

An ecological-economic analysis of allotment gardens in Vienna from a Degrowth perspective

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Affidavit

I hereby affirm that this Bachelor's Thesis represents my own written work and that I have used no sources and aids other than those indicated. All passages quoted from publications or paraphrased from these sources are properly cited and attributed.

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Abstract

Under the current economic situation, society is facing an imminent socio-economic and ecological crisis that threatens human well-being. In order to address these multiple crises in a sustainable manner, the Degrowth movement calls for the abolishment of the hegemony of economic growth and to instead focus on a prosperous frugality and sustainable living within planetary boundaries. Urban gardening is one of the strategies that is considered in line with Degrowth ideas. Urban gardens contribute to food security of cities and green spaces, which have been shown to relate to better physical and mental health.

Although allotment gardens are the oldest and most prominent type of urban gardening, they have not been given significant attention in the degrowth discourse. This is partly because many allotment gardens are characterized by high fences, privatization and single-family homes. Nevertheless, there is evidence in qualitative data from various books and studies that show that values such as democracy and conviviality are present in the allotment gardens of Vienna today. Therefore, this thesis aims to find out to which extent allotment gardening in Vienna could be considered a degrowth strategy and a desirable convivial technology. The data was generated through an online survey, sent to 140 allotment garden compounds. The results show that the majority practices fruit and vegetable gardening, and the yield covers 10% to 80% of the fruit and vegetable needs of the households. The results indicated high life satisfaction and autonomy in the allotment gardens, however, participation in club-related events is rather low. In general, socializing is of low importance to the participants, however, trust and mutual help is present within the neighborhood. To conclude, not all elements of allotment gardening in Vienna are in-line with Degrowth principles. Yet they offer valuable benefits for their tenants, owners and the city of Vienna. In addition Vienna's allotment gardening offers good potentials as a Degrowth technology from a conviviality perspective, but further research is needed into other criteria such as feasibility and viability.

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List of Abbreviations

AG = Allotment garden

AGs = Allotment gardens

1 Introduction

The term degrowth has become a common term within sustainability research, as books, journals, and conferences are published and held on this topic regularly (Degrowth, n.d.). One reason why the discussion about degrowth is prominent is because evidence has shown that the impact of climate change and decreasing biodiversity will have tremendous effects on the human population within the upcoming decades (Hickel, 2021). Even though decoupling production-based emissions from economic growth has been attained by some countries (Hubacek et al., 2021), green growth has nevertheless been criticized by researchers, saying that the positive effects of decoupling are not sufficient to fight the imminent ecological crisis (Parrique et al., 2019; Hubacek et al., 2021). Climate change and the exploitation of natural resources have been linked to capitalism and the growth paradigm since the early 1970s when the Club of Rome first published a book stating the limits to perceived “infinite” growth in a world with limited resources. The degrowth movement, which was later established in the early 2000s (Degrowth, n.d.) aims to eliminate the goal of economic growth and foster a new economy based on the well-being of society instead (Schneider et al., 2010). Even though the key terms and characteristics of the degrowth movement have been defined (Kallis et al., 2014), there is still a lack of research about degrowth strategies and how to implement them (Ambach et al., 2018).

In general, Degrowth is a call for a prosperous frugality and convivial living. Degrowth advocates, scholars and activists come from various streams of thoughts. Those who follow the ecological and biophysical standpoint argue that a degrowing economy is the only way to avoid an environmental crisis in the future (Demaria et al., 2013; Kerschner, 2010), which will have tremendous effects on human population and well-being. Others emerged from the idea that there are social limits to growth (Kallis, 2014), and therefore see a need for deeper democracy, justice, increased human well-being and the abolishment of seeing humans as a means for productivity and efficiency. Any Degrowth practice should follow a combination of these streams. Another big part of the Degrowth discourse is convivial technology (Kerschner et al., 2018), which is any type of method, process or machinery that fosters autonomy,

creativity and where the user is the main driver of the activity (Illich, 1973). Best-practice examples are bicycles and urban gardening.

Urban gardening is one of the key strategies related to degrowth, covering aspects like self-sufficiency, localization, and community (Anguelovski, 2014). Urban Gardening has so far been analyzed and compared in various cities (Jahrl et al., 2021; Glavan et al., 2018; Carbral et al. 2017), and has taken on various forms such as allotment gardens and community gardens. In Vienna, allotment gardens, also referred to as 'Schrebergärten', go back to the early 20th century (Exner & Schützenberger, 2018). Since then, the use and purpose of these gardens has changed in various ways, from being originally so-called 'Kriegsgärten' ('war-gardens') during WWI to permanent residences nowadays (Exner & Schützenberger, 2018). Back then, the 'Kriegsgärten' played an important role to ensure self-sufficiency when food was rare (Kleingärtner, n.d.). Self-sufficiency is still a motivator for urban gardening today (Glavan et al., 2018; Trendov, 2018; Zainudding & Mercer, 2014) and has been discussed as a post-growth strategy to ensure food security and food resiliency in cities (Markoni & Götze, 2020).

At first glance, allotment gardens in Vienna, are generally associated with privatization, high fences and industrialization (Exner & Schützenberger, 2018), and do not seem to have much in common with the Degrowth discourse. There is, however, qualitative evidence that practices within the allotment garden compounds are in fact compatible with Degrowth. Social interaction, participative democracy and well-being are part of what drives the demand for allotment gardens in Vienna (Autengruber, 2018). There are also indicators that organic agriculture is a common practice in allotment gardens (Martinho da Silva et al., 2016; Exner & Schützenberger, 2018; Ma ckiewicz & Asuero, 2021, Glavan et al., 2018), which is, based on an analysis by Gomerio (2018) a convivial technology. Thus, the following research questions evolve: (1) To what extent does allotment gardening in Vienna represent a Degrowth practice (or strategy)? And, (2) To what extent could allotment gardening in Vienna represent a Degrowth technology?

This thesis aims to answer the research questions and back up the claims with quantitative data about food cultivation, food productivity, gardening practices, and social aspects, such as democracy, justice and well-being. The data will be collected through a survey distributed to 120 allotment gardens in Vienna. The findings of this thesis will contribute to the existing literature in the following way. First, within the Degrowth discourse, urban gardening has mainly been analyzed from a social and cultural standpoint (i.e. Anguelovski, 2014b). So far only Gomiero (2018) analyzed the feasibility and viability of convivial agricultural practices as a Degrowth technology through rough calculations. Based on a study by Glavan et al. (2018), this thesis calculates the number of servings of grown food to make an assumption about the self-sufficiency potential in the allotment gardens. In this context, the author wants to add that allotment gardens were not chosen because it is believed that they are the best example of a Degrowth practice, but because there is potential of it and that there is a need to analyze existing institutions. This thesis therefore can provide insight into reformist approaches. Further, most research focuses on the “newer” forms of gardening, such as community and guerilla gardening (i.e. Veen et al., 2016; Trendov, 2018; van der Jagt et al., 2017, van der Haide et al., 2011), but allotment gardens, which make up more area in urban areas, are generally left out of the discussion. This thesis aims to close this gap. This thesis can also provide valuable insights for the city of Vienna regarding relevance and importance of allotment gardens, which have taken a back seat in the city’s development plans (Autengruber, 2018). Third, there is currently no account of pesticide, herbicide and fertilizer used in home gardens in Austria. The only numbers available are from the organization Global2000, who calculated the approximate number of products sold by adapting Germany’s sales numbers to the population of Austria (Global 2000, 2019). Last, the findings will be relevant for the Zentralverband der Kleingärtner und Kleingärtnerinnen Österreichs (“Central association of allotment gardeners in Austria”) and all participating allotment garden clubs, as it provides insight into the life, needs, wishes and sorrows of their members.

The structure of this thesis is the following. The first part provides an in-depth summary and analysis of the existing literature regarding the growth paradigm,

degrowth, urban gardening and allotment gardens in Vienna. Next, the methodology part includes a justification of the chosen research approach, followed by a description of the study design and tools of analysis. The third part includes a thorough analysis of the results. Last, a conclusion summarizes the final findings and gives recommendations for allotment garden clubs.

2 Literature Review

2.1 Introduction to the Growth Paradigm

For the past century, mainstream economists have deemed economic growth as the remedy for all kinds of socio-economic issues in society (Schmelzer, 2015). Economic growth is typically measured by the gross domestic product, or GDP and was considered a proxy for affluence and well-being in the 20th century (ibid). Its history dates back to the 1930s. Influenced by the Great Depression in the United States, the economist Simon Kuznets created the formula for calculating GDP to get a better grasp of how the economy was doing. It was only about 30 years later, fostered by the economic competition of the Cold War, that GDP growth became the non-plus-ultra of development (Hickel, 2017). In his book "Farewell to Growth", Latouche (2009) observed that we live in a "*growth society*", since economic policies and laws on a national and global level are made to ensure the pursuit of growth, which ultimately shapes the individual's and society's life as they take on their role in production and consumption. While the growth imperative still holds hegemony in today's world, the once stable foundation of the growth ideology has been undermined by research backed by strong evidence that considers the pursuit of continuous economic growth unsustainable (Bauwens, 2021; Latouche, 2009; Meadows et al., 1973; Meadows et al., 2012; Georgescu-Roegen, 1977; Kerschner, 2010). Indeed, it did not come as a surprise. Simon Kuznets already mentioned that GDP is not an appropriate measure for wellbeing when he first presented it to the United States Senate in 1934 (Kuznets, 1934). In 1962, he warned that growth should only be pursued if it is justifiable by its costs and benefits and that "*Goals for more growth should specify more growth of what and for what.*" (Kuznets, 1962 in Croly, 1962). Not only is growth questioned by

researchers, the discussion has been picked up by newspapers as well. A quick look on Google Search today shows a rise of questioning the growth paradigm in articles published by The Guardian (“*Is it time to end our fixation on GDP and growth?*”) or The Atlantic (“*Does the Economy Really need to keep growing quite so much?*”), while others are in favor of it (“*Why Growth Matters.*”) (Partington, 2019; Semuels, 2016; Dorfman, 2017). But what is behind the claim that perpetual economic growth is both socially and economically unsustainable? The following chapters will dive into this question.

2.1.1 Ecological Limits to Growth

The human life is dependent on the ecosystem on Earth to survive (Farley, 2014). For over 10.000 years the Holocene geological epoch has provided humanity with a stable climate to support the flourishing and exponential growth of the human population (Zalasiewicz, 2008). It is so far the only epoch that scientists are aware of that could support the way humanity currently lives (Steffen et al., 2015). Whenever there is a drastic change in the Earth’s ecosystem, the Earth enters a new geological epoch. According to Crutzen (2002), over the past 200 years the Earth has slowly entered a new era, called the Anthropocene, where humanity’s interactions with the environment are the main cause for global changes in the Earth’s system. His conclusion is based on vast amounts of evidence of ecological changes that have occurred since the industrial revolution began about 200 years ago (ibid). This includes i.e. increased global warming, deforestation and biodiversity loss – all of which destabilize the current system with potential detrimental effects on the well-being of society (Röckström et al., 2009). Researchers identified ecological thresholds, or so-called tipping-points, for these changes, which, if surpassed, lead to a sudden, unforeseen collapse of ecosystems (Groffmann et al., 2006) and hence destroying the resilience of the Holocene (Steffen et al., 2015). One example are the nine planetary boundaries. Created by Röckström et al. (2009), they each measure a part of the ecosystem on Earth, such as climate change, measured by CO₂ density, and ocean acidification, measured by the pH-scale. For each of those boundaries a “*safe operating space*” (p.1) is defined, in which the stable state of the Holocene is preserved. Breached boundaries may, however, cause a disruptive domino-effect on

the other planetary boundaries. So far, six boundaries had already been breached by 2022 (Wang-Erlandsson et al., 2022), which is double to when they were first developed in 2009. According to Steffen et al. (2015) the key boundaries are biosphere integrity, aka biodiversity, and climate change. There is strong evidence that global warming has severe consequences on ecosystems and human welfare (Masson-Delmotte et al., 2018), such as causing the death of ocean reefs, which, according to the NOAA (National Oceanic and Atmospheric Administration), currently provide about five hundred million people with food, income and “*coastal protection*” (NOAA, n.d.). To counteract, the Paris Agreement bound 192 countries in 2015 to limit global warming to a maximum of +2 degrees Celsius (UNFCCC, 2015), based on the average of temperatures before the industrial revolution (United Nations, 2015). To achieve this, a reduction of greenhouse gas emissions of 45% by 2030 and reaching net-zero by 2050 is necessary; *net-zero* meaning the break-even between greenhouse gas emissions and its conversion to oxygen (ibid).

The reason why humanity struggles, and mostly fails, to stay within the safe operating space is the Earth’s limited biocapacity. The biocapacity described in an identity developed by Ehrlich & Holdren (1971), the impact made on the environment can be calculated by the product of three factors: the population (P), their affluence measured by GDP per capita (A) and technology (T) ($P * A * T$). *Technology* in this case stands for the impact per unit of consumption (ibid). Since a deliberate reduction of the population is generally not discussed (Kerschner, 2010) and growth of GDP per capita is highly desired (= growth paradigm) by mainstream economists, the general mainstream consensus to stay within the planetary boundaries is through technological advancements and efficiency. Thus, claiming that perpetual economic growth on a global scale is sustainable given new technologies.

2.1.2 Is Green Growth the Solution?

The question of how countries can reduce carbon emissions while still achieving economic growth gave birth to the notion of green growth. The idea is based on decoupling, which is decreasing the environmental impact per unit of consumption through technological advancements (Ehrlich & Holdren 1971) while continuing to

grow the economy. Relative decoupling is achieved when environmental impact grows at a smaller rate than GDP. If environmental impact reaches a negative growth rate, it is considered absolute decoupling (Parrique et al. 2019). Green growth combines growth-oriented and sustainability-oriented policy making. One study showed that Nordic European countries achieved “*genuine green growth*” (p.1), aka green growth within the planetary boundaries (Stoknes & Rockström 2021). Tilsted et al. (2021), however, revealed later that significant factors, such as international transport emissions, were not taken into account (Tilsted et al. 2021). Numbers from Germany and OECD show strong relative decoupling over the past two decades, while worldwide absolute and relative decoupling cannot be supported empirically (Ward et al. 2016). Especially of the kind that is needed: of sufficient magnitude (e.g. for decarbonization until 2050), permanent, global, including all major pollutants, etc (Parrique et al. 2019). In general, the concept of decoupling is problematic. Quite often the numbers provided only account for territorial emissions and not for emissions embodied in imports i.e. the full footprint (ibid). One green growth strategy example is the circular economy concept. The circular economy is based on recycling used material to new goods, whilst reducing waste and resource consumption (Valavanidis, 2018). The circular economy has been incorporated in sustainability strategies by big corporations, such as H&M, Ikea and Unilever (EllenMacArthurFoundation, 2022). Despite these companies showing results in adopting circular economy practices, Bauwens (2021) argues that some strategies to implement a circular economy, such as increasing product durability, are in conflict with the aim of making profit and the pursuit of economic growth. And even those strategies that seem to align with a company’s financial goals, include hidden future costs or increased negative effects on material use. For example, the continuous degradation of materials that happens as they pass through the recycling loop could bear even higher costs to companies in the future as they try to uphold the quality (Allwood, 2014). To conclude, even though relative and absolute decoupling of emissions have been attained by some countries (Hubacek et al., 2021; Ward et al., 2016), green growth has nevertheless been found unattainable, as the positive effects of decoupling are not sufficient to fight the imminent ecological crisis (Hubacek et al., 2021; Parrique et al., 2019; Hickel & Kallis, 2020, Ward et al., 2016).

2.1.3 Post-Growth Alternatives

The consensus of many researchers is that the growth imperative and the continuous quest for eternal growth is the root cause of why many sustainable development policies are unattainable (Goulden et al. 2014, De Blas et al. 2020, Parrique et al., 2019, Hickel & Kallis 2020). In fact, many say that a post-growth approach is the only way to stay within planetary boundaries (i.e. Hickel & Kallis 2020, Parrique et al., 2019, Farley, 2014). These are not new findings. In fact, the limits to growth were first published in a book (of the same name) by the Club of Rome, a collective of experts of numerous disciplines (Meadows et al., 1972). Through a computer simulation, the Club of Rome forecasted that without substantial and continuous reduction of resource depletion, the human population will decrease drastically by 2050 (Meadows et al. 2012). But what are the economic models of a post-growth world? The most discussed post-growth alternatives are economic Degrowth, new economy or the steady-state-economy. Economic Degrowth is “a downscaling of production and consumption that increases human well-being” (Schneider et al., 2010, p. 511) while the Steady-State-Economy (SSE) describes a state where the global economic output stays the same over time and no growth is desired (Daly, 1973). The New Economy identifies “*de-materialized services*” (p.212), hence low-carbon activities, such as recycling, leasing, urban gardening, as key economic activities (Jackson, 2014). All three of them have advocates as well as critics. While economists such as Daly (1996) promoted the SSE, Georgescu-Roegen argued that only Degrowth is feasible due to the laws of thermodynamics (Georgescu-Roegen, 1977). Kerschner (2010) on the other hand combines both, stating that the desirability of de-growth depends on where it is applied. He suggests that de-growth could be a strategy applied by the global, rich North to give the global, poor South room for economic development – which would result in a global, dynamic SSE (ibid). “Economic development” in this case, however, does not mean economic growth for growth’s sake, but for as long as it improves the welfare of society. Yet, rearranging the growth paradigm to a de-growth “paradigm”, has been considered utopian and would likely not find much endorsement by the public (Latouche, 2009). However, the awareness of environmental destruction, climate change and their link to economic growth along with social issues, gave birth to the degrowth movement, a movement consisting of activists as well as academics,

who not only rejects the growth ideology, but calls for a socio-economic transformation (Schneider et al., 2010).

2.2 The Degrowth Movement

Degrowth has been defined as “an idea that critiques the global capitalist system which pursues growth at all costs, causing human exploitation and environmental destruction” (Degrowth, n.d.) and “a downscaling of production and consumption that increases human well-being and enhances ecological conditions” (Schneider et al. 2010, p.511). However, degrowth, as the term might imply, does not mean economic recession in a capitalistic sense. Rather, it calls for a collectively decided, social-ecological and economic transformation in which GDP growth is not the goal (Demaria et al., 2013, Smith et al., 2021). The Degrowth movement combines various schools of thought, initiatives, movements and concepts, that at the core share the following values: (1) disapproval of the growth paradigm rooted in the evidence of Earth’s ecological limits, like the law of thermodynamics (Georgescu-Roegen, 1977), and GDP as a measure of society’s well-being, (2) call for social justice and democracy, and (3) offer a bottom-up approach. Demaria et al. (2013) describes degrowth as a framework (or, in his words, “*interpretative frame*”, p. 194) for a social movement, as it is neither economic theory nor ideology, but an umbrella term that converges the goals and notions of each of the activist movements it entails, from car-free city initiatives, advocates of commons to urban gardening. In this chapter the history and origin of degrowth will be explained. Then, the intellectual sources of degrowth and their related initiatives will be described. Last, this chapter gives an introduction to suggested degrowth strategies.

2.2.1 History and Origin of Degrowth

The term degrowth originated in France (“*décroissance*”) in the 1970s, where it was first mentioned by intellectuals such as the philosopher André Gorz and the economist Georgescu-Roegen, who both criticized the growth paradigm (Kallis et al. 2014). In the early 21st century, *décroissance* became the name of a social movement in France, that promoted, among others, car-free cities and anti-advertising campaigns. At this point, degrowth had also been mentioned by various authors and researchers (ibid).

In 2002, for example, the Lyon-based magazine “Silence” published a special issue about décroissance, which received vast public attention and sold over 5,000 copies (Degrowth, n.d., Kallis et al., 2014). Nevertheless, it was not until the first Degrowth Conference in 2008 in Paris, that degrowth started to receive international academic attention (Demaria et al. 2013, Kallis et al. 2014, Flipo & Schneider 2014). Over the years, it has turned into a multinational movement (Demaria et al., 2013, Kallis et al. 2014), although mostly on the intellectual level so far (Akbulut et al. 2019). By 2018, roughly 300 research articles related to degrowth had been published (Kerschner et al., 2018) and by 2023 Degrowth will receive its own scientific journal (degrowthjournal.org, 2022).

2.3 Degrowth Sources

As mentioned above, Degrowth is an accumulation of imaginaries and initiatives that originate from various intellectual backgrounds, movements and philosophies (Schneider et al., 2010). Flipo (2007) first grouped these backgrounds into 5 different sources: Culturalist, Democracy, Ecology, Spiritualist and Bioeconomic. The sixth source, Justice, was later added by Demaria et al. (2013). It is important to mention though, that just like one degrowth author cannot be attached to simply one source, nor can the initiatives, schools of thoughts and ideas (Demaria, 2013). Any degrowth-related initiative that emerges represents at least one, most of the time all, of these sources.

2.3.1 Bioeconomics

This source is based on the ecological limits of the Earth’s system explained in Chapter 1 of this literature review. Economist Georgescu-Roegen coined the term bioeconomics and was one of the founding fathers ecological economics (Levallois, 2010), meaning that he was one of the first incorporating the laws of physics and other environmental factors into economic theory and calculations (Bonaiuti, 2014). He was a radical proponent of economic downscaling of production and consumption, disagreeing with his former student Daly, the main author behind the steady-state-economy concept (Kerschner, 2010), and condemning the notion of sustainable development in general (Bonaiuti, 2014).

2.3.2 Ecology

Ecology is somewhat similar to Bioeconomics, however, this source focuses more on ethics and humanity's relationship to nature instead of economic calculations (Flipo, 2007). The ecologist source calls for “*respect for living beings*” (p. 9) and respect for ecosystems (ibid). The term “Ecosystems” is preferred over “natural resources”, which implies the human dominance (Demaria et al., 2013). Currently the relationship between humans and nature is one of exploitation – the surpassing of the planetary boundary of biosphere integrity (biodiversity) demonstrated by the current mass extinction of species (Steffen et al., 2015), illustrates this unequal relationship. One strategy to address this issue proposed by the DG movement is the management of ecosystems in a communal fashion.

2.3.3 Critiques of Development and Praise for Anti-Utilitarianism

Degrowth advocates from this source generally (1) critique the idea of the homo economicus (Flipo, 2007) (2) praise anti-utilitarianism, (3) disapprove of the notion of development (Demaria et al., 2013), and (4) critique the standardization of cultures through following the Western development paradigm (Latouche, 2009; Schneider et al., 2010; Demaria et al., 2013).

The term *homo economicus* refers to the idea of the ‘perfect’ human that acts in the most rational and efficient way to maximize their own self-interest - something that is deeply imbedded in today's economics university syllabuses (Flipo 2007; Demaria et al., 2013). The term is rooted in the belief that the only driver of human behavior is selfishness, regardless of seemingly altruistic behaviors, such as giving someone a gift. In 1981, this led to the foundation of MAUSS (Anti-utilitarian Movement in the Social Sciences) by intellectuals that disagreed with the stated belief (Romano, 2014), and thus laid an essential foundation for Degrowth. Anti-utilitarianism takes its place in the degrowth discourse as a foundation for democracy, emphasizing that people are by their nature willing to be cooperative and selfless for the sake of it (Romano, 2014).

The second integral part of this source is the criticism of the notion of development. There is not one definition for development that is universal (Escobar, 2014).

According to Escobar (2014), interpretations of the term are either related to the idea of Western cultures dominating the others by imposing the idea of (economic) development on them, or, on a more personal level, it describes the path of achieving one's desires, or desires imposed by others. Degrowth is concerned with the notion of sustainable development as well as development itself. The former was first debunked by Latouche (2004) in an influential research paper, pointing out the ecological and social limits of growth. Kerschner (2010) on the other hand argues that sustainability alone is still a desirable goal, yet due to the interpretation of sustainable development as being achievable via green growth, it is widely accepted that sustainable development is an oxymoron, meaning that the two terms are contradictory to each other (Demaria et al., 2013). The latter, the notion of development by its own, has been connected to the idea of capitalist (economic-) development since the 1940s (Escobar, 2014). During this time, the Western countries first started labelling other countries, mostly colonies, on the Southern Hemisphere as "underdeveloped" (Kallis et al., 2018, p. 296) and "Third World", hence in need of intervention policies (ibid), and thereby asserting the dominance of the Western development ideology (Escobar, 2014). The reason why this is problematic is because 'development' is closely tied to consumerism, growth and technological cornucopianism (Kerschner & Ehlers, 2016), which is at the core of the growth paradigm and hence portrays the (Western) "growth society" (Latouche, 2009) and the foundation of the current ecological crisis. Indeed, it does make sense for some countries, mostly in the Southern Hemisphere, to grow its material and energy throughput, yet this requires a close look at the country's individual situation and should not happen for the sake of it (Kerschner, 2010). To summarize, Degrowth proponents disagree with the reduction of the human being to simply an economic agent and call for a farewell of the current development ideology, through offering alternatives to development.

2.3.4 Democracy

There are areas in society that are mostly left out of the democratic discourse. This applies to debates about the role of technology (Kerschner et al., 2018), institutions, education, growth and development in society (Schneider et al. 2010, Demaria et al.,

2013) Degrowth is a call for “*new forms of democracy guided by local (global) social and environmental justice, solidarity and autonomy*” (Kallis et al. 2018, p. 307). The aim is to restore the close connection between the political system and the economy, for more control of the government over the market system, such as saying farewell to paradigms like Adam Smith’s (2008) invisible hand theory, which is a metaphor for the market regulating itself (ibid). Degrowth proponents propose two ways of strengthening democracy. The first imagines a reform of the current existing institutions (reformism), while the second way is the abolition of the said institutions and the establishment of new ones (revolution) (Demaria et al., 2013).

There are two concepts within the Democracy stream that are particularly relevant for this study, which are conviviality and autonomy. The philosopher Ivan Illich, an influential voice of degrowth and democracy, argued that certain technology suppresses democracy (Demaria et al., 2013), and that therefore, when imagining a deeper democracy, one must inherently question the role of technology in society (Alarcón Ferrari & Chartier, 2018). The following two sub-chapters will dive into Illich’s concern with technology, conviviality and autonomy.

2.3.4.1 Convivial Technology

“I believe that, in any society, as conviviality is reduced below a certain level, no amount of industrial productivity can effectively satisfy the needs it creates amongst society’s members.” (Illich, 1973, p.11)

The concept of conviviality was first introduced by Illich in his book ‘Tools for Conviviality’ in 1973 (Illich, 1973). Illich grouped tools into ‘tangible tools’, such as material objects, and ‘intangible tools’, such as methods, institutions and educational systems (ibid). Further, Illich differentiates between ‘manipulative’ and ‘autonomous’ tools (Samerski, 2018, p.1637). Manipulative tools are tools where the technology is the main protagonist of the activity. Its application is limited to its predetermined abilities and requires humans to go out of their way to adapt to the tool. Furthermore, manipulative tools generally require certificates or experts to be handled (Illich, 1973). Illich’s main example for a manipulative tool is the automobile. Cars, and inherently

the highways that are built for them, create spatial scarcity and a dangerous environment for pedestrians and cyclers. This line of thought fits the degrowth discourse frame, as car-free city initiatives were one of the first campaigns under the Degrowth name in France in the early 2000s (Kallis et al., 2014). Regarding institutions, Illich identifies similar problems. He argues that as much as there are tipping points to the environment and earth's ability to regenerate, there are tipping points to society as well (Samerski, 2018, p.1639). Therefore, any institution, such as public or private schools, or businesses, are subject to reach a certain point where their marginal utility is maximized, at which afterwards the tool loses its convivial aspect. Once this threshold is passed, humans become the tools manipulated by the institutions, not vice-versa (ibid).

Convivial tools on the other hand support and enhance a person's innate abilities and promote a self-determined, creative engagement with the environment (Deriu, 2014). After production the manufacturing company has no control over the tool, which functions independent of it (Bradley, 2018). Illich defined three characteristics that make a tool convivial: (1) It shall be easy to use, easy to repair, and of a do-it-yourself nature (2) free to use by the user whenever they want, and (3) versatile and promoting creativity (Gomiero, 2018; Samerski, 2018). Examples for convivial tools are the bicycle (Samerski, 2018), sewing machine (Bradley, 2018), hand tools and urban gardening (Kallis et al. 2014). All of these fit the characteristics of conviviality, as they are simple in their practice and nature and the user is in full control of the tool. One implementation of conviviality are Bike Kitchens, a repair-it-yourself facility managed in a collaborative effort, by providing the space, tools and education to repair your bike yourself (Bradley, 2018). Nevertheless, even convivial spaces like this are subject to commercialization since material has to be bought and rent for the facility needs to be paid (ibid). Regardless of his critique of the - in our society very prominent - use of manipulative tools, Illich says that industrial production and manipulative tools should not be completely abandoned (Illich, 1973). Rather, there should be a balance of both. Illich argues that economic growth is facilitated not only through industrial production, but also through institutions, whereas the mainstream growth discourse today focuses mainly on material growth.

2.3.4.2 Autonomy

Another important aspect of convivial tools is autonomy, which is a core principle of Degrowth (Robbins, 2020). Autonomy should not be confused with independence. While both are defined by making self-determined choices and rules in one's life, the latter focuses solely on the individual, while autonomy recognizes and values the interdependencies and relationships in one's life (Deriu, 2014). By using convivial tools, the user regains autonomy over the technology, which is otherwise dictated by the market and corporations (Illich, 1973; Deriu, 2014). According to Gorz (1982), autonomy is also about having the option to work and produce for oneself, instead of monetary gain. The current economic and technological setting, however, does not allow alternative practices and consumers are bound to follow the predetermined path given by the technologies and the experts that created them (Muraca & Neuber, 2020), something that Illich named a "radical monopoly" (Illich, 1973).

Furthermore, the consensus among degrowth scholars is that collective self-limitation is a key component of living democracy, autonomy and conviviality (Kallis et al. 2014; Demaria et al., 2013; Deriu, 2014; Kallis, 2014). This is because anything that increases in scale at some point loses the possibility to be collectively governed, as the user moves too far away from the decision-making process (Kallis et al. 2014).

2.3.5 Meaning of Life and Well-Being

At the core of Degrowth's sustainability efforts lies the quest for improving human well-being in the short and long-term (Schneider et al., 2010). The Merriam-Webster dictionary defines well-being as "*a state of being happy, healthy or prosperous*" (Merriam-Webster, n.d.). While this definition might seem simple, the concept of well-being, however, is quite complex (Ryan & Deci, 2001). One of the main perspectives on well-being is the hedonic perspective (ibid), also referred to as subjective well-being. The hedonic perspective sees well-being as the happiness and pleasure that a person experiences in their life, based on their own subjective assessment (Diener, 1984). When measuring subjective well-being, the focus lies on the predominant emotional affectivity experienced by a person and their overall life satisfaction (ibid). Affectivity describes the emotional state of person and can be measured through

letting participants rate the frequency of experiencing certain emotions in a given time frame (Diener et al., 2010). Life satisfaction on the other hand describes the perceived overall quality of life based on a person's chosen indicators (Diener et al., 1985). Besides well-being, the degrowth literature also focuses on the concept of happiness (Sekulova, 2014), which is often considered synonymous with life satisfaction, and hence an element of subjective well-being (Ryan & Deci, 2001).

GDP has been considered an accurate representation of well-being of a society for a long time (Ivkovic, 2016). Empirical evidence, however, suggests otherwise. It was shown that among countries which report the highest levels of well-being, rich and poor countries (based on GDP per capita) can be found and that the relation between happiness and GDP follows a diminishing curve (Easterlin, 1974). In fact, on the personal level, higher income correlates to higher happiness only to a certain level, after which non-pecuniary activities have a heavier influence on happiness. Despite these findings people work more – a phenomena also known as the Easterlin Paradox (Easterlin, 2010). One reason why the relation between happiness and GDP growth follows a diminishing curve is because intangible aspects of life, i.e. relationships and health, have a stronger influence on happiness than monetary goods once a certain standard of living is reached (Easterlin, 2003). Based on these findings, together with the ecological limits of material wealth, Degrowth finds alternative ways of living that enhance well-being while staying within the ecological thresholds. These alternatives combine reduced consumption while promoting relationships and conviviality (Sekulova, 2014).

One promoted alternative is voluntary simplicity. Voluntary simplicity is a way of living with reduced consumption patterns in exchange for more time for endeavors with no or low monetary value, such as community work, community engagement, relaxation, production from home (food, art, tools), etc. (Alexander, 2014). Such streams have found their way into popular media through terms such as “downshifter” or “minimalism” (Kang et al., 2021) and are currently practiced by eco-communities such as the squatters in Barcelona (Cattaneo & Gavaldá, 2010). According to Alexander (2014), practices of voluntary simplicity should not take on the form of escapism but should be the drivers of transformation of current living practices. Based on an

analysis by Cattaneo & Gavaldà (2010) of squatters in Barcelona, Spain, the authors state that a frugal, convivial lifestyle while improving subjective well-being is attainable. Despite this promising claim, some scholars have expressed critique about the implementability of voluntary simplicity. Van den Bergh (2010), who takes a rather critical standpoint toward Degrowth in general, expressed strong doubts regarding the feasibility of voluntary simplicity due to the inherent competitive nature, greed and pursuit of self-interest by humans, which is the opposite of those who follow the anti-utilitarian thought (Romano, 2014). Kallis et al. (2012) add two concerns. First, they say that voluntary simplicity on a societal level would be more challenging compared to the lifestyle of today's downshifter communities. This is because these communities currently still depend on industrial production, regardless of their reduced consumption (ibid). Second, voluntary simplicity is often practiced by those that have had a choice to downsize, therefore the concept excludes and disregards the needs of those people that have never had the choice but to live simply due to involuntary poverty (Kallis et al., 2012).

2.3.6 Justice

The last source of Degrowth is Justice, particularly socio-environmental justice. The goal of Degrowth is a transformation to a socially and environmentally sustainable world. On the quest to sustainability and better well-being should not happen to only some people or some parts of the world but should happen to all – equally. Authors of this degrowth source analyze and try to find ways within the degrowth framework to better equality in the world. This stream comes from activists and scholars that support a degrowing of inequality on a local and global level, aspiring to combine sustainability and justice (Demaria et al., 2013). Recent data proves that income and wealth is disproportionally distributed, and that economic growth increases this inequality (OECD, 2015), often amplified by insufficient redistribution policies, such as trickle-down economics in political agendas or inadequate regulatory policies, such as lowering the minimum income (OECD, 2011). Degrowth solutions to social injustice can be summarized by *“less competition, large scale redistribution, sharing and reduction of excessive incomes and wealth.”* (p.199) (Demaria et al., 2013). Proposed strategies are, i.e. capping wealth at a certain amount (Alexander, 2014) which would

decelerate consumerism, which in turn is strengthened through comparison to the lifestyle of others (Demaria et al., 2013). Other suggest hitting it at the root, through establishing a minimum basic income (Alexander, 2014). Social justice does not only cover money, but also issues like feminism and gender equality (Demaria et al., 2013). The second part of this source is environmental justice, which is a social movement that tackles the unjust extraction and exploitation of natural resources of low-income and marginalized groups on a local and global scale (Anguelovski, 2014a). Degrowth criticizes the advancement of the commodity frontiers, which defines the – often cheap – extraction and commodification of foreign natural resources, while harming and disrespecting the people that live off or around these resources (ibid). In the past this was connected to colonialism. These injustices include deforestation, taking traditional land from indigenous groups, and pollution (Conde & Walter, 2014). Long-term poverty is common within communities that were depended on resources that underwent extraction and commodification (Malin et al. 2019). Commodification describes the process of a resource becoming a good of the market, i.e. hypothetically making air a market good buy selling its use or privatizing a natural spring and selling its (previously free) water (Gómez-Baggethun, 2014). One approach proposed by Environmental Justice advocates is that of repaying ecological debt. Ecological debt accounts for the “buying” of natural resources and disposal of waste abroad and using them in a different economy (Martinez-Alier & Shmelev, 2014). Based on this perspective the North, the global ecological debtor, needs to pay the South, by whom the concept is often brought forward in climate change debates (ibid). On a global level, injustice matters concern the North and the South. Besides extraction, environmental justice also deals with unequal waste disposal between the Global North and the Global South (Schneider et al., 2010). This means repairing past and / or current injustice from colonialism and giving the South room for autonomy and economic development, while the North focuses on degrowing sustainably. From an ecological/biophysical perspective, the aim here would be to reach a global Steady-State-Economy (Kerschner, 2010). First and foremost, deepening democracy regarding the extraction allocation of natural resources is a vital part of the path to more environmental justice. Another important aspect is to stop putting certain worldviews, i.e. Western, on a moral pedestal and putting an end to favoring them

over others by recognizing and respecting different worldviews and traditions. This leads to the restoration of past injustices, such as by letting indigenous groups reclaim their land (Malin et al. 2019).

2.3.7 Degrowth Strategies

For the Degrowth movement to gain momentum, not only needs there to be research and action on the sources side, but also, and even more important, research and action on the strategies side. Researchers and degrowth advocates have come up with a broad variety of strategies for the Degrowth movement to gain momentum. These range from small-scale local strategies, such as creating alternative ways of living in eco-communities, to global or national resistance to the current capitalist and political system, such as green anarchists demanding the abolition of the state. Ambach et al. (2018) calls the extreme plurality of the proposed strategies a “*detrimental strategic indeterminance*”. Others, however, welcome the diversity (Demaria et al., 2013). According to Ambach et al. (2018), Degrowth strategies should be co-designed by academics and activists alike and should be versatile to allow adjustment in the context of the situation where they are implemented. Different countries, cultures, institutions and values simply do not allow a one-size-fits-all approach. An analysis of the Degrowth strategies can then provide insight and guidance on which are most effective and appropriate in a given context (Ambach et al., 2018).

There are various types of ways to achieve societal change and transformation. Demaria et al. (2013, p.201) identifies three types in the context of Degrowth: “oppositional activism”, “building alternatives” and “reformism”. Oppositional activism includes demonstrations, strikes and non-violent civil disobedience (Renou, 2014) to assert the need for change in bottom-down institutions and governments. Building alternatives, on the other hand, includes initiatives like Bike Kitchens (Bradley, 2021), Eco-Communities, Urban Gardening, veganism and voluntary simplicity (D’Alisa et al., 2014). These aim to provide alternatives to existing institutions and are perhaps the most prominent type of Degrowth strategies on the micro level. There are many advantages that alternative approaches bring with them. First, the creation of an alternative causes a change in one’s lifestyle that can be felt

by the participants on a day-to-day basis, and can therefore live their own utopia (even though Degrowth itself is not considered an utopia by Degrowth advocates). Second, through living by example, others can feel inspired to follow a simpler lifestyle too. Third, they are an opportunity to test prototypes of new forms of living as well as help gather experience and know-how of what works in practice and what does not (trial and error)– similar to a lab. Reformism, on the other hand, aims to change institutions from within. As a socio-ecological transformation does not mean to abolish all existing institutions and technologies, reformism as a strategy has the advantage of keeping what goes in line with Degrowth while making room for changes (Demaria et al., 2013). Reforms can take on different scopes – from a minor change in a law to full-on revolutionary reforms, such as moving away from a debt-based money system. A Degrowth transformation should happen in a democratic, bottom-up process instead of being imposed by authorities (Schneider et al., 2010) or experts (Illich, 1973).

2.4 Urban Gardening

Urban gardening is the practice of cultivating food on urban or peri-urban areas in the form of allotment plots, shared gardens, domestic gardens, roof tops, etc., or on any other urban free land that can be cultivated (Müller, 2011). Often, they are managed collectively (ibid). Urban gardening was established in the 1850s by the working class to ensure independent food supply and was later adapted as a form of self-expression and hobby by the middle and upper class (Jahrl et al., 2021). The most known urban farming revolution developed in Cuba in the 1990s, which had its main food supply imports cut off and led to the population growing their own crops (Borowy, 2013). Since the early 2000s, urban gardening increasingly caught the attention of local governments, science and media in Europe (Müller, 2011) and evolved into a movement with a political message. The Urban Gardening movement wants to change the city from within: autonomy, food sovereignty and commons are just a few of the political motivations that drive it (Müller, 2017a). In this chapter, the types of urban gardening and gardener’s motivations will be described, followed by an analysis of why urban gardening is relevant in the current urban areas. Afterwards, the social and ecological aspects of urban gardening will be explained in more detail. The last

subchapter discusses the feasibility, viability and desirability of the implementation of urban gardening as an alternative to the current industrial agriculture industry.

2.4.1 Types of Urban Gardening

The term urban gardening is sometimes used along with urban agriculture and urban farming, however, scholars and activists use them in different ways. Anguelovski (2014b), for example, uses these terms interchangeably, however, Glavan et al. (2018) says that urban agriculture and urban farming is used for commercialized practices and are typically practiced at a larger scale. In this thesis, the term urban gardening will describe non-commercial, small-scale gardening. There are many types of urban gardening, such as roof & balcony gardens, princess gardens, domestic home gardens, etc. This study will mainly focus on allotment gardens and community gardens, as these are the most common practices.

2.4.1.1 Allotment Gardening

Allotment gardening (AG) is the oldest type of urban gardening, dating back to the early 20th century and later playing a significant role in fighting famines during the world wars (Trendov, 2018). Allotment gardens are characterized by fenced plots and are administered by an allotment garden association (Exner & Schützenberger, 2018). Urban gardening advocates often criticize allotment gardens, saying that these are not the historic predecessors of the urban gardening movement since they are products of industrialization embodied through privatization (Müller, 2017b). AG associations usually have a trained garden expert or consultant and provide information for organic agricultural practices (Jahrl et al., 2021). Usually they have at least one or multiple shared communal facilities, such as an allotment garden area in Budapest where approximately a third is a public community garden (Trendov, 2018). Given that AGs in some cities, such as Vienna, are often used as a main residence (Stadt Wien, 2021c; Letzbor-Kalusch, 2013), the difference between allotment gardens and urban domestic gardens blurs. Based on the definition by Cameron et al. (2012) urban domestic gardens are “the area adjacent to a domestic dwelling, which itself is either privately owned or rented.” (p.129) but do not have a larger authority or association and the associated policies that governs them, which is common in

allotment gardens (Cameron et al., 2012). The main difference between allotment gardens and newer forms of urban gardening, like community and guerilla gardening (see Chapter 2.4.1.2 and 2.4.1.3), is not the administration or the fences – but the way that the gardens want to be perceived in relation to the city. Allotment gardens have historically played the role of “escaping” the industrialized city, whereas community and guerilla gardening aim to change the city from within (Müller, 2011). Engagement with their own garden, cultivation food and creative outlet and aesthetics is why allotment gardens have been so successful in European cities, and provide these advantages compared to other greenery initiatives in urban areas (Breuste & Artmann, 2015). The age demographic in allotment gardens is generally the older generation – the majority of allotment gardeners in European cities are 60 years or older (Trendov, 2018; Breuste & Hufnagl, 2015).

2.4.1.2 Community Gardening

A current trend in cities are community gardens. Community gardening goes beyond simply self-provisioning, but provides a space for collective, interactive gardening activity meant to bring people together (Trendov, 2018). They are established by foundations, associations or sometimes by local authorities to strengthen communities. Closing the link between production and consumption through knowledge-sharing is the integral part of community gardening (ibid). In Vienna members of community gardens often belong to a “cultural elite” or “creative class”, a well-educated, middle to high-income class (Exner & Schützenberger, 2018). Community gardens practice a more open culture and free-flowing communication compared to allotment gardens, which is enhanced through being able to look in other people’s garden beds (ibid). They also focus on the idea of commons – meaning collective management with a high degree of democracy and participation of community members (Müller, 2011). Cultural exchange through working on one goal, self-grown food, where being in tune with and working with nature is the connecting stream that underlies all cultural differences and therefore creates an invisible bonding experience (ibid).

2.4.1.3 Guerilla Gardening

While Community gardens and allotment gardens are managed collectively (Exner & Schützenberger, 2018), Guerilla Gardening is done through an informal approach. It is the practice of planting food in small green spaces in cities without permission by authorities, often done through planting home-made seed balls. Even though it is an informal approach, guerilla gardening is not illegal nor done by radicals (Hardman, 2018).

2.4.2 Motivations behind Urban Gardening

Studies conducted across various cities and urban gardening types show that the driving factor behind gardening is leisure and food (Glavan et al., 2018; Trendov, 2018; Martinho da Silva et al., 2016; Zainuddin & Mercer, 2014; Kortright & Wakefield, 2017; Breuste & Artmann, 2015; Breuste & Hufnagl, 2015; Lewis et al., 2018). In more detail, motivations include health, well-being, food quality, learning a skill, autonomy over production practices (i.e. organic gardening), self-subsistence, cost, leisure, relaxation, happiness and community (ibid). Many gardeners simply enjoy the satisfaction and feeling of accomplishment of harvesting their own grown food (Lewis et al., 2018). Differences in the relevance of these motivations depend on the socio-economic background of the gardeners and what type of gardening they practice. The self-provisioning aspect in countries of the Global South is more important than it is in cities of the Global North (Pourias et al. 2016). Participating and engaging in community work is a higher motivational factor in community gardens compared to allotment gardens (Trendov, 2018; Breuste & Artmann, 2015). In allotment gardens in Zagreb, Croatia, food security and self-sufficiency are the main motivators among the older generation (Trendov, 2018). A study conducted in Portugal, showed that 24% were motivated to start allotment gardening to support themselves financially, although none were motivated by necessity (Martinho da Silva et al., 2016). Some motivators are also extrinsic – gardeners have reported to be motivated by wanting to look good to their neighbors (Nassauer et al., 2009). Behind many urban gardens there is also a political aspect, a mindset mostly found in community gardens and guerilla gardening initiatives (Müller, 2017b). The gardeners see them as a form of political protest connected with creativity, solidarity and community. They are often

a reaction to privatization of public space and the exclusion of marginalized communities.

2.4.3 Current Relevance of Urban Gardening in Cities

One of the reasons why urban gardening is prominent in current urban development policies is because it is a way to implement urban development policies that promote “Green cities”, which describes the goal to create more public green spaces (Breuste et al., 2020). But besides spatial planning, one of the major topics in sustainable urban development is food production and distribution. Urban food distribution is confronted with various challenges such as climate change, pollution and food waste along with assuring food supply security. According to Markoni (2020), to follow a post-growth urban development strategy, it is essential for the urban food system to radically decrease external supply in favor of regional and local production and self-sufficiency. This goes hand-in-hand with the degrowth approach of ‘relocalization’ (Xue, 2014), meaning the shift from globalization, where cultures and economies are interdependent, to localization, that focuses on independent and decentralized decision-making, consumption and production in the local area (Xue, 2014). The urban gardening movement, for example, is a practice of relocalization as production and consumption happen geographically close to each other. With the approximately 70% of people living in urban areas by 2050 (United Nations, 2018), urban resilience, which is the capability of urban residents to handle and deal with adversity, has become a prominent topic in urban policy and urban science literature (Nunes et al., 2019; Bautista-Puig et al., 2022). Urban gardens have shown to increase urban resilience. After the earthquakes in Christchurch, New Zealand, urban gardening not only ensured food security but also provided a social safety net and support to the people (Wesener, 2020). It also fostered bonding and social cohesion, offering a place of hope and escapism to people dealing with the aftermath of the natural disaster. When talking about urban resilience, degrowth and post-growth discussions, subsistence is a common topic. Subsistence is the reduction of the gap between production and consumption and is based on rekindling the capabilities and skills of urban residents to provide themselves independently (Müller & Paech, 2011). Müller & Paech (2011) see this as a gradual change and balance and incorporates food subsistence, sharing

(or commons) and prolonged use of things through repairing. Urban gardening is also seen as an alternative to the current agriculture industry which is considered one of the main contributors to surpassing planetary boundaries (Meier, 2017). It can be a strategy for food sovereignty, which is about challenging the commercial, capitalistic agriculture industry and market-led decision making, however, the definition is ambiguous and varies depending on contradictory definitions on the source (Exner & Schützenberger, 2015).

2.5 To what Extent is Urban Gardening a Degrowth Practice?

Müller (2017b) and Anguelovski (2014b) see that urban gardening and degrowth go hand-in-hand. Indeed, urban gardening is deeply intertwined with commons, conviviality and autonomy (Rutt, 2020), closing the distance between consumption and production (Gomiero, 2018), it gives the power back to the locals and diminishes their dependence on outside food production (Anguelovski, 2014b) It provides an alternative to the capitalistic, chemical-heavy agriculture industry (ibid) and fosters social relations. Some, however, are critical of the effect urban gardening has on urban societies. A frequent argument brought against urban gardening is that it cannot feed the population of cities (Gomiero, 2018). Müller & Paech (2011) argue that this is – temporarily - not the goal.

2.5.1 Social Aspects

Most forms of urban gardening are, at the core, social activities. Socializing is a common motivator for gardening practices in cities (Müller, 2017b; Lewis et al., 2018), which show to have impact on the individual as well as society. In this sub-chapter, the social aspects of urban gardening will be discussed based on the streams of Degrowth by Demaria et al. (2013).

2.5.1.1 Well-being and Social Interaction

Urban green spaces increase mental (Pretty et al., 2007) and physical health benefits and provide high restorative potential (Cervinka et al., 2016). There is also evidence that those who garden also report higher life satisfaction than the ones that do not (Waliczek et al., 2005). Furthermore, especially older gardeners appreciate the tactile

work, because it gives them something to do and to stay active in retirement (Lewis et al., 2018). Gardening is considered moderate physical activity and therefore enhances cardiovascular health (Pretty et al., 2007). As mentioned in the chapter before, urban gardening fosters urban resilience, especially from a social standpoint, which can support the well-being of residents in times of crisis (van der Jagd et al., 2017). These findings are represented in the fact that well-being is one of the key motivators for gardening (Lewis et al., 2018). There are also indirect impacts of urban gardening on well-being. For example, there are lots of studies that show bad air quality is related to lower happiness (Sekulova, 2014) and that urban green spaces improve air quality (Száráz, 2014).

2.5.1.2 Democracy, Justice and Politics

Not only residents have caught up with the urban gardening trend, also corporations and businesses use the hype for marketing purposes. However, through machine-heavy equipment and paid gardeners, some companies miss the true nature of urban gardening and its purpose, which is to create a different city, away from consumption (Müller, 2017a). The Urban Gardening Manifest, for example, stems from this development. It is one of the initiatives to bring political attention to the movement and foster public discourse about the importance of communal places and their contribution to a sustainable city (Urban Gardening Manifest, 2018; Müller, 2017a). In general, besides being caused through necessity, Müller (2017b) sees urban gardening as political action, where new streams of thought of how a city should be lived come together to be practiced “in the real world” on a small scale. Initiatives like community gardens are a best-practice example of living such ideas like the commons (Müller, 2011). Urban gardening serves to bring nature into the city and blurs the line between the rural and the urban.

Due to their intercultural and social aspect, community gardens increase resilience in communities compared to typical privately managed greenery initiatives (Clarke et al., 2019). Nevertheless, urban gardening initiatives are still subject to neoliberal urban development policies. Although public gardening plots often prevent the commodification of public spaces, the trend has attracted investors and hence, gardening spaces are often purchased for private use by higher-income classes

(Anguelovski, 2014b). Often, this happens simultaneously to gentrification processes (ibid).

In North America, where community gardens were first established in the 1970s, food justice was a driver for the creation of community gardens (Rosol, 2014). Another common theme is “Recht auf Stadt“ (Urban Gardening Manifest, n.d.), a motto followed by various urban movements that protest against gentrification and fight for communal collective places (Mayer, 2011). It follows the idea that food is a human right and should be accessible to all (Anguelovski, 2014b). But deeper democracy is not only found in community gardens: A study conducted in allotment gardens in the UK shows strong local governance, participation and social cohesion in the gardens (Scott et al., 2018).

While new forms of urban gardening are given a lot of attention and are incorporated in sustainable development plans, allotment gardens are often left out (Breuste & Artmann, 2015). Nevertheless, urban planners criticize allotment gardens. They are scrutinized and critiqued because they do not help against living shortage and are often an escape from the city and hence foster social separation in society (Scott et al., 2018). This has led to the dissolving of many AG plots in European cities to make room for other development projects and densification, meaning apartment buildings (Rall & Haase, 2011), as well as commercial buildings and highways (Spilková & Vágner, 2016). Overall, the number of allotment gardens are declining in cities (ibid). Such development is often met with fierce protest. For AG gardeners, their garden is a place to socialize and to experience greenery in urban space, which is where their objection and reluctance for giving up gardens for development projects stems from (Scott et al., 2018).

2.5.2 Ecological Aspects

Urban gardening can be found in many urban development policies on the path to greener cities, because Green spaces promote biodiversity, regulate the microclimate and improve air quality (Ferreira et al., 2018). In this chapter, the impacts on biodiversity and microclimate, as well as food provisioning will be discussed.

2.5.2.1 Biodiversity and Microclimate

The impact gardens have on biodiversity depends on how they are managed. Gardens that are managed moderately intensely show the largest degree of biodiversity, leaving room for an equilibrium of wild plants and intentionally grown edible crops, compared to gardens that were highly or barely managed (Cabral et al., 2017) . Allotment gardens have also been shown to provide living-space for birds, bees and insects. Natural ponds and trees in gardens help cool the area on a microclimate level, yet tree-planting patterns and maximum size of trees are often specified by law in allotment gardens (ibid), as well as community gardens (Clarke et al., 2019). Environmentally degraded areas in the urban periphery have been enhanced through the establishment of allotment gardens through strengthening ecological components (Albaladejo-García et al., 2021), such as eco-system services (Breuste & Artmann, 2015). Same counts for community gardens. What makes urban gardens promote biodiversity is that they are – more often than not – organically managed in comparison to the chemical-heavy agriculture industry (Anguelovski, 2014b). For example, a study conducted on private and public allotment gardens in Seville, Spain, showed that AG clubs had strict rules regarding type of garden management: Anything other than organic farming is not permitted (Mackiewicz & Asuero, 2021). In general, the impact on biodiversity is influenced by the goals and information provided by the administration of the garden. For example, in public allotment gardens in Seville, biodiversity is an explicit goal which is fostered through regulations and exceeds biodiversity aspects compared to the private one (Mackiewicz & Asuero, 2021). A study conducted across 3 European cities revealed that mainly organic growing methods are used (Glavan et al., 2018).

2.5.2.2 Food

Urban gardeners cultivate a variety of vegetables, fruits and herbs. Lettuce, tomatoes, carrots, beans, raspberries and various fruit trees are the most popular foods grown in urban gardens (Lewis et al., 2018; Pourias et al., 2016). In fact, Pourias et al. (2016) found out that 50% of study participants said that the yield from their community garden covers at least half of their vegetable and fruit needs of their household. Another study, conducted in allotment gardens, concluded a self-sufficiency rate of

33% (Vávra, 2018). In general, gardeners report perceived higher freshness and taste of homegrown food (Pourias et al., 2016). It was also revealed that gardeners have lower food-related household CO₂ emissions than those that do not grow food (Säumel et al., 2012; Cleveland et al., 2017). Nonetheless, there are some downsides to growing food in metropolises. The higher CO₂ density and particle density in cities is reflected in the pollutants found in harvested produce. Over 50% of vegetables cultivated in central districts of Berlin indicated a lead contamination load higher than the EU limit for lead found in commercial food, however, barriers between gardening beds and busy roads have shown to be effective in trace metal concentration reduction in foods (Säumel et al., 2012).

2.5.3 Is Urban Gardening a Degrowth Technology?

Any social, economic and ecological transformation needs feasible and valid strategies to implement. Some scholars say that urban gardening and degrowth complement each other (Müller, 2017b; Anguelovski, 2014b), but there are also critical voices. This chapter will provide an overview of different opinions on the feasibility and viability of urban gardening and organic agriculture as an alternative to the commercial agriculture industry on a local and national level.

2.5.3.1 Feasibility and Viability

When it comes to food production, the question is how much homegrown food can cover the needs of individuals, households and communities. There are two terms used in this context: self-sufficiency and (auto-)subsistence. Self-sufficiency is when homegrown food covers the needs of whole communities through giving away surpluses, whereas subsistence and self-provisioning is used to describe a household or individual only producing for themselves (Gomiero, 2018). Some scholars, however, use self-sufficiency and subsistence interchangeably, such as in CoDyre et al. (2015) or Glavan et al. (2018). Regardless of urban or rural, Degrowth generally promotes organic agriculture, which means low chemical and low to no machine use (ibid). This raises the question of how productive this type of agriculture can be and if it can feed enough people.

2.5.3.1.1 Feasibility and Viability – on a local level

Researchers agree that urban gardening has a high potential of self-sufficiency regarding the amount of possible food production (CoDyre et al., 2015; Glavan et al., 2018). Currently, most gardens do not produce enough to be totally self-sufficient (CoDyre et al., 2015; Glavan et al., 2018; Vávra et al., 2018; Breuste & Artmann, 2015). Yet the studies revealed a variety of results: The study by Vávra et al. (2018) reported 33% of vegetable and fruit needs covered, Breuste & Artmann (2015) revealed that half of the participants only managed to have 10% covered. However, Conk & Porter (2016) reported that in Laramie, Wyoming, some study participants managed to cultivate enough vegetables for one individual for 9 months on a 23 m² bed. Nevertheless, some urban gardening beds have shown the same or even higher productivity as the commercial agriculture industry, such as urban tomato fruit yields in Cleveland, Ohio (Reeves et al., 2014) and urban gardens in Laramie, Wyoming (Conk & Porter, 2016). In the Degrowth literature, scholars like to bring up the urban gardening revolution that took place in Cuba. There, urban gardening experienced a major boom in the 1990s, which caused the establishment of over 5000 gardens in the capital Havana. Researchers, however, are in disagreement about the quantified impact of the urban garden production (Borowy, 2013). Despite the Cuban government reporting a coverage of almost 60% of vegetable needs through homegrown beds, some say that the yield only covered about 5% of the caloric needs of the Cuban people (Wright, 2009), yet Borowy (2013) concludes that Cuba attained self-sufficiency. Despite these rather sober findings, researchers see high potential in urban gardening food production (Codyre et al., 2015; Glavan et al., 2018). The reason for the varying and mostly low rates of self-sufficiency lies in: (1) lack of land dedicated to food cultivation, (2) lack of knowledge and skill (CoDyre et al., 2015), and (3) varying year-to-year productivity (Conk & Porter, 2016). Through larger gardening plots, increased hours of gardening work and maximized productivity through higher knowledge and skill, Glavan et al. (2018) argues that self-sufficiency can be achieved in urban gardens. Yet, to ensure the amount of vegetables an adult person needs per year, not only needs the garden be large enough, but it requires a basically a full-time job to manage the garden, to receive the output needed to fulfill the vegetable needs. For a family of four, the amount of labor would have to be tripled, up to an average

of labor days would be 277 days (Glavan et al., 2018). As a solution, they suggest the incorporation of small machinery to increase productivity.

2.5.3.1.2 Feasibility and Viability – on a national level

Many degrowth scholars talk about urban gardening from the perspective of social and cultural gains (i.e. Anguelovski, 2014b). So far, there have only been two academic studies that focused on agriculture and degrowth from a quantitative perspective: Amate & Gonzalez (2013) and Gomiero (2018). Amate & Gonzalez (2013) argue that the path to degrowth agriculture should follow a 4R-strategy, that is: *“re-territorialisation of production, re-localisation of markets and re-vegetarianisation of diet and re-seasonalisation of food consumption”* (Gomiero, 2018, p.1826). Nevertheless, they do not discuss the feasibility (i.e. if enough calories can be produced for the population) of this form of agriculture. Gomiero (2018), hence, takes a critical standpoint. He argues that complete re-localisation and self-sufficiency would not be possible in population-dense areas such as Europe, because there is simply not enough land and labor to nourish the large population without relying on heavy machinery and industrial food production (Gomiero, 2018). He emphasizes his points by calculating the feasibility of Germany becoming self-sufficient: Even in almost perfect conditions (i.e. no food losses, maximized yield and no livestock being fed) of growing wheat and peas in Germany, it would barely reach the needed calory production to feed the German population. That is without the calculation of the caloric need of those who do the physical strenuous work in the fields. From this he draws the conclusion that if Germany were to only practice organic or traditional agriculture, with low technology, it could only properly feed about 40 million people – which is half of the current population. Furthermore, he concludes that if all people in urban areas were to grow their own food to reach complete subsistence, there would not be enough land available (Gomiero, 2018).

2.5.3.2 *Desirability: Conviviality*

Besides feasibility and viability, proposed transitions need to be desirable. Gomiero (2018) suggests that conviviality could be the desirability criteria when assessing Degrowth technologies. This chapter will summarize and analyze the convivial aspects of urban gardening that were mentioned in the chapters above as well as to what

extent organic agriculture practices in the urban gardening context can be considered a convivial – and therefore desirable – technology from a Degrowth perspective.

Summarizing the social and ecological benefits mentioned in the chapters above, it can be concluded that urban gardening practices are convivial. Gardeners practice autonomy and self-determination in their gardens, while fostering social cohesion (Veen et al., 2016) and focusing on social (community) relationships (Firth et al., 2011), regardless of their motivations behind practicing gardening. Gardeners are in complete control of what comes in and what happens with their output. Sharing, exchanging and gifts, often up to 30% of their produce (Conk & Porter, 2016), a habit that has been found across gardens regardless of crop size (Pourias et al., 2015). Giving advice to other gardeners (Lewis et al., 2018) is also a big topic. Overall, Illich (1973) already said that urban gardening is a convivial technology, however, this author argues that not every type of urban gardening is inherently convivial. It depends on the administration and framework of the gardens, as well as individual practices of the gardeners. Especially allotment gardens, with their more secluded nature due to high fences, might not be just as convivial as community gardens. Urban gardening can also only be considered convivial, if the agricultural practice aligns with conviviality values. In most urban gardens, only organic agriculture is allowed (Mackiewicz & Asuero, 2021; Exner & Schützenberger, 2018). Degrowth favors and supports organic agriculture practices from a conviviality standpoint, however, an analysis by Gomiero (2018) revealed that conviviality is a complex concept, and therefore not all implementations of organic agriculture may be desirable for a degrowth transition. Especially for poorer regions with a dense urban population, organic agriculture alone may not provide enough food to support the people (Gomiero, 2018).

2.6 Allotment Gardening in Vienna

Just like in many other European cities, various urban gardening initiatives in Vienna have gained momentum in the past two decades. From community gardens, allotment gardens, roof top gardens to guerilla gardening, pretty much all forms of urban gardening are currently present in the city of Vienna (Roth et al., 2021). The

oldest form of urban gardening and area-wise the most prominent one in the city are the allotment gardens (AG), also referred to as “Kleingärten” (official term) or “Schrebergärten” (colloquial term) (Exner & Schützenberger, 2018). This chapter will first dive into the history and emergence of AGs in Vienna, followed by a presentation of their current structure and summary of the laws that govern them. Afterwards, the gardening, ecological and social aspects of the current AG lifestyle will be described. The subsequent conclusion will give insight into the compatibility of AGs in Vienna and Degrowth.

2.6.1 History of Allotment Gardens in Vienna

The term Schrebergärten first emerged in the 1860s in Leipzig. School principal Ernst Hausschild founded a “Schreberverein” that purchased lawns and built playgrounds for children in the city. The association and its name were dedicated to Dr. Daniel Gottlob Moritz Schreber, a doctor who was known for the development of radical educational methods. Later, the lawns were converted to harvestable plots to educate children about nature through gardening practices. Over the years, the small plots grew in popularity and by 1870, Leipzig had 30 gardens of this kind. Later the plots were fenced, leased and the Schrebergärten started to spread to other urban areas (Autengruber, 2018).

The first allotment garden association in Vienna was founded 1909 by Julius Straußghitel. After deciding against the purchase of an allotment garden plot in a municipality in Lower Austria because of its distance from the city, he founded an association whose goal was to acquire a piece of land at the periphery of Vienna in close enough proximity to the city that it could be reached by those who did not have a car (Autengruber, 2018). The aim was to provide the working class with a recreational space and the health benefits related to gardening. Through advertisement in the inner city and pressure by the public, a property in the – nowadays – 14th district was secured in 1910. In the following months various AG associations were founded, which was partially driven by the ongoing food scarcity, which caused prices to skyrocket (ibid). Although Vienna experienced a housing shortage at the time, full residences were prohibited in the plots and spending the

night was only allowed under exceptional circumstances. The outbreak of WWI further increased the demand for AGs (Zentralverband, n.d.). Citizens occupied random free land for food cultivation, which were later called “Kolonien” (“colonies”), a term that is still present in a few AG association names today, such as “Kolonie Blöckinger” in the 17th district (Kolonie Blöckinger, n.d.). Property owners provided a total of 800.000m² of their gardens to the public for cultivation, which were named “Kriegsgärten” (*war gardens*). To protect the newly established gardens, the first AG state association was founded in 1916, which was re-named to Zentralverband during the interwar years (Zentralverband, n.d.). In 1928 the area of AGs was approximately 9 million m², of which about 35% were used for fruit crops, 30% for vegetable crops and 13% for berry bushes (Swoboda & Lattinger, 2004). Some of the AG established during WWI still exist today, such as Am Ameisbach, Favoriten, Altmannsdorf, and Alsegg (Swoboda & Lattinger, 2004).

The number of allotment gardens grew a lot in Vienna up until the start of WWII. After the war, Vienna experienced a drastic housing-shortage, which led to the dissolution of many allotment gardens to make room for apartment buildings (Autengruber, 2018). This led to more public pressure to secure more land for AGs, as well as a call for a federal AG law, which was first passed in 1959 (RIS, 2022).

In the beginning years only small cabins of 8 – 10 m² were allowed. In 1978, AGs transformed from kitchen gardens to recreational use with a law that permitted constructions of houses of up to 35 m². The latest federal AG law passed in 1992 caused substantial changes in the lifestyle and significance of allotment gardens in Vienna. The new law introduced a new type of spatial designation that allowed year-long living on the plots, called “EKlw” (Erholungsgebiet Kleingarten ganzjähriges Wohnen – *Allotment recreation area for year-long living*) (Stadt Wien, 2021b). Those plots designated as EKlw were allowed to use 25% of their garden plot and a maximum of 50 m² for construction and housing purposes. The new AG law also allowed the privatization of allotment plots, however, the sale was shut down due to speculation and rising land prices in 2021 (Figl, n.d.; Ludwig, n.d.). With the permission to year-round living, gardens moved from being a symbol of survival and self-sufficiency to living space, recreational use and hobby gardening purposes

(Autengruber, 2018). Newly built EKLw sites nowadays have little in common with the original “Schrebergärten” – some parcels have been misused for architectural houses that violate the construction law and large winter terraces and swimming pool urged the gardening aspect to disappear. These sites show no difference to regular suburban neighborhoods in their spatial use and purpose (ibid).

Allotment gardens have been mainly left out of the development plans of Vienna in all aspects (social, spatial, etc.) (Exner & Schützenberger, 2018). Hence over the years, hundreds of parcels were dissolved to make space for cars, highways and subways. In the 1970s this caused AG club members to protest on the streets and sue the city for ejectment, yet the AGs lost (Swoboda & Lattinger, 2004).

2.6.2 Current Structure of Allotment Gardens in Vienna

Nowadays, there are 26,637 allotment parcels with a total area of 1015.6 hectar, making up 2.5% of Vienna’s total area. Each group of allotment gardens is still managed as an AG club (“Kleingartenverein”). Currently, there are 235 clubs and 13 district organizations. Most of the allotment garden clubs are located in the outer districts of Vienna (Zentralverband, n.d.). The average parcel is about 250 m² large, and depending on the designation can be used for year-long living (EKLw), with a construction permission of up to 50 m², or designated EKI, which is not for living and can only be build up to 35 m² for construction. The majority of the allotment gardens (68%) are designated for year-long living (Stadt Wien, 2021c).

One of the recent changes in the allotment gardens was the decision from the city of Vienna to stop the possibility to buy an allotment garden. For almost 20 years, those who wanted one could either lease as a tenant or buy the property (Zentralverband, n.d.). Many AG clubs today still position themselves against private property acquisition. Investment into AGs by real estate firms, sub-tenants that lack responsibility in regard to adhering to the AG’s rules, and partial extinction of the fundamental value and core idea of allotment gardens are some of the points of criticism by AG chairmen and women (Autengruber, 2018). In general, the consensus between various AGs chairmen is that new owners are often only part of the Verein due the usage of shared space, e.g. parking slots (ibid).

2.6.2.1 Gardening and Ecological Aspects

The use of the gardens as a means for food production declined in the 1960s and recreation became the prominent use, but the trend toward biological gardening reignited in the 80s (Zentralverband, n.d.). Nevertheless, gardening is still practiced, although at a much smaller scale. The Zentralverband and the AG clubs continually invest in the ecological education of AG owners and tenants. Since 2012, beekeeping workshops are offered on a regular basis and those who are certified maintain the community beehives (Zentralverband, n.d.). In 2017 the city of Vienna started the initiative “Fruit tree for conifers” (“*Obstbaum statt Nadelbaum*”) that planted 250 new fruit trees (Haug, 2022).

The allotment gardens and the city of Vienna have rules regarding gardening practices and the use of chemicals. According to Exner & Schützenberger (2018) only organic farming is allowed in the allotment gardens. If tenants want to use chemical herbicides, a written permission of the AG owner is necessary (Gartenordnung, n.d.). The selling of surplus is prohibited (Haug, 2022). Taking into account that the average AG plots is 200m² to 250m², Eklw parcels take up to 50m², sometimes more, for housing, which leaves significantly less area for gardening purposes than Ekl plots (Autengruber, 2018). AGs are required to be managed and designed in a “horticultural manner” and upkept neatly (Gartenordnung, n.d.). Each AG club has their own garden expert that helps gardeners with topics and questions about fertilizers, pesticides or flower species (Autengruber, 2018).

Since green and overgrown surfaces are dominant in the AGs, especially those only for seasonal living, AGs contribute to (micro-)climate regulation, temperature relief, fine dust reduction and better air quality in Vienna (Autengruber, 2018). Especially older parcels that have not undergone construction work in many years, provide space for a variety of animals, insects and plants. Furthermore, it fosters education in nature for children.

There is barely any data on the amount of food produced in allotment gardens in Austria, nor specifically in Vienna. The most recent is by Letzbor-Kalusch (2013), who did a study including 4 clubs all over Vienna. 90% of the gardeners questioned, plant

some sort of fruits or vegetables in their garden and 66% cultivated some form of vegetable crop. Almost 45% of the participants dedicated less than 5 m² for cultivation. Only 20% dedicated more than 10 m² for their crops. It was also reported that gardening practices were present in all types of parcel designations. The most common cultivated vegetables are tomatoes, various lettuces, various beans, zucchini, cucumber (Letzbor-Kalusch, 2013).

2.6.2.2 Community and Social Aspects

“Man works 8 hours and sleeps 8 hours, in the remaining 8 hours he wants to “create, shape and form himself, does not want to be a machine, wants to be a human being. And allotment gardening and housing, keeping of small animals and flower care, they offered the seeker what he wanted, they made him the thinker, the creator again.”
(Swoboda & Lattinger, 2004, p.22)

Each AG compound has a communal facility, also referred to as “Schutzhaus” (shelter facility), they usually offer restaurant services and have community rooms for events, gatherings and workshops (Autengruber, 2018). Although technically allotment gardens are required to open their paths and streets to the public during the day, many AG compounds limit access to the area through locking the entry gates (Exner & Schützenberger, 2018). In their earlier days, AGs acted as a compensation for the bad living conditions in Vienna, such as air pollution and dense population in residential buildings and streets. Tenants were mostly employees and working class. Yet nowadays allotment gardens are a privilege for the stable middle class and the AG are structured similar to suburban neighborhoods. AG clubs offer a variety of activities, shared spaces, events and clubs, such as: community excursions, hobby clubs, beekeeping, youth group, choir, theater, shared room for gardening and kitchen tools, parties, football and fishing competitions (Autengruber, 2018).

2.7 Contribution to Research & Literature Deficiencies

The findings of this study will contribute to the existing literature in the following ways. There have been various studies on initiatives that complement with Degrowth, such as the Bike Kitchens (Bradley, 2018), Fairphone (Haucke, 2018), squatters (Cattaneo & Gavalda, 2010) and eco-communities (Cattaneo, 2014). Barely any

attention, however, has been given to institutions that do not necessarily fit into the Degrowth streams. As mentioned in a chapter above, Degrowth proponents have different takes on what type of strategies a Degrowth transition should have (Demaria et al., 2013). Degrowth stems from the work of academics and activists, which is why many prefer an oppositional or more radical approach, through establishing new initiatives and new institutions and are generally more critical toward a reformist approach (Demaria et al., 2013). Demaria et al. (2013) argues that for a majority of people to sympathize with oppositional activism, they need to be motivated by the current conditions in society. This is where reformist approaches become relevant, which is the approach of changing existing institutions from within to provide a path for a Degrowth transition. Analyzing traditional institutions such as the allotment gardens in Vienna, that have had strong relevance in the history, provides insight into what could be changed within them. Similar to Alarcón Ferrari & Chartier (2018), who conducted a study on a localized energy system in Vajxö, Sweden, this study analyzes where Degrowth can be found within it.

Urban gardening is considered convivial (Anguelovski, 2014; Illich, 1973) but there is little discussion about that urban gardening might look different depending on its implementation. Organic agriculture, for example, is a convivial practice (Gomiero, 2018), however, urban gardeners might not always conform to organic practices in their gardening, i.e. through heavy chemical use. In the Degrowth discourse, urban gardening is often only discussed from a social or cultural perspective (i.e. Anguelovski, 2014). To conclude, there is a need to look at the ecological aspects of urban gardening practices to define if it is suitable for a Degrowth transition. Through asking gardeners about their fruit and vegetable cultivation, work time in the garden and handling of surplus, data on crop productivity, and levels of subsistence and self-sufficiency can be found. Some studies indicated that the practice of growing food at home increased due to the Covid-19 lockdowns (Mullins et al., 2021; Nicola et al., 2020) so the assumption can be drawn that gardening practices increased since the last quantitative study conducted in the AGs of Vienna in 2013 (Letzbor-Kalusch, 2013).

Aside from the topics covered by the research questions, this study will provide valuable insights for the allotment gardens in Vienna, the AG clubs, Zentralverband and the city of Vienna outside of Degrowth. From an ecological perspective, there is currently no account on the amount of herbicides, pesticides and fertilizers used in home-gardens in Austria. The only numbers that could be found were through the organization Global2000, that approximated the amount of pesticides used by taking the sale numbers from Germany and adjusting them in relation to Austria (Global2000, 2019). Although the scope of this study is too small to draw exact conclusions, the quantitative record of the fertilizer, pesticide and herbicide use in the questionnaire will give more practical results. Records on use of these kinds of product might also be relevant for groundwater protection. There is currently only one academic study on Schrebergärten. Letzbor-Kalusch (2013) did a thorough survey on vegetable, fruit and fruit tree cultivation as well as motivations and use. It is the third record of yield numbers, the first record was from 1924 and the second from 1934. The latter two were only rough estimates. The study by Letzbor-Kalusch (2013) provides an opportunity to compare motivations and gardening practices between then and now.

Another advantage of this thesis is that the results will be completely anonymous and participating allotment gardens will not be named. This provides a safe space for the allotment gardeners to state their personal opinion about the situation and perceived satisfaction in the AG clubs. Through covering topics such as democracy and justice, the results can provide awareness of perceived (in)justice, perceived strength of democracy and participation in the various clubs. With the in-depth survey design that is sent out to the allotment gardeners, the gathered data provides new input from a variety of perspectives (ecological, social, etc.) about the life in the allotment gardens. So far, no survey has been distributed that covers all these different aspects. Although not all data is discussed in this thesis, the remaining data is highly relevant and can be used by other research to dive deeper into the subjects, and hence provides a framework for future studies in the allotment gardens.

2.8 Hypothesis Development

Based on the literature review above, it becomes clear that there are aspects of the allotment gardens in Vienna that go in line with Degrowth practices and technologies. Since organic agriculture is prominent in allotment gardens all over Europe (i.e. Glavan et al., 2018) and the gardening statutes established by the city of Vienna (Gartenordnung, n.d.), which for example restrict the use of herbicides, the assumption can be drawn that organic gardening is a common practice in the allotment gardens in Vienna. Based on this, the author claims that allotment gardens do fulfill the aspects of the ecological dimension in terms of gardening practice. Other aspects such as constructions, pools and biodiversity are not asked in this thesis due to time and scope constraints.

No study so far has covered democracy and justice in the AGs in Vienna. Since the compounds are organized in form of clubs, that legally require a yearly general assembly and where every member has an, at least indirect, right to vote, the author claims that democracy does in fact go in line with the degrowth notion of democracy. In terms of the justice dimension, the topic becomes rather complex as some allotment gardeners have shown their dislike for privatization (Exner & Schützenberger, 2018). Originally, allotment gardens were meant to be an affordable oasis for the worker's class, and this was threatened due to privatization and the inherent price speculations. The decision to stop the sale of allotment gardens (Figl, n.d.; Ludwig, n.d.) shows that, as preferred by many AG gardeners, accessibility remains an important notion. On the other hand, even the affordable and leasable plots can be considered "semiprivate" – high fences and closed gates on the compounds are common (Exner & Schützenberger, 2018). Nevertheless, it can be criticized here that allotment gardens take away a lot of land that could otherwise be used for living space for more people or more easily accessible green spaces, such as community gardens. Regarding efficiency in the context of the anti-utilitarianism dimension, it can be said that most gardeners in European allotment gardens are motivated by health benefits and relaxation (Pourias et al., 2016) and only one study was found where cost was a distinctive motivator (Trendov, 2018). Therefore, the

assumption can be drawn that efficiency has little relevance to them, which goes in line with the anti-utilitarianist approach.

To conclude, this author claims that the allotment gardens represent a Degrowth practice to some extent. Based on the literature it is clear that allotment gardens in Vienna do not fully represent a Degrowth alternative and that other types of urban gardening, such as community gardening, are inherently more in line with the Degrowth discourse.

For the feasibility, viability and desirability of allotment gardening in Vienna, it can be claimed based on the literature that allotment gardening is not a feasible or viable way to ensure adequate nutrition for a population, but that it is a desirable, or convivial, technology. This claim traces back to the analysis done by Gomiero (2018). Nevertheless, the quantitative study by Letzbor-Kalusch (2013) about food cultivation in the AGs in Vienna shows that gardening contributes to the self-sufficiency of allotment gardeners. Since the Covid-19 pandemic caused people to stay at home during lockdowns, the assumption can be drawn that the amount of food cultivation increased. Conviviality, as a desirability criteria, is also represented in the allotment gardens since sharing, social interaction, well-being and creativity is present (Autengruber, 2018; Swoboda & Lattinger, 2004) (Table 1 and 2).

Hypothesis 1	Allotment gardens in Vienna represent a Degrowth practice to some extent.
Hypothesis 2	Allotment gardens in Vienna represent a Degrowth technology to some extent.

Figure 1 Hypotheses 1 & 2

Dimensions	Criteria	Criteria met?	Research Question
Ecology	<ul style="list-style-type: none"> • Use of Pesticides • Use of Herbicides • Use of Fertilizers • Self-Sufficiency 		Degrowth Strategy
Democracy	<ul style="list-style-type: none"> • Participation in AG events • Willingness for political involvement 		
Justice	<ul style="list-style-type: none"> • Handling of discrimination issues • Private property vs. Lease contract 		
Well-Being	<ul style="list-style-type: none"> • Life Satisfaction • Perceived Impact on Mental Health 		
Anti-Utilitarianism	<ul style="list-style-type: none"> • Subjective (importance of) Efficiency • Gardening Motivations 		
Feasibility & Viability	<ul style="list-style-type: none"> • Productivity 		Degrowth Technology
Conviviality	<ul style="list-style-type: none"> • Perceived Creativity • Social Interaction • Sharing of gardening tools • Sharing of homegrown food • Autonomy • Motivations 		

Table 2 Criteria & Hypotheses for Research Question 1 & 2. Legend: Green - Rather satisfied, Orange - Unclear, Red - Rather Dissatisfied. References: Gomiero (2018), Demaria et al. (2014), Illich (1973) & Flipo (2017)

3 Methodology

3.1 Justification of Chosen Research Approach

This thesis uses a quantitative exploratory study design with a focus on descriptive analysis. Quantitative research is the testing of assumptions through statistical tests. It involves data collected through surveys or experiments (Creswell & Creswell, 2017). The data collected for this thesis is quantitative. The goal is to measure the extent to which allotment gardens in Vienna are in-line with Degrowth principles and therefore certain indicators and criteria are needed. The framework chosen are the 5 Degrowth dimensions proposed by Flipo (2007) and Demaria et al. (2013) (see Chapter 2), as well as 3 central Degrowth and Technology qualities identified by Kerschner et al. (2018): conviviality, feasibility and viability. The actual criteria are chosen based on how in line they are with the values of each of the dimensions within the framework (Table 3). This includes, i.e. life satisfaction as a proxy for well-being, autonomy and social interaction as a criteria for conviviality. Nevertheless, no quantitative benchmarks have so far been developed that would provide thresholds of when an activity is sufficiently in-line with Degrowth. In this context such thresholds would also be rather reductionist and inappropriate. The evaluation therefore follows the following procedure:

1. **Descriptive Analysis:** i.e. number of respondents, frequency, amount of pesticides used
2. **Descriptive Analysis:** Identification of majorities or averages (if possible)
3. **Qualitative Discussion:** Based on established criteria grouping of results in either (A) rather satisfied, (B) unclear or (C) rather not satisfied

The first two steps are a descriptive analysis, which is the summarizing and organizing of data with statistical means (Creswell & Creswell, 2017), but the third step is a qualitative discussion given the above described absence of numerical thresholds. Some data from the survey is ordinal, meaning that the variables are categories with unknown distances between them (ibid). In this case, only the frequency tables are described, and no further calculations are done. Minor adjustments of the path are

made depending on the topic of the individual question. For example, if the majority of allotment gardeners use low or no pesticides, but 25% report heavy pesticide use, the weight of the minority in this case must be considered in the final rating (Figure 1).

Common techniques in quantitative research are correlation and group comparison. Group comparison is not appropriate within this thesis as it does not aim to compare the performance of allotment gardens to other types of urban gardening (e.g. community gardens). Correlational research on the other hand identifies relationships among variables. This was not relevant for this thesis as the relationships between the variables is already adopted from the literature, meaning that the literature describes criteria that would qualify a practice to be rather in line or not with Degrowth principles. For instance, if allotment gardens fostered social interaction and political engagement that would be considered favorable from a Degrowth perspective according to the literature (criteria conviviality & democracy).

	Degrowth Strategy	Degrowth Technology
Framework	Ecological • Democracy • Justice • Well-being • Anti-Utilitarianism •	
	Feasibility • Viability • Conviviality	
	Criteria based on Demaria et al. (2014), Illich (1973) & Flipo (2017) Kerschner et al. (2018), Gomiero (2018),	

Table 3 Evaluation Framework

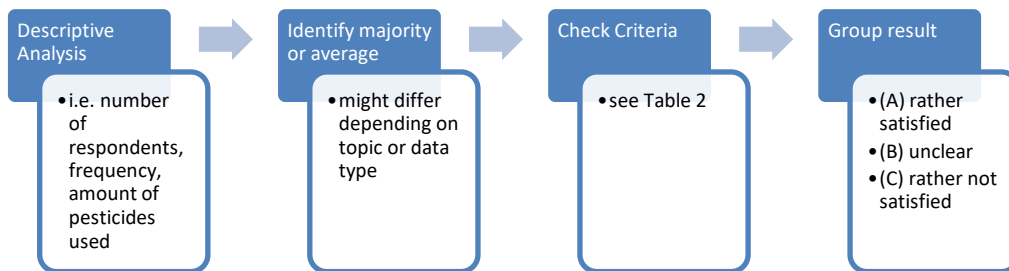


Figure 1 Steps in the Evaluation Process

3.2 Study Design

The population for this study is defined as allotment garden owners and tenants within the city limits of Vienna that are members of an AG club. From this population only those were contacted, who could be reached via e-mail. Else one would have had to personally approach each AG-club without available contact details - an unmanageable logistical challenge for the scope of a BA thesis. This step could be regarded as a convenience sample of clusters (the AG-clubs being the clusters) or rather as an 'incomplete sampling frame'. However, the omission of certain units (the clusters or AG clubs without email contact) from the sampling frame is not expected to introduce a systematic bias, that would impede the generalization of results to the whole population. The sample size is therefore 20,000. It is taken from the number of parcels in each of the allotment gardens that could be reached, since it is unknown how many people live there exactly. According to the literature an acceptable response number in order to generalize the results to the whole sample would be 195 (i.e. a response rate of 0.97%) , based on a confidence interval of 95% and a margin of error of 7%.. The data was collected through an online survey using the platform socsisurvey and the language is German. Glavan et al. (2018), who conducted a similar

study, had an average online survey response rate of 18%. Drawn from this number and taking into account that the survey for this thesis will be a lot shorter, the expected response rate was about 20%. To reach the desired participants, the AG clubs were contacted via e-mail and asked to send the link out to their members. The e-mail contained a short introduction to the topic of the thesis and the author, and the aim of the research was described (see Appendix 1). The allotment garden owners or tenants could then access the survey through a link. The survey link was also posted on the official Facebook account and website of the Zentralverband. Due to data privacy regulations, the Zentralverband only has the permission to share the contact details of 120 clubs with the author. The remaining 130 clubs could therefore only have been reached through a personal visit at each club facility, which was, however, outside of the scope for this thesis. To achieve a higher response rate, the largest 30 AG clubs received reminders and those who have a phone number available were called (10 clubs). Because of this procedure response biases are possible, but not considered as a major threat. Since this thesis will provide valuable insights into the perceived life satisfaction, justice, participation and other aspects in the AG clubs, the participants and the AG clubs will receive a summary of the most relevant results after thesis completion.

3.3 Instrumentation

The online questionnaire is divided into 5 parts: (1) Allotment plot information, (2) Gardening practices, (3) Motivation and opinion about gardening, (4) Life in the AGs and (5) Basic Data See Appendix 2 for the full questionnaire.

In the first section, participants are asked to provide basic information about their allotment plot and what AG club they belong to. This includes questions about the spatial designation, plot size and how many months the allotment garden is their main residence. The question type is selection and the plot size options are given in steps of a hundred m², which is based on Letzbor-Kalusch (2013) and Autengruber (2018).

In the second section, the participants are first asked if they cultivate fruit, vegetables or both. Those who grow neither vegetables nor fruit are immediately rerouted to section (4) Life in AGs. For those who garden, the survey then goes into more detail

regarding number of fruit trees, area of gardening bed, hours spent gardening, handling of surpluses and self-sufficiency (Glavan et al., 2018; Pourias et al., 2015; Conk & Porter, 2016). Here, the participants are again given a selection of answers to choose from. The chosen answer options are based around the average results by Letzbor-Kalusch (2013) and Glavan et al. (2018), who covered similar topics. For the self-sufficiency question, the participants are shown a slider to indicate the percentage of needs covered by their produce. Next, participants indicate what type, if any, of fertilizers, herbicides and pesticides they use in their garden. This includes manure, granulate, liquid, compost, mulch, organic and artificial herbicides, sprays and homemade tinctures. For each type, they are given a range of ml, kg or grams to indicate the amount used per year. The answer options are chosen based on the most common sizes of fertilizers, herbicides and pesticides available in commercial home-builder stores such as OBI, Bauhaus and Hornbach. For this, the author talked to shop assistants and conducted research on the websites of these stores (Hornbach.at, Obi.at, Bauhaus.at). Then, participants are shown another slider to indicate the proportion of machine use versus hand tool use when gardening. Last, participants choose whether they use and own a chainsaw, tiller or cultivator, which are the machines used most often for small-scale gardening (Bello, 2012).

In the third section, participants are asked to rank five out of 12 given gardening motivations based on their relevance. The options range from health benefits to social aspects and were chosen based on reported results by various studies (such as Glavan et al., 2018; Trendov, 2018; Martinho da Silva et al., 2016; Zainuddin & Mercer, 2014). A text field gives participants the opportunity to write their own motivation in case it is not covered in the given prompts.

The fourth section covers topics such as participation, social interaction, shared space, justice and democracy. Participants are asked how often they participate in certain activities, if offered in their AG club. The list of activities is based on reports by Autengruber (2018). Next, the participants are presented with various statements regarding social interaction, creativity, governance, democracy, justice and autonomy, which they can rate on a Likert scale from 1 to 5 to the extent at which they agree or disagree. Additionally, a two-sided slider is used to indicate the

emotions associated with spending time in the allotment garden. On each side of the slider are opposite emotional states: Happy/Sad, Content/Angry and Relaxed/Stressed. This scale is adapted from the Life Satisfaction Scale by Diener et al. (2010). Lastly, the participants rate their perceived life satisfaction on a 5-point Likert scale, adapted from the Subjective Well-being Scale by Diener et al. (1985). Throughout the survey there are two open-ended questions asking if they want to elaborate on why they are satisfied or dissatisfied with their allotment garden life and whether they have any comments on the questionnaire as a whole. Both open-ended questions are not mandatory.

The last section covers the age and gender of the participant and gives the option to leave an e-mail address, through which they will receive the promised summary of the results. The approximate length of the survey is 20 minutes, depending on whether they garden or not. An exact record of all the questions can be found in Appendix Y.

3.4 Data Analysis

For the statistical data analysis, the programs R and Jamovi will be used. All data will be analyzed with descriptive statistics.

4 Results and Discussion

This chapter describes the gathered data and provides a descriptive analysis of it. First, the basic information about the participants, such as age, gender and plot size, will be presented. Then each subchapter dives into the results relevant for the Degrowth dimensions.

4.1 Demographics and General Information

A total of 122 participants finished the survey, which given the potential sample size of 20,000, equals a response rate of 0.6% which is far from the 0.97 % that was aimed for. Hence when interpreting the results of the study in terms of its representativeness for the whole sample, caution needs to be applied. However the number of responses is still rather high, and the study can therefore provide highly valuable insights. 53.3%

of the participants were male, and 44.3% were female. One person identified as neither (Table 4). The majority (73.7%) of the participants were over 50 years old, of which over a third were 65 years or older. 19.6% of the remaining participants were between 35 and 49, and only 6.7% were between 20 and 34 years old. The average household consisted of 2.2 people, whereas 4 household members was the reported maximum.

Gender	Counts	% of Total
female	54	44.3%
male	65	53.3%
other	1	0.8%

Table 4 Gender frequencies in Survey

4.2 Biophysical Dimension

In the context of the biophysical dimension, it is relevant if allotment gardeners practice organic or conventional gardening. Organic gardening is the practice of using natural, mostly non-chemical or homemade mixtures to fight off unwanted plants or other intruders (Gomiero, 2018), or through using methods such as crop rotation (Meena, 2014). The survey therefore asked how much, if any, fertilizer, herbicides or pesticides the participants used in the past year. The most common fertilizer used by the participants was home-made compost (by 50% of participants), followed by concentrate and granulate, each used by 40% of the participants. Manure is most rarely used. Regarding herbicides, the majority of the participants use neither organic nor artificial herbicides, but those that do, generally use organic ones. The most popular pesticide among allotment gardeners was home-made tinctures. Other types, such as granulate, liquids or sprays, were barely used, but a preference towards organic pesticides was shown. That organic growing methods are preferred is pattern also seen in other allotment gardening studies across Europe, such as Glavan et al. (2018) and Mackiewicz & Asuero (2021).

Out of 122 participants, 107 grow either fruit, vegetables, or both. Almost 50% of the participants indicated that the grown food covers about 10% of their household's needs for fruit and vegetables (Figure 2). Compared to studies conducted in allotment gardens in other cities, this result is rather low. While in London and Milan homegrown food also covered 10% to 20% of a household's needs, 48% of gardeners in Ljubljana reported having 50% of their needs met (Glavan et al., 2018). Another study conducted in home gardens in the Czech Republic, revealed that on average 33% of the needs were covered (Vávra et al., 2018). Regarding vegetables, most people dedicate 3 to 5 m² of their plot for the vegetable beds. Nevertheless, over 60% of the gardeners have gardening beds between 3 and 15 m² and 10% dedicate more than 25 m² to vegetables. One participant in particular reported a 70 m² gardening bed. Compared to a similar study conducted by Letzbor-Kalusch (2013), the square meters of gardening beds reported in this thesis are much higher than what was reported in 2013, where 44% grew in beds smaller than 5 m² and only 3% in beds larger than 25 m². Both studies contradict the common notion that food gardening has only little relevance in the allotment gardens. Regarding fruit, the questionnaire asked about fruit trees and fruit bushes separately. 94 participants reported to grow fruit in their garden. The majority (70%) has between 1 and 5 fruit trees on their plot, 10% have 9 fruit trees, and 6% reported having more than 10 fruit trees on their plot. Based on a rough calculation, it can be assumed that the participants have on average at least 3 trees in their gardens and in total at least 437 fruit trees. Letzbor-Kalusch (2013) in comparison reported 570 fruit trees for 230 survey respondents in 2013. One reason why the number of fruit trees increased could be the annual "Fruit tree for conifer tree" initiative by the state association of allotment gardeners in Vienna (Landesverband der Kleingärtner Wien) launched in 2017. Those who remove a conifer tree from their plot, receive a free fruit tree (Zentralverband, n.d. A).

Fruit bushes are not as prominent. Out of 88 survey respondents, 37% have less than 5 fruit bushes, and another 40% grow between 5 and 15 bushes. Only 5% grow more than 20 bushes. Unfortunately, the data for fruit bushes was collected in a different format than Letzbor-Kalusch (2013), thus an accurate comparison is not possible.

Based on these numbers, one can calculate how many servings of fruits and vegetables these gardens provide. The recommended fruit and vegetable intake per day for an adult is 5 servings á 80g (= 400g a day). Based on Letzbor-Kalusch (2013), the most grown vegetables in the allotment gardens are tomatoes, lettuce and beans. The average yield for these plants is 5 kg/m² for tomatoes, 4 kg/m² for lettuce and 3 kg/m² beans (Glavan et al., 2018). The most common fruit trees and bushes are apple and raspberry (Letzbor-Kalusch, 2013), with an annual yield of 200 kg per tree and 3 kg per bush. Table 5 shows the approximate number of servings that most of the gardeners could yield from their plants. It is important to mention that yield heavily depends on various factors such as plant size, plant type, climate, soil and weather conditions. Skill is also one of the key factors that influence productivity of gardens (Codyre et al., 2015; Glavan et al., 2018). Based on the calculations, those that grow at least 5 trees of fruit could cover their entire fruit servings needs within a year – given perfect conditions. For the vegetables, an average household who grows on 5 m² can meet their vegetable needs for 3 to 4 weeks. The few survey respondents that have gardening beds larger than 25 m² are technically able to cover their fruits and vegetable needs from 94 to up to 156 days, depending on type of vegetable.

Average household	Rec. servings/day per person	1 serving
2	5	80g

Bushes:

	Yield p.a.	5 bushes	servings	# of days covered
Raspberry	3 kg	15 kg	187,5	19

Fruit tree:

	Yield p.a.	5 trees	servings	# of days covered
Apple	200 kg	1000 kg	12500	1250

Vegetables:

	Yield p.a., in kg/m ²	5m ²	servings	# of days	25 m ²	servings	# of days
Beans	3 kg	15 kg	187,5	18,75	75 kg	937.5	94
Tomatoes	5 kg	25 kg	312,5	31,25	125 kg	1562.5	156
Lettuce	4 kg	2 kg	250	25	100 kg	1250	125

Table 5 Rough fruit & vegetable servings calculations

At first glance, the rate of self-sufficiency seems a lot higher than what participants rate it to be, however, the calculations are based on perfect conditions and do not take into account disruptive factors. Therefore, it can be concluded that the perceived rate of self-sufficiency that covers the needs of vegetables and fruits (Figure 2) is similar to the calculations in Table 5. Contrary to popular belief, as Letzbor-Kalusch (2013) pointed out already, food production is in fact a common practice in the allotment gardens and the potential for subsistence per household is there. While for the majority, fruit and vegetable gardening is not practiced heavily, the amount of trees, bushes and m² cultivated indicate a higher food production than originally expected.

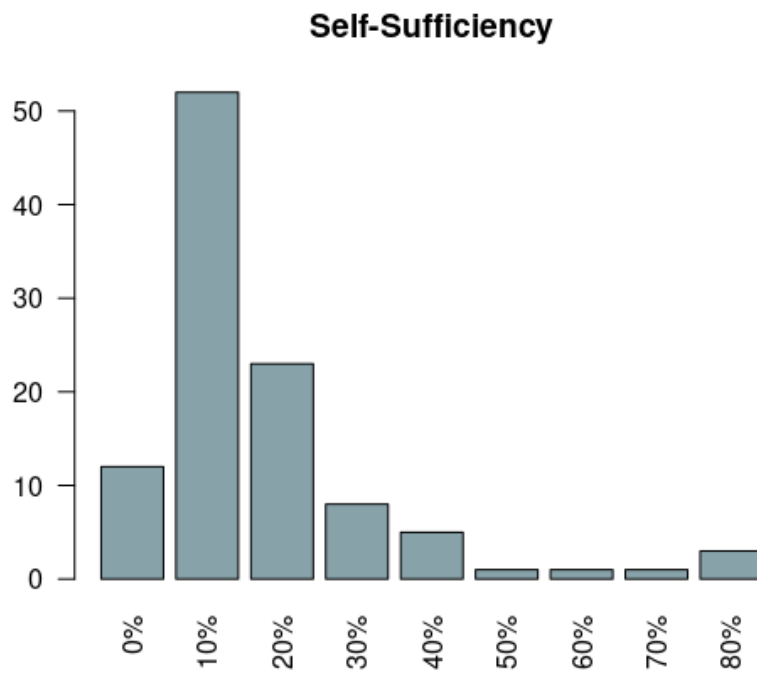


Figure 2 Percentages of participants' household needs covered by homegrown food. x-axis: percentages, y-axis: number of participants

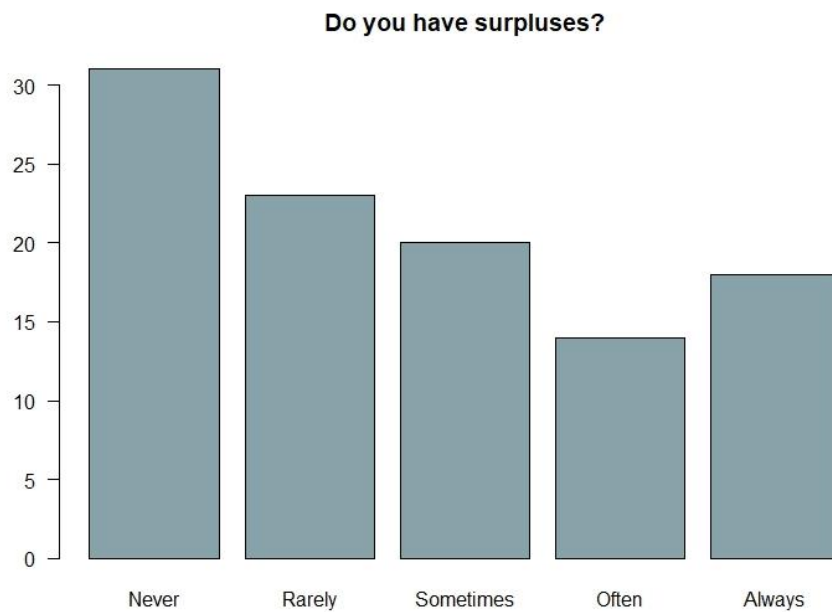


Figure 3 Frequency of surpluses. x-axis: perceived frequency, y-axis: number of participants

When asked if they had any surpluses, almost 50% said that they never or rarely have surpluses (Figure 3). Although the maximum of reported self-sufficiency was 80%, one-third of the participants said that they always or often have surpluses. This could be because vegetables and fruit grow ripe all at once and might cover more than a household's needs at certain times. Figure 4 shows what happens to surpluses, based on frequency. Throwing away food seems to be avoided by almost all participants, as only 7 people answered that they sometimes or often throw away surpluses. The most frequent habit is giving produce to neighbors, followed by exchanging. Donation of produce is not as popular, with 75% saying that they rarely or never do it. Similar patterns are found in other studies (Glavan et al., 2018, Pourias et al., 2016, Conk & Porter, 2016, Zainuddin & Mercer, 2014).

To conclude, self-sufficiency in allotment gardens is quite low. At current gardening levels, allotment gardening can neither supply the individual households nor the AG population. The reason for this could be that gardening is not a necessity but rather a hobby done for enjoyment purposes (see Chapter 4.7) and therefore productivity and output are not important to the gardeners.

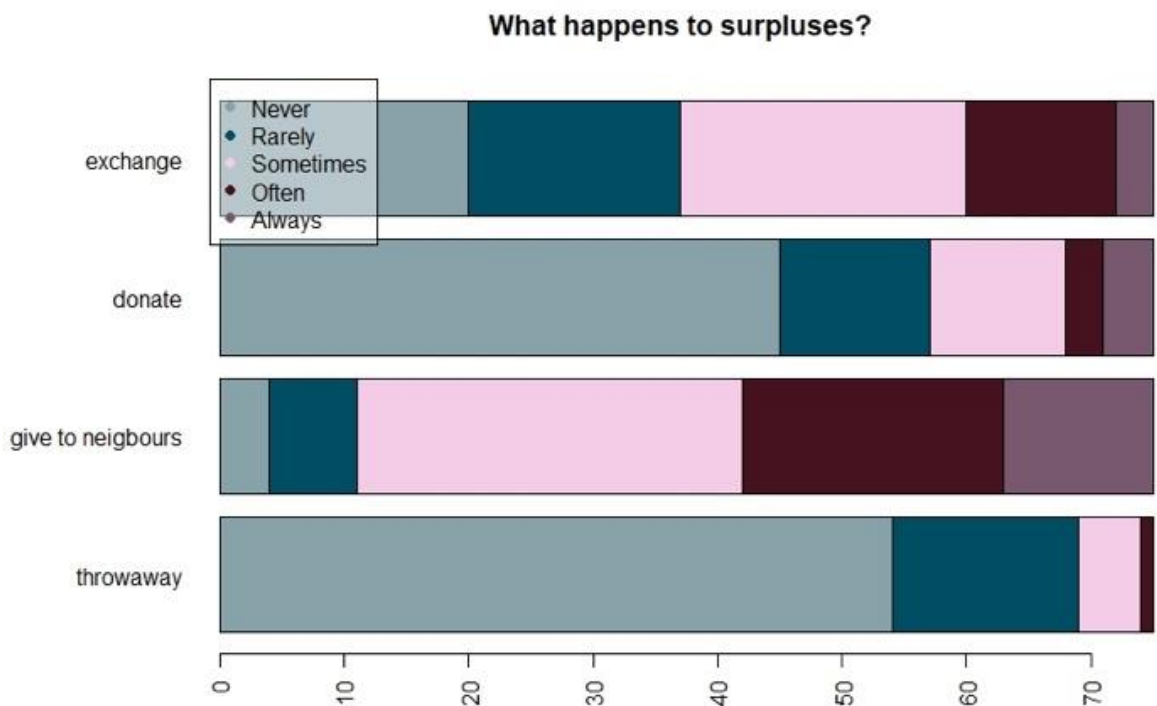


Figure 4 Frequencies of exchanging, donating, throwing & giving away produce surpluses. x-axis: number of people, y-axis: handling of surpluses

4.3 Well-being

91% of the participants agree or strongly agree with the statement that they are satisfied with their life in the allotment garden. As life satisfaction is a strong indicator for well-being (Diener, 1984) it can be said that allotment gardens are a contributor to well-being. The satisfaction could stem from the fact that green spaces are a promoter of good mental and physical health (Pretty et al., 2007). Further, results from the survey indicate that stress-inducing factors, such as discrimination, are rather not prominent or at least addressed in the community when they happen. Mutual help between neighbors and a decent amount of trust also point towards a, not necessarily close, but a rather peaceful cohabitation in the allotment garden compounds (see Chapter 4.4 and 4.5).

In general, the results also show that 90% of the participants are rather happy, rather content and rather calm when having spent time in the allotment garden.

Nevertheless, about every 10th participant expressed either a rather stressed, angry or sad feeling.

4.4 Democracy

When it comes to the participation in the governance of the clubs, 49.2% of the participants do not actively take part. One-fourth, however, indicated that they participate actively. These results are affirmed by their willingness to hold an official position in the gardens. Again, one-third indicated that they would absolutely not, whereas one-fourth would be strongly willing to hold an official position. In a news article published by derStandard, a club representative complains about the rare willingness to hold official positions and a lack of active do-ers in the club community (Bauer, 2020).

Participation is also rather low in leisure events. The most common social events are the general assembly, workshops and parties. The general assembly has the highest participation rate, but since it is legal obligatory for a club, it is not an accurate representation of socializing. The general assembly has the highest participation rate (81%). Although participation is usually not mandatory, the general assembly is where on-going topics in the AG are discussed and every few years the new AG representatives are elected (Bundestministerium für Inneres, 2022). The high participation is a sign that allotment gardeners are interested with new developments in the compounds. 60% of the allotment gardens offer workshops, and they are also the most frequently attended event. About 30% of the allotment gardeners participate in parties, which shows that these play a rather secondary role in the clubs. Hobby clubs and excursions are rarely offered and only few participate. To conclude, social events are less offered and fewer attended, whereas workshops raise higher interest. The assumption can be drawn that allotment gardeners are more interested in knowledge transfer and skill acquisition events than other types of socializing events. However one could deduct that workshops could in fact serve as both a learning *and* socializing experience for the participants, but further research is needed to determine to what extent.

Participants were also asked about their opinion on the political role of allotment gardens. When prompted if allotment gardeners have a duty to get involved in political issues, the answers were quite balanced with a tendency to agreement. About one-third each disagreed or were indifferent, while nearly 40% think that they have a duty get involved in political issues. This result is not surprising as historically there have been protests against construction developments that threatened to move or abolish allotment gardens (Autengruber, 2018). Willingness or duty about political issues could also be strongly influenced by the leadership in the individual clubs.

4.5 Justice

For over 20 years, allotment gardens could be purchased and made private property. In 2021, the city of Vienna stopped the sale and currently leasing is again the only way to acquire an allotment garden (Ludwig, n.d.). The reason why it was stopped was because of speculation issues. The Green party and the SPÖ criticized that the plots would be sold by the city and were then resold with a much higher price, making allotment gardens a luxury good (Kautzky, 2021). In total over 5.000 plots are currently in private hands. The results of this study underpin these statements. Participants were asked to what extent they agree or disagree with the following statements: “Allotment gardens should only be sold as private property” and “Allotment gardens should only be leased”. Since these two statements mean the exact opposites, one would assume that the answer distribution would be same. However, the results show that when asked about private property, 62% rather disagree, whereas when asked about leasing, only 40% agree (Figure 5). Based on these results, the assumption can be drawn that the allotment gardeners are generally more indifferent to leasing, but have a stronger and more negative attitude towards private property.

Opinion: Private Property vs Leasing

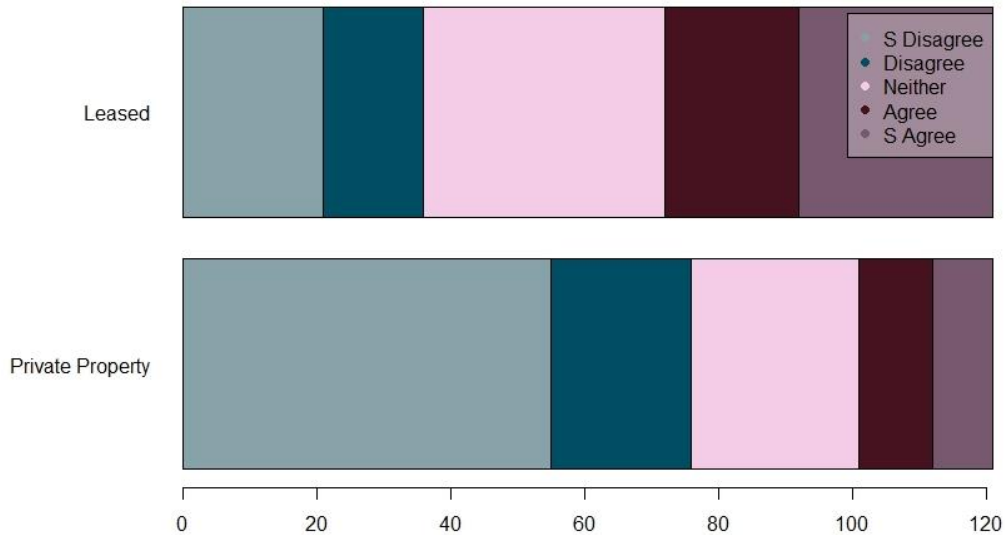


Figure 5 Responses to the statements: “Allotment gardens should only be leased” and “Allotment gardens should only be sold as private property. x-axis: number of participants, y-axis: statements.

In general, the mindset among the participants is that allotment gardens should be accessible to all people, regardless of income. More than half agree with the statement that in a more just world, everyone should be able to own a small piece of land. Nevertheless, a third of the participants show indifference or no tendency towards either side.

The second topic addressed was discrimination and equality. 60% disagree and another 20% strongly disagree with the statement “The larger the parcel, the more you have to say.” Regarding other types of discrimination and the handling of it, the majority is indifferent to the topic (Figure 6). One-third of the participants say that issues of discrimination are addressed, whereas 15% say they are not. There could be various reasons as to why the majority voted neither agreed nor disagreed. One of them could be that the people simply do not care about discrimination issues in their club. Another could be that discrimination is not prominent in the clubs. Given the lack of participation in the club events, it could also be assumed that limited contact to other club members decreases the chances of discrimination to happen.

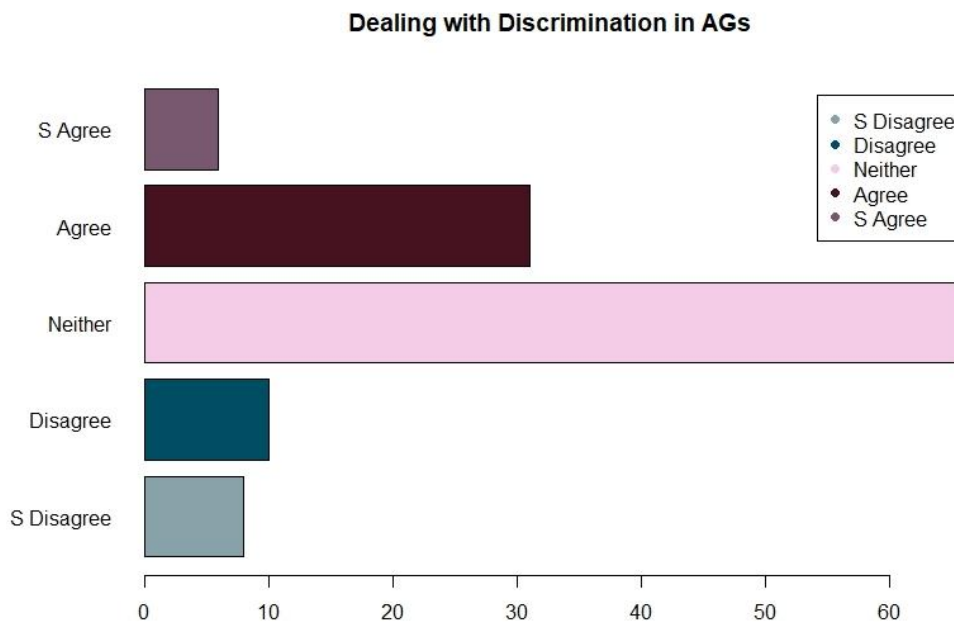


Figure 6 Responses to the statement: “The allotment garden society addresses issues of discrimination when they occur”. x-axis: number of participants, y-axis: Likert-Scale.

Historically, it is common for allotment gardens to be passed on in the family tree. The current waiting lists are very long, multiple websites from AG clubs have a disclaimer on their website, saying that the waiting list is full and that they are not taking new applicants. This is underlined by forum posts with headlines such as “*Can I get an allotment garden in Vienna as a mere mortal?*” (pmarion, 2015). For example, in order to receive a plot at the KGV Predigtstuhl, applicants must be an extraordinary member through paying a yearly fee to stay on the waiting list. Nevertheless, currently they are not taking any more people on their waiting list.

81% of the participants agree or strongly agree with the statement that allotment gardens should be passed on in family ownership. In the legal sense an allotment garden is not part of inheritance, but with a declaration of consent by the old and new leaser, the AG can be passed on within family (Lehner, 2017). This result shows that there is a tendency for the allotment gardens to remain a more closed society.

4.6 Anti-Utilitarianism

50% of gardeners think that allotment gardening is an efficient model of food production that should receive wide-spread support. About one-third is indifferent,

whereas only 15% disagree with it. The majority also indicated that efficiency is not their main focus when gardening. Since cost, independence from commercial supermarkets, and self-sufficiency are among the lowest ranked motivations from the survey, it can be assumed that efficiency is neither their motivation nor given much importance in their gardening practices. In this context, it is quite complex to describe if allotment gardening could be considered a Degrowth practice from the anti-utilitarianist perspective. Anti-utilitarianism is about getting rid of the hegemony that the human being is inherently selfish and maximizing yields, which sits at the core of the current economic paradigm (Demaria et al., 2013). Nevertheless, the question must be asked if efficiency is in fact important when it comes to food production and security, to ensure adequate nutrition for everyone. Saying that allotment gardening is in parts a Degrowth practice because gardeners do not care about efficiency contradicts with the other parts of this thesis trying to evaluate the feasibility and viability of self-sufficiency through allotment gardening.

4.7 Conviviality

Conviviality is a part of the Democracy stream, however, since it is quite extensive and substantial, it is discussed here in an additional chapter. Conviviality was measured through certain criteria, such as sharing, social interaction, creativity, autonomy and leisure. About 45% of the participants indicated that their allotment garden offers shared tools for gardening purposes, others either do not offer or do not know if their allotment garden offers any. That allotment gardeners are willing to share is also seen in the handling of surpluses (Chapter 4.2). Regarding creativity, the majority (65%) sees allotment gardening as a creative outlet, but only 40% find time for creative activities on a regular basis. Nevertheless, this shows that allotment gardens are an enabler for creativity. For those that garden, more than half of the participants (55%) agree or strongly agree with the statement that growing their own produce gives them a sense of autonomy. Allotment gardeners are free to choose when to garden (81%) and how they garden (86%), yet about every 10th allotment gardener disagrees. This might be due to club statutes that give certain gardening rules. For example, continuous closed hedges over 1.50m are only allowed if they face towards a louder street or area (Gartenordnung Wien, n.d.). Yet, this does not seem to bother the

majority. The majority of gardeners also think that in their garden they are in control (79%). These results show that autonomy in the allotment gardens is prominent and practiced. Aside from obvious laws and rules within the club, they can decide for themselves how to structure their garden.

To measure social interaction, participants were given statements about chatting with other gardeners, mutual help, and feeling of belonging to the club. Chatting with neighbors and allotment garden fellows is not the most important (40%). 50% indicated that they trust their fellow allotment club members, whereas 30% are indifferent. Mutual help between neighbors, on the other hand, is quite distinctive, with over 75% agreeing with helping their neighbors. Interestingly, 60% of the participants say that they feel a sense of belonging to the club, even though, as shown in Democracy chapter above, not that many people participate in events. The assumption can be drawn that the allotment garden club provides a framework that keeps people together but socializing within it is not too high. If they are neighbors, with which they have more contact, however, the mutual help indicates that there is a relationship of trust. Further, the regular sharing and giving of produce to neighbors underlines this result.

Recreation and leisure have been an integral part of the allotment gardens since the 1970s (Autengruber, 2018). Almost half of the participants dedicate 5 to 15 hours each week for leisure in their garden. One-fifth spends more than 25 hours on leisure per week. The leisure time did not change for the majority compared to pre-pandemic times. For those that it did, on average, leisure time increased by 5 hours.

The main motivators for gardening are, ranked from highest to lowest, enjoyment, being in nature, food quality, environmental impact and physical health benefits. Caring about food quality and environmental impact can be the reason why the majority of allotment gardeners prefer organic gardening. The least important motivators were cost, independence from commercial supermarkets and, ranked lowest, social aspects. Social aspects were only chosen 6 times as a motivator, which supports the nature of allotment gardens based on their high fences and creating their own idyll. The motivations questions were only asked to those that garden, but the

results in the other chapters show that social interaction is not very important regardless of gardening or not. Compared to other literature about allotment gardens in other cities, it is surprising that social aspects as motivator is quite low in Viennese allotment gardens. However, it is known from qualitative analyses that socializing is not a big factor in AGs in Vienna (Autengruber, 2018). Nevertheless, all given motivations were at least ranked 6 times. This speaks for the multifunctionality of allotment gardens (Pourias et al., 2016) and the benefits that they give their tenants and owners.

From a conviviality standpoint, allotment gardening does not tick all the boxes. While creativity and autonomy are highly present, social interaction in total is rather low. It can be concluded that although some substantial convivial aspects are present, allotment gardening is not as convivial as other forms of urban gardening, such as community gardening. Table 6 provides a summary of all results from this section and groups them into the categories of how well, if at all, the criteria was met. The colors in each section of the table indicate to what extent the criteria is met: Green means sufficiently met, yellow means that it is unclear, meaning that there is no tendency towards either side. Last, red means that the criteria is not sufficiently met. The right hand side of the table summarizes the results of the research questions in color as well. Only two criteria were sufficiently met (Well-being and Anti-Utilitarianism), whereas the results from conviviality, ecology, democracy and justice did not gravitate more toward either side. Feasibility and viability are the criteria that are not sufficiently met at all.

Dimension	Results Summary	Meeting of Criteria	Research Question
Ecological	Mainly organic products, but barely any self-sufficiency.		Degrowth Practice
Democracy	Low participation, except for workshops. Rather low willingness for getting		

	politically involved. Majority thinks that their wishes & concerns are heard by the club.		
Justice	Participants agree that discrimination issues are handled accordingly. Leasing is favored over private property. Closed community due to passing on lease contract within the family and often closed gates.		
Well-Being	High life satisfaction. The majority feels positive feelings after spending time in the garden.		
Anti-Utilitarianism	Quite a few see gardening as efficient, but efficiency is not important. Gardening motivations are not efficiency related.		
Feasibility & Viability	Not calculated due to ordinal data. But based on literature, it is neither feasible nor viable.		Degrowth
Conviviality	High creativity outlet. High autonomy. Social interaction is not a gardening motivation,		Technology

	<p>but mutual help between neighbors is present. Feeling of belonging to the club present. Giving & sharing of produce is a common practice. Enjoyment is the highest motivational factor. Lack of social interaction.</p>		
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Table 6 Criteria & Results for Research Question 1 & 2. Legend: Green – Rather satisfied, Orange – Unclear, Red – Rather dissatisfied

5 Limitations & Future Research

Due to the limited access to the E-mail addresses of the allotment garden clubs as well as no direct way to contact their members and the therefore necessary convenience sampling strategy, the results of this study cannot be taken as a representation for the population of allotment gardeners in Vienna. The response rate of 0.6 % means that caution needs to be applied when generalizing the results to the whole sample. Nevertheless, a participation of 122 individuals in a survey that was not personally administered is still a major achievement. Some spontaneous positive feedback from participants by email (about the good design of the survey questions) was also encouraging.

A further response bias could be present due to the fact that participating AG clubs had a vast range of response rates, and since every club has their own rules and culture, the results may be skewed towards those clubs that had the higher participation rates. However for those wanting to take this research further, the data could be grouped into the various allotment garden clubs or specific types of allotment gardeners, however, this was out of the scope of this thesis. To maximize survey responses, the survey was designed in an efficient and easy-to-fill-out way, which caused some data to be in an ordinal format. This led to issues when analyzing the data, as no averages could be calculated.

The following paths for future research have been identified. To minimize the margin of error in the sample, hence making a more exact conclusion on the population, future surveys should not only be available online, but spread to the allotment gardeners in print version. This can be achieved through working with the individual AG garden clubs. To make the data comparable, future data should be collected in forms of discrete and continuous values. Data bias due to uneven distribution of participants between AG clubs should be avoided, by, for instance, drawing a limited random sample from each AG club and trying to achieve the same response rates. What is missing from the literature is correlations between different factors of AG gardeners. One recommendation would be the creation of allotment gardener “types” (i.e. “female, Eklw, gardens, low club participation, uses pesticides” versus “female, Eklw, no gardening, high club participation”). Not only may this help draw further conclusions on the social interactions and habits within the allotment garden population from a Degrowth perspective, it can also be useful information for allotment gardens that struggle with social cohesion and low participation. The correlation between Eklw versus Ekl plots and their gardening activities as well as private property versus leased plots and their level of gardening, socializing and participation are interesting areas to further explore. Since this study confirmed that the gardening done in the AGs is not enough to supply enough food, it would be interesting to research if enough labor hours and space would be available to see if self-sufficiency is feasible within the AG population.

6 Conclusion

This study analyzed to what extent allotment gardening in Vienna could be considered a Degrowth practice and technology. The extensive questionnaire prompted allotment gardeners to share information about their gardening behaviors, motivations, opinion about democracy and justice issues as well as well-being and general satisfaction in the allotment gardens. Based on the findings, one can say that the allotment gardens in Vienna are not appropriate as a blueprint for a Degrowth practice. Privatization, high fences, low participation within the communities point towards the notion that allotment garden compounds are, in many cases, similar to

any other type of single-home neighborhoods. As Exner & Schützenberger (2018) put it, they are remnants from Fordism and industrialization, where leisure and work are strictly separated. This contradicts the notion of urban gardening, which is to change the city from within, rather than serving as an “escape” from it (Müller, 2017b). Technically, they can be affordably leased but some people stay on the waiting list for years in return for money and those gardens that are private property are expensive. Nevertheless, there are still various aspects of allotment gardening that go in line with the values and streams of the Degrowth movement. The preference for organic gardening practices, the high life satisfaction and strong feelings of belonging indicate that the gardens have valuable benefits for its residents – which is also reflected in the high demand for these gardens. From a technological perspective, allotment gardens could be considered convivial practices. They foster creativity and autonomy. Although the structure of the allotment garden clubs gives the opportunity for social exchange, it is often not taken. Here it can be concluded that allotment gardens provide a framework for a convivial technology, however, the conviviality is only lived to a certain extent by its residents. Although feasibility and viability were not calculated in this thesis, calculations about organic agriculture conducted by Gomiero (2018) show that it may not be feasible nor viable in a Central European context. See complete results and hypotheses in Table 6.

Now, in case of a Degrowth transformation, there could be various steps to take – either a reformist approach, creating alternatives or both. Abolishing the current allotment garden structure for a more Degrowth-ish alternative might sound lovely to activists, but it is likely to fall on death ears, especially since life satisfaction and well-being is high among residents. Changes could include opening up more community areas within the gardens and continuing the leasing of allotment gardens as the only way to acquire one. Lease time could be reduced and if the lease contract ends or the contract holder passes away, the allotment garden goes to the next person on the waiting list, instead of their own family. In general, the high demand for the allotment gardens can also be interpreted as a symptom that the inner urban areas are lacking something that makes people want to have an allotment garden. This can be an

impulse for policies within the city to increase public spaces where people can enjoy nature but also have room for creativity and creative self-fulfilling.

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Appendices

Appendix 1

Letter to the allotment garden clubs

Dear AG club [club name] !

In the context of my bachelor thesis on the topic "Viennese allotment gardens from a post-growth perspective" under the supervision of Mag. Dr. Christian Kerschner, I am conducting an online survey in several allotment garden associations.

Viennese allotment gardens have a long tradition, therefore the aim of my work is to explore the ecological and social added value of these gardens.

The online survey includes questions about life satisfaction in the allotment garden, gardening activities and opinion about allotment gardening. It takes a maximum of 20 minutes to complete. The participation is anonymous and voluntary. The names of the participating allotment garden associations will not be mentioned in the survey.

In order for the survey to be successful, we need participants! Therefore, my big request: Would it be possible for you to forward the following link to your association members? - the more people, the better! :)

Here is the link to the questionnaire:
<https://www.soscisurvey.de/Kleingartenumfrage/>

It would be best if the link is spread through your Facebook group, website (if available) or by e-mail. For your convenience, you can simply use the e-mail attached. This contains a shortened version to send out to your club members.

Those who are interested in the results of the survey can indicate their e-mail address at the end of the questionnaire and will receive a summary of the results after thesis completion (autumn 2022). I am happy to send the results to your association e-mail if you wish. The entire written thesis will also be available online for anyone interested.

If you have any further questions, please feel free to contact me at any time.

Either via email 61900552@modul.ac.at or directly by phone +43xxxxxx.

Thank you very much for your support!

Yours sincerely,

Marie Greiner

Appendix 2

Questionnaire

Dear allotment gardener,

My name is Marie Greiner and I am currently studying at Modul University Vienna. As part of my study on "Allotment gardens in Vienna from a Degrowth perspective" under the supervision of Mag. Dr. Christian Kerschner, I would like to ask you to participate in this survey. On the following pages you will be asked questions concerning your satisfaction in the allotment garden, gardening activities and opinion about allotment gardening, among others.

The survey will take up to 20 minutes to complete. All data collected from the answers will of course remain anonymous and will only be used for academic purposes. Please read the information and individual questions carefully.

If you are interested in the results of the survey, you can provide your e-mail address at the end of the questionnaire and you will receive a summary of the results after the study is completed (Fall 2022).

By pressing "Continue" at the bottom right, you confirm that you have read the information and are voluntarily participating in the survey.

Thank you for your participation!

Sincerely,

Marie Greiner

1 Biophysical – Ecological Dimension

Fertilizer

Do you use fertilizers? If yes, please indicate what type of fertilizer you use by providing an approximate amount in ml. If no, please select "not at all".

For convenience, a conventional pack of tomato slow-release fertilizer has about 750g.

<p>Mulch bought</p>	<p>Not at all < 5 L per year 5 to 10 L per year 11 to 20 L per year 21 to 30 L per year 31 to 40 L per year 41 to 50 L per year</p>
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	<p>51 to 60 L per year 61 to 70 L per year 71 to 80 L per year > 80 L per year</p>
Mulch home-made	<p>Not at all < 5 L per year 5 to 10 L per year 11 to 20 L per year 21 to 30 L per year 31 to 40 L per year 41 to 50 L per year 51 to 60 L per year 61 to 70 L per year 71 to 80 L per year > 80 L per year</p>
Fluid / Concentrate	<p>Not at all < 100 ml 101 to 200 ml per year 201 to 300 ml per year 301 to 400 ml per year 401 to 500 ml per year 501 to 600 ml per year 601 to 700 ml per year 701 to 800 ml per year 801 to 900 ml per year 901 to 1000 ml per year > 1000 ml per year</p>
Granulate	<p>Not at all < 100g 101 to 200 g per year 201 to 300 g per year 301 to 400 g per year 401 to 500 g per year 501 to 600 g per year 601 to 700 g per year 701 to 800 g per year 801 to 900 g per year 901 to 1000 g per year</p>

	> 1 kg > 2 kg
Compost bought	Not at all 1 to 10 L per year 11 to 20 L per year 21 to 30 L per year 31 to 40 L per year 41 to 50 L per year > 50 L per year
Compost home-made	Not at all 1 to 10 L per year 11 to 20 L per year 21 to 30 L per year 31 to 40 L per year 41 to 50 L per year > 50 L per year
Manure	Not at all 1 bis 10 kg per year 11 bis 20 kg per year 21 bis 30 kg per year 31 bis 40 kg per year 41 bis 50 kg per year > 50 kg per year
Other fertilizers you use:	/text/

Herbicide

Do you use herbicides? If yes, please indicate what type of herbicide you use by providing an approximate amount in ml. If no, please select "not at all".

Organic brands: e.g. Neudorff, Compo-BIO, Compo Herbistop, ...

Non-organic brands: Vorox, Celaflor, Roundup, Glyphosate...

For your convenience, one pack of conventional herbicide has either 500ml or 1L.

Bio - Herbicide	Not at all < 100 ml 101 to 200 ml per year 201 to 300 ml per year 301 to 400 ml per year 401 to 500 ml per year 501 to 600 ml per year 601 to 700 ml per year 701 to 800 ml per year 801 to 900 ml per year 901 to 1000 ml per year > 1000 ml per year
Other herbicides	Not at all (gar nicht) < 100 ml 101 to 200 ml per year 201 to 300 ml per year 301 to 400 ml per year 401 to 500 ml per year 501 to 600 ml per year 601 to 700 ml per year 701 to 800 ml per year 801 to 900 ml per year 901 to 1000 ml per year > 1000 ml per year

Pesticide

Do you use pesticides? If yes, please indicate what type of pesticide(s) you use and how much per year. If no, please select "not at all."

As a guide, a commercial pack of pesticide weighs 750 ml and a pest spray weighs in about 400 ml. A pack of liquid slug attractant from Vandal has 30g.

Organic brands: eg Neudorff, Compo-BIO, Windhager, Dehner, Kwizda Bio

Non-Bio brands: e.g. Vorox, Celaflor, Bayer, Aeroxon, Vandal

Liquid – non organic	Not at all < 100 ml 101 to 200 ml per year 201 to 300 ml per year 301 to 400 ml per year 401 to 500 ml per year < 500 ml per year
Liquid organic	Not at all < 100 ml 101 to 200 ml per year 201 to 300 ml per year 301 to 400 ml per year 401 to 500 ml per year < 500 ml per year
Spray organic	Not at all < 100 ml 101 to 200 ml per year 201 to 300 ml per year 301 to 400 ml per year 401 to 500 ml per year < 500 ml per year
Spray non-organic	Not at all < 100 ml 101 to 200 ml per year 201 to 300 ml per year 301 to 400 ml per year 401 to 500 ml per year < 500 ml per year
Powder non-organic	Not at all < 100g 101 to 200 g per year 201 to 300 g per year 301 to 400 g per year 401 to 500 g per year < 500 g per year
Powder organic	Not at all < 100g

	101 to 200 g per year 201 to 300 g per year 301 to 400 g per year 401 to 500 g per year < 500 g per year
Tinktur	gar nicht < 100 ml pro Jahr 101 bis 200 ml pro Jahr 201 bis 300 ml pro Jahr 301 bis 400 ml pro Jahr 401 bis 500 ml pro Jahr > 500 ml pro Jahr
Andere / Others	

Self-sufficiency

Estimate what proportion of your household needs for vegetables and fruits is covered by the food you grow.	0% - 100% (slider)
How many people live in your household?	1, 2, 3, 4, 5, 6, >6 people

<p>Do you have surpluses and what happens to them? (multiple answers possible) Please rate the following statements according to what applies most to your case.</p>	<p>I have surpluses (<i>filter question</i>)</p> <p>*Never – Rarely – Sometime – Often Always*</p> <p><i>If not Never, the following questions are asked:</i></p> <p>*Never – Rarely – Sometime – Often Always*</p> <p>Surpluses are thrown away Surpluses are given away to allotment garden neighbors Surpluses are donated Surpluses are exchanged with neighbors</p>
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2 Meaning of Life and Well-being Dimension:

Life Satisfaction

<p>Please rate the following statement.</p>	<p>I am satisfied with my life in my allotment garden.</p> <p>*Strongly Disagree – Disagree - Neither Agree nor Disagree – Agree - Strongly Agree*</p>
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Please move the slider to the feeling that fits most.	<p>After spending time in my allotment garden I feel....</p> <p>Happy ---- Sad Content ---- Angry Calm ---- Relaxed</p>

3 Democracy

Please rate the following statements.	<p>*Strongly Disagree – Disagree - Neither Agree nor Disagree – Agree - Strongly Agree*</p> <p>I am actively participating in the governance of my allotment club. I feel that every member's wishes, concerns and requests are heard by the allotment garden society and their members.</p> <p>I would be willing to hold an official position in my allotment society. Allotment gardeners have a duty to get involved in political issues related to allotment gardening. There is nothing "political" about allotment gardening.</p>
How often do you participate in the following activities in your allotment society? If your allotment society does not offer a certain activity, choose N/A.	<p>*Never – Rarely – Sometime – Often – Always*</p> <p>Parties Excursions General assembly Hobby club (choir, orchestra, fishing, football,...) Workshops</p>

	Other activities that you participate in in your club: [enter text]
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4 Justice

Rate the following statements.	<p>*Strongly Disagree – Disagree - Neither Agree nor Disagree – Agree - Strongly Agree*</p> <p>Allotment gardens should only be sold as private property. & Allotment gardens should only be leased. In my allotment society, the larger the parcel the more you have to say. The allotment garden society addresses issues of discrimination when they occur. I feel that issues of injustice in my neighborhood are not my concern. In a more just world everyone should be able to own a small piece of land. & Ownership of an allotment garden should be accessible to all people (regardless of income).</p> <p>Allotment gardens should be passed on in family ownership.</p>
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5 Critiques of development and praise for anti-utilitarianism

Please rate the following statements about your opinion on gardening.	<p>*Strongly Disagree – Disagree - Neither Agree nor Disagree – Agree - Strongly Agree*</p> <p>Allotment gardening is an efficient model of food production that should receive widespread support.</p>
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	<p>Allotment gardening is in my opinion NOT an efficient form of food production. I don't care about how economically or efficiently I am producing food in my allotment garden, because this is NOT my main motivation as an allotment gardener.</p>
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6 Conviviality

Creativity

<p>Please rate the following statements</p>	<p>*Never – Rarely – Sometime – Often – Always*</p> <p>Allotment gardening is a creative outlet for me.</p> <p>When spending time in the allotment gardening I devote time to creative activities (e.g. DIY).</p>
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Social interaction

<p>Please rate the following statements</p>	<p>*Strongly Disagree – Disagree – Neither Agree nor Disagree – Agree – Strongly Agree*</p> <p>Allotment gardening for me means mostly meeting and chatting with other people in the allotment</p>
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	<p>society. I trust my allotment garden fellows. My neighbours and I offer each other mutual help. I feel a sense of belonging within the club.</p>
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Sharing of tools

<p>Please rate the following statement.</p>	<p>My allotment garden club offers shared gardening tools. * Yes / no *</p> <p>If yes, how often do you use them. *Never – Rarely – Sometimes – Often – Always*</p>
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Leisure time

<p>If you are in the allotment garden: On average, how many hours per week do you spend on leisure and other gardening activities?</p>	<p>less than 5 hours 5 - 10 hours 11 - 15 hours 16 - 20 hours 21 - 25 hours more than 25 hours Exact number of hours:</p>
<p>Was this different before the Covid-19 pandemic?</p>	<p>Yes / No</p>
<p>If yes, what was it before the Covid-19 pandemic?</p>	<p>//same question as above</p>

Autonomy

<p>Please rate the following statements regarding your opinion on allotment gardening.</p>	<p>*Strongly Disagree – Disagree - Neither Agree nor Disagree – Agree - Strongly Agree*</p> <p>Knowing that my produce comes from my own garden gives me a sense of independence. Within my garden, I can decide when I practice gardening. Within my garden, I can decided how I practice gardening. Within my garden, I feel in control. Allotment gardening is a form of practicing self-determination.</p>
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Motivations

Out of the pool below, choose your top 5 main motivations for growing your own food and rank them according to importance: Click on the field and drag them to the respective rank

<p>Physical health benefits Mental health benefits</p>
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<p>Food quality Cost Enjoyment Environmental Impact Independence from commercial supermarkets Lifestyle Social Aspects Being in nature Recreation Self Sufficiency Other motivations: [enter text]</p>
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7 Feasibility & viability

On how many m² of your garden do you grow vegetables?	less than 5 m ² , 5 to 10 m ² , 10 to 15 m ² , 15 to 20 m ² , 20 to 25 m ² , more than 25 m ²
How many fruit trees do you have on your plot?	None, 1,2,3,4,5,6,7,8,9,10, >10
How many bushes or other fruits do you have on your plot?	Such as strawberries, raspberries, blackberries, etc. None, < 5, 5 – 10, 11 – 15, 16 – 20, 21 – 25, 26 – 30, 31 – 35, 36 – 40, > 40

Machine use (Ownership of tools & sharing)

Please tick the machines that you have used in your garden in the past year (multiple answers)	<p>Tiller Cultivator Chain Saw other None of the above</p>
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possible) If you didn't use any, please select "none of the above".	
how is this machine powered?:	Electric-cord, Electric battery, Petrol/Diesel
do you own this machine?	I own this machine The machine belongs to multiple people in my neighborhood I borrow it from neighbors for free I borrow it from the allotment club for free I rent it from the allotment club I rent it from a gardening shop (or similar)
how many hours a year do you approximately use it?	[enter text]
Please click on either scale to indicate the ratio of machine versus simple hand-tools that you use in your garden.	Use of Machines 0% - 100% Use of simple Gardening Tools 0% - 100%

8 General Information

Please indicate the approximate size of your allotment parcel:	less than 100 m2 100 – 200 m2 200 – 300 m2 300 – 400 m2 400 – 500 m2
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	600 – 700 m ² 800 – 900 m ² 900 – 1000 m ² more than 1000 m ²
How many months a year do you live in your allotment garden?	Never Less than 1 month 1 2 3 4 5 6 7 8 9 10 11 12
How many hours a week on average do you spend taking care of fruits and vegetables in your allotment garden?	less than 2 hours 2 - 4 hours 4 - 6 hours 6 - 8 hours 8 - 10 hours Exact number of hours:
How many hours a week on average did you spend taking care of fruits and vegetables in your allotment garden before the Covid-19 pandemic?	less than 2 hours 2 - 4 hours 4 - 6 hours 6 - 8 hours 8 - 10 hours Exact number of hours:
Please indicate the spatial designation of your allotment parcel.	Ekl Grünland – Erholungsgebiet – Kleingartengebiet Eklw Grünland – Erholungsgebiet – Kleingartengebiet für ganzjähriges Wohnen Gartensiedlung
Name of allotment garden club	[enter text]
Age	younger than 15 years old 15 to 19 years old 20 to 24 years old 25 to 29 years old 30 to 34 years old 35 to 39 years old 40 to 44 years old 45 to 49 years old 50 to 54 years old

	55 to 59 years old 60 to 64 years old 65 years or older
Gender	female / male / diverse