja and Lettenmeier, 2008) Mobility, housing, and nutrition make up 84% of the average Finn's material footprint (Lähteenoja et al., 2007; Laakso, 2011).

Lettenmeier, Liedtke and Rohn (2014) report the material footprints of 18 Finnish low-income single households ranging between 7 and 35 tons per person in a year with an average of 18 tons.

Table 1: *Material footprint of Finnish households*

Consumption component	Status quo material footprint		Sustainable material footprint		Change required	
	kg/(person·a)	Share	kg/(person·a)	Share	%	Factor
Nutrition	5,900	15%	3,000	38%	–49%	2.0
Housing	10,800	27%	1,600	20%	–85%	6.8
Household goods	3,000	7%	500	6%	–83%	6.0
Mobility	17,300	43%	2,000	25%	–88%	8.7
Leisure activities	2,000	5%	500	6%	–75%	4.0
Other purposes	1,400	3%	400	5%	–71%	3.5
Total	**40,400**	**100%**	**8,000**	**100%**	**–80%**	**5.1**

Lettenmeier, Liedtke and Rohn, (2014)

The material footprint is used as a synonym to the Total Material Requirement (TMR) calculated for products and activities and uses the Material Input Per Service Unit or MIPS methodology from the Wuppertal Institute for Climate, Environment and Energy. Bringezu's 2009 original target of 10 tons of Total Material Consumption is split into 8 tons of household consumption and 2 tons for related public consumption of a person in a year (Mäenpää and Juutinen, 2001; Mäenpää, 2005; Bringezu, 2009; Watson, 2013).

Households have space for even immediate decisions reducing their material footprint. Sustainable decisions can be made in the fields of nutrition, electricity procurement and tourism at any time so that even fast changes could be envisaged in these areas (Lettenmeier, Liedtke and Rohn, 2014).

Prosuming is an activity to reduce the individual material footprint. The prosumer is taking on that challenge to use less, to define what is enough, to localise instead of "globalise" and to intensify utilisation of the existing, repair, care and share towards a good life – from an expansive to a reductive modernity to prioritise the sustainable environment, our livelihood.

2 Research Methodology

The development of the research questions followed the principle idea of the thesis, manifested in its title. Personnel producer-consumer stories transfer knowledge and with it tellers conditions. It was this complexity let to chose the narrative research method, to analyse narratives from the three interconnected view points of sustainability – Environment, Society and Economy. The hypothesis evolved prior to this thesis but was written down first time at the beginning of the thesis process, during which the narrative enquiry questions developed.

2.1 Research questions

- Why we do not apply what we already know – here sustainability knowledge?
- What are the main reasons big enough to become a prosumer, to change to a sustainable lifestyle, to apply sustainable knowledge and solutions?
- What are the definitions for a prosumer, and what are possible obstacles to become a prosumer? How to overcome these obstacles? What are necessary behaviour changes?
- What are the actions of a prosumer and prosumer networks to reach and maintain a sustainable cycle of natural resources? What can be done, and how can it be reached in areas such as food, energy, mobility and repair?
- What can be reached in terms of natural resource consumption reduction? How much can be reached for a defined set of prosumer actions, circumstances and assumptions?

2.2 Method

The narrative research methodology has developed since the 1980s, a nascent research methodology of its own right with a potential for use across a wide range of disciplines such as philosophy, education, theology and psychology to economics, medicine, biology and environmental science. (Webster and Mertova, 2007).

Narrative research or inquiry is a mean by which the researcher collects, analyses and represents people's stories as told by them. It is based on the world view that people live

storied lives and that we live in a storied world (Gergen K J and Gergen M M, 1986; Sarbin, 1986; Mair, 1989; Howard, 1991). A narrative represents, constitutes and shapes social reality (Spence, 1984; Bruner, 1987, 1990, 1991; Ochberg, 1994; Frank, 1995) A competing narratives represent different realities, not simply different perspectives on the same reality (Freeman, 1993; Gergen, 1994; Baldwin, 2004) and that telling and re-telling one's story helps a person create a sense of self and meaning (Burr, 1995; Cushman, 1995; Frank, 1995).

This approach is based upon a social constructionist epistemology that views reality and knowledge as socially constructed, and on the idea that knowledge is situated within contexts and embedded within historical, cultural stories, beliefs and practices (Gergen, 1985, 1994; Burr, 1995; Crossley, 2000). It challenges the accepted nature of modern certainties and questions how we know what we know and who tells us what we know (Polkinghorne, 1988; McLeod, 1997).

Because there is a complex interaction between the worlds, the individual inhabits and their understanding of that world, narratives are suited to portraying how people experience their position in relation to a culture, whether on the margins or being part of it or on becoming part of a new culture. When people tell us stories we hear their feelings, thoughts and attitudes, and the richness of the narrative helps us to understand how they understand themselves, their strategies for coping and how they make theoretical sense of their lives. Narrative approaches can therefore be used to explore socialisation into aspects of certain professions (Mattingly, 1998). For this reason this approach seemed eminently suited to my purpose of gaining insider stories of how people experience themselves as or become prosumers.

Narrative inquiry is a useful means of gaining an insider's view of the culture in which the story prosuming is embedded (Polkinghorne, 1995). Narrative methods go further than obtaining historical accounts; they also show how individuals create meaning within a culture. The structure of a story depends on a remembered past that leads to an anticipated future, showing how changes occur over time and how cultural patterns evolve and link with an individual's life (Carr, 1986; McAdams, 1993; Widdershoven, 1993). In this research, stories allow the reader to enter into the narrator's prosuming experience and may invite questions and hypotheses that might lead to further enquiry. They depict actions and

perspectives across prosumers that might be used for a comparative study, perhaps with another emphasis on prosuming, such as mobility, food, energy and repair. Narrative methods highlight the value of a person's individual story and provide pieces in a mosaic that depict a certain era or social group (Marshall and Rossman, 1999; Etherington, 2002) Therefore there is no truly "one objective version" of a story, because it is told by someone. The story is just that: the story we tell each other. The narrative is the perspective through which the story is told and subsequently, believed. (Ates, 2018)

In this thesis, the research strategy is quality research on the phenomenon at present, data collection by semi-structured interview (Bryman and Bell, 2003). Scientific literature and Internet research are used along the thesis process. Practically I applied the narrative enquiry and analysis in a step on step approach. Based on the research questions of chapter 2.1 I started to develop my hypothesis in chapter 2.3. On these two elements of the research methodology I developed a set of narrative enquiry questions of chapter 2.4. The questions I found useful in the context of a prosumer and sustainability. The personal story of the teller could circle around these narrative inquiry questions with little as possible interference as it would be in a question and answer interview style, a more careful guided monologue by the story teller.

To develop the narrative enquiry questions I first wrote down my own story of prosuming bread in chapter 8.1.3, an observation of my own experiences. Clearly, telling my own prosumer story presents a subjective view to the topic. Firstly, I chose to do that to develop suitable questions and test the method. Secondly, I wanted to share my 10 years experience of prosuming without knowing that I am a prosumer. An elaborated set of questions arose during my personal story writing. I found useful to answer these research questions, which fell into the frame of my hypothesis. This process of writing, exploring questions and questioning, led quite naturally to the analysis of the written word, triggered thoughts, developed further questions and delivered answers based on this process.

In chapter 8.4 related to community gardens, I tested these narrative enquiry questions with the story telling of other people. These story narratives were also conducted by others, often by professional journalists, documented as videos, partly in German and needed to be translated for this thesis by myself. The transcripts of the story narratives can be found in the appendices. I started to do basic research of the concept of community gardens and

combined it with the story narratives. That turned out to be very powerful, far reaching learning experience exploring all three pillars of sustainability, shaping as a by-product the narrative enquiry questions further.

For the chapters 8.2 Walk & bike and 8.3 Repair café and I did first some background research to get familiar with the topic but also to verify the suitability of the narrative enquiry questions. After my own story narrative, story narratives conducted by others, now in the last part of my research, the story tellers told me their prosumer narrative face to face. Prior to the story telling I explained briefly the prosumer concept to the teller, the area in which they are prosumers. I mentioned the narrative enquiry questions as well as the three pillars of sustainability: environment, society and economy. I started with the question: "What is your story of prosuming?" The length of the story telling was both times 45 minutes unplanned, by coincidence, and ended rather naturally. The first part was mainly a monologue by the teller. I tried to be quiet as long the telling was flowing. I carefully used comments and described narrative enquiry questions rather to deepen the telling than directing the narrative. To analyse the different narratives I combined the content of the transcripts with the earlier researched theory part of the prosuming topic to elaborate on the research questions.

2.3 Hypothesis

For the Global North the guiding principles are: less is less, enough is enough and competition is for beginners. Live with the existing a good life.

- The Global North has accumulated a high enough level of affluence and civilizing standard. Additional economic growth will not any longer add to happiness neither to good life – utilize, obtain, reduce the use of the existing and stay put.
- Competition leads to growth, to natural resource consumption, related pollution, illnesses and war. The human is a *Zoon politikon*, likes to be together, be for each other not against each other – is a social being.
- The good life for future generations is determined by our planet's limitations, carrying capacities and it defines individuals' concept of enough by taking global environmental justice into account.

- The consequence for the Global North is to do less of every adverse environmental impact activity by factor 4, to reduce these activities by 75% by 2050, to reach Earth's human life-sustaining capacity. (Mariano, 2019)

Is this hypothesis utopia under current political and economic system? Possibly yes. Scientists show that we are in the phase of the 6th mass extinction of species (Ceballos et al., 2015; Rifkin, 2017, 5:05 – 6:48). By assuming continuity of human activities the human species will be extinct by year 2100 – some 80 years from now. There are 3-4 generations left, a bit more than an average human lifetime in the Global North. Do we, in the Global North, need to do, change something - our behaviour maybe? Mathis Wackernagel, executive Director of the Global Footprint Network, phrased it in the film the Planet in the part Choices and consequences: "What do we have to do? We have to do nothing. There is no have to. There is just choices and then there is consequences." (Stenberg, Söderberg and Torell, 2006)

2.4 Narrative enquiry questions

Elaborate on your action – tell your own story.
What were your motives, circumstances, obstacles, emotions, supports, thoughts, resources, philosophies.

- What is the story? Please describe that prosumer action - here …
- How did you come up with or developed the idea of that action?
- What thoughts guide you to that action?
- What personal circumstances you were in when you got that idea, started that action?
- What kind of motive you had to start that action?
- What was needed to put the idea into action?
- What circumstances foster, motivated you to start, retain that action?
- What kind of behaviour change was necessary to start, retain that action?
- What kind of obstacles were to overcome to start, retain that action?
- Will you retain that action? What would be circumstances, motives to stop action?
- Why did you do it?
- Is the action part of a bigger picture?

3 Prosumer

The prosumer is a producer and consumer in one person. The prosumers are empowered consumers, who produce goods and services as well as energy by themselves for themselves. They use the added value creation, which is taken away from industry and others, at and for themselves. This added value can offset reduced income based on less employment and time spent for it. The concept can be widened by exchange between prosumers to repair and share networks or communities, where the latter are less capital intensive. Capital is substituted by sustainable systems and time. The consumer becomes a prosumer and supports the development towards a decentralized reductive modernity – a good life.

The prosumer refers to the product, service or experience which has been produced and consumed by the same agent, individual or a community, without necessarily seeking any monetary consideration with the market. Prosumer activities are within the framework of invisible economy outside monetised economic production. However, such activities have meaningful impact at the same economy sustainment and development of the society. (Ortegón Clavijo, 2015)

Toffler (1980) suggested that the Western economic system can be usefully divided into two sectors. Sector A (which might be called the 'use value sector') comprises all unpaid work done by people for themselves, their families or their communities, whereas Sector B (the 'exchange value sector') comprises work done to create goods or services for sale or swap through the exchange system. Humphreys and Grayson outlined (2008, 8-9) some recent observations concerning marketplace contexts in which consumers assist companies in the process of value creation. These practices may create the impression that the distinction between consumer and producer is becoming blurred and argue that the most important distinction - that between creating use value and exchange value - still offers a useful lens for analysing these practices and for understanding how and why they work.

Toffler (1980, 481) argued that an expanding decommodified "prosumer sector", stressing "production for use" rather than "production for exchange," was the driver of nascent "Third Wave Civilization."

Toffler's hopes that prosumption was reining in capitalism's excesses and giving rise to a new deeply democratic civilization were dashed by increased commodification, employment problems, and de-democratization, which accompanied the new regime. But his ideas about linking prosumption for end use to a decommodified, less alienated, more democratic future provide resources for envisioning alternatives to neoliberalism. (Antonio, 2015, 7) Toffler (1980, 152–3) spoke of prosumer practices fostering a "techno-rebellion" that would eventually give rise to environmentally friendly production and consumption—a "more 'metabolic' system that eliminates waste and pollution by making sure that the output and by-product of each industry becomes an input for the next. Something we would call nowadays circular economy. He held presciently that ever-expanding production and consumption is ecologically unsustainable. (Antonio, 2015, 8)

Responding to major ecological risks, recent thinkers (Jackson, 2009; Schor, 2011) have parallel views to Toffler's ideas about de-commodification, emphasizing well-being and de-emphasizing Gross Domestic Product growth. Especially if prosumption is as extensive, exploitative and central to the current state of accumulation, showing how it can be redeployed to serve more humane, ecologically friendly ends will be necessary to help envision and create a more democratic, sustainable alternative to neoliberal capitalism. (Antonio, 2015, 8)

More and more people seek self-expression through producing their own products and experiences as a matter of proudness, self-identity enhancement (Holt, 1995), self-fulfilment and shift more of their time to prosumption. Rather than having their lawns mowed and fertilized by companies offering those services, and their need for food and social events taken care of by restaurants or catering companies, they decide to accomplish by themselves such services. (Xie, Bagozzi and Troye, 2008, 3)

Some researchers have used interpretive and ethnographic approaches to capture the richness of consumption practices and have made us aware that prosumption is more than economic activities. It is also a creation process of socio-psychological experiences that allows us to construct and maintain our self-identity and social image. (Firat, 1991; Holt, 1995) Research of meal preparation as part of consumer culture (Moisio, Arnould and Price, 2004; Bugge and Almås, 2006) demonstrates that home-made can be a retaliatory practice that negates mass production and conceals and de-commodifies the market-made.

Home-made can also deliver devotional performance expressing love and sustaining family relationships and traditions. Prosumers also try to create their own subjective experiences, e.g. making a delicious meal for family or friends. Food prosumption, own produced staple, is a classic example of prosumption. (Xie, Bagozzi and Troye, 2008, 4 & 9)

Xie, Bagozzi and Troye (2008, 10) found empirical support that attitudes, self-efficacy and past behaviour have significant effects on prosumption intention. Self-efficacy has the strongest positive impact on intention showing that self-efficacy plays a central role in people's prosumption decision process. Global values influence domain-specific values in food prosumption, and domain-specific values then affect attitudes, self-efficacy, and on-going behaviour before ultimately shaping intentions to engage in prosumption in the future. (Xie, Bagozzi and Troye, 2008, 1)

4 Sustainability

For this thesis sustainability has been defined by the Herman Daly "Rules for Sustainability", which is based on Georgescu-Roegen (1971) fundamental research and reads as follows (Meadows et al., 2004, 54-55).

1. Renewable resources (such as fish, soil, and groundwater) must be used no faster than the rate at which they regenerate. In other words: its rates of use of renewable resources do not exceed their rates of regeneration.

2. Non-renewable resources (such as minerals and fossil fuels) must be used no faster than renewable substitutes for them can be put into place. In other words: its rates of use of non-renewable resources do not exceed the rate at which sustainable renewable substitutes are developed.

3. Pollution and wastes must be emitted no faster than natural systems can absorb them, recycle them or render them harmless. In other words: its rates of pollution emission do not exceed the assimilative capacity of the environment.

In this thesis sustainable development is defined by the definition of the Brundtland report for the World Commission on Environment and Development, 1987 (Meadows et al., 2004, 254): "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Daly's Rules are based on ecological theory and the laws of thermodynamics, and should perhaps be considered implicit or foundational for the many other systems, such as a society.
The Bruntland definition of sustainable development and the Daly's Rules of sustainability can be seen as complementary. Bruntland provides an ethical goal of non-depletion of natural capital, whereas Daly details how this ethic is operationalized in physical terms. The outcome is a system rationally complete and in agreement with physical laws – the thermodynamic reality.

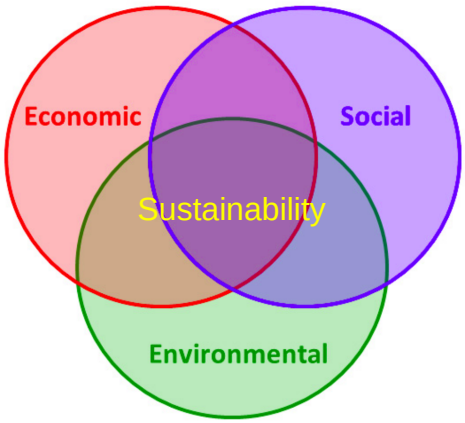

Figure 1: *The three pillars of Sustainability - the lowest common denominator* (GALA, 2015)

Figure 2: *Reality of Sustainability* (author)

The accumulation of compromises, the lowest common denominator, so called integrated approach of sustainability, overemphasis the economical aspect of sustainability, leading to the reality of today. Without paradigm change of that economic aspect the future is and will be unsustainable for becoming generations.

4.1 Sustainable systems

According Mollison and Holmgren (2017) conscious functional system design is sustainable design. A sustainable system is any system that in its life time can produce more energy than it takes to establish and maintain it. Looking at a system as a whole there are two undesirable things: one is work and the other one is pollution. Pollution is the product of work. Work is the result of not supplying every component of a system with its needs. Pollution is an unused resource, which did not go where it would be used. Naturally, based on the given environment where a sustainable system is implemented in, the design solutions are appropriate different.

4.2 Strategies to reach sustainability

Sustainable development can be grouped into three different strategies for achieving sustainability:

- efficiency with regard to production processes and the use of products;
- ecological consistency of production processes and products in order to achieve compatibility between the industrial and natural metabolism.
- sufficiency with regard to population growth, as well as the level of affluence, life-style and consumption patterns; (Huber, 2000, 8)

Scrutinising is preceding the above mentioned sustainability strategies. It questions any activity with adverse environmental impact before they are established, during planning, their necessity and proportionality but also uses creativity to eliminate or mitigate impact.

The balanced approach of the three pillars of sustainability in the Global North needs to change and prioritized until the needs of society and economy can be created from the environmental stock without reducing it. The order of priority is to rebuild a sustainable environment, followed by a society build on sufficiency and the existing – a paradigm shift.

To be able to reach a sustainable environment any resource taken from it, human action with adverse impact on the environment needs to be analysed before the resource withdraw or action take place – precautionary principle.

The target is to avoid adverse environmental impacts, caused by society and economy, instead of tampering with the symptoms such as pollution, illnesses and loss of biodiversity. This is another paradigm shift to place the sustainability principle at the beginning of the added value chain (Welzer *et al.*, 2017). Welzer uses added value chain instead of supply chain including all aspects of a product and service life cycle (IHK Nürnberg, 2015).

Human creativity is able to support these paradigm shifts by changing perspective, our questions. Welzer uses these narratives to illustrate the change: the minister of the German Ministry of Research and Development abolished all electro cars for the inner-city use, with the reason that the ministry new building was now close to the main station of Berlin. This raised criticism because the electro cars represent the future of mobility in some opinions. The future of mobility is primarily less mobility based on a different organisation of living- and work environment. In very rare cases the question of demolition, removal of infrastructures and existing technology is asked. How to omit individual mobility need to be considered. For instance, shopping facilities and medical care in rural areas will reduce the need of individual mobility. (Welzer et al., 2017, 16-18)

Another example by architects Anne Lacaton and Jean-Phillippe Vassal, who won a competition to redevelop a square in Bordeaux, France, with their solution to leave the square like it was and to use the budget for regular care. The square has kept its appearance until today. Vassal described architecture as building but foremost as cogitation. The creation of a disposition with a new atmosphere, not only by adding a new but at first of all to comprise the existing atmosphere. (Vassal and Tröster, 2012)

According Huber; the sufficiency strategy of sustainable development is an agenda for the conservation of nature. The efficiency strategy of sustainable development is an agenda for the improvement of existing technologies and infrastructures in order to economize on natural resources and sinks. The consistency strategy of sustainable development is an agenda for innovation of new technologies, products and material flows in order to change

the qualities of the industrial metabolism, thus rendering possible a true industrial ecology. (Huber, 2000, 14)

The strategies of sufficiency, efficiency and consistency can be combined, although the degrees of combinatorial freedom are less discretionary than thought. The best overall strategy puts priority on long-term consistency and utilizes mid-term efficiency as much as possible, and at the same time fully acknowledges that certain limitations, hence sufficiency, must finally be respected. (Huber, 2000, 15)

According to Paech (2014b) there are two main philosophies of sustainability developed since 1972, marked by the report Limits to Growth of the Club of Rome. The decoupling strategy is based on the premise that economic growth can be decoupled from material and energy flows with the help of technological and systems change and innovations using ecological efficiency and consistency (e.g. use of renewable energies) leading to product and service innovations. Economical growth is seen as a peacemaker, so everybody in society benefits from growth albeit unproportionally. A backlog demand for wealth instead of redistribution of wealth. The triple bottom line model is linked to the decoupling strategy to create a balance of all the different interests in a modern consumer society – economic, social and environmental interests. Example are green, blue and bio economy. The post-growth economy as a second path to sustainability is based on the premise that permanent economic growth can neither be ecological neutralized or optimized nor preserved over time based on economic, social and environmental limits.

Redistribution of wealth (=growth neutrality) refers to the logic of a zero sum game, which mans taking wealth from the rich part of the society to develop the poorer part, increasing social justice concerning income and wealth distribution.

For the post-growth economy a cultural change is needed instead of technology and product innovation, more institutional innovations such as modest structures and supply chains are needed. The latter reduces distance between production and consumption. This approach to sustainability accepts growth limits. It sees the environment as the limiting factor, which can not be expanded by technology innovations. It rather limits and reduces the economy to provide more space for the society and the environment. (Paech, 2014, 13:15-19:08)

Material (production side – push, supply) and financial rebound (increase of income – pull, demand) effects are very often outbalancing any progress in efficiency and consistency. Economic growth implies always an increase of production. Products, services and technology needs to be added to create economic growth. These are causing adverse environmental impact and can not be decoupled. The only reason for economic growth is to increase private, public and national income, to increase capital, to reinvest it, to create wealth. This income can not be de-materialized because it will sooner or later end up in material assets or consumption for goods or services – a classical financial rebound effect. This is an important rebound effect on the demand side of the economy. It means that an increase of economic growth, income of a worker, even in the renewable energy sector, will lead to spendings of that income for an additional use of natural resources and related pollution. (Paech, 2014, 23:30- 26:00)
Paech (2014a, 23:00-23:45) has researched that one additional Euro of economic growth will lead to 1-5 kg CO_2 emission. A conclusion might be to reduce income, therewith also reduce natural resources consumption and related pollution. That would lead consequently for working less hours, reducing production and using gained time for local and regional activities. The collected added value formerly spent on external supply, production and its long supply chains could cover the reduced income. To be able to cut these long supply chains short it is needed to reduce specialisation and division of labour. That would concentrate the adverse environmental impacts close to the consumption of goods and services, e.g. in a city. The environmental impact of these human activities, positive or negative, with short supply chains would be felt by the same people, which might lead to change in their behaviour how to do these activities.

Another conclusion is there is no sustainability without settledness (Paech, 2015; Paech and Jäger, 2018). Meaning commuting and mobility in general should be reduced. The consequences are far reaching for human life in the Global North, since people like to have the world at their reach, by means of mobility, information technology and money (Rosa and Schiermer, 2016, 3)

4.2.1 Efficiency

According Herring (2006, 10) improving energy efficiency lowers the implicit price of energy and makes its use more affordable, which is then leading to greater use - an effect

termed the ‘rebound’ or ‘takeback’ effect. What is needed to limit energy consumption, is actually energy sufficiency or conservation rather than energy efficiency. Despite many actions to reduce energy use over the last 25 years, still energy consumption continued to rise, not fall in all of the world’s industrial countries. (Herring, 2006, 10)

The terms ‘energy efficiency’ and ‘energy conservation’ have often been used as equals in policy discussions but they do have very different meanings (Herring, 1996). Energy conservation is reduced energy consumption through lower quality of energy services. This could include for example speed limits for cars, lower heating levels by turning down thermostat levels or consumption limits on appliances. Often it means doing without, omit, to save money or energy. Energy conservation is strongly influenced by regulations, consumer behaviour and lifestyle changes. (Herring, 2006, 11)
Energy efficiency is seen as the ratio of energy services output to energy input: getting the most out of every unit of energy one consumes. It is mainly a technical and historic process caused by stock turnover where old equipment is replaced by newer more efficient ones. In general energy efficiency is an outcome of other social targets such as productivity, comfort, financial savings or fuel competition. Measuring energy efficiency, particularly on a macro scale, is charged with methodological difficulties and thereby hard to measure over time, especially between countries or sectors (Schipper and Haas, 1997). For example, a more efficient aircraft leads to cheaper air fares, which can increase travelling by air (Herring, 2006, 12).

McLaren, Bullock and Yousuf (1998) commented in a Friends of the Earth book: what is really important is to make sure that gains of efficiency strategies are used to deliver real environmental improvements. It is not so much how to be more efficient. Proponent of energy efficiency agree that some of the efficiency savings are offset by higher energy consumption. These so called “takeback” or “rebound” effects compromise, sometimes overcompensate reached efficiency gains.

Greening and Greene (1997) presented three principle types of rebound effect. The direct rebound effect is “the increased use of energy services provoked by the reduction in their price due to greater efficiency”. This works like any other reduction in price of commodities. Secondly, the indirect rebound effect is caused by the decrease in the cost of energy services, which leaves the consumer with more money to spend on all goods and

services. Thirdly, the general equilibrium rebound effects involve both producers as well as consumers and represent the result of innumerable adjustments of supply and demand throughout sectors. Rebound effects are important while judging the relevance of technological change as a strategy for solving the greenhouse gas adverse impacts. The rebound effects combined impact determines whether technological improvements in energy efficiency substantially reduce greenhouse gas emissions or not. Measuring them is therefore essential for developing effective policies to mitigate anthropogenic greenhouse gas emissions. (Herring, 2006, 12)

Several environmentalists say that in the future the economy of industrialized countries will be de-materialized, because of the structural shift in the economy from energy intensive manufacturing to energy frugal services. This is also known as the Factor 4 revolution (Hawken, Lovins and Lovins, 1997). In disagreement William Rees reminds that improvement in the efficiency of resource use, such as with information technology, leads to a decline of product prices, a mass market and consequently to a large global consumption of resources. He argues that "moving from a primary (resource-based) or secondary (manufacturing) economy to a knowledge-based or service-orientated economy does not 'decouple' the economy from the environment. Rees 'ecological footprint' research suggests just the opposite and it concludes that high-end service economies actually increase global energy and material throughput". (Adriaanse *et al.*, 1997)

Most of the people seem to believe that information and service-based economies are more ecologically friendly than manufacturing economies and resulting in smaller ecological footprints. Unfortunately, this is a clear misperception. This argument is based on the belief that the appropriate "economic niche for the most advanced of the developed countries in a globally- restructured economy is as purveyors of high-priced technology, of so called intellectual capital, has the unpolluted products of mind". (Herring, 2006, 13)

Rees (Herring, 2006) pointed out already in 1997 that ones personal ecological footprint is determined on how one earns a living but also how much one consumes. As the economies become increasingly knowledge-based high incomes potentially will spent on high consumption with an increase to the average contribution of ecological destruction. This effect will potentially intensify with the rise of disposable income. Overall global pollution will rise further, when the trend of manufacturing migration to developing countries with

lower environmental standards continues. Rees adds (Rees and Wackernagel, 1996), “the air over Northern cities might seem clearer but the world’s atmosphere is much worse for wear” - the common atmosphere connects all humans.

Ted Trainer (1999) made similar points. He disagreed with the ‘dematerialization’ of economy assumption and argued that services and information are surprisingly energy intensive, especially transport, tourism and the Internet. He stated that continuing economic growth will lead to increasing demands for materials, energy and productive land. He commented: “The essential element in this general position is rejection of any need for fundamental change in lifestyles, culture or the economy”.

Wolfgang Sachs, (1999) warned environmentalists that advocating only ‘resource efficiency’, they obscure the fact that ecological reform must be based on two principles: scrutinizing means as well as moderating goals. An increase in resource efficiency on its own leads to nothing, unless it goes together with an intelligent restraint of growth. Sachs disagrees with a mechanistic approach to nature, which means that we are treating it as a mine for inputs and deposit for waste. “Instead of seeking to optimize maximize outputs through efficiency, we should seek to optimize inputs and do more with less”. To Sachs is important the overall physical scale of the economy with respect to nature. He advices that efficiency without ‘sufficiency’ is counterproductive: sufficiency must define the boundaries of efficiency.

According Andrew Rudin (1999) what is needed for sustainability is less consumption not more efficiency, which later often leads to bigger consumption. Our singular goal can't be just improved efficiency, but also using less energy. He says that improved efficiency rationalizes consumption by expanding the limits of natural resources, and justifies “a wasteful lifestyle”. He argues for limits to consumption through “moral restraint and cultural change. He advocates a policy of conservation not efficiency, saying while efficiency tells us what to buy, conservation tells us how to behave”. According Rudin, if we want to protect the environment, we should concentrate on conservation and self-control, not improved energy efficiency and consumption. He sees that as a moral issue, rather than an economic one. Conservation is courageous because it demands discipline, sacrifice and caring for common interests. “We should use less energy because it is the right thing to do, not just because someone asks us to do so.” Rudin demands changes in

lifestyle, which means returning to the Jeffersonian ideal of the 'wisdom of frugality'. A society should be based on 'voluntary simplicity' leading to stable communities, local consumption and small scale production by independent businesses. Also Sachs and Trainer advocated this concept of sufficiency with its emphasis on reducing consumption and 'living well on less'. Unfortunately, it so far remains a mainly ethical warning rather than practical approach to western consumers. Regardless, academics have developed and governments have encouraged it into a weak form under the slogan of 'sustainable consumption'. (Herring, 2006, 15-16)

Rudin (1999) states that efficiency is good for business. The Capital highlights that improved efficiency is a must to remain globally competitive. The concept of improved efficiency is seen politically correct, receives funds and is the basis for economic growth, and has therefore become the manifesto of our environment movement. Rudin argues that efficiency investments benefit the already rich ones, with the greatest advantages going to owners and investors - the Capital - rather than employees.

According Herring (2006, 19) energy efficiency saves people's money, but it does not solve the problem of global warming. Despite great improvements in energy efficiency over the past 25 years, overall energy use has risen in Western Europe. This shows that people prefer to utilise the efficiency savings in forms of higher levels of energy service, rather than decrease their actual consumption. This could have been foreseeable since the effect of increased efficiency lowers the implicit price of an energy service to make its use more affordable, which all leads to greater use.

Carley and Spapens (1998) argue that some environmentalists already accept that increasing efficiency only does not automatically lead to reduced consumption. Instead they emphasize the need to decouple economic growth from resource consumption and a policy of sufficiency which is living well on less. This kind of policy of sufficiency means lower consumption, which can be achieved by cutting working hours, and having more leisure for family as well as community life instead of greater material consumption (Trainer, 1995). However, to achieve this, a big change is needed to challenge the present dominant ideologies of free market capitalism and 'consumer choice' (Levett, 2003).

I agree that the key questions are more ethical and cultural rather than technical and

economic. What do we consider as a ‘good life’? Are we able to consume more goods and services for so called higher ‘quality of life’ and still use less materials and energy? Could lower energy lifestyle be made desirable by moral suasion or cultural example? (Herring, 2006, 19)

4.2.2 Consistency

Compared to efficiency and sufficiency, consistency is not usually used as a sustainability strategy. Lately, a consistency strategy of sustainable development has been defined for instance as an attempt to link natural and industrial metabolisms (Huber, 2000). According this, human-made systems should try to imitate natural systems and this should lead to sustainability – this is so called industrial ecology perspective. Consistency as a strategy would concentrate on green innovations and green economics (Schäpke and Rauschmayer, 2014).

According Huber (2000, 280) consistency stands for compatibility, coherence among things and correspondence among related aspects, and this applied to the ecological issue, means the environmentally compatible nature of industrial material flows and energy use. Consistency promises altered production and consumption patterns through fundamental innovations in technology oriented toward a basic consistency with natural capital protection (Kleinhückelkotten, 2005). Consistency improvements aim at qualitative changes in production and consumption patterns by resource substitution and adaption to natural resource flows and therewith at safeguarding spaces for growth of material flows, consumption, and the economy at large (Grunwald and Kopfmüller, 2012).

Circular economy, as an example of designing products to go in a loop, does not necessarily lower CO_2 emissions . Gutowski et al. (2011) compared energy savings between manufacturing and remanufacturing of 25 different products, from clothing to IT equipment, and came to the conclusion that remanufacturing in general actually does not save energy. Energy savings in the remanufacturing process took only place when less energy for transport was required or no new primary materials was needed. In addition to this, the potential for resource-efficiency was reduced by a number of constraints. The number of cycles different materials can handle is limited before they loose their value and usability (McDonough, W.; Braungart, 2002). It is great that most of the aluminium in the

world is recycled, but an increase in production leads to a continued extraction of primary sources. A circular economy means a huge shift in mind-set compared to predominant linear consumption habits. To increase the amount of durable products and support lower consumption patterns with slower turning circles, might be the key to reach true sustainability. (Ahnfelt, 2016, 45)

Huber (2000, 280) underlined that the consistency approach does not primarily concentrate on lessen material usage but to use different kind of material usages, which can support also large material volumes.

Schmidt-Bleek (2000, 58) indicates that closed loops ignore the origin of used materials, meaning the input side. He adds that 70% of man-made solid material throughput can not be managed in loops, because these materials never enter the production circle. Examples are excavation material, materials, which will be moved but not used in the production. In addition, it is unexplained if a circular economy will require additional transport. The concentration on technical solution is striking in the circular economy's consistency approach and degrades the consumer to a passive background actor without any own responsibility, who task it is just to consume. It is suggested that circular economy is sustainable just by designing reusable products, which can be consumed endlessly and in ever growing amounts.

Increasing personal well-being would go hand in hand with consuming different, innovative, and more environmentally friendly products. Besides technical and institutional interventions, and in contrast to mere efficiency strategies, the promotion of consistency attempts would benefit from deeper consideration of psychological aspects such as values, knowledge or social groups (Defila, Guilio and Kaufmann-Hayoz, 2011). Nevertheless, innovations increasing consistency are still missing in numerous fields of production and are unlikely to emerge at scale in the foreseeable future, while other challenges, such as the sustainable harvesting of fish or wood, cannot be addressed by consistency attempts at all (Kleinhückelkotten, 2005; Jackson, 2009; Stengel, 2011).

Alcott (2008) argued that efficiency improvements and consistency attempts need to be combined with behaviour changes and aligned with the principle of sufficiency. Still, the systemic effects of sufficiency principles or their combination with efficiency and

consistency need further analysis regarding resource consumption and environmental impact.

4.2.3 Sufficiency

The term sufficiency derives from the Latin word *sufficere* and can be translated “to be enough”. It is about to have enough to meet one’s needs – material and immaterial. Sufficiency is about to establish the right measure. Wolfgang Sachs defined four principles for sufficiency called the “four Lessens”: lessen our speed, lessen our distance, lessen the encumbrance of our acquired possessions and lessen the role of commerce and the market in our lives. (Schneidewind et al., 2014, 13-14)

Wolfgang Sachs (1993) summarised sufficiency with "four Ds":

- Decelerate (going slower and less far);
- De-clutter (accumulate fewer things);
- Decentralize (choosing local and regional);
- Decommercialization (leaving less room for the market in your life).

As human beings we can create unlimited numbers of new wants. These wants are not only constrained by the limits to factors of production but also by finite natural resources. Sustainability transitions demand altering individual behaviour patterns. Policies,which are aiming at changing people’s consumption behaviour are designed according to the three sustainability strategies namely efficiency, consistency, and sufficiency. Considering the shortcomings of the first two principles, focus rests on the sufficiency principle. Sufficiency policies are not found attractive based on the fear that they may reduce the materialistic part of quality of life. The attractiveness could be increased by highlighting the motivational side of sustainable behaviour, for example the wish to care for future generations and the world’s less fortunates – global environmental justice.
(Schäpke and Rauschmayer, 2014, 1)

While the efficiency and consistency strategies predominantly concentrate on innovations of the technology and the production process, the sufficiency strategy targets behaviour modification, voluntary changed behaviour patterns. In the focus is the consumer who should consume less material and energy in all sectors of life. The following actions should

be supported by avoiding replacement of goods before their life time ends (Stengel, 2011, 26):

- Mobility: replacing individual motor car traffic by bikes and public transport
- Nutrition: reducing omit animal products, mainly meat and fish
- Housing: stopping building and buying new residential buildings

Likewise efficiency rebounds, sufficiency rebounds may happen on macroeconomic level. Products and services, which are not used by one consumer may get consumed by others (Alcott, 2008; Madlener and Alcott, 2011). In contrast to efficiency rebounds, "the overcompensation of sufficiency savings by sufficiency rebounds is not typically possible" (Madlener and Alcott, 2011). Scientists assert for a policy mix based on sufficiency, efficiency and consistency or de-commodification strategies alike (Schäpke and Rauschmayer, 2014, 31).

Also sufficiency can have rebound effects when the reduced consumption of fossil fuels leads to financial savings, which is used for another consumption such as meat consumption. This is also valid for fossil fuel taxes, which the government might use to build, for example to extent an airport, instead of investing into renewable energies. Even when investing fossil fuel taxes into renewable energies, which in turn leads to additional natural resource consumption, like gear material for wind turbines, but also leads to financial income for the workers building these turbines, will lead to consumption. (Alcott, 2008; Madlener and Alcott, 2011)

The return to a sustainable economy can not put into practice without sufficiency. That is, "per se sustainable technologies and objects are simply unthinkable. Only lifestyles can be sustainable, - not products". (Paech, 2018b) To phrase it different: cultural growth driver can be only mollified by sufficient demand implementation (Simon, 2014, 204).

Paech, subdivides sufficiency into three categories, see Figure 3 below:

- Streamlining - jettisoning affluence ballast
- Decelerated lifestyles - gaining time sovereignty
- Avoiding over-stimulation (e.g. social media, advertising)

He based these categories of necessary and potential reduction on the logic of ecological and psychical constrains. They are both fuelled by the same cause – a too high affluence. In the Global North reduction of consumption is possible since the level of affluence is far above the poverty line and offers freedom of action without compromising a "good life" style. (Paech, 2014b)

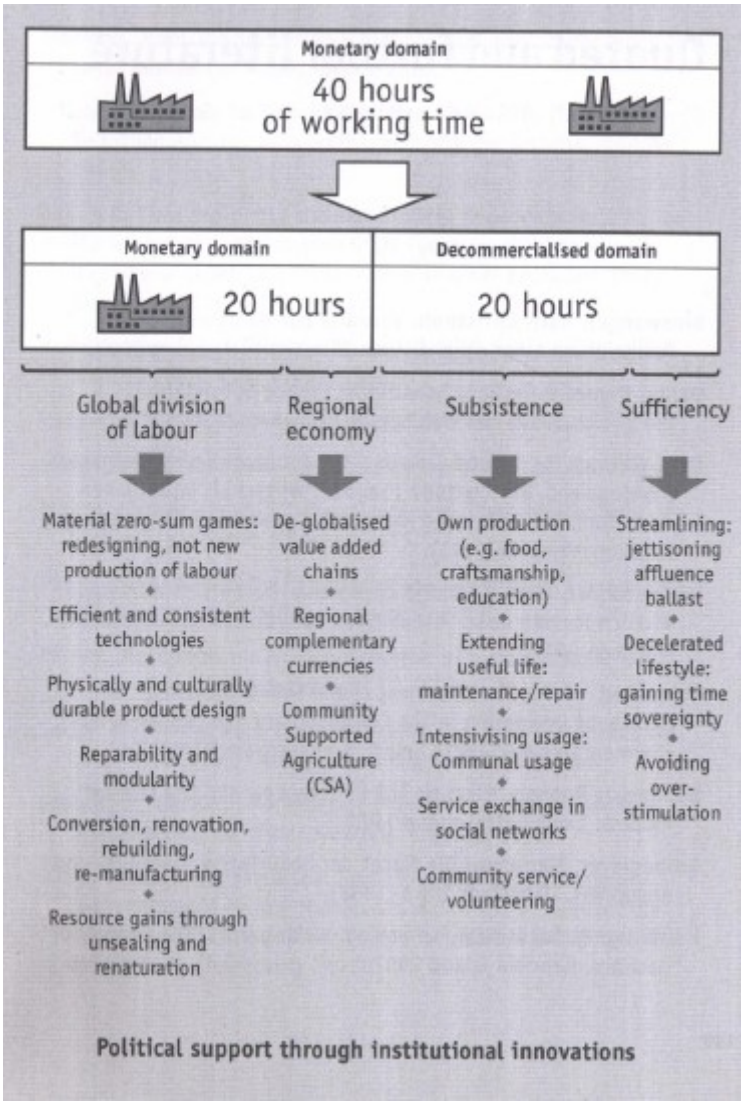

Figure 3: *Post-growth economy (Paech, 2016, 139)*

4.2.4 Modern subsistence

Subsistence means "existence, independence", sometimes also "substance, reality and stability". In the English word, meaning "act or process of support for physical life" is from 1640s. (Dictionary Online Etymology, 2019) Based on the German meaning of "Subsistenz", the definitions are self-provision, to deal, cope with the environment to safeguard a living and satisfy basic needs. Subsistence includes everything physical and social necessary for day-to-day survival such as food, clothing, dwelling as well as care and sociality. Subsistence is synonymous with livelihood and means of existence. The mode of this attempt is called subsistence strategy, and include craft and trade. (Wikipedia, 2018b)

The subsistence approach defines a path to greater autonomy and quality of life by strengthening regional, local or individual self-provisioning. (Mölders, Szumelda and von Winterfeld, 2014) Subsistence mollify structural growth drivers by shortening and simplifying complex production-, supply chains – the supply side. The resulting reduction of external supply can range from regional to local supply and even-self supply, so called subsistence. (Paech, 2016)

The shortest value added chain represents complete or "pure" subsistence, a prosumer, combining the supply and demand side at first, and potentially use their outputs as inputs – a value added cycle. Example would be a prosumer kitchen garden (seed production, produce, human faeces as fertilizer). A group of people cultivate a garden hardly need any money, nor capital, nor profit or interests and therefore have no need to expand and the added value stays within that group of people. (Paech, 2016)

Fossil fuel based activities and technologies might be to a degree covered by brawn and time. Ivan Illich proposed for that the concept of "convivial technology". In simple terms, these tools and activities enhance the productivity of human work, without replacing them. Instead they are more labour intensive, but require less energy carrier, land area and capital. Examples are manual, organic, community supported agriculture (CSA), insect rearing, transport with cargo bikes, sailing ships, mechanical lawnmowers and sewing machines, handheld tools, fishing rods and repairable wooden and metal products. (Paech, 2016, 53)

Based on previous arguments I could assume that urban people, dependent employees, can and may be forced to reduce employment based on efficiency measures in the industrial production chain, and could then use the gained time in their subsistence strategy to create and keep added value for them selves or their community. Beside own production modern subsistence include extending useful life of products, intensifying their usage, exchanging services in social networks, community services and volunteering.

To be in harmony with sustainability, it should be possible to freely choose the two ways of life, sufficiency and subsistence without being mandated by the authorities. When both principles are self-imposed, for instance via a grassroot movement, then they are in-line with sustainability, which is obliged to observe the imperatives of justice and fairness. (Mölders, Szumelda and von Winterfeld, 2014)

For the majority of people living in cities, purchasing the necessities for living usually involves some form of paid labour and shopping activities. The goods are consumed in the private sphere of the home but produced by industries for and procured from the consumer market. Self-provisioning, prosuming, as part of people's subsistence strategies is considered not "productive" in a conventional sense, nor in a political economy sense, a perception of economy that has long been criticized also by feminist economists (Bennholdt-Thomsen, Mies and Werlhof, 1992; Gibson-Graham, 2006b, 2006a).

Mainstream society traditionally identifies self-provisioning with poverty, loss of comfort or bare survival, with hippies returning to the land where they live in communes and try to revitalise a pre-industrial lifestyle, including more current lifestyle trends of rooftop gardens and the like (Murton, Bavington and Dokis, 2016). Recently there have been several projects in anthropology and the social sciences, that made it their purpose to question the "capitalocentric" representations of the economy and to document the persistence of subsistence strategies as socioeconomic activities in capitalist market societies (Gibson-Graham, 2006a, 2006b; Gudeman and Hann, 2015; Roelvink, St. Martin and Gibson-Graham, 2015; Murton, Bavington and Dokis, 2016).

It seems that a path to sustainability for the Global North is to shape our demand to sufficient level first - what do we really need for good life? And then supply these reduced demands with less external supply with simplified production, and create regional and local supply chains, even self-supply.

Urban Subsistence: Resilience by a Prosumer movement

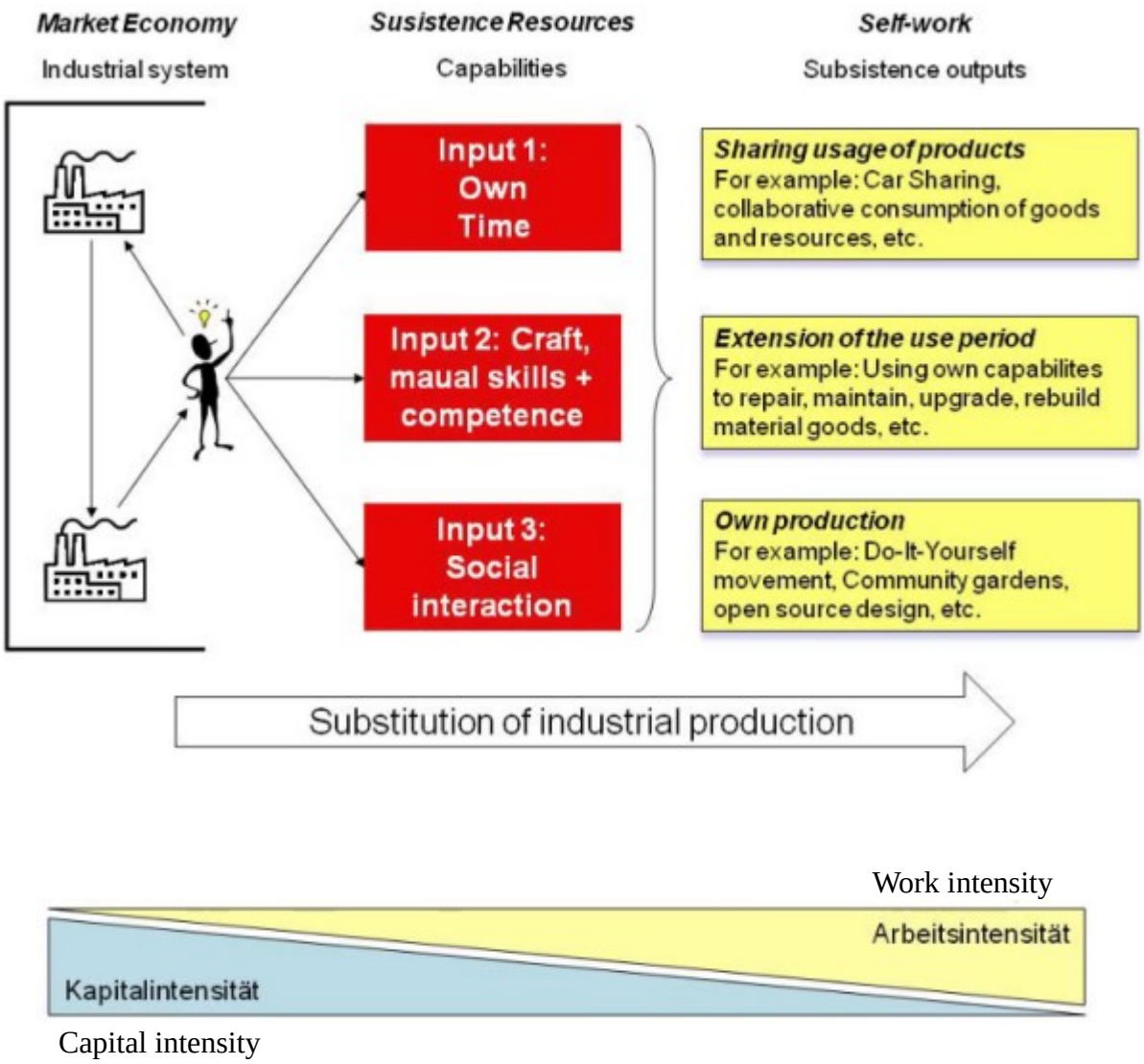

Figure 4: *Urban Subsistence (Paech, 2014b)*

4.3 Precautionary Principle

There are two broad classes of definitions of the precautionary principle. The strong version of precautionary principle basically states that one should not take any action unless you are sure that it will not have adverse impacts. The weak version of the precautionary principle would state that lack of full certainty is not a justification for preventing an action that might be harmful (Morris, 2000).

The Rio Declaration produced by the 1992 United Nations Second Special Session on Environment and Development (United Nations Conference on Environment and Development 1992) endorsed the following precautionary principle formulation: “When there are threats of serious and irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”

The Wingspread Statement defines the precautionary principle proponents as follows: ”When an activity raises threats of harms to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically (Science and Environmental Health Network, 1998).”

These two precautionary principle formulations have critical dissimilarities. The Rio Declaration applies only to serious and reversible risks. The Wingspread Statement presumably applies to any risk. The Rio Declaration applies only to actions that would result in environmental degradation. The Wingspread Statement is broader and applies to actions that would harm either the environment or human health. The Rio Declaration indicates that any regulatory actions undertaken should be cost effective. The Wingspread Statement gives no consideration to costs. The Rio Declaration imposes no affirmative duty to act. The Wingspread version has a positive obligation to act. The combined effect of these differences could easily result in inconsistent regulatory outcomes in many cases (Marchant, 2003).

4.4 Global environmental justice

In almost any part of the world, globalization impacts everyday life and shapes international and political relations. Globalization can be broadly defined as the "process of interaction and integration among the peoples, companies and governments of different nations". It has led to rapid changes in economic, political and cultural terms, and is responsible for economic growth in both "developed" and "developing" countries. (Chiu et al., 2011, 664)

Since there is no clear definition for a developed or developing country, usually the degree of economic development, for instance measured by per capita income or general standard of living, is used to divide countries into highly developed economies with advanced technological infrastructure and those without these characteristics. Economic development has increased positive and negative interdependencies between nations and cultures. One of the negative outcomes is often related to globalization leading to socio-economic inequality between various regions in the world. (Reese, Proch and Cohrs, 2014)

The US Environmental Protection Agency (EPA) defines environmental justice as "the fair treatment and meaningful involvement of all people regardless of race, colour, national origin or income with respect to the development, implementation and enforcement of laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic or socio-economic group should bear a disproportionate share of negative environmental consequences resulting from industrial, municipal and commercial operations or the execution of federal, state, local, and tribal programs and policies." (Sexton, 2014, 381)

Latest during the twenty-first century, environmental justice has become a global issue. This is due to current inequalities between relatively rich, industrialized countries in the northern hemisphere (e.g., North America, Western Europe) and relatively poor, developing countries in the southern hemisphere (e.g., Africa, South America, Southeast Asia). The globalization of economies, fostered by the liberalization of trade rules, supported the rise of multinational corporations. All contributed to a geographical shift of polluting industries and hazardous wastes from the North to the South. This is resulting into adverse effects of climate change, deforestation, and declining biodiversity, which fall

disproportionately on developing countries and their poorer populations around the world. Examples of environmental injustice are attempts of rich countries to exploit poorer countries as a source of raw materials, a sink for waste disposal, or as a preserve for natural ecosystems and biodiversity (e.g. tourism). (Sexton, 2014, 381)

Despite several different definitions for the concept of environmental justice it has been generally agreed that it emphasizes the underlying principles of fairness and equality, which must be a part of society's efforts to protect all of its members from the harmful effects of environmental pollution. Environmental justice can also be defined as a "societal goal of achieving adequate protection from the adverse effects of stressors in the environment for everyone, regardless of age, culture, ethnicity, gender, race, or socio-economic status". (Sexton, 2014, 381)

The principals of global environmental justice could be interpreted that every human has the same right to consume and pollute at the same rate than every other as long environmental sustainability is kept. This logic was applied to climate protection by the German Advisory Council on Global Change (WBGU) on the base to keep the global average temperature increase at 2°C and for a population of at least seven billion people at that time. That resulted in a per capita CO_2 volume of around 2,7 tonnes CO_2 equivalents per year. Based on a total budget of 750 billion tons of CO_2 equivalents until year 2050, the life time budget of an 80 years old cosmopolitan would end up to 200 tons CO_2 equivalents, see Figure 5 below. (Paech, 2018b)

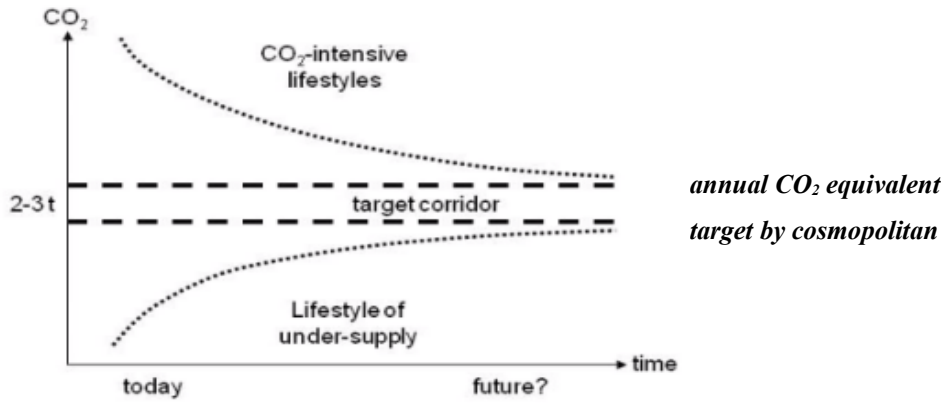

Figure 5: *CO_2 target corridor – global environmental justice (Paech, 2018b)*

According this research, the average CO_2 volume in Germany per capita and year was 11,8 tonnes, which would make, while applying global environmental justice, a needed average CO_2 volume reduction of 77% – a bit more than factor four. The value of 11,8 tonnes does not include the CO_2 emissions from outside that country needed to create its Gross Domestic Product – the CO_2 emissions of the globalisation. By calculating the individual CO_2 volume in a year and comparing it with the average target value of 2,7 tons CO_2 volume a year, the reduction, rarely an increase, will provide a guideline for the necessary personnel behaviour change to keep the global average temperature increase at 2°C. (Paech, 2016, 52) This calculation concentrates on the output of a process with an environmental impact, e.g. gas. Similar calculations are available for the input side. For example the ecological backpack calculation from the Wuppertal Institute for Climate, Environment and Energy, which is based on the Material Input Per Service Unit Methodology (MIPS), which transfers the required natural resources (M - Material) into kg or kW/h (I - Input) / per kilometre train ride (PS – per service unit). (Ritthoff, Rohn and Liedtke, 2002)

5 Civilising standard

Civilising standard is a non-material standard, based upon a free, democratic society, it is based on rule of law, providing social-, health- and educational services, which are worth to protect. Welzer and Sommer subdivide the civilising standard in a material and an non-material part. Noticing that the former has led to a possession of on average 10.000 goods per adult person in the western societies (Welzer, 2013; Kern, 2014; Gerber and Welzer, 2015)

Our economic model and social structure has been developed from the beginning of early industrialized societies and led to unprecedented common prosperity in the Global North and other comparable societies elsewhere. Specifically the globalisation of current economic system, concentrating on profit maximisation and privatisation threatens its own achievements, which are built on continuous economic growth exploiting and polluting the environment. That effects not only the Global South, but also societies world-wide. It is one of the big questions of our times: how to maintain and develop the non-material civilizing standard by simultaneously eliminating exploitation and pollution of the

environment and nature consumption. Therewith we should be able to adjust the material civilizing standard to a sustainable, global environmental justice level, to provide a good life for all present and future generations. (Welzer, 2013)

6 Economic growth

Economic growth is an increase in the capacity of an economy to produce goods and services, valued at market prices (or at cost when the goods are not sold), compared from one period of time to another and adjusted by inflation. Traditionally, aggregate economic growth is measured in terms of gross national product (GNP) or gross domestic product (GDP). (Chen, 2018)

GDP can be interpreted as a measurement for ecological destruction. The GDP consists of all performance achieved as a result of money-based division of labour. GDP basically includes things, which are produced to be delivered to someone else as cash-equivalent service. This is exactly the transfer of productivity, which cannot be ecological neutral. A CO_2-neutral Euro, dollar or yen is impossible, because they contain the demand for material values, which need to be produced, transported and acquired to an ever-increasing degree. Otherwise GDP growth would disappear and the stability of the financial system would be threatened as well as related economy. (Paech, 2016, 8-9)

Since the publication of Limits to Growth in 1972 (Meadows and Club of Rome., 1972) it is known that exponential economic growth is impossible on a finite plant. Since then the average annual global economy growth has been around 1,7% with dramatic negative consequences for the environment and societies. It has been analysed that one additional Euro of GDP leads to 1 – 5 kg CO_2 emissions, unsustainable use of natural resources, land degradation increase and to a decrease of biodiversity (Paech, 2014a).

According Rifkin (2017) scientist say we are in the phase of the sixth mass extinction. The human spices is endangered by its own actions (Ceballos et al., 2015). Lately Sánchez-Bayo and Wyckhuys (2019, 16) made a compilation of published scientific reports, where they estimated that the current proportion of insect species in decline (41%) and twice as high as that of vertebrates. The pace of local species extinction (10%) is eight times higher

confirming previous findings (Dirzo *et al.*, 2014). At present, about a third of all insect species are threatened with extinction in the countries studied, and every year about 1% of all insect species are added to the Red List. These biodiversity declines are resulting in an annual 2.5% loss of biomass worldwide, and with it a loss of ecosystem services such as food for other creatures, pollinators and recyclers of nutrients. Sánchez-Bayo stated: "The loss of biomass world-wide is very rapid. In 10 years you will have a quarter less, in 50 years only half left and in 100 years you will have none." Sánchez-Bayo and Wyckhuys (2019, 16)

According to Jeremy Rifkin, American economic and social theorist, the combined wealth of the eight richest people of the world equals the accumulated wealth of the 3,5 billion poorest people on the planet - half of its total population. Rifkin declares mismanagement of the world's economic family (Rifkin, 2017, 1:20-2:20). GDP is slowing worldwide and productivity, aggregated efficiency, has plateaued at 20% since the 90s and can not be improved on current energy, communication and mobility systems based on the law of thermodynamics (Rifkin, 2017, 18:44).

The increase in material wealth since the beginning of industrialisation is based purely on ecological plundering and in addition to that social exploitation takes place. (Paech, 2016, 51)

Employment

American and German scientists project a 47 – 25% job substitutability potential by automation and digitalisation by 2025 based on employment figures from 2010 (Wolter et al., 2015; Frey and Osborne, 2017).

Pollution and disease

Peach claims that the prescriptions for antidepressant drugs have doubled between 2000 and 2010 in Germany, the decade where Amazon and Ryan air brought many goods and services to peoples' reach. He together with Jean Gadrey, a French economist present research claiming economic growth as detrimental to and incompatible with sustainability (Paech, 2014a, 4:25-6:05; Robin, 2014, 1:40-1:60 & 22:28-23:04).

Materialism, natural resource scarcity

Harald Welzer, German social psychologist, claims that on average an adult person in the western society possesses 10.000 goods (Welzer, 2013, /:00-7:30) and predicts for this century that scarcity of natural resources and climate change will lead to militant conflicts and migration in and from failed states (Welzer, 2013, 22:40-23:35).

Economic growth obligation

Ulrike Herrmann, German economic journalist, states that investments are made to create profit and wealth, to increase competitiveness. When demand declines for instance based on low income, investments will decline and employment will decrease. This creates a downward spiral from degrowth to financial collapse. Without investments there is no economic growth. (Herrman and Paech, 2017, 30:50-33:45)

These are only a few boundaries the human race faces in all three areas of sustainability; ecology, society and economy. It is essential to develop and implement ways to balance these areas for the survival of our species on this one planet.

European Union GDP, annual average, economic Growth rate, 1996-2017 (20 years): 1.72 %

→ 41% more goods and services.

Figure 6: *EU GDP average, annual economic growth (Trading Economics, 2018).*

The Economy is a subsystem of the Earth – the limiter of economic growth

“Anyone who thinks that you can have infinite growth on a planet with finite resources is either a madman or an economist." Kenneth Boulding (1973)

Households

The welfare and the consumption of households are the main reasons for basically any economic activities (Smith, 2010). The amount of household consumption is still growing on a global level (Defila, Guilio and Kaufmann-Hayoz, 2011). The way households are living and consuming is a major basic driver of the overconsumption of natural resources by the human technosystem (Baedeker *et al.*, 2008; Welfens, Liedtke and Nordmann, 2010). But this does not mean that households were the only actors that influence sustainable resource use. In order to reduce the resource use of household consumption, both production and consumption patterns have to be changed, as well as infrastructures and politics that are provided by governments. (Lettenmeier, Liedtke and Rohn, 2014)

7 True sustainability

Human population their consumption pattern of natural resources as well as the predominant economical target, short-term profits, implies also pollution, which leads to global climate disruption, habitat loss and to the extinction of human species. Human population growth will accelerate the process of extinction when the individual adverse environmental impact is above the sustainable level.

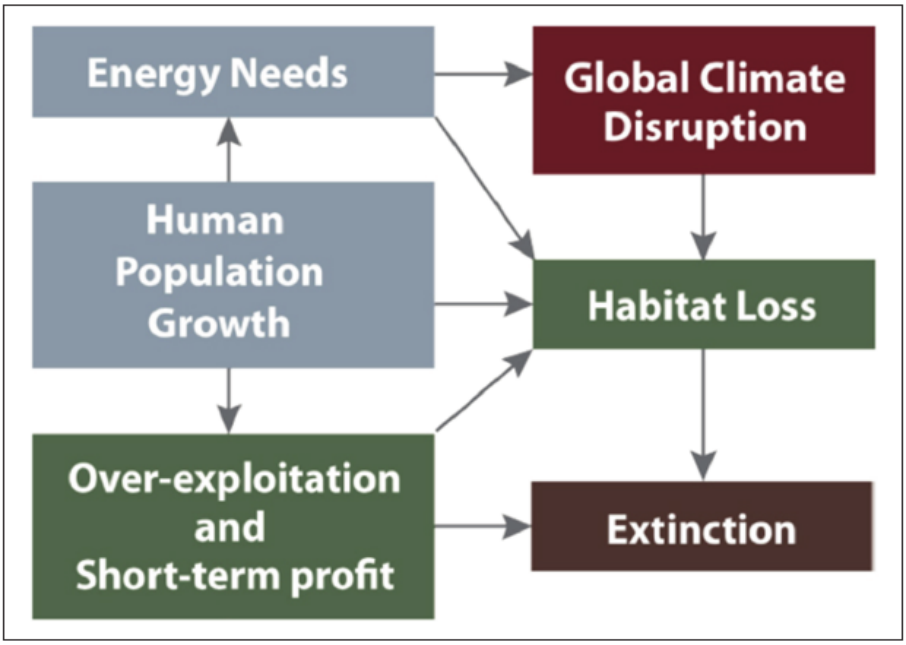

Figure 7: *Barnosky's model of extinction (Barnosky et al., 2014, 90)*

Extinction rates are now too high because old models of natural resource use are no longer sustainable. Supplying 7 billion people (9.5 billion by 2050) with a high quality of life requires investing in nature's capital, rather than spending it. (Barnosky et al., 2014, 90)

In line with global environmental justice the natural stock needs to be rebuild, put into a position to create abundance again. Natural resource consumption and related adverse environmental impacts needs to be frozen on current levels and reversed in a controlled manner towards the new defined Enough. Recovering natural stock needs to be protected to allow natural stock rebuild. Only part of the abundance created by natural stock can be managed in a sustainable way, to establish a contingency buffer, see Figure 8 below.

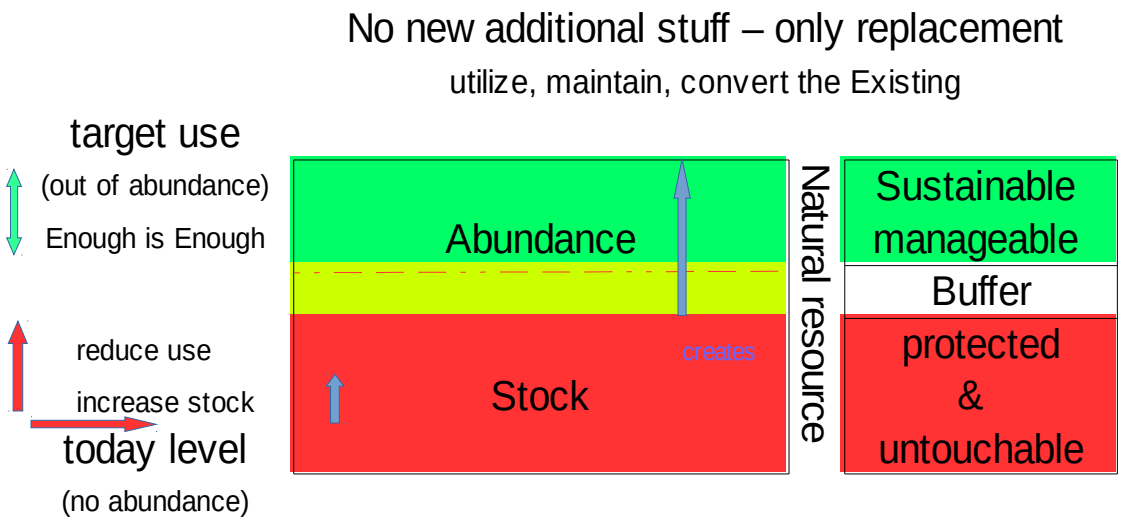

Figure 8: *Natural resource appreciation (author)*

8 Stories of prosuming

Tukker et al., (2010, 1) confirms that food and beverages, mobility, housing, and energy-using products are the most critical fields of consumption from the environmental sustainability point of view, and the fact that higher household income leads to greater environmental impacts. The latter raises the question how to motivate high income earners to reduce their income and thereby consumption and impacts – become prosumers?

Harald Welzer (2014) adds that a master plan for societies often will not work, because they are too complex and ever changing. Instead combinatoric assembling of single arrangements according local requirements delivers different customized overall solutions – like a modular toolbox. This is a toolbox of opportunities created, chosen by the locals but supported by leadership (board of real estate, city, government). The disposal of niches, where playful, experimenting arrangements are possible, encouraged and visibly supported, empower citizens and increase creativity and engagement. These niches are a prerequisite for paradigm shift. Narratives, success stories of niche activities, act as positive backing for ones own undertaking and can be used as a discussion base, to integrate them with other citizens activities, which create a sense of participation and citizen power (Arnstein 1969).

The following chapters mention sustainable activities from the areas of nutrition, mobility and subsistence. These solutions reach for fast realisable activities, which need little capital and planning but can be scaled from individual to community activities. All activities could be summarized with the core message health and save. Core messages need to be understandable for a wide audience; they need to be specific, concrete and used at the beginning as a lead. The core messages should address peoples' senses and their imagination, but might need a few words of explanation.

8.1 Making own food – from staple to table

Simplicity, originality, buried evolutionary and cultural knowledge maybe a recipe to fulfil the basic need for food, for all humans without depleting the natural stock – an important pillar of good life.

8.1.1 About food intake

According to research reducing food energy intake is another factor to reduce diet-related greenhouse gas emissions (GHGE). A study shows that most French adults have a low level of physical activity. This suggests that a part of the French population has an excessive energy intake and that reducing food consumption to match the energy needs may lead to a decrease in the GHGE. Reducing food consumption to match the estimated energy requirements of each person may lead to a 2,4% - 10,7% decrease in GHGEs depending on the assumption made on the average physical activity level of the population. These reductions can be achieved without the need to modify habitual food patterns. The impact on the GHGE is likely to be modest, maximal 12%, when the decrease of energy intake is reached by a reduction of meat and deli meat consumption. (Vieux et al., 2012, 98)

It seems obvious that simply reducing energy intake will reduce the environmental impact of diets, but this is rarely emphasized as such. In fact, some modelling studies that have analysed the impact of environmental variables of adopting healthier food patterns did simulate a decrease in total energy intake without explicitly acknowledging it. For instance, two highly cited papers estimated the GHGE reduction associated with a simulation of meat consumption reduction without estimating the loss of energy associated with this reduction and without compensating for this loss. (McMichael *et al.*, 2007; Friel *et al.*, 2009)

More recently, a study concluded that adherence to the Mediterranean diet pyramid would reduce GHGEs footprint by 72% compared with the average Spanish diet, which includes more meat. The energy consumption footprint of the recommended Mediterranean diet was calculated with 52% less than the Spanish average diet and therefore has a lower impact on GHGEs. (Sáez-Almendros et al., 2013, 4)

In another recent study, two modelled diets derived from the average European diet to be vegetarian or to follow the German dietary recommendations, were found to have a lower water footprint. The modelled diets contained approximately 20% less energy than the average reference diet, suggesting that a large part of the positive influence of those diets

on the environment could be related to their lower energy content. (Vanham, Mekonnen and Hoekstra, 2013, 5)

Encouraging frugality should be one of the first strategies for promoting sustainable diets in industrialized settings because it has the potential to help resolve both health and environmental issues, with no prejudice on financial affordability. This is in line with public health recommendations that promote small lifestyle changes resulting in a reductions of energy intake and an increase of energy expenditure to address the obesity epidemic and the related health conditions. (Hill, 2009) However, the cultural acceptability of eating less may prove challenging. (Macdiarmid *et al.*, 2013)

Three guiding principles were proposed when developing a healthy and sustainable diet by Friel, Barosh and Lawrence (2014, 1159):

1. Any food that is consumed above a person's energy requirement, a kind of overconsumption associated with obesity, represents unnecessary adverse environmental impacts in the form of GHG emissions, use of natural resources and pressure on biodiversity.
2. Reducing the consumption of optional food choices, which are energy-dense and highly processed and packaged, reduces both the risk of dietary imbalances and the use of natural resources.
3. A diet with less animal- and more plant-based foodstuff increases both health and ecological benefits.

As a first option one could consider reducing overall food intake: in several developed societies nutritional energy intake has increased with raising purchasing power and is higher as recommended (Lenzen and Dey, 2002, 387). The quantification of the potential environmental benefits requires careful analysis of various factors and goes beyond the scope of this paper. It is the relatively small excess intakes over time that causes overweight and obesity. An intake reduction therefore might have limited environmental benefits. An increase of physical activity is seen as an even more important recommendation to improve health in the Global North but it requires a higher energy intake. (Tukker et al., 2011, 1785)

Humans in the Global North have taken on weight. Obesity is seen as a contributor to many illnesses. In Finland the percentage of obesity has been risen from the 1950's to 24,8 % in 2017 of its population over 15 years old. In 2016, Finland self-reported 56% of its population over 15 years old overweighted or obese (OECD, 2018) defining the potential population for a reduction of food and energy intake in Finland. On OECD level, in 2017, 54% of the population aged over 15 was overweight, including 19% who are obese (OECD Obesity Update, 2017).

Obesity is defined as Body Mass Index (BMI) greater than 30kg/m2 (weight/height², with weight in kilograms and height in metres). A normal weight BMI is defined by the World Health Organisation between 18.5 and 24,9 kg/m2. (OECD, 2017). It seems to be safe to say that reduction of weight by more physical movement and less food intake would do good for the health and well being, especially when the food would contain its natural nutritional value.

In theory, to generalize, 54% of the OECD population over 15 years old could reduce their food intake. This food then does not need to be produced at all or can be different distributed to fight hunger with positive effects on peoples health and well-being. The individual food intake could be stabilized permanent at a normal BMI level, to define the new enough.

The activity of loosing weight, e.g. through interval or fasting cure, in German "Heilfasten", is a well established medical method to palliate and heal life-style diseases and moreover, with far more implications than loosing weight. Fasting is a process during which the human organism switches from external to internal supply and by doing so protects, adapts, restores the disturbed self-regulation of the body and activates recovery on cell level. In the context of this thesis fasting is a method of prosuming. The healthy prosumer switches slowly from usual food consumption to water and sieved soup intake for 72 hours or several days before slowly introducing food again. This is producing mental and physical cleansing of the body, a self-regulation. It seems that from human evolution, genetical point of view our organism can handle lack better than abundance. (Gilman and de Lestrade, 2011; Nencioni *et al.*, 2018)

Worldwide, evolutionary experience has shown that also without medicine or money one's health can be improved. The prosumer takes the added value from the pharmaceutical industry. Fasting can lay the ground for a more conscious ingestion, which can lead to savings of natural resources, money, and increase of health.

8.1.2 Making bread

To elaborate on prosuming bread I present my own narrative of bread making. This story has been used to develop and answer the research questions in chapter 2.1 as well as the narrative enquiry questions in chapter 2.4. I tested the developed questions by answering them with my own narrative in this chapter and also reflect on prerequisites of bread making, the process and costs as well as the benefits for the prosumer.

The organic grain comes from a farmer, who produces rye, spelt, wheat and oat and sells it directly at a farm shop, local market to a prosumer in bigger lots of 5, 10, 15, 25 and 50 kilograms. Cleaned whole grain lasts up to 10 years when stored correctly and does not lose much of its nutritional value because it can not oxidate.

The prosumer invests into necessary additional equipment such as storage equipment for 1-2 years of consumption, household flour mill and flake squeezer, pasta maker, bread baking machine and germ device. Surely, part of the equipment can be shared, placed at a common space to increase utilisation and reduce start up investment of 800€.

After the initial investment the prosumer is able to bake a 650 grams whole-grain spelt bread for 1,70€ instead of nowadays 5-6 € at retail prices in Finland. The cost price of 1,70€ includes ingredients, equipment depreciated over 5 years and energy. The difference between the two prices is the indirect received value for the time spend by the prosumer. The actual time needed to make this bread is less than 7 minutes: to weigh the ingredients, to grind the whole-grain to flour and to fill all ingredients into the baking pan. The backing machine delivers unattended in 2-3,5 hours a fresh bread, which lasts in the fridge in a bag minimum 14 days without any preservatives. The only ingredients used are whole-grain spelt, water, sea salt and yeast.

While having a variety of whole grain at home, with the proposed investment for equipment, all kind of foods can be made by the prosumer – porridge, shoots, pasta, pastry, pie, cake, sauce thickener. In general staple foods are suitable for storage over long periods of time without decay. Salt is lasting indefinite when stored dry. Other perishable foods can be dried or stabilized to last longer, for instance by fermenting in 1,5% salt water in preserving glasses. In the case of stabilizing, food can be bought at main harvest time when ripe at lower cost – again the prosumer receives the value from the cut out of "middle man", the food processing industry.

In this bread example the nutritional value received is by far higher than industrial produced bread since the industry uses refined flour, where the nutritious edge layers and the oily germ of the grain are separated and sieved out to keep the ground grain long lasting. The flour will oxidate and the loss of nutrients continues. It is well documented that refined flour lead to caries, obesity, cardiovascular disease and diabetes (Schnitzer, 2004).

The food processing industry disaggregates staple, adds preservatives as well as natural and chemical additives to compound it again and processes it to many different food products. This focuses on convenience and attraction for to the customer to maximise food products profits. Highly energy intensive processes along the industrial food chain lead to an unsustainable energy input of 10-12 kcal for 1 kcal of industrial, conventional produced and processed food (Herve-Gruyer et al., 2014, 0:30 – 0:40).

It seems that public health would increase with lower cost for the public, when the industrial produced food would be reduced by cooking directly from staple food without preservatives and artificial food additives. This could not only happen at homes but also at public places like restaurants and canteens. More labour would be required. This work force could be available based on projected labour reduction from automation and digitalisation of industries. The process of "staple to table" would also lead to a smaller amount of pharmaceuticals, food preservatives and food additives. This adds to degrowth, as well as to less pollution based on reduced production and use of these substances. Packaging for bread will also be reduced. Nowadays almost all bread is packed and have at least a plastic viewing window to allow consumer to inspect the product (visit to K-Supermarket, Manhattan, Turku, 08.03.2018).

Transport costs in total would be reduced. For example, 50 kilo grain can be stored in 90 litres airtight drums at home. This amount of grain lasts for 110 breads of 650g (456g grain per bread). That equals to two breads a week for one year. The need to visit a shop is reduced because different staples can be stored at home, such as rice, potatoes, pulse, nuts, food oils and salt. The prosumer will become more resilient, need less capital, is more independent based on provisions and skills, which are interchangeable with other prosumers. This reduces the need for crisis prevention on national level and increases the cohesion of a community, which increases well-being.

When prosumers spend more of their gained time from less employment to produce food by themselves, a high level of self-sufficiency and circular subsistence economy can be achieved. This can be done by growing food on balconies, in own gardens, community gardens and urban farms. To produce own seeds and exchange them with others closes the circular flow. Excessive produce can be sold or exchanged for other goods and services not available in this circular flow.

"Staple to table", from knowledge to action, is an instant possibility for informed citizen to add and live towards a sustainable life without any need for political or economical changes. When then the production of staple follows permaculture design principles, a sustainable food bio-economy can be reached. French studies show that 1000 m² land cultivated in accordance with permaculture principles can employ and correctly pay one person and produce the staple food for 10 people (Herve-Gruyer et al., 2014, 2:20 – 3:00).

8.1.3 Elaborate as an interviewee – tell my story

What were my motives to become a bread prosumer and overcome possible obstacles? Below I present my own narrative of bread making. This story has been used to develop the narrative enquiries questions of chapter 2.4.

What is the story? Please describe that prosumer action - here self made bread, staple to table. I produce fast and with little effort affordable, healthy and good tasting whole-grain bread with high quality ingredients. I do it at home for my family of two, and occasionally for friends and relatives.

How did you come up with or developed the idea of that action?

I have always been a bread eater. Well, I love eating good food. First I was missing the taste of the bread from the local bakery back in Germany. Then it was the knowledge that that bread was empty of nutrients based on the fact it was made out of refined flour, which is a reason for many diseases of civilisation. Whole-grain bread was and is very expensive in Finland. I researched alternatives and found a book from Dr. Schnitzer, which introduced a whole-grain diet plan. I also found out that a household kitchen flour mill was a prerequisite to mill the whole-grain just before mixing the flour with other ingredients to avoid oxidation and nutrition loss. But the process of baking bread would have taken a lot of time to do it in the oven, so I discovered bread baking machines. I analysed them in the Internet and bought a mill, backing machine, kitchen scale, ceramic-biochar water filter, sea salt, fresh yeast and of course whole-grain spelt and wheat on a visit by car from Germany. I tried a lot of recipes from the manual of the baking machine, bread baking books and the Internet. I tried to produce a good whole-grain bread, but it did not work out until I found another book from Dr. Schnitzer with whole-grain bread recipes. I converted the recipes to be suitable to bake with a baking machine – voilà it worked. Fast, easy, cheap and good tasting whole-grain bread with high quality "healthy" ingredients was prosumed. I used two standard recipes for spelt bread and wheat toast, and made detailed cost calculations of the breads and used equipment to discover a significant difference to the price in Finland. On the next visit to Germany I bought 200 kg of whole-grain (spelt, wheat, rye and oat), three 90 litre wide-mouth drums, and another drum to store oat over the period of two years. In addition I bought a flaking system, a germ device and a pasta machine as well as 10 kg specific sea salt. From that on I extended my whole-grain recipes to rye bread made in the oven, pasta, cakes, oat flakes and grain sprouts. I did not buy these products any longer for the next two years, I prosumed them. That was in 2010, and I still do it but allow few exceptions. My next batch of oat I will buy in Finland. Later I did similar process with green coffee, after I saw a TV documentation what is actually included in industrially ground coffee. There is nothing better than a self-roasted and brewed coffee. Same goes for self-brewed beer I heard, a next project together with the meal worms for substituting meat.

What thoughts guide you to that action?

Increase independence, improve of health and cost structure as well as food quality, resilience and acquire skills and knowledge.

What personal circumstances you were in when you got that idea, started that action?
I was just fired from a challenging, leading position was diagnosed with burn-out, lived in a too small apartment and wanted to do something meaningful on my pace for my household and became, without knowing it, a prosumer.

What kind of motive you had to start that action?
To contribute to my household with “healthy” food and lower cost structure.

What was needed to put the idea into action?
The belief that health can be maintained and regained with “healthy” food. Money and time was needed to acquire knowledge, skills, equipment and ingredients.

What circumstances foster, motivated you to start, retain that action?
I got good feedback from my wife, friends and relatives, which established a kind of purpose, elf-efficacy, joy, satisfaction when others enjoy my bread. That I felt even more when I made rye bread, cake in the oven or fresh pasta as part of a meal or a quick oat flake muesli as a starter of the day with a self-roasted, brewed cup of coffee.

What kind of behaviour change was necessary to start, retain that action?
To plan reverse. Instead of going to a shop and buying the bread when needed I needed to know when the next bread is needed to start the 7 minute long preparation two hours beforehand to let the baking machine do the actual work. That also meant bulk purchasing of ingredients, coverage planning and organising transport needed attention, but only every two years.

What kind of obstacles were to overcome to start, retain that action?
The biggest obstacle in the beginning was to have a working whole-grain bread recipe for a bread baking machine. Nowadays it is sometimes laziness and lack of consequent action. When shopping food I sometimes buy also a baguette from refined grain. That is very bad for the health but good tasting.

Will you retain that action? What would be the circumstances, motives to stop that action?

After seven years I changed the first baking machine. It makes even better bread. It is so good, easy and fast. Time is not an issue and the ingredients are always available. I use the same recipes but add nuts and seats from time to time for variety. I do not think to stop bread baking with a baking machine.

Why did You do it?

For recognition, appreciation, meaningfulness to do, to see, smell and taste the result of my work time spent, to keep the added value for myself, to prove it is doable with less to get a better healthier result. Later I found more reasons such as less need to go shopping because I had all ingredients at home. I gained time by spending less time to buy unnecessary in a shopping centre. It also meant less travel, pollution, diesel spent, less shopping in general. The gained time I used to do more food by myself – pasta, cakes, sprouts, cooking from staple and later coffee roasting. Basically I often bought only yeast, fruits and vegetables in the shop or on the market which I later partly substituted with produce from my own garden.

Is the action part of a bigger picture?

I would say so. With the move from consumer to producer one moves from just in time consumption to plan full action. Storage of ingredients becomes a topic - the storage life, forecast of consumption, quantities, reorder points, planning horizon. The supplier base partly changes, widens, to be closer to the producer. To buy bigger quantities leads to economy of scale advantages when purchasing. Sourcing becomes a topic – where to get higher quality at reasonable but lower price. The advantage to wait for special offers is possible because of the storage buffer. It was not necessary to buy always new tools and material. Some things people were happy to give to me, e.g. a food dryer. Preservation of food and produce for longer times, needs knowledge and skills. It also needs preserving jars, additional suitable storage place, sauerkraut barrel, some kitchen tools and labelling. Improvisation skills grew to live with on the existing – convert, use different. I also started to realise that I do not need so much when I do manual work – only some tools. Things connect, you acquire, exchange information what you do and things fall into place. I became become calmer, because I could feed myself. To omit goods is really liberating. Soap, soda, lemon and precipitate chalk covered almost all toiletry and household cleaning

agents. That grew into reduction of waste, packaging waste such as plastic container like shampoo bottles. Waste reduction and utilisation is an important topic. When you produce something by yourself you usually respect it and do not waste it and that leads to lower consumption. Since the used ingredients are organic it was easy to cycle them: sieved whole-grain, for example for pasta, leaves you with bran which can be used to thicken sauce or muesli. Old bread is used to make croûtons or used soaked in meatballs. Peels from vegetables, actually all vegan kitchen waste, went into a worm box in the kitchen. The worms, I called them the “boys”, produced the humus. I did not need any longer to buy fertilizer nor soil, that reduced cost and time. I used the humus for the balcony plant container to grow salad, herbs, garlic, tomatoes and chilli, even potatoes in a tower. A cycle evolved in a small household. There are many possibilities to extend this cycle to become a sustainable household of urban prosumers. The next logical levels in a city would be housing companies of prosumers, group of housing companies, quarters of a city, the city of prosumers.

8.2 Walk and bike

In this chapter the narratives of interviewees are combined with other research material. The complete transcripts can be found in the appendix.

Prosuming is doing things by yourself for yourself and keeping related benefits for oneself to compensate own efforts and reduce external supply, here mobility and transport. The idea is to use one’s own power for mobility and transport either with or without support technology of varying degree to walk or to bike and to bridge the first half an hour or 7,5 kilometres in an urban environment. This mobility, walk and bike (w&b), is mainly detached from fossil fuels during use and related pollution. Subsistence of motorised individual traffic is possible and has high potential. For instance in Germany, 81 million passengers use car rides for under 5 km of distance, and 113,4 million passengers use car rides for under 10 km of distance every day. The latter is 70% of all car rides, see also Figure 9 below.

The car rides, which are under 5 kilometre distances could be replaced by walk and bike. That means 50% of all car rides in Germany.

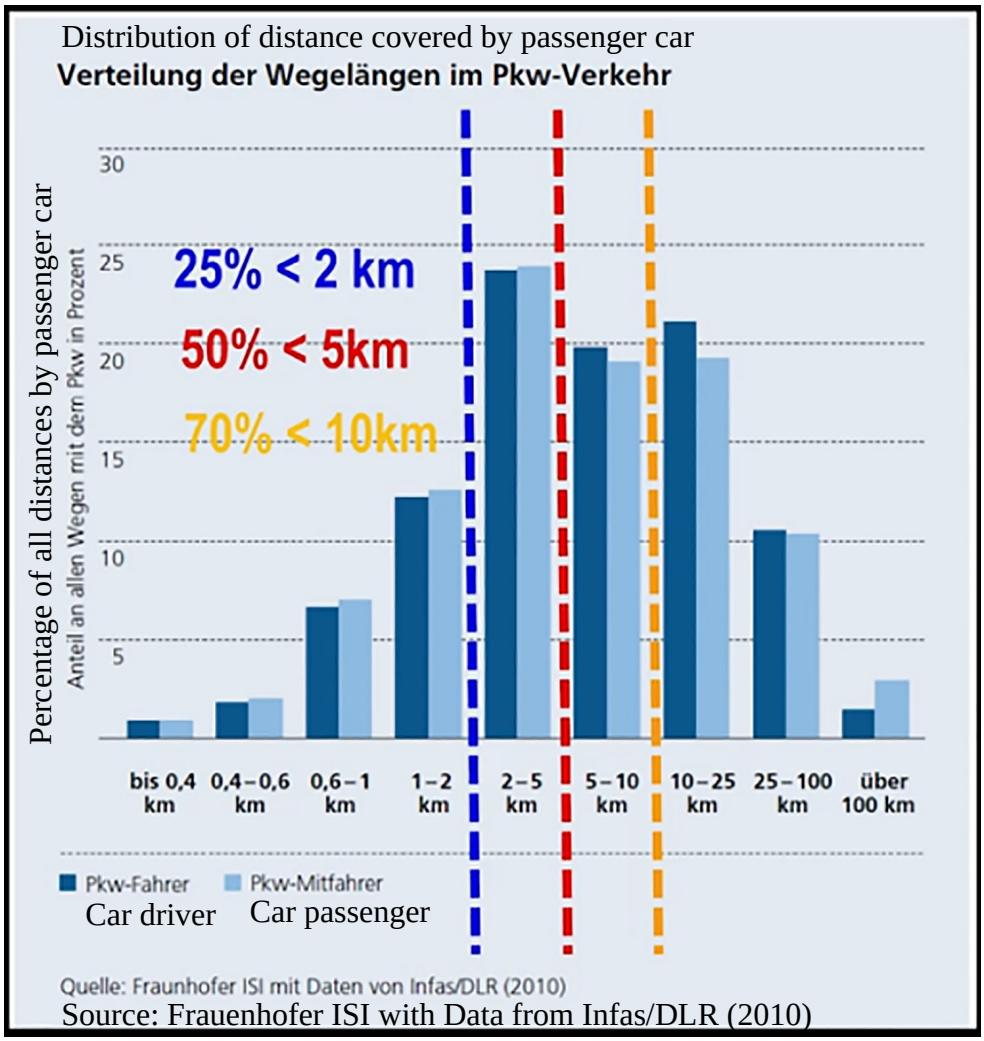

Figure 9: *Distribution of distance covered by passenger car in Germany (Stork, 2017, 5:30)*

The thought to reduce passenger cars is a starting point for the mobility transition, which is of course part of and influences the energy transition from fossil to renewable energies. (Stork, 2017, 5:30 – 8:48) Brawn used for w&b replaces fossil energy as well as the need to build new infrastructure for renewable energies. This correlation is typical for subsistence activities.

To bring the German situation into a Finnish perspective the amount of vehicles in Finland are shown below in Figure 10.

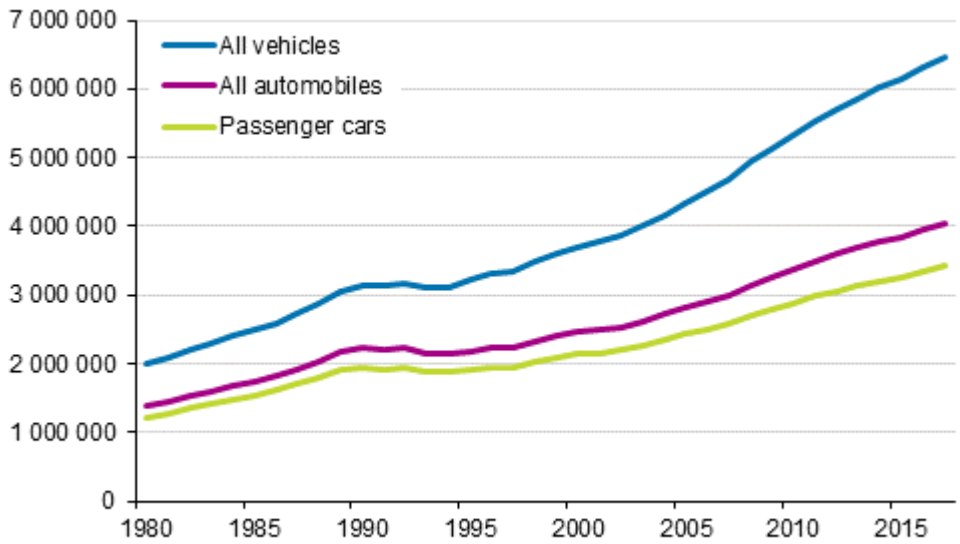

Figure 10: *Vehicle stock in Finland 1980–2017 (Official Statistics of Finland, 2017)*

At the end of 2017, the Finnish vehicle register contained 6,474,783 vehicles, of which 5,045,365 were in traffic use. The total number of registered vehicles grew by 2.5 % and the number of vehicles in traffic use grew by 1 % compared with the situation at the end of 2016. At the end of 2017, there were 3,422,792 passenger cars in the register, of which 2,692,785 were in traffic use. The number of registered passenger cars went up by 2.3 % and the number of passenger cars in traffic by 1.5 %. (Official Statistics of Finland, 2017)

The average age of registered passenger cars in Finland was 14.6 years and that of cars in traffic use was 12 years. (Official Statistics of Finland, 2017)

The amount of passenger cars is still rising, not only in Finland. In a decade or two passenger cars, buses and trucks are planned to be electrified - a change from combustion engine to electro motor for the automotive fleet. Will this change reduce the number of automobiles in our cities in general, just based on the change of its operating power? Stork (2017) and others are not convinced. Is this technical platform change promoted by law maker and car industry primarily to create economic growth and disregard related adverse

impacts? Smil (2015) questions the ability of intermittent renewable energies to reliably create the necessary energy for that platform change and gives cause for serious concerns that there will be enough natural resources to cover the additional needed infrastructure resulting from the lower energy density and capacity factor of renewable compared with fossil energies.

How should mobility in and between cities look like by 2030 or 2050? Welzer (2013, 22:40-23:35) asked and promotes to answer this question first during a participatory transition design approach before radical mobility and energy platform changes are made. According Paech (2018) there is no sustainability without settledness, and one additional Euro of economic growth leads to 1-5 kg CO_2 emission (Paech, 2014a). It is said that in Berlin one car needs 12m² space for parking and 60m² for moving, and that 30% of city's surface is used for car parking as well as for driving cars. That means 60% of that city's surface is dedicated to cars-an unjust, inefficient allocation (Perris et al., 2018, 2:25-2:30 & 3:45-4:28).

As mentioned earlier obesity related lifestyle diseases are a growing health risk in the Global North based on too high calorie intake and lack of exercise. These constraints together with the amount of unnecessary car rides of short distances as well as rising car amounts and related space allocation could be solved by walk and bike. Just by walking and cycling, bridging the first 7,5 km by one-self, the consumer becomes a prosumer and can benefit by saving natural resources and related pollution, increase own health and save money for transportation.

Walk and bike can be easily integrated in urban daily routine and replace gym and swim, with less time and money spent, still physical and mental health is improved. Together with public transportation, walk and bike can replace the car in the city and gained space can be converted for walk and bike. Dedicated spaces for walk and bike will increase acceptance, usage, safety and reduce accidents – life quality raises.

For example, promoting car-free lifestyles in city planning can reduce car use and the need for public and private infrastructure like streets and parking space. Thus, it can decrease the material intensity of both mobility and housing. Attractive car-free quarters can reduce the highly relevant need for leisure time trips and could possibly also reduce the need for

private living space. (Luoto, Lähteenoja and Lettenmeier, 2008; Veuro and Lettenmeier, 2008) Without a car, closely situated shops, other services and work places are more attractive than distant ones (Handy and Clifton, 2001, 321). In addition, the health effects of decreasing car use are evident (Thommen Dombois, Braun-Fahrländer and Martin-Diener, 2007, 764). Increasing walking and cycling could reduce the resource use needed for free-time activities as well as for health care. (Lettenmeier, Liedtke and Rohn, 2014, 502) Since exercise is gained by w & b, fitness centres could partly be converted into spaces for aquaponics, insects and mushroom farms.

The amount of bikes in the city can be reduced by public city bikes. They can be an integrated part of city's public transportation, by increasing the utilisation per city bike – a subsistence principle. Mobile IT applications offer to the prosumer time and money saving information to combine w&b with public transportation – faster, cheaper and with less adverse environmental impact and noise than a car.

To walk, to move, detaches one from the scheduled life, slows things down and with another person allows movement and conversation simultaneously. That is a healthy break like a moment of recreation. To establish a routine of walk and bike, a minimum of six month is needed. Drop backs based on laziness and excuses such as weather may happen, but it is just a question of will power, just to do walk and bike. It is time for oneself to feel self-sufficient. Additionally, walk and bike does not need much additional equipment than the normal city outfit, other than an ordinary bicycle and a helmet- simplicity.

8.3 Repair café

In this chapter the narratives of interviewees are combined with other research material. The complete transcripts can be found in the appendix.

A repair café lacks a clear definition but could be defined to offer a free meeting place, organised by and for local residents, a 'community-centred workshops' for people to bring broken consumer products, which need to be repaired, to fix them together with volunteer repairers from the local community. In addition to repair, many repair cafés provide assistance with product modification, particularly to clothing to improve fit and appearance. (Charter and Keiller, 2016, 1)
Repair cafés can be seen as social, non-commercial events, where people are helping themselves and each other to repair together, to meet and talk by a cup of tea or coffee. At the same time they are exchanging and sharing knowledge, learning with and from each other, to build community and to strengthen coherence, resilience within. Repair activities in repair cafés are cost-free unless spare parts need to be bought and if they can not be taken from other broken products.

There are over 1.500 Repair Cafés worldwide. The Repair Café Foundation International was founded in 2007 in the Netherlands, by Martine Postma, as a way of actively promoting sustainability in local communities and is a world-wide movement. (Postma, 2019) Their website delivers concrete information how to establish a repair café. Also other non commercial repair initiatives, open workshops and online repair platforms have developed and are on the rise. They are united in the battle to overcome the planned obsolescence of products introduced by the industry to assure continuous selling of new products – economic growth. In addition to planned obsolescence, fast changing technical and functional requirements of products (e.g. interoperability of soft- and hardware of electronic devices) are causing functional obsolescence.

Across the EU, the recorded share of employed people working within the circular economy remains low. For example, the number of enterprises and people employed in those enterprises that repair computers and personal and household goods is low. In 2014, Sweden had over 4,400 such repair sector companies compared to less than 1,700 in Finland, with around 3000 employees. (Eurostat, 2019)

The coalition of the repair revolution – the rediscovery of the repair, has published a manifesto:

Figure 11: *Repair Manifesto (IFixit, 2019) - apposition by author (red)*

A prosumer produces and consumes goods and services by and primarily for oneself but might also consume at first and then produces a service, the repair, to lengthen the useful lifetime of the product, but also to widen the activity range covered by the prosumer, e.g. product conservation. This reduces the need for replacement production for the still functional parts of a product and additional natural resources consumption (e.g. material and energy). At the same time related exploitation, pollution and waste, work time and income from employment as well as capital use are reduced. This is a trade-off with spending prosumer's time and craftsmanship. Repair is an essential part of modern subsistence.

A group of prosumers with different skill sets of craftsmanship might form a group and interchange goods and services among them to extend variety and social relationships. This group of prosumers might share their repair skills with consumers, by showing them how, educating the consumer to repair by themselves for themselves, to become a prosumer.

8.3.1 The process

The consumer buys a product and uses it until it gets broken. The consumer brings the broken product to the repair café and learns from a prosumer, who does not need to be a professional expert, how to repair the product. Ideally the consumer is instructed by the prosumer and does the repair by himself and develops towards a prosumer, who is able to help other consumers with their broken products enabling them to become prosumers.

Practically, a place is organised, usually by an individual or a group, where people with repair knowledge and people with broken products are brought together. The most common products brought to a repair café are small kitchen appliances, household appliances, lamps/lightening, DVD/CD players, clothing and bikes (Charter and Keiller, 2016, 9). The visitors of the repair café describe the problem with the broken products at the reception. The reception takes a note of the problem and lets the visitors sign the rules of the repair café (84%), usually including a damage exemption clause and a public liability insurance, which 39% repair cafés have (Charter and Keiller, 2016b, 12). The repairer will pick one from the open repair request according to their skills and interests and start together with the visitor the repair.

The repairers bring often their own repair tools and naturally their craftsmanship. Online platforms complement the craftsmanship with repair instructions and guides, such as IFIXIT, Youtube and product manufacturer's websites. Also the repair cafés themselves document their successful repairs and share them online. The repair instructions often include hints of the eventual needed spare parts and source of supply, which to a large extend are bought online (71%) and might bear costs for visitors or are financed by donations for repair café. (Charter and Keiller, 2016b, 9)

The broken product is usually repaired at an average rate of 63% with or without spare parts (Charter and Keiller, 2016b, 17). Otherwise it is irreparable, taken as a source of spare parts or given back to the visitor or to a recycling facilities. When the repair is too complex or time consuming, commercial repair companies are proposed to the visitor. The repair café movement does not see itself as a competitor for commercial repair companies. It rather raises awareness of the possibilities and advantages of repair, disseminates the idea of repair and reduces barriers of repair.

8.3.2 Motivation and benefit

What can be repaired does not have to be disposed, replaced, produced or bought. Repair conserves natural resources, reduces pollution and waste, and even saves money and often time. Most of the information needed to repair are findable in the internet, as well as needed tools, which often come with the spare part itself. Internet forums allow knowledge exchange communication. Nowadays even language barriers can be overcome by internet based language translation programmes. The broken product determines what is needed, so it is a step-by-step approach, learning by repairing but also by trial and error.

The main reasons for participation at a repair café according Charter and Keiller (2016b, 3) are:

- Support people to live more sustainably
- Increase value and deliver a helpful service to the community
- Participate the movement of improving product reparability and longevity
- Encourage others to fix their own stuff - become a prosumer (author).

Ecological benefit

Repair concentrates on the broken part of a product to repair its functionality, not on selling an additional one. By repairing less natural resources are use than for a new one. Manufacturers often do not offer repair but replace the whole product.

Repair creates an understanding of the efforts embedded into the product, creates appreciation for it and might lead to handle products with more care, which supports longevity with less need for repair. In any way, less is thrown away, less waste created. As an example, electronic waste is shipped from Europe to Africa where the children recycle them, is causing adverse environmental and health impacts. With repairing replacement production and related natural resource exploitation and consumption, pollution and waste can be reduced. Often a broken product can be repaired without spare parts, just by knowledge and craftsmanship, meaning long supply chains can be avoided as well as their adverse environmental impacts.

Social benefit

Repair connects by meeting new people, helping each other, having the same cause – networks and communities formed and extended. Repair is often less capital intensive than production, therefore repaired goods can be provided to people with less financial means, specifically recipients of social benefits in charity department store such as Möbelkiste in Hamburg (Möbelkiste, 2019), either for free or on repair cost base. Goods can be provided also for the general public e.g. at Ekotori in Turku (Ekotori, 2019) or Stillbruch in Hamburg (STILBRUCH-Betriebsgesellschaft mbH, 2019). The latter receives repairable and sellable items from Hamburg's public waste collection fleet from house and apartment clearance, but also from people directly donating their excess items.

Financial benefits

Repairing at a repair café is free of charge. Money can be saved by omitting to buy a new product and less capital is needed. Often repairing is several times cheaper in terms of money than an initial purchase, since the reason for the breakdown of a product is often rather small, e.g. phone screen. Time needs to be spend for the repair but also to search, analyse, compare and buy a new product will often outnumber time spend for repair. This leads to more time available to create income or work less, earn less, consume less.

Individual benefit

Repair is a forgotten skill, which teaches one to help oneself. Repair creates satisfaction to achieve something useful, practical and can be fun. It makes products unique and teaches technical understanding. Repair is appreciation, increases independence, self-assurance and resilience. Repair can also be a hobby to escape the normal daily routine: it is therapeutic, has a clear start and finish, makes one use ones own hands, requires creativity, delivers a concrete result and makes somebody happy. The individual benefits might lead to the thought to commercialize repair activities such as phone repair shops in malls.

Repairing is also a life-style. It can change behaviour pattern and develop into a routine. It can also influence ones world view towards less possession by learning to trust own ability to keep the needed products useful for a long, long time – a healthy self-confidence has emerged.

8.3.3 Obstacles

Publicity is an obstacle for repair cafés when is comes to recruit repair volunteers and visitors with items for repair as well as to raise overall awareness. Word of mouth, social media and online presence are the most common channels used for a repair café to reach out to the local community.(Charter and Keiller, 2016a, 5) Repair cafés and other repair initiatives need to form more efficient networks – to network online and repair offline. Campaigns are needed to improve reparability and product longevity and about wider sustainability issues.(Charter and Keiller, 2016b, 13-14)

Volunteer repairers are ageing: 54% of them are 56 years of age or older, so a regeneration needs to take place also to consider the raising amount of higher end micro-electronic products, including tablets, desktop, notebook and smart phones to repair. Charter stated that in average 75% of the participants of a repair café had a bachelor or higher degree. (Charter and Keiller, 2016b, 3, 15) According to the interviewee a lot of young people provide qualified repair advise in the internet-based forums and are an integral part of the international repair scene specifically of higher end micro-electronic products.

Spare parts existence, availability and quality can be a problem. This is often the case when broken goods are brand new or old, but also when the reparability is not wished by

the manufacturer. In general, the manufacturer has an obligation to provide spare parts for 10 years for certain products, e.g. automobiles. But when a part is not supposed to be repaired, spare parts does not need to be provided. It is a question of design and manufacturer's philosophy. Modular design allows repair, the availability of spare parts and creates an after sales market. Fairphone offers mobile phones with a modular design allowing consumers to repair their phones by themselves, becoming a prosumer. The company policies follow the philosophy of repair and sustainability as good as possible. (Fairphone, 2019) It offers also traceability of component also as a quality assurance, and a supplier management based on ethics, for example based on the labour and work condition abroad. This criteria is difficult to fulfil based on complexity of components, their bill of material as well as their supply chains.

The internet is a good place, based on its reach, to find information internationally about spare parts and the repair itself. It comes with certain risks, because some suppliers or authors are not known, and their credibility and quality is not proven. Often repair requires online activities to be successful. Spare parts can come from far, often from Asia. To reduce long transport and delivery times 3D printing offers a solution, enables local creation of spare parts with technical drawings from the internet.

People are often worried about their personal data on broken electronic products and therefore do not dispose or repair them, but stack them at home. In a repair café the repair is done together with the help of a repairer, who might have also tips to erase data safely or how to remove the data medium and use the remains as spare parts.

Repairers own skills and craftsmanship will not prevent mishaps, which can lead to further damage and non-repairability. But since the product is already broken, that is a risk one should take. Repair cafés are protecting themselves with insurances and exclusion of liability with the need to respect trade regulations and safety laws.

Functional and planned obsolescence is a growing problem. By eliminating forward and backward compatibility of devices and slowing down devices, or even stopping their function by software upgrades or its manipulations, make repair more difficult. Devices block their function when they are opened or do not allow non-original manufacturer spare parts. It is the task of law makers to create the legislation to assure longevity and

reparability of products. Lengthening of warranty deed periods, guaranteed spare parts availability, compatibility and modular design are starting points to force manufacturer towards sustainability.

8.3.4 The broader context

Repair cafés, their action, volunteer based repair of consumer goods are an act of sustainability. Repairing in general is a life style. Repair cafés act as part of modern subsistence, prosuming and as such can be seen as part of a post growth economy: they are replacing capital, production and income by individual time spend, while regaining productivity of that repaired item with reduced adverse environmental impact.

Repair cafés include care and share elements for products as well as for people sharing knowledge. The careful handling with products and natural resources is an outcome of the activities in a repair café: a prosumer strengthens society and its resilience. Repair cafés are places to help people to help themselves. (Repair cafés Oldenburg, 2019)

Repair of goods is a service to lengthen the useful lifetime of a product – their permanency, longevity. Repair is at the end of a linear product made-use process before products becomes waste. Preceding processes, also called conservation, such as heedful use, upkeep and care, postpone the need for repair and therefore contribute to lengthen the useful lifetime of a product and keep their value. The activities of these proceeding processes are often less challenging to take care of, which is suitable for a prosumer. Mechanical products such as house hold appliances, garden tools and bikes are examples, where prosumer independently can maintain value of a product in a cycle of conservation, and repair until the less favourable option of waste prevention takes place - recycling.

In the future the waste hierarchy should explicit include conservation and repair at the same level as what it is, meaning waste prevention. This would presume a product design of longevity, reparability and recyclability as well as access to product technical documentation and availability of spare part to reduce production and to utilise the existing. Obviously this is in contradiction with predominant economic growth paradigm and therefore combated by industries.

While thinking about the 10.000 things people posses in average in the Global North and only a fraction of it is in active use, one could think that there are enough things already existing. Consequently we do not need to produce news things. We need only to provide access to the excess: share, care, repair and reuse the existing.

At the beginning is the shared vision that when I, the individual, share my excess I will be able to use excess of others. To make the excess visible people catalogue the items in an application, and store the items until they are requested by another person and the give away is agreed. When the item of excess gets broken during my use and I am not able to fix it, I bring it to the share-care-repair-reuse shop (scrr) and get it fixed or it will be taken to another use, cascade use or as a spare part. A network of scrr-shops cover the city in a distance to be reached for each participant by bike distance, and is financed by its users on donations. The scrr-shop is a kind of relay station were products will be refreshed, and their lifetime is prolonged. The application and its provided visibility will intensify products utilisation. Two important strategies of modern subsistence.

Repair service replaces production and related downstream processes such as supply chain activities, marketing and sales – sales activities develop and convert into repair activities. Linear cradle-to-grave consumption is replaced by circular share-care-repair-reuse model, which extends prosuming opportunities.

Unused, reusable materials are brought, repaired and stored at civic amenity sites, where materials can be picked up for free or sold for reuse. In Finland these non-profit social enterprises are called reuse centres or officially know as Kierrätyskeskus. (YLE, 2019)

8.3.5 Thoughts and integrative development

Wolfgang M. Heckl sums up in an interview some philosophical thoughts regarding repair – from where repair origins, what it does, what it provides to humans and talks about its revival.

- Human survival is only possible when the life has repair mechanisms (Heckl and Huemer, 2015, 1:55-1:59). But there is a point at the end of life, where this repair mechanisms cannot be effective any longer to keep alive. (Heckl and Huemer, 2015, 2:15-2:25)

- The mindfulness towards fellow men ranks first, but the mindfulness appreciation towards things is an aspect of repair, the culture of repair promotes (Heckl and Huemer, 2015, 18:58-19:14).
- Only when you have produced, done something by yourself, you can comprehend it (Heckl and Huemer, 2015, 2:48-2:56). To disassemble things fosters understanding of functions and this is the premiss for future improvements (Heckl and Huemer, 2015, 3:33-4:16).
- To repair means to deal with something to understand the world, in the sense of Humboldt's educational ideal - coherent comprehension. From this perspective, repair has a pedagogical claim. (Heckl and Huemer, 2015, 7:21-7:36)

Research is needed how to reduce the growing pile of rubbish, based on the accelerating technology development and planned obsolescence – the designedly, shortened useful lifetime of products. Consumer in the Global North have lost awareness for the possibility to repair broken products. Repair as an option and its social bearing is not a relevant educational topic of today. For this reason and to re-establish a culture of repair as part of general education, a 3-year-long German project, financed by German Federal Environmental Foundation, called RETIBNE has started in 2016 and is in its closing (University Vechta, 2018). RETIBNE stands for repair knowledge and skill as an element of technical and informatics education for sustainable development. Eight northern German Universities have created an academic network in cooperation with schools, small medium enterprises, repair cafés and similar initiatives (Wegner, 2017). The University of Oldenburg has created a curriculum as well as learning materials and methods to integrate and transfer repair and useful lifetime lengthening knowledge into school operations (Röben, Dutz and Wegner, 2016; Dutz and Wegner, 2018). The project is expected to propose supportive actions for a paradigm shift to repair, repairable design, product useful lifetime lengthening and legislative change (Dutz and Wegner, 2018, 4:26-9:32) - to utilise the existing, eliminate planned and functional obsolescence. Nothing creates a stronger feeling of freedom than the experience to be independent and conversely to be able to act for others – to help them with the repair of things. (Heckl, 2015; Heckl and Huemer, 2015, 9:57-10:12)

8.4 Community garden

In this chapter the narratives of interviewees are combined with other research material. The video interviews were constructed by others mainly in German, and can be found translated into English in the appendix.

Generally the term ‘community garden’ refers to ‘open spaces which are managed and operated by members of the local community in which food or flowers are cultivated’ (Holland, 2004; Pudup, 2008; Kingsley, Townsend and Henderson-Wilson, 2009). This is a broad, clear definition. It refers to the variety of community gardens as well as into the literature, which has not a standardised definition for them. Community gardens are similar to urban agriculture, but differ from backyard gardens, which are mainly privately managed by a family. (Guitart, Pickering and Byrne, 2012, 364)

Community gardens serve as social interaction place for communities beyond cultivation but uses it as convergence to each other. It is this come and do together on that common place, that given or taken space to experiment. It is a place to produce, consume, exchange ideas and knowledge, to stimulate and develop the common space, its societal services, cycles, the surrounding community and beyond. It is the ideal breeding and developing ground for prosumer.
The “Prinzessinengärten” is such a community garden of encounters in Berlin in the district of Kreuzberg. The borough was one of the poorest quarters in Berlin in the late 1970s, when it was an isolated section of West Berlin. Now it has become one of Berlin's cultural centres in the middle of the reunified city. It is known world-wide as an alternative scene with a counter culture. Kreuzberg has a large population of immigrants and descendants of immigrants, many of whom have a Turkish background. In 2006, around 32% of Kreuzberg's inhabitants did not have a German citizenship.
Kreuzberg has a high unemployment rate and compared with other boroughs of Berlin a low average income level. Still, it is seen attractive based on its diverse culture.
(Wikipedia, 2018a)

To follow the motives and obstacles to establish and maintain a community garden, also from the urban prosumer perspective, narratives with the two founders of

“Prinzessinengärten” were published on Youtube. Also the book “Prinzessinengärten – Anders gärtnern in der Stadt” (Clausen, Müller-Frank and Shaw, 2012) has been analysed.

The context of the stories.

The Prinzessinengärten is a social and ecological farm, which focuses on education about food and is motivated by the necessity to cultivate food providing natural acceptance and curiosity. It has been founded on 5800m2 land in 2009 by Marco Clausen and Robert Shaw as a non-profit limited company, inspired by the Cuban urban gardening movement Agricultura Urbana. The leading design principle of the garden is its mobile structure, which allows to transfer and build its elements efficiently and fast to on unfavourable sites, often sealed surfaces, if necessary. These include e.g. stackable plant containers, standard bread boxes, creating high beads, rice and jute sacks on pallets or any other type of movable container. It has a container based restaurant built on the foundation of this agricultural crop garden with around 500 different crop plant species in the heart of Berlin in Kreuzberg.

The Prinzessinengärten uses the garden to grow food, but it is not about food production. It is about growing community. A place, a niche, were people can experiment, actively work and learn together, from with each other and to socialise. The Prinzessinengärten reaches out and brings elements of community together and makes it experienceable at one place. It elaborates close loop cycle of food and encourages participation and development in the cycles and adjoining activities. The food cycle is connected with the outer society and economy via supporting cycles such as for used materials, knowledge and labour at low cost, and is returned to the society in form of knowledge, food and community, multiplying the concept of Prinzessinengärten elsewhere – a growing organism.

The Prinzessinengärten is open for anyone and offers gardening, bee keeping, aquaponic, restaurant and café, various workshops, on site education, guides and events, outdoor kitchen, playground as well as open metal, wood and bike repair shop at side. The Prinzessinengärten had 50 000 visitor in year 2016, 20 000 alone attracted by the garden. It has 2500 volunteers, who take care of the garden and the other activities as well as up to 25 employees, of whom some plan and build similar gardens for institutions and businesses.

The visitors of the Prinzessinengärten can decide, which role they want to take on: observer, learner, teacher, epicure, worker, producer, consumer or prosumer. For example one can come to the introduction days to get acquainted with Prinzessinengärten and the work needed to be done in the garden. When one feels confident, they can work in the garden themselves according a work list prepared by a professional gardener once a week. The person working for the garden becomes a member of Prinzessinengärten for that day. On the way they are learning how to produce food and can buy products most likely produced by others for half a price – they become prosumers for one day. The price of the produce from the producer and the consumer is asked to finance the Prinzessinengärten, which does not receive governmental support. It just applies funds to start projects, which should be able to finance themselves later. The legal form of Prinzessinengärten, a non-profit limited company (gGmbH) assures that potential profit does no end up with the shareholders, instead it stays in the company to be spend for the public good. Shaw underlines that to work sustainable means to work economic, to prove that a social project is able to cover its costs. The sale of produces grown in Prinzessinengärten is more of symbolic character, since the amount of produce produced is not enough to cover the costs. Other activities of Prinzessinengärten such as consulting and gastronomy, need to contribute.

From prosumer point of view it is possible to learn the whole cycle of plant based food and supportive cycles: from the preparation of the plant container, soil, seed and seedling production to sow, plant, care and harvest, to food preparation in the restaurant and preservation, to consumption as well as use of organic waste for soil and fertilizer production with composting and worm farms. It is important to understand that these activities belong together and can be done on site. Questions are answered by the other gardeners or personnel, or in workshops. Knowledge and experiences are generally understandable exchanged. A transfer to one's own household is easy imaginable. This is breeding and development ground to become a prosumer.

The wide variety of people come together into one place – the garden stimulates cultural exchange. The productive element of this exchange, and openness when people come together from different context, defines Prinzessinengarten. This mixture of people and activities lead to beauty and productivity, a kind of biodiversity, which is also favourable

for a city. Prinzessinengärten is not only to feed mouth but also to feed minds and communities.

Kreuzberg has a high percentage of foreigners with a lot of social and educational problems. The Prinzessinengärten has its position to foster the understanding among people and cultures. Foreigners, specifically from rural areas, are a rich source of agricultural know-how. Sharing knowledge provides self-esteem and -confidence. This empowerment is possible without many words, and could bring another foreign plant to the garden – biodiversity in a broader sense.

Gardening, the connection with soil, seems to "heal" and also the community provides a feeling of security. The Prinzessinengärten builds gardens for immigration centres with neighbourhood support as well as integrates and creates meeting places of common interest. Migrants often have traumatic experiences and regard a garden and gardening as neutralising activity. The trauma related to ones earlier home, community and a piece of land, is replaced by similar activity but in a safer place in this new garden. This builds a new community, first around food, later beyond. In Finland similar projects are occurring: Central Baltic Interreg programme is funding Active Refugees in the Community project (ARC), with gardening and household guidance lessons implemented by the Tampere region by Martha Association in Finland. (Ovaska, 2019)

Clausen points out community gardens are more than just planting together. There is a need of the public in general to leave the victim role to passively accept what is introduced, but instead actively create, to do, codetermine. This is a deeply democratic and participatory process, which is more than a ballot. Prosumerism is also a protest against power concentration of industrial supply chains. People want to actively shorten them, cut out the "middlemen" and create added value in social and economical terms for one-self locally, and to influence the quality of own production and consumption. That as well empowers oneself creating independence from global industrialized food market. Community gardens as well as prosumers are grass root initiatives and movements that are vital at times the political caste has not any longer the trust of the people to find intelligent solutions according Christa Müller from the foundation Interkultur. The foundation supports Prinzessinengärten and 130 other intercultural gardens, and is part of the Foundation anstiftung, (2019), which promotes subsistence practices in everyday life,

draws attention to their importance for a sustainable society in a sustainable global context and carries out research into commons, do-it-yourself and sustainable regionalisation.

The Prinzessinengärten's strong focus is on sustainable education in an urban context and involves, beside people also pupils from kindergarten to university students. Kids learn very early about sustainability and put it into practice, which is a cornerstone for cultural and behaviour change. For the initiators it is important to create sensitivity where and how things are produced, and what is consumed. They promote sustainable products from the region, which deserve a higher value based on qualities such as freshness, variety and diversity. Learning to grow your own food creates appreciation, changes ones relationship with food and knowledge about food. The young generation invests time and strength to cultivate own vegetables. They rediscover the beginning of our civilisation in a city context. Prinzessinengärten communicates new insights to town people. Gardens have a different time management based on the growth periods of cultivated plants, it teaches seasonality and patience. Community gardens are experimental laboratories for the future, likewise a group of households can become for prosumers.

The educational aspect in general is a feedback loop. Clausen and Shaw, the initiators of Prinzessinengärten, see themselves as dilettantes, a historian and a film maker, acting as facilitator and communicator, learning every day from and with the people. Clausen and Shaw admit that they had no master plan how the garden should look like and which functions it should provide. They, alone, would not be able to cope with the workload of the Prinzessinengärten, nor they want to. They see their task is to create a lively interaction, establish connections between the garden and the neighbourhood as an open process, and support peoples' ideas and activities. The size of the project requires a lot of interacting to do the work and to keep the Prinzessinengärten afloat. It is therefore correct to say that the people which have built Prinzessinengärten with all its facets somewhat own it. This is a kind of slow takeover by the people of city owned land. During times of uncertainty, Prinzessinengärten received 30.000 signatures for a petition to extend the lease contract with the city, resulting extension until 2019, with the intention of the people to take root for ever.

All this raises questions - how do we want to live together in cities in a sustainable future? Do we want or can we environmentally afford to be employed and work 40 hours a week? Community gardens and prosumer possess potential answers.

The complete interview transcript, which supported this chapter can be found in the appendix of this thesis.

9 Combinatorics

Welzer (2013) proposes an answer to the necessary movement from an expansive to a reductive modernity in sustainable solutions, which can be combined and scaled with each other, where the combinatoric is more than the sum of each sustainable solution. The concept of community garden can be scaled up beyond prosuming to urban farms using permaculture philosophy and design to deliver many things: fruits, vegetables, mushrooms, insects, honey and small livestock as well as private and public lunch places with local and seasonal products.

According Mikkel Karstad, an award-wining chef from Denmark, we need to change the way how we prepare food and which ingredients we use to stay in the limits of our planet. He developed a concept for canteens in 2012 using half the amount of expensive meat to save costs to increase health. He used the gained amount to improve the freshness of the high quality ingredients – seasonal, local and organic. To be able to stay in the budget (2,75€ sales price per lunch), he shortened the planning horizon: instead of weekly menus, he planned according fresh availability. He set daily menus, a set of different small portions, to compound an individual serving for lunch, based on recommended amount and nutrition values. However, Karstad managed to stay in budget and his concept was awarded and is still used where he started it and was adopted by many canteens. (Aumüller, 2018)

This is a delicious way to feed the public at large with freshly prepared, non-industrialized meals, from close-by as the main base of ingredients and only use far-away ones when essential. This shortens supply chains and lower adverse environmental impacts in total, but also concentrate these impacts locally, where they can be better controlled and

managed also based on public pressures and requirements. Customers have tasted what is possible on low budget, and now they can choose canteens based on an authority controlled, Bio-Cuisine Label, which shows the percentage of organic ingredients used in canteens of public authorities in Copenhagen. These labelled canteens serve 75 000 people daily. The target is to have at least 90% organic grown ingredients in all canteens. Copenhagen buys 10% of the food in Denmark, which is as such a big influencer. This label could be extended to show the percentage of locality (food produced in a radius of 50 km) and could be extended to restaurants, too. (Aumüller, 2018)

Mikkel Karstad stated that is was vital for the success of his canteen concept to explain his lunch clientèle his vision. He had to make the necessary changes step-by-step and to explain each step to the clients to gain trust and commitment but also to adjust according his customers' needs – a participatory approach seems to extremely valuable. (Aumüller, 2018)

10 Conclusion

To justify prosumer activities in the Global North this study defined constraints for sustainability. These constraints were used to challenge the hypothesis, which this study partly validated. Researchers pointed out several macro-level conclusions. For instance, Welzer stated that each household in the Global North possesses in average more than 10 000 goods - and an additional amount of goods will not increase happiness, on the contrary, it occupies the consumers and takes their time. He concludes: less is less. Paech introduces an idea that there is no sustainability without settledness, and uses the concept of sufficiency to define the new enough. Lettenmeier and Schmidt-Bleek were using the MIPS-calculation to define the individual ecological backpack and the needed reduction of material use by factor 4 to ten. According to Sanchez-Bayo and Wyckhuys, the sixth mass extension of species is ongoing. The conclusion on the macro-level states that the Global North has room to manoeuvre, freedom of action to experiment with environmental sustainable forms of economy by still keeping the reached civilising standard and accepting global environmental justice.

Prosuming, individually and with others, can be also seen as a political act, which is rapidly feasible and difficult to suppress by the capital in the Global North. It effects the economy by reducing long centralized value chains towards local supply chains. It also fosters independence of individuals and communities and reduces adverse environmental impacts based on behaviour change.

Based on the analysed interviews the findings can be split according to the main research questions. Firstly, the main reasons to become a prosumer are related to health and saving money and time. Prosuming activities were seen meaningful, recreational and provided good social relationships. Doing something with your own hands increased learning new skills and knowledge as well as developed creativity and improvisational skills. On the personal level prosuming brought self-efficacy, empowerment, self-sufficiency and pride about your doings. It brought also appreciation and recognition for the prosumers, and also increased their appreciation of goods and services. On a practical level prosuming supported the household and its resilience. Protecting the environment was seen as an overall value.

Secondly, the main obstacles for not becoming a prosumer were lack of time, being occupied with other things, laziness and excuses as well as missing knowledge of prosumer activities or simply finding it difficult to change habits. Some findings directed to economic pressures and missing opportunities. On practical level planned and functional obsolescence together with lack of access to information and spare parts hindered prosuming activities.

Thirdly, to overcome these obstacles a strong will-power, "just do it"-attitude and capability to be persistent and try again were needed. It was also seen helpful to build the prosuming activity into daily routine – and repeat it often enough so that it becomes an enjoyable routine. Defining one's motives, understanding why and what needs to be done, were seen helpful while struggling with prosuming activities. It was seen important to start small, master the activity and eventually create networks with others. Socializing, prosuming together with others, increased joy as well as sharing your own prosumer experiences. It was seen helpful that niches are provided for experiment prosumer activities.

At last, the answers for the question what a prosumer can do to reach sustainability were numerous. The list includes for example following actions: to combine different prosumer actions, to question your own needs now and in the future, to do and consume less in general, to define what is enough and to avoid unnecessary doings and buyings. The prosumers were also advised to identify and measure adverse environmental and health impacts with the use of ecological backpack calculators to eliminate or mitigate the impacts. Basic project management skills seem to be useful also for prosumers, who were encouraged to connect and exchange with others, to co-operate instead of competing, to think the process through from the beginning, to influence it as early as possible and to plan careful before implementing actions. Likewise, using local supplies and staying put as well as reducing use of fossil fuel and increasing use of brawn (muscle power) were seen important. Prosumers were advised to lengthen and intensify the life-time of products and services, and at the end, to utilise the existing to live within their means without debts.

These findings are supported by sufficiency and subsistence approach of post-growth economy defined by Paech and others. On a micro-level the interplay of the studied prosumer activities, namely nutrition, repair and mobility as well as housing mentioned by

Lettenmeier, should be researched further. That could increase the possibilities for low-income earners to support their livelihood. Still, an open question remains and might lead to further research as well: how to persuade high-income earners to consume less? This question is to be elaborated in the field of post-growth economy and transition design.

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12 Appendices

12.1 Transcript – Walk and bike

Interview transcript 4th of December 2018, 12:30-13:15 (45 min), interviewee male, mid forties, a family of three, at his home place in Helsinki, Finland.
Prior to the interview this thesis as well as the questions of chapter 2.4 were introduced.

Jörn: What is your story to start to walk and to bike?
Basse: The reason to start with walk and bike (w&b) was a very selfish reason. It goes back to a situation where I got ill and had to go to a doctor and it turned out that I was not moving enough. That put into motion the idea that I had to do something, so I went to a gym but did not like it at all. Then I went to swimming, which I still do from time to time, but like with the gym I spend quite much time for the thing (Gym and Swim), which I felt I did not have. Then came pretty natural the idea to bridge the distance between home and work place with a bike, because it is a very nice bike ride. So basically I did that once ore twice every day. That turned out to be really great both concerning my physical health but also somehow my (6:34min) mental health. In a way you switch off every morning when you leave (with the bike) for the study (work place) you focus on going there and the same when cycling back home. So you leave your stuff (work, thoughts) behind a bit. I did not take me long, I think it was a matter of month when I could actually both measure, if you think blood pressure and weight, I started to feel better, my physical health improved. So that was the issue there. (7:19) That had continued then. We had moved around quite much. But this feeling of regular exercise combined with ordinary life kind of got stuck with me. So now I have a study (work place) at home. I try to do always a little bit by w&b, it takes a bit of planing, but I try to do all the things I need to achieve during the day with w&b. If I have to go to a shop or if I have a meeting in the centre I like to figure out, and I know by now, from where I live, how long does it take me to walk to certain places in Helsinki, which places I can reach in 15-20 min by walking and if I am pressed by time I hop on the bike, which basically takes half of the time (compared to walk). This is something, which got stuck with me from the years back. This is something which I feel is very important. I can immediately feel when I not do it enough. Combining this of course with, comes the knowledge, our car pretty much stands on the street, because we do not

use it much. (8:39) My son takes the public transportation to school. My wife also uses w&b quite much. In relation to one of your question it has been really important for us to find an apartment were we are pretty much in the centre, not dependent on driving every day, to go either buy necessities or having to drive my son to hobbies, etc. we are in the network of basically getting everything what we need by foot or by bike. And then when there are some longer distances to cover of course we have the option to take a car but we can also take the bus then or get on the tram. That is it pretty much in the nutshell. (9:42) This is completely from a personnel level. Now when everybody it talking about your carbon footprint and these kind of things of course that perhaps plays a role, a bigger role now, that you even stronger feel that this is good. And then you have this small added things that comes into this equation. For example, if I five years ago walked to a shop to buy food, nowadays I walk to the shop and have my own bag with me. These kind of things, you basically add up on these things.

Jörn: One becomes more professional (environmental conscious).

Basse: Yes, but quite frankly. I do not know, we are living in a society right now, which I feel what I do is, and what we both, you and I do is very small so it is more for your own personnel benefit. I thing the benefit is bigger on the personnel level than it is on the grand scale. It would of course be interesting to know how, what a the implications would be if a lot of people would do it. (11:17)

Jörn: To give there an idea only 1/30th of the space is needed when walk or bike. Everything is basically build for and surrounded by the car.

Basse: For me it is also important the kind of the idea of efficiency (time and money) in that way that I get the exercise (w&b) without using many hours of going somewhere and with one thing which bothered me a lot is this issue of getting an expensive gym card for example, which I found totally unnecessary. So I have some weights at home to cover that (kind of exercise). I even have this system, when I am travelling, I try to walk there as well and if the hotel, well usually they have a gym, but I have become so accustomed to this exercise that I do it in the hotel room.

Jörn: So you do not do it (w&b) only in your home environment but you take it also somewhere else and do it there?

Basse: Yes. Basically I have replaced the gym and swimming with w&b because it is more sufficient. From time (use) point of view but also (time utilisation) I can do a phone call when walking, which I would not have time to do otherwise, if I like, so you have this possibility of simultaneous activity. And then it actually helps me in my work. Somehow

you relax your mind in another way. So suddenly an idea pops up when you are half way that you could not think of when you where sitting at home try to focus on it (e.g. work), that helps a lot. (13:51) It is a break and you are out there on your own, if you have a good route it is pretty silent, when you are in a public place where 30 people are lifting weights and you have music in the background and everything, that is no relaxation for me.

Jörn: Did your social environment played a role, how your actions were perceived?

Basse: This is not an issue I have broad casting, and I think anybody really would.

Jörn: You said you felt better, did you receive comments.

Basse: Ah, yes, I received comments that I look trimmed.

Jörn: That is also kind of motive, a reward?

Basse: Yes, but biking is, fairly, developing a lot in Helsinki, so a lot of people b&w. And especially, I think of, people who are playing in orchestras, in music, I mean there is, that is not a strange thing (w&b). We are all, the working environment is in the centre. We have all the music halls here, we have the opera we have everything else. So from that perspective there is not so much information in it (w&b) for somebody creating a wow that you are walking.(15:58)

Jörn: You said w&b became a routine, but before that, once you said it needs three month to become a routine, Do you stick to the routine?

Basse: At least, and still you get dropped back. You get a bit lazy, well I hop on the tram now. But I still stick to it (w&b). Its both, me trying to eat vegetables as well as w&b. I would think three month is the minimum (to reach a routine, a change in behaviours), I would say rather six month. You need to struggle but after that is has become a habit.

Jörn: Can You describe how you overcome these struggles?

Basse: Just by deciding, bloody hell I am going to do this.

Jörn: Of course sometimes it is much more nicer (not to do the activity), it is a bit rainy outside…

Basse: now we come into the things, that sometimes prohibit you from doing the things (w&b) (17:16) and of course the Finnish climate is not, it would be much easier in Spain to do this (w&b), so now when it is autumn, pouring rain outside or then you have minus 20°C, of course the bicycling is for my part out, because I do not want it, I know some people using bike winter tyres and they are dressed like Eskimos push through the whole winter but that is not for me. So our bikes are now in the cellar and we take them out in the spring. Right now (December) it is walking for me. That is with good shoes and jacket.

Jörn: So basically an all year around activity when you take w&b.

Basse: Yes.

Jörn: Of course walking is a very natural thing.

Basse: Yes, it is. But sometimes you do not have the time and energy.

Jörn: So you connect walking with public transportation?

Basse: Yes, sometimes I walk through the city and when I bought something and I have my hands full then I hop on the tram, or the other way around.

Jörn: Do you do similar thing with the bike (combine bike with public transport)?

Basse: Sometimes I left the bike (at a stop), but there is the issue that bikes get sometimes stolen. So I usually use it (the bike) both ways.

Jörn: I think that is also one obstacle (not to use a bike or leave it at a stop), that it gets actually stolen.

Basse: But I think that the stealing of bikes has been going down because of all this (public) city bikes, because this has been a huge success. You have so many people now bicycling. It is amazing how it (the use and amount of bikes) changed, in a period of one month and suddenly everybody using them (public city bikes).(19:33)

Jörn: Have you tried (public city bikes)

B. No, actually not, because I have my own bike.

Jörn: What could foster, support a person to w&b.

Basse: The public city bike is a perfect example for people, which have not felt to buy a bike, can now use it year around, when ever they want, and that system seams to be very well working, when you have enough bikes, in enough places all over the city, where you can drop them off and just hop on a new one if you like. That is one (supportive action) on a general level. Another is maybe just to be a silent example. At least in my family I know that is one way it spreads. Some days ago I went out walking together with my son without any purpose and both reacted that is has been very nice. You have the chance to talk, and you talk in a different way than you would talk sitting at home at the table, TV on, and these things (interruptions). Otherwise I do not know what other, can not think about any concrete (supportive measures).

Jörn: What I get from the last comments. It (w&b) is not only target orientated like to go to work, to pick up some food, but also recreational.

Basse: Yes, then we are coming into an important thing. I think we need these spaces in the city, where you then can make this walks. Because if you do not have them (spaces), then, I think nobody is enjoying to walk on Mannerheimtie (wide street, heavy traffic, small

pavement). But if you have a very nice park where you can go, or you have nice routes, where you can walk then it is a totally different issue.

Jörn: How is it practical done (w&b)? It is a good day, You want to go to another place. Are you planning that?

Basse: No I, we just walk. Because it is so close (the city park).

Jörn: Are you checking the route?

Basse: No, we are knowing the place so well. When you go to the central park (here in Helsinki), there are some places which we do not know, so it is quite nice to explore, to follow the path and then you are surprised (where you end up). That we have done with the bike actual, it is very nice.

Jörn: Then, (when you explore), you find out that places are not so far away.

Basse: Yes exactly.

Jörn: Like you just said that Böle is not that far away.

Basse: Yes exactly. Not at all actually.

Jörn: There for I was asking about the planning, I am not so (familiar with Helsinki) so I use, what is it, HSL (Helsinki public transport application), they have this (application) to plan my way, which (mode of) transport I am using. I took the walking (option to plan my walk here).

Basse: Then I do it (use it) if I need I go to a place where I have not been.

Jörn: That is what I meant with planning because it (the application) works quite nice.

Basse: Yes it does.

Jörn: How do you see w&b when you put that in a bigger picture? Could have w&b a bigger effect on the society?

Basse: Of course I am not an expert but if you think about it. If I just take me as an example and I, because of these decision (to w&b) I stay healthy, that saves the society, in the long run a lot of money. Instead of me running to the hospital all the time with all sorts of luxurious diseases (civilisation disease) and if you multiply that with the ageing population and so on then of course you are talking, taking big savings. If you think in money terms.

Jörn: It is of course also the lengthening of the life time (to stay longer healthy).

Basse: But of course from another perspective, it is important for me as a composer, to take that time, you walk around, you take the time to reflect and these kind of things.

Jörn: You mean the speed of life?

Basse: Perhaps, I have not thought about it, Perhaps it is a good counter balance, (better) counter weight to an otherwise very hectic life. You try to take that time. And I have seen that with a lot of colleagues, conductors and musicians, even if you are living a hotel life for one week, and there is a certain concert tour, almost everybody, who are in my age now, feel that is very important, they need to have their run, they need to go for a walk, they need to do something. And I have the feeling it has to do with somehow to detach yourself from this schedule thinking, in a way.

Jörn: Because the activity (w&b) is limiting your speed.

Basse: It creates the illusion of you having, being free of schedules. Even you know that you have only a few hours, but still you have taken the time but, during the time you need to go from one place to another, you are kind of by yourself.

Jörn: When you do this w&b in the city, in a crowded city, are there conflicts with others (traffic participants)?

Basse: That varies. Helsinki is not a crowded city. The first thing I start to think of, were I was also living, was Amsterdam, that is crowded. But (over) there for some reason they are so used to it. It is basically a flow of water, the flow of bikes there, everybody knows there intuitively what to do. But in Helsinki I think the biggest problem is, there are many opinions on this depending if you are a cyclist or car owner. The bicycle routes have improved massively and that has created security and that has also eased the tension between the groups but still, I think you regular have this issue, where, bicycles have developed, OK you have people cycling extremely fast, and also behaving like a* (very badly), and you have people in cars, who are extremely fast and behaving the same and that creates tension. But I have never been in a life threatening situation or any thing like that. (29:59). That is mainly because I have tried to use this paths, which are meant for bikes also when I start from here I go on a bicycle route and I have a few crossroads to cross and then I am again on a bicycle route. So it is organized. But it could be a lot better.

Jörn: In which way?

Basse: Just more bicycle routes and routes for people to walk on, that is all. That is what they tried to do. They had this idea of turning all the mayor motorways that led to Helsinki into boulevards, but that got shut down. I think it created such a big political risk in some (parties) so I think, but a few of them, for example the bridge that leads to Lautasaari which has been basically impossible to, you only have the cars there, with really tiny path to walk on. There you have now lanes for bikes and lanes for pedestrians and etc., but that means, that is the friction issue, is that they have now taken of one whole car lane, I do not

know exactly, but one lane going in and two car lane leading out, and before there where 2 lane in and 3 lane out of Helsinki. Of course all the people who drive into Helsinki in the morning are angry, out of there minds. But everybody using a bike are happy.

Jörn: Of course everybody needs to be considered.

Basse: Yes, and I thing that is also a thing that slowly changes. I think you can not make changes over night, and of course it creates resistance but then when it is done, I think people quite soon stop complaining. So I have a feeling that when you do a solution there is a massive resistance, but when the solution is done you adapt and realize this was pretty good actually. (32:22) But that is only my personnel few I have no knowledge to back that up.

Jörn: To conclude the biggest, the biggest reason why you became a prosumer in walking and biking, we had health issues, we had time issues, do you see also these financial issues, like I explained, you take the added-value from somebody else.

Basse: Well, I see it but I am not really sure how many people do that because of money, like kind I said to you, we are kind of freaks (both laughing, admitting). When I make a simple calculation for me a monthly card of HSL cost about 50-60 Euro, I have not used it for a while, I change to a (travel) card, which I started to charge with 30 Euros and then charging it with 20 Euros (a month) and then I realised 20 Euros is what I need. Just in case I need to hop on a tram or bus. So basically w&b saves me a certain amount of money. And this (the savings) is of course something that gives you a tiny bit of pleasure.

Jörn: But something to consider when thinking about a common friend. And I do the same calculation by myself. I did it (walking) this morning for example from home to the train and from the train to your place (50 min), takes of course time, but also to prepare for the interview.

Basse: The crazy thing about time is of course you realize to use the car here in the centre is absolute madness. In that way if I hop on the bike I am almost faster than a person leaving with a car from here and being stuck in traffic. So that is better also from that perspective.(35:33)

Jörn: Do you prepare yourself before you go cycling?

Basse: I do not do. I have a lot of friends they gear up for it. They have all the equipment, even the bloody water bottle. But I kind of like the idea of being dressed for the city, in the city, and being able to do these things (w&b) without, I do not like going into the city into a nice café dressed in a heavy muddy shoes. I find (w&b) path were I can be in normal trousers, I have a long black coat, and I bike with it as well. OK if I bike I like to be a bit

more practical then I have a short jacket. But the idea is that I use the same cloth as I use then (normally). And this again is perhaps part of my sign of my freakishness, but I feel it is unnecessary to then, of course you are allowed to spend on your hobby if you like to spend, also a lot of cash to get the best bike ever, and the best biking shoes and helmet, etc. please do it but for me that is not the issue. I have a decent bike, which I can use in nature and in city and I can do it in my leather shoes if I like. But everybody has the right to do how they want, of course. I do not use a helmet but I should. Also to be a sample for my son. I know a violinist, who was thrown of the bike and is now disabled. On the other hand driving a car the possibility to get hurt is way bigger than using a bike.
Jörn: Very nice, Thank You! Anything to add.
Basse: This whole thing would not work if we would live in a suburb, far out. Of course it could also work their but the obstacles gets many times bigger. And I am not sure if I would be comfortable biking on a free way and knowing it takes me one and a half hours, or one hour to get to the city. I do not know were the threshold lies. But for me, I have a feeling, linked to that idea, I like to live in a place, where you have the stuff around you.
Jörn: There is that thinking that biking could replace also transport. They say that 7,5 kilometres of distance can be covered in half an hour. When you have a cargo-bike.
Basse: 7,5 kilometres is nothing, that is easily covered. The distance I covered regularly was four kilometres and that was just a piece of cake. But it was nice you got your heart rate up, broke a little bit of sweat, that was all, many times a day.
Jörn: Thank you very much!

12.2 Transcript – Repair café

Interview transcript 20th of January 2019, 12:30-13:15 (45 min), interviewee male, end thirties, a family of four, at his home place in Turku, Finland.
Prior to the interview this thesis as well as the questions of chapter 2.4 were introduced.

3:08 Kenneth: What is the story? The story begins in 2007 when Apple launched the first iPhone. It was launched exclusively in the United States. No sales out of the US. But it was like a toy everybody, who was aware of this newcomer (iPhone) wanted and they obviously did not get then. People which went on business trips to the US, got lots of orders from all their bodies to buy these (iPhones). The first phones were operator locked so you had to use an AT&T subscription you ordered to have it work but that did not take

many seconds to hack and then these phones start to flood into Europe and Asia from the US. And they were unlocked (based on the hack) and then you can basically use them without any operator (phone not bound to a specific phone operator). This story could now lead to many side stories but I will keep it in the Apple story, which led me to repairing these devices. 04:21

Then I had my first iPhone in 2007. It was quite nice. It costed in the US 199 USD at the time. I think the larger part of the price was covered by AT&T because they got new customers through this channel because they (iPhone) were operator looked. Obviously that changed when they (AT&T) figured out that people actually using the devices with their Sim cards, abroad with different sim cards (of different phone operators) (05:02). I had my phone, I was bedazzled and amazed because it was a bit, everything we have seen so far, I mean Nokia, it was instantly clear that Nokia, they had nothing. All their phone, which I had been using for decades already they were in a different ball league. They were the phones of the past and this (iPhone) was the next generation, which we still use actually. I do not know if they have even numbered the generations This was the first smart phone (iPhone). And they worked exactly as they do now. I mean it was a toy everyone wanted and now everybody has. Or everybody who lives in the Western world. Eventually the iPhone broke and there were no spare parts on the market and I mean channels like ebay, alibaba and amazon and this where you can buy all kinds of small gadgets and parts from Asia. I mean they were not really working at that time, so it was hard to figure out who would repair it (iPhone), which was not sold in Europe. (06:19)

I wanted a new one firstly, but it was not easy to get because not everyday the of my bodies is going to the US who could bring me a new phone. Eventually I figured out that, OK, my insurance will cover the repair costs regardless how high there are. I contacted some iPhone repair shop in the US (huge motivation) and they said you have to send the phone over, they will repair it, which I did. I can not remember the repair costs. But eventually when I got the phone back and I had to pay customs and what not, freight back and forth and the repair costs there, I mean, I spent maybe three times more than the phone had cost. (Repair cost defining the process) The repair was OK but the phone was not as it was when it was new. You could still see or feel that somehow it (the part) was replaced. That was the first generation iPhone anyway. (07:24)

Then time went by with new iPhone on the market, which was sold in Europe. I got that iPhone eventually I did not do this kind of hacking with the operator lock it was already free when you bought it in Finland and you could use any phone operator. You could

always update the phone software without getting blocked again. I had a new iPhone and everybody started to have this phones and everybody's screens were always cracked, because this is made of glass. If you drop it, easily the screen cracks. Specially these older smart phones they were not that durable as the new ones (nowadays) are, and then there was a huge market for iPhone repairs, which Apple did not offer. Apple changed the whole device always.

Jörn: There was this thing with the battery, there were also legal claims.

Kenneth: Probably, I do not know the background of that, but they (Apple) did not take them to parts and change the parts, they changed the whole device and it was really expensive. Then started the Asian market boom with this spare parts. You know this grey market spare parts, which were, they were suited for the Apple iPhone, but they were obviously not from Apple. You could see it in the finish of these parts that somebody had made something by hand and maybe from used parts, but this market had boomed. It is possibly as big as the phone market itself or even bigger. You could get the parts and the change of the screen or battery or whatever, many things can break if you had water on into your phone then you might have lost your microphone or loading dock or whatever and I started to firstly (to repair) for my own purpose (prosumer).

Then also for my friends and friends of my friends, etc., it was like a pyramid scam, and then I had daily contacts with people who wanted their phones repaired and I did it as a hobby, because it was nice to have something besides your common work, which you could do like in 30 minutes, had a start and a finish (repair task) and you could see the product and the result of your work (motivation). So I did that and it was obviously ten times cheaper for somebody who broke their glass (screen) to have me fix it then to change their phone, from Apple. So then time went by and these phones started to fill the markets from different brands also, I mean it was not only the Apple phone, the iPhone, then all Sumsung, the Android phones came with the same problem; cracked screens here and there, then came the iPads, similar products from Sumsung and Huawei, cracked screens, the demand for this kind of repair went through the roof. (10:39) Which you can see even today when you go to a shopping mall. There will be several small booths where you can get repaired your iPhone or device, while you go shopping.

Jörn: Even now?

Kenneth: Yes, yes, yes.

Jörn: So it has commercialized?

Kenneth: Yes. So the prices (spare parts) have also dropped now. So you can get it done quite cheaply already done here (in Finland, in a shop). You do not need to go to e-bay buy the parts there and do it by yourself. Obviously that will be still be cheaper because these guys have to live but in general those are, like me, a bit younger, they buy the parts from China, then they change them to peoples devices and then they charge them by the hour. That is their business and I am happy for them. I still do it now and then, but I do not get these calls any more but changed probably hundreds of screens to friend's Apple products. Still I do it now and then, all these repair manuals are also so easy to come by, they are in Youtube. I do not know how many billions of devices have been produced, so obviously the amount of information regarding these (repair manuals) has also multiplied.
So you do not need to be a genius usually when you buy these parts from China you get a small plastic bag with all the tools, mini tools, you need. All is really small, you need stable hands, clean working environment, where you do it (the repair), so you do not mess up the phone. Which I also have done a few times in order to save one hundred Euros in damage products, for a six hundred Euro device, it is completely lost, that is the down side of this (repair). That was the story. (12:53)
As a true life example: Marina broke eight displays on her iPhone, or iPhones, before I bought her the first Oneplus (Chinese smart phone brand). Regardless were she would have let this eight iPhones be repaired. This would have been a big junk of cash. I used maybe, nowadays I mean, the older iPhone glasses go for maybe 20 or 15 Euros back then it was maybe 40 Euros per display.
Jörn: But still, I mean, based on the fact that you could change the display you saved the rest of the phone.
Kenneth: Yes. Every now and then I made a shout-out to friends. I have a few relatives and friends who would like to have an iPhone but they can not afford it. If somebody has a broken iPhone (13:58) I am happy to take it, and repair it and then somebody will have fun and use of that.
Jörn: You have a perfect present!
Kenneth: Yes, and everyone had them (broken phones), they were stockpiling, because they did not know to what do with them, they feared that there is some information on the phone they can not just through away and they had no interest and no idea how to repair or let it get repaired, that would cost them money and usually like their employer who bought them a new phone anyhow, they had an insurance to bought them a new phone or they just bought a new phone themselves. Also the phone market has changed during the years since

2007, you do not have to pay a lump sum payment for a phone, it can be charged for every month (debt-based payment plan), you do not actually feel the value (no appreciation) in your skin that way, even they (the phones) cost a lot of money. (15:02)

Jörn: We are talking now about your history as a repair man, where there also other devices, or did you start with mobile phones. A bit about the history how you did come to repair?

Kenneth: I had this kind of interest for since I was a kid. When computers came in the 1990s usually you assemble them yourself, you bought the components. Components I do not mean you have to weld them on the circuit board, you brought your memory, graphic card and motherboard and put them together. So somehow the idea (of repair) was not that foreign that was already planted in my head. I would gladly take everything apart that I have, always, it is interesting and nice, specially you can put it back together and it still works. Somewhat this repair guides on the internet give you this kind of save feeling, that this can be actually done.

Jörn: They are kind of motivator and safety net. Was that kind of desire for repair always directed to electronics or was that directed also to household appliances?

Kenneth: Probably. It is part of my character to repair and fix old staff instead of buying new.

Jörn: To carve a bit out the motives. What makes this desire? What you gain from that?

Kenneth: I have not put much thoughts into it what makes that desire but obviously if you think a bigger picture instead of having the need to produce new phones, because we have perfectly good phones, already produced which easily can be fixed. I like the idea that I also support that (good phones) by repairing old phones. Not to flood the market with this kind of electronics that nobody needs and eventually are chuck away somewhere and then they end up in Africa where you know children are melting off the valuable metals. Of course that is also one thing I want to be part of to make the world a better place. But I can not say that was the biggest motivator. It was my own thing, my own personal thing, my own coins (savings) to save and then the whole idea of sending one phone somewhere to the United States to be repaired and have customs – that is crazy.

Jörn: To make it local (repair)

Kenneth: Yes. But having ordered all the parts from ebay and China is not sustainable in that way.

Jörn: But one leg (of transport) is basically missing (saved) from China to US. Still talking about motivation. You said Marina, you helped her eight times, or other friends they got

sometimes a present from you. Is that also some kind of motivator for you? They must be happy, or?

Kenneth: Yes, obviously that is also a motivator, of course to make my family happy. Again an example the first Oneplus phone (20:19) I got for Marina eventually the screen was cracked but that phone had already reached its limit capacity for her because it was quite small, the memory capacity was quite small, and she likes taking pictures (LESS pictures would mean LESS phones), it (the memory of the phone) filled up and there was a need to by a new one. So it was a win win in that way that we do not have to repair that one, because that was not an easy repair, but I kept that phone, when now Marlin needs her first phone, now the price level of the parts have come already down, lower than a new one, maybe 40 Euros. The repair is not that nice because everything is glued so you have to heat it up and rip it off, that you never know the result (of the repair), is not that nice (as a new phone). But I think I get it work for Marlin and then again I do not have to buy a new phone again, extended life (of the phone). Of course I could buy a used phone for the same 40 Euros but now the idea is in my head so I need to do it.

Jörn: And it is appreciated, of course!

Kenneth: Yes. One motivator also, I remember I brought Marina's MacBook, when I wiped the keyboard with a, some kind of, cleaning substance, which was not suitable for it, it went behind the keys and damaged the keyboard. I contacted Apple but it was not changeable. I was insured, but that was a challenge for me check that online and I figured out that it was actually possible to change it. Just a ton of work like 200 screws had to be opened and closed and then some things melted again, because it is glued, but eventually I did the change (of keyboard) and it did not cost me more than 40 Euros (but time) and it is in perfect working condition, not by us any longer but I exchanged it with somebody else computer. So that was the motivator, in that case, it was the thing that Apple told me it is impossible to repair. Of course it had to be done, just to prove them (Apple) wrong. Of course for them it is impossible because there is no business for them, just rather update their device and sell a new MacBook instead of repair an old one. (23:04).

Jörn: Do you think this is, talking Apple now, called planned obsolescence, so meaning that they have (in the device) certain thing, that can break or which is not repairable easy, to plan it so that after the warranty time it actually breaks and the customer, who is not a prosumer, who could fix it, has to buy a new device?

Kenneth: Maybe, maybe not, I do not know. I think more in the way that they make the products turn slower by the time and then eventually they will create the need to make it fast again, which then is not possible, and then you have to buy a new product.
I think that has been even proven (slowdown). I do not remember now exact details but it was a television, was it maybe a Sumsung television. There is some kind of chip that is sticking away and when it reaches how many clicks, then it shuts it self down and then something does not work in the television – so you have to buy a new one. Obviously televisions does not go slow in that way. I think with computers (phones) it is easier to create this kind of need to buy more memory or do something (to make it faster).
The funny thing is, I want to claim that if you would reset your computer or smart phone, to the same software it had on day one, after it is five years old. It will be slower than it was. You know, just to prove that there is this kind of function maybe in it, to create this need. Because I mean it was not than it should be exactly as fast as it was on day one. If the software is the same, than the software does not require anything more, you totally reboot it, reset it, empty it, and put on it (phone) with the same operating software and the same software. Of course they have made it quite hard to even try it because you can not even get the same software. That is of course one way to make a new operating system, three times a year (26:00) and eventually the newest operating system does not support your old phone.
Jörn: For the repair activities of yours what did you need to set up?
Kenneth: Nothing, just some time in the internet, then ebay. From ebay you find all the parts, all the bits and pieces, if you need tools, if you need spare parts and there are different sizes of phones, were you find the tutorials and the guides how to do it (the repair) and videos and pictures. For example iFIXit.com. Then you have these, lets call them experts, who know this (how to repair), could be twelve years old kids, who call themselves experts, who have answers to all kind of tricky questions. Forums are nice but the downside is you have no idea, who is answering your questions. The further you dig the more weird everything becomes. There will be eight answers to every question and you do not know, which one (answer) is the right one. How can you tell? You have to try by your own. And you have to have some kind of filter to smell out, to avoid, following the wrong path. (27:36)
Jörn: Is it so that, I have a feeling that, from behaviour point of view you did not have to change, it was in your very young days that you started to repair, maybe a bicycle or you watched somebody (doing repair)? But to extend the question a bit. When you have been

with your friends and so forth, have you been a forerunner or could you turn people so (towards repair), they thought, I possibly could also do this repair, or not so obvious, you were in the centre of it (repair)?

Kenneth: Many lights were lit when they (my friends) noticed, I can repair these phones. Please repair my phone instead of doing it by themselves. I think the biggest challenge would not be to do it. It is to understand all the tutorials and everything, which is maybe not in Finnish. Nowadays maybe yes, but at that point they were in English or a different language. Nowadays you do not even need to speak the language, they are translated online, which would help you along the way. You could actually do it without knowing what every thing means in English. Just use some kind of translator page.

I stopped this (repair) actively some years ago. I just remember last time I touched somebodies iPhone, I had to cancel everything (the repair), because it was not any longer doable (repairable) as it used to be. Because there was something, something that Apple had made to the phone. When you open the phone, the phone knew, you could not use it any more.

Jörn: I read about it also, that it is a piece of software or hardware, which is not the original part and that it (the part) does not work. Basically we could say, the makers have actually recognised, that the repair scene as a competition and a reason for reduction of their sale?

Kenneth: Yes, probably.

Jörn: So, could be and therefore actually, actively prevent repair?

Kenneth: Yes, Apple does it at least with this feature in the iPhone.

Jörn: Forcing to buy new, instead of lengthening the lifetime of the old (product) …. You can not overcome it!?

Kenneth: Everything can be overcome. But I do not possess these skills.

Jörn: Or you are not willing to put the time in it?

Kenneth: I could learn it of course, and that would be a big leap and big investment, not just something you google in five minutes.

Jörn: That is right. More time needs to be invested, then it becomes more a profession than a (hobby), like you said, You needed something to work with your hands and see the result after an hour and make somebody happy. So it needs more effort?

Kenneth: It would need a lot of effort. But that being said, of course, this problem has been for quite some time. Fortunately you go to the right forum (in the Internet), already find the hacker who has published his study on this (problem) and a way to go around the problem. There is a chip, there is a programme, there is something, that detects, when the phone has

been opened. So to tackle that, the phone does not need to know that is has been opened, and we are happy again. Or it is the part (new part) you plug in, the part needs to make some kind of hand shake with the rest of the phone, in order to, for it to work. Then somebody will figure out a way to get that handshake made, so that everything will work again (33:04). When the need is big enough, these people (the repairer), who know their staff will show up.

Jörn: There is a huge repair scene out there, a kind of competition (to the manufacturer). What you think about it, you can once again, maybe a bit deeper this time, repair is the part of a bigger picture, how do you, what do you see, you mentioned in the beginning, save the world or save natural resources. I mean the whole repair scene how, or the repair itself, a bit more about what you feel about it, what does it?

Kenneth: I would like to feel that something is saved when you repair an old phone, but that being said I have no idea how the spare parts come into play, which come from China. How dirty is that. Something was made (the parts) in order for me to get the parts (34:37), in order to reassemble the old phone and have have it brought back to use. How dirty was it in the production compared to produce a new phone? Which are obviously also made in China. For me to know that, I really have to dig deeper, go there myself, see with my own eyes.

If I start to goggle "iPhone production in China", that probably would be something, information given out by Apple in California, who is the producer. They will not shot their own leg. They probably will give nice pictures, nice modern factory, were grown up people are working in a sterile environment, happy places.

One thing is sure, to know (how the working conditions are), the truth, you have to see it with your own eyes, to go there, go to the source, to the beginning of the beginning. Where do the components come from. I know this is a dirty, dirty world (of phone life cycle). This is possible linked to small, little villages in Africa, where the kids are melting out the metals from the old electronic boards and what not. Everything we ship over, want it or not, and then the (used components) end up in China in new iPhones.

Jörn: Could be, interesting thought, a very good way but people suffer!

Kenneth: There was a train accident in Germany. When they investigated, dug deeper they found out there was one chip, which was placed in the control unit of that train, and that chip was 20 years old and the train 2 years old. The numbers are fabricated but something like that. When they started to dig into it they found out that the chip was from some machinery, was taken out of use, put into parts, and this parts travelled to Africa, where

people taken out everything what can be reused and they (the chip) went back to China and ended in the “new” train control unit.

Jörn: There is obviously also a risk with repair!

Kenneth; Yes this is one of many risks. The biggest risk are of course your own hands, you do something wrong (37:27), make the assembly wrong. That is why these new phones assembled by robots. They do not make mistakes. If they do, every phone has the same mistake.

Jörn: A bit to the bigger picture, because how you as a prosumer basically consume goods, repair them and return them, and it is a cycle. Do you have here in Turku persons with your capabilities, but there would be people, which (repair) cloth, bikes and household equipment and they come together and ask people to bring their broken stuff (to be repaired)?

Kenneth: I do not think I have heard about it, but the idea sounds quite OK. Probably somebody has thought about it and had this kind of forum put together. Where ever people meet to repair staff I do not know. I have not a clue where that could be, not maybe in Turku, but maybe in Helsinki were you could find that. If not then somewhere else – Central Europe probably.

Jörn: But you have not heard about it, about people making every month, every second week an announcement in the Net, in Facebook, that we have a group of people people, a repair café, a group of volunteer repairers, and you are asked to bring your broken staff to you (the repairers) and you can repair it by yourself. But you have not heard?

Kenneth: No.

Jörn: Because You know many things going on. I checked a lot and could not find. It (so called repair café) was developed in Holland. Now we have 1500 (repair cafés) of them (worldwide). But it has not reached us here.

Kenneth: No I have not heard, but that does not mean it is not there. But You and I have not heard.

Jörn: It does not mean that it is not there.

Jörn: Maybe the last thing, my thesis are about prosumer, the benefits for you (as one of them). Maybe you go a bit (more in detail). You have said many things already, so to make it. What do you feel are the benefits for you (out of repair)?

Kenneth: The benefits for me are my own coined therapy. I have a break in my working day, in order to make a repair, result in something, tangible, touchable, half an hour and you have something concrete achieved. When it is my own stuff (to repair), then I save

some coins and I can cut the time table a bit because I have not to wait for any product because I can use the one I have there (available), which I repaired.

Jörn: It is also time saving, you do not have to analyse the market again, what would be now good for you. You just use what you have, lengthen the product life cycle, productivity.

Kenneth: Obviously the big picture, I do not want to say that, because I have no idea is that saving the planet when I do repair the phones.

Jörn: OK, we can go a bit into that. When you think a bit about, we have talked a lot about the screen of the phone and the repair was also tricky. You have to warm it up because it is glued, so it is not so simple. So maybe 95% of the people when the screen is really broken, they just through the phone away. A screen is maybe 5-7 percent of the whole phone, meaning 93 percent of the phone is going just to waste. Now you replace 5-7 percent and save basically 93 percent for a longer time period. So, I mean regardless we have to ship it over (the spare parts) otherwise you have to ship the whole phone over. I would rather say there is a clear saving in it to have something (relatively small) repaired and have it for a longer time. Actually would you think the phone would work endlessly (43:10) if you do not drop it?

Kenneth: No, based on the battery.

Jörn: OK, right, but anyway until the next drop.

Kenneth: All the components will by age die somehow. This is made from stuff (by humans) of planet Earth. It degrades, but will outlive me, you, our generation. This phone, if you do not (drop it), it could be here for 500 years working without problem, without a glitch.

Jörn: It has a clear benefit (to repair) from the (natural) resources point of view. This is also, when you go further, you do not have to buy, you spend 40€ for the new display but the phone cost maybe 800€ and you lengthen it (the useful lifetime), so you need 760€ less to earn and what comes with it.

Kenneth: Yes, that is the bigger picture I did not think about it.

Jörn: So, you do not need to earn this (760€), then you could reduce working time, less income. So you replace income, you spend less (pollute less) and then it comes into this circle (degrowth) we might go into. Thank You Kenneth!

12.3 Transcript – Community garden, Prinzessinengärten

A. Information based on video material

Webinar – a seminar via World Wide Web:
Title: Was ist eine gGmbH und für welche Projekte eignet sich diese Rechtsform?
[Webinar: How is a non-profit limited company (gGmbH) structured and for what kind of projects this legal form is useful]
Length: 1:13:59 hours
Interviewees: Dominik Renner, Anna Linde, Leipzig ANNALINDE gGmbH; Robert Shaw, Prinzessinengarten, Nomadisch Grün (gGmbH). (Renner and Shaw, 2016)

The Prinzessinengärten have been founded by Marco Clausen and Robert Shaw in 2009 as a non-profit limited company with the telling name Nomadisch Grün gGmbH as a parent company, as with several subsidiaries, were profits stay in the parent company and can be only spend for the public good.
The Prinzessinengärten are established on 5800 m² former fallow land area and offer the following services beyond cultivating food for everybody:

- Consultancy and installation of gardens outside the Prinzessinengärten for institutions and businesses (schools, centre participative with neighbours, hospitals) – subsidiary
- Café and restaurant (gastronomy) using own produce – subsidiary
- Sales of seeds, seedlings, plants and soil (horticulture) – subsidiary
- Sales of guides, presentations, book and photos
- Rent of workshop kitchen
- Charged workshops for specific groups
- Free common workshops
- Honey production and bee keeping workshop.
- Open bike repair shop, metal and wood workshop

In 2016 Prinzessinengärten had 25 employees with 50.000 guests in that year. 20.000 of them were visitors of the community garden and approx. 2500 volunteers.

The education provided is based on exchange between participants. The concept of Prinzessinengärten is based on financial independence from governmental and institutional aid with the possibility to create profit, which flows into the Non-profit limited company and can be used only for social purpose. Aid is applied and required to start projects with the aim of self-financing capability after project implementation.

B. Interview based on video material

Title: Urban Gardening - Stadtgärten in Berlin [Urban Gardening – City gardens in Berlin] Geschichten des Gelingens [Stories of Success]
Length: 4:23 min
Interviewees: Robert Shaw, Mejra Buric, Mirsada Besic, Christa Müller, Marco Clausen. (Christely *et al.*, 2012)

Prinzessinengarten was initiated by Marco Clausen and Robert Shawn 2009 as a non-profit limited company.

The young generation invests time and strength to cultivate own vegetables. It is a re-discovery of the beginnings of our civilisation – cultivation, in a different context – urban gardening in the middle of a city. Prinzessinengarten communicates town people new insights:

Robert Shaw: A different time management, feel for time, base on growth periods of the cultivated plants. From plant to produce, to lean seasonality and patience. Very different from the pulse of the city around the garden. Gardening with others, together, in a community garden is a social and communicative activity detached from social stratum, income and origin.

The harvest will be shared or sold respectively prepared and sold in the restaurant and café. The concept of the garden is its mobility, to allow displacement to another city fallow. Mobil beds are made from bread bins, two on top of each other, filled with a layer of branches for long term fertilization and self produced organic soil garden mould as top layer according plants' need. (1:14)

Community garden is more than just planting together. Marco Clausen: Their is a need of the public to leave the victim role, to passively accept what is introduced but instead actively create, to do, codetermine. A deeply democratic and participatory process, which is more than a ballot.

The Prinzessinengarten belongs to 130 gardens, which are supported by the foundation Interkultur, these are also places where question asked how we can become more independent from the global, industrialized, food production.

Christa Müller from Interkultur calls on people for a search of alternative developments to support independence and add that the politics has not any longer the trust of the people to find, to be capable of intelligent solutions. Therefore grass root initiative are vital.

Community gardens are places to heal traumatic experiences, so the experiences of a group of female migrants in the Berlin Rosengarten. The problems on hand fade when doing garden work The memory of gardening at the place of trauma is little by little neutralised by the experience of gardening with others in a save place. The connection with soil, to grow food with own hands seem to have therapeutic, healing effects. To experience nature in the community garden seems to provide vitality, become more independence, experience community, to codetermine ones environment. Urban community gardens are experimental laboratories for the future. How can we, how do we want to life together? Community gardens possess the potential for answers.

C. Interview based on video material

Title: Nomadisch grün: Der Prinzessinengarten in Berlin-Kreuzberg
[Normadisch grün (company name nomadic green): Prinzessinengarten in Berlin-Kreuzberg]
Length: 9:58 min
Publisher: Foundation association anstiftung & ertomis
Interviewees: Marco Clausen, Robert Shaw (founders of Prinzessinengärten Berlin). (Eich, 2010)

Prinzessinengarten is open to the city and for the inhabitants, in contrast to a confined allotment or courtyard garden. Prinzessinengarten opens to the city, communicates,

exchanges with the contemporary city and grows based on that interchange. Clausen and Shaw admit that they do not have a plan how the garden should look like but grows in this exchange relationships. For example students from a University start with the Prinzessinengarten a project of urban organic farming. A Swedish artist, deep in the potato topic starts a project. Or exchange with health and integration institutions. The productive element of this exchange, together with people from different context, this openness defines Prinzessinengarten. This mixture of people and activities lead to plenty, beauty and productivity, a kind of versatility, biodiversity, which is also favourable for a city.
Shaw calls the urban farming done at Prinzessinengarten a mobile urban farm, which is transportable, build on container such as movable raised beets, boxes, milk cartons, and bags, conceptualized as temporal use, but also to create gardens efficiently, fast, on unfavourable places. These mobility allows urban farming to adapt, react to changing usage and convert city spaces to a garden. Examples would be underutilized hard surface areas, such as parking spaces, market places but also small spaces, fallow, balconies and roofs. Agricultural methods can still be applied such as crop rotation and companion planting. The Prinzessinengärten is in the first instance a fruit and vegetable garden, but is also a cultural space of exchange for and with foreign people, which bring their agriculture expert know-how and plants with them from far, often rural places and distribute, communicate their knowledge, which increase self-esteem and biodiversity. A community garden is also a green corridor, recreation space, oasis, where the people pause be temporarily be part of it and by doing so provide community for others. The garden is just a hock, the basic element, where different activities and people latch onto, participate, create community – a self-stimulated cycle with a self-created nature core. The difference in comparison with a flower garden is beyond its beauty and connection to soil, it is the necessity to cultivate food which provides natural acceptance and curiosity. A community garden provides slowness, based on the growth period, deceleration, and on the other hand activity, work for the gardener in contrast to the café or restaurant with more recreational elements for the visitor. It is this combination, in the open, which makes the Prinzessinengärten a resting place even it is surrounded by noisy traffic and bustling activity of a major city. Clausen stresses that both initiator had no master plan, they are not landscape architects, with the knowledge how a garden should look like and what kind of functions it should provide. Instead they wanted to create a lively interaction between the garden and the neighbourhood as an open process. It seems that their openly admitted dilettantisms was helpful to accept and welcome assistance. Clausen and Shaw see their

task to establish connections and support, were possible, peoples ideas and activities, since they can not do, and do not want to do the work on their own.
Shaw: To work sustainable means to work economically, in the end to prove that a social project is able to own its own money. We do not give away the produce, which comes from the Prinzessinengärten. We sell it even we will never earn relevant money with the amount of food we produce. It is more about to show symbolically; it is good when a social project is able to cover its cost and willing to work economically.

Clausen: It is important for us, where and how things are produced and to explain to the people that there are great products out there in the region – just try them. We want to build, strengthen our restaurant, to cook and preserve produce *in situ*, to cover the whole cycle. From composting, to sowing, cultivate, harvesting, cooking, preserving, eating. We want to bring together these activities, so that the people have a place where they can experience this cycle and understand that these elements, activities belong together. We are not dogmatic, only organic food or no meat, but we want to establish sensitivity. We say: when You eat meat then that comes with a cost and ecological consequences and that You can not afford so often. Same with organic food. That is not only a dogma, but also a quality, with a value, to get these kind of produce, as fresh as it can be, in a wide range of variety, diversity, which do get nowhere else. We try to make these thoughts accessible to people, which do not have a direct bear relation to these topics, knowledge.

D. Interview based on video material

Title: Prinzessinengarten Berlin (English)
Length: 5:27 min
Interviewees: Marco Clausen, and two anonymous supporters. (Maretto, 2010)

Clausen: Prinzessinengärten is a social and ecological farm in the middle of Berlin. We grow food and community. We do planning, practices, workshops, are part of and build international networks and try to be also an open workshop with the question: How the city could look like in a more sustainable future.

The planning of Prinzessinengärten started 2008, gardening started in summer 2009. My Partner Robert Shaw went to Cuba some years ago and by accident came across an urban agriculture programme called Agricultura Urbana where people just started to grow food in

the cities and he realized that is was not just growing food it was and is also about connecting people, exchange knowledge and created sources of income. We try to transfer this experience into the Berlin context.

Unknown male: A lot of people have some idea what urban gardening, urban agriculture or the Prinzessinengärten is, but a lot of people are surprised that this although it is a project focused on food, it is not a project on food production. It is a project focused on education about food, other use of material, having a space to experiment, to build things, which all surrounding the food, but are not directly linked to the food in itself. It is more about food as a vehicle for something else.

Clausen: We are selling vegetables but it is not the main source of income. We have a barn restaurant (mobile, build of a modified container), we do gardening jobs outside the Prinzessinengärten for institutions, businesses, kindergardens and Universities. We do a lot of communication, published a book and pictures. We get smaller funds to start projects we do with children and teenagers. We are now trying to create a platform for consulting, initiatives, how to create places like Prinzessinengärten. So we have diverse sources of income.

Unknown female: The garden exists since 2009. It was an abandoned area for 60 years, fallow land, a flee market and a space for car dealer, but only temporary used. Around 50.000 people to Prinzessinengärten every year. 8.000 people participant actively the offerings of Prinzessinengärten. There is not only gardening, people can also use our open workshops, open bike repair shop. A lot of children come here as well, also to use the playground. School classes are visiting us. Some come for two consecutive years others only one-time. We have also a garden department that builds gardens at for other locations. We have workshops about dye and healing plants, bee keeping, it is a platform for many things and people and exchange.

Part of the harvest is for sale. People can buy vegetables like on a market, but see it how it grows and harvest the produce by themselves. Everybody who help in the garden, gets everything from it for half of the price. Part of the harvest is used in our kitchen, which cooks for the restaurant, whose dishes one can buy.

Unknown male: Being with the food, seeing it brings a lot of things in our daily life together, and this place represents that. It does provide a lot of space for people to learn about food, where it comes from, what it takes to grow it. Lets say You could not survive, You would not grow all tomatoes You need here for your diet. But You can learn how to long it does need for a tomato to grow. And next time You go to a shop and look at the tomatoes You have a different relationship with them because of your experience here at Prinzessinengärten. In a way it is one side of urban agriculture. There is one side of urban agriculture that is about productivity and to grow food in the city. That is great but I think there is another lack, which is not a lack of food but a lack of knowledge about food.

Prinzessinengärten is not only about feeding mouth but also feeding minds and feeding community. That is what we are cultivating here at Prinzessinengärten, so we are growing knowledge.

E. Interview based on video material

Title: Sehenswert! // Prinzessinnengärten (Teil 2), 2015
[Worth seeing! // Prinzessinnengärten (Part 2)]
Length: 10:34
Interviewee: Robert Shaw Managing director Nomadisch Grün gGmbH, Prinzessinengarten; Frejalina, visitor from Sweden; Beryl, trainee. (TV Berlin, 2015)

Robert: In addition to the agricultural and urban gardening topics, we explore very different things, one can learn here. For example the reuse shop at Prinzessinengarten, the so called Material Mafia, which collects materials to be reused, repurposed. That raises the question how we treat our resources in the city. It is not just wood that incur as waste, it is also our own household waste, bio-waste. For example, one could recycle by building, using a worm box. These are always very practical activities (we do, communicate at Prinzessinengarten), such as building a worm box, to chuck, collect our restaurant kitchen waste into it, so the worms feed the waste and produce fertilizer (humus). That (process) can also be done in ones own Kitchen. I have a worm box at my office and my son is very proud to tell his friends that he has 5000 pets. When elaborating, discussing such topics you arrive at superordinate topics. How should we actually treat our waste on a large scale?. (0:55)

Journalist, unknown: On what are we sitting on just now?
Robert: We sit on chairs, which we have developed together with the Material Mafia. These are blue wide-mouth barrels were used to transport dispersion paint. We get from print shops.
Journalist, unknown: And yellow hoses.
Robert: Exactly we sit basically on outdoor stackable chairs we developed for the Heinrich Böll Foundation. When opening the previous fastener of the barrel one can stack the seat pans into each other and store things in the lower part of the barrel. To sit comfortable we have filled maize bags with our plastic waste to have a cushion, which does not gather water – a superior outdoor cushion. (1:51)
Journalist, unknown: And the lamp fits to it.
Robert: Exactly, the lamps are tinkered from bonbon box lids. Alfredo made the design. He is engaged with recycling. (2:02)
Robert: We are sitting here in the workshop kitchen. During the day we provide workshops for children, school classes and others. We inform about, show how to grow salad and herbs. How to harvest and make herb butter from the produce. We have also workshops to learn fermenting. We introduce how to produce salve and tincture. In the evening people rent the outdoor kitchen to come together to cook for each other or to have a festivity. Once in a month we organise a waste cooking, for which we collect edible waste from the surrounding stores and wholefood shops. We have a perennial nursery behind us run by our chief gardener. We have a deal with him. He can use the space to grow perennial and shrubs and in return he oversees the gardening activities and once a week creates the working list for the garden. Furthermore we have a restaurant, a café, an open bike repair shop as well as , a wood and a metal work shop. (3:00).
From 9 am on one can visit the Prinzessinengarten, at 11 am opens the garden shop and the information point, from 12 am the gastronomy is open, which usually closes at 10 pm.
Journalist, unknown: You are original a film maker. How did it happen that You run such a garden?
Robert: I was on Cuba to be an exchange student of film making but they did not take me in. Therefore I was on Cuba. The urban gardening movement over there was relatively big. The movement was born out of necessity, since after the collapse of the Soviet union, the Cuban had little to eat. They created gardens, which functioned different because land is not a speculation object, people collaborate and are used to shortages. Cuba developed a huge gardening movement. I got to know one of these gardens and returned to Germany as

recently as 2008. I visited that garden again and returned from it with the question: How to implement such a garden in Berlin. I engage myself together with Marco with the question; what are urban gardens in essence and how could they function in a city? It became more and more apparent how beautiful and important it could be for a city to have such a place of design, a niche where people are allowed to create something new by themselves. Today is hardly available in cities. By raising my son I have to convey him rules, what he is allow to do in the playground, what is a cycle path, how to behave at a traffic light and on the pavement. I need to teach him how much noise he is allowed to make, where and when. In contrast to have a place where you can try things out was relieving, specifically with foodstuff and crops. From these thoughts the concept for this garden arose. (5:02)

Journalist, unknown: 2009 You started the Prinzessinengarten, for what was the space used earlier?
Robert: The area was occupied by a Wertheim department store until the war. They wished for a subway entrance since their competitor Karstadt had also one. Therefore we have now a Underground entrance (Moritzplatz) were 20 people can enter parallel the station. The area was for a long time empty (destroyed during the war), city development plans were not realised. For temporary use the fallow land was used by a car dealer, a flea market but empty for 10 years before Prinzessinengarten was established. (5:55)

Journalist, unknown: When one wants to garden in Prinzessinnengarten, can one just come by or must one enrol?
Robert: Usually, when we are not too busy, one just comes by and starts gardening. When a lot is going on we ask to come to the gardening working day. It is like a introductory workshop every Thursday afternoon and Saturday forenoon. During these times one get to know the garden, the tasks and the people. When one feels confident one can garden during opening hours by themselves.

Journalist, unknown: Does it cost something?
Robert: No way! Most of what we offer is for free, even most of the workshops. We have a very good bee keeper and bee keeping course. They work a lot to build a association structure to promote species-appropriate bee keeping and take a fee. For some workshops one has to pay for the materials used. In general workshop not given for a specific group are for free. (7:00)

Journalist, unknown: After 6 years of Prinzessinnengarten; how has gardening developed?
Robert: Urban gardening has become a real movement. During the time we have build more than 20 school gardens. To write a concept for a school garden is fine but when You actually do gardening along the beds with 90 pupil You are surprised that it really happens, it is very exiting. The best thing of all is how much I and others learn from each other and how well it works to do things together. One has to talk, communicate a bit more but the outcome is much nicer, versatile and also larger compared with the doings by oneself. (7:38)

D. Interview based on video material

Title: Prinzessinnengarten, Berlin – Interview with Marco Clausen. (English)
Length: 4:34
Interviewee: Marco Clausen Shaw Managing director Nomadisch Grün gGmbH
(Redwood-Martinez and Clausen, 2014)

Marco: This is the Prinzessinengarten in Kreuzberg, Berlin. It started in 2009. We call it a social and ecological urban farm located in the centre of the city. We grow organically 500 different species with the help of hundreds of volunteers. We are a social business, we do not get any funding from the city. We finance our projects by ourselves, by our activities, and one is our own restaurant and bar were we use the products from the garden. We don't see it as a project between uses but as a showcase, to show what is possible on a specific place, a pioneer use. How do we deal with public spaces here in Berlin – in a city? How is it possible, can it be supported, that initiatives like Prinzessinengarten can create alternatives for urban life – "utopia in miniature", be laboratories for the sustainable city of the future? The space of Prinzessinengarten is owned by the city of Berlin and threatened to be sold.

We have 3 mayor demands:

- Five more years for the garden. Main reason: Prinzessinengarten is a social enterprise, employs 13 people full time during in summer, which would need otherwise to be fired. For all social and educational projects of Prinzessinengarten

we have to get money from somewhere. This is only possible when you make sure that you stay for a longer period of time than 12 month.

- When dealing with public property. The people immediately effected should be part of the decision making process. Participation, should reflect the very diverse neighbourhood with a lot of social and educative problems. We should find new ways to address people and get them involved.
- Prinzessinengarten is just one example what is going on in the city. The threat is that all the open spaces, which the people created by themselves, bottom-up, will loose due to a policy that operates for short term financial profit. If you want to maintain this places, this Berlin specific quality, we need to find a new framework. We need to integrate these places, open spaces, into city planing and be serious about it. Until now the city is just using these unique places as a tool for image, which cost them nothing and they do nothing to give this initiative a security for their work. I see people gardening in the city with a specific attitude. People taking care for something living, fragile by using their time to do so. For me gardening is also an attitude, which can be transferred to the question of city planing. We need to think about things as growing, which needs time, nourishment, protection to maybe get bigger. So we should be careful at this places so they can nourish and that we have processes of cultural pollination. What kind of things, (influenced by this places) happen around these places. This is really the potential.