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Deurbanized Cities as Strongly Sustainable Human Settlements

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Abstract: Current approaches to sustainable urbanism follow a weak sustainability approach, which assumes technological and market-based solutions to sustainability problems in human settlements. This makes them inadequate from a sustainability perspective to both respect the sustainability perspective and to maintain critical natural capital in the long-term. Additionally, concern for the well-being of the cities' inhabitants becomes a secondary issue. We argue that de-urban design and deurbanization offer a viable path for redesigning urban human settlements according to strong sustainability principles. This paper examines the potential of the deurbanization framework to regenerate cities and transform human settlements into permanent habitats that build harmonious relations between human beings and non-human natural elements. We first identify key principles of strong sustainability and deurbanization, and address their relevance for the design of human settlements. We synthesize concepts and practices into the deurbanization framework to establish what practices would constitute deurbanized human settlements, and we briefly illustrate how some of these practices would take place in a design-case study. Finally, we establish deurbanization as a strongly sustainable approach to redesigning cities because it views the human and non-human natural world as equally valuable and necessary for life to flourish.

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1. Introduction

In complex settings such as urban environments, where multiple systems and dimensions intersect, most mainstream sustainability proposals are guided by technological and market-based solutions (Huang et al., 2015; Rees & Wackernagel, 1996). Such solutions depend on many special features (e.g., energy-saving, green construction), which makes the initial development cost of such cities much higher than a conventional city of the same size, and often makes them a distant dream (as in the case of Dongtan eco-city) (Cheng & Hu, 2010). By considering the natural capital and the manufactured capital (as well as their kinds of well-being they generate) substitutable, mainstream approaches to urban sustainability can be said to follow the weak sustainability paradigm (Pelenc & Ballet, 2015).

Weak sustainability downplays the importance of the political and social dimensions of sustainability and its proposed solutions fail to adequately remain within the planetary boundaries (Steffen et al., 2015), and may in fact increase the vulnerability of cities. In this context, we propose the idea of deurbanization (Sadri & Zeybekoglu, 2018a), a concept emerging from the de-urban design field, as an integral approach to sustainability in cities. We argue that, based on its features, deurbanization can lead to the strongly sustainable

redesign of cities that views the human and non-human natural world as equally valuable and necessary for life to flourish.

We first offer an overview of the theory on strong sustainability and deurbanization. Then, we synthesize and detail different practices that would be characteristic of deurbanization, and outline some of them in a design-case for the city of Dumfries. We finally discuss what makes deurbanization strongly sustainable.

2. Theories and Methods – Strong sustainability and deurbanization overview

2.1. The principles of strong sustainability

Strong sustainability is a paradigm of sustainability that seeks to preserve the integrity of natural ecosystems, understood as natural capital (Daly, 1991), because of its contributions to welfare, such as by providing resources for meeting human needs or by absorbing waste (Ekins et al., 2003). It is one of the different forms of sustainability identified by Turner (1993), which emphasizes the non-substitutability of critical natural capital, and is opposed to the weak sustainability paradigm, which assumes perfect substitutability between natural capital and other forms of capital (social and economic). The principles of strong sustainability, outlined below, offer ideas on what criteria must be followed so that human settlements, specifically cities, can be redesigned so that they become strongly sustainable and are able to generate well-being for human and non-human beings:

2.1.1. Aligning human societies with the Earth

Human activity, particularly that linked to capitalist economies and societies, has contributed to widespread ecological degradation, making the Earth both hotter and fuller (Bonnedahl & Heikkurinen, 2019a; Brand et al., 2021). Current societal forms of organization depend on the transformation of nature into capital, and this is visible in how the notions of development, growth, wealth and demand all view the elements of the biosphere as something that can be converted into capital for economic processes.

Strong sustainability critiques the way human societies organise themselves around the transformation of nature into capital, and emphasizes the need of reaching sustainable lifestyles by aligning human activity to be in approximate harmony with the biophysical surroundings (Bonnedahl & Caramujo, 2018). To move towards strongly sustainable societies, there needs to be a recognition of the embeddedness of human societies in an earth-bound whole, and “their relations to the biophysical world with its systems, processes, and non-humans, must be recognised and understood” (Bonnedahl & Heikkurinen, 2019b, p. 10).

2.1.2. Reaching well-being in coexistence and meeting inclusive needs

In contrast to the weak sustainability paradigm that emphasizes development, growth, and wealth, strong sustainability instead considers as a foundational concept that of *well-being in coexistence*, which promotes human quality of life while simultaneously respecting all life for other actors, such as species and systems (Bonnedahl & Heikkurinen, 2019b, p. 5). This entails adopting a post-anthropocentric perspective wherein the human species is not considered above or most important than other species and natural entities. Reaching well-being in coexistence would mean building up the resilience of ecosystems and maintaining the integrity of both species as a whole and individual members in them.

Building on the concept of well-being in coexistence, a goal of strong sustainability is *meeting inclusive needs* (Bonnedahl & Heikkurinen, 2019b, p. 9). Meeting inclusive needs goes beyond simply satisfying the needs of human beings, adapted according to the context. It requires that the relations between elements in ecosystems are mapped out and the need of each element is identified so that their integrity can be maintained and ecosystems are not rapidly deteriorated by human activity. This way, when human activity may endanger ecosystems, a needs assessment can be conducted so that human needs and the needs of non-human others are balanced and met.

2.1.3. Combining sufficiency, effectiveness, and efficiency to cultivate autonomy

Heikkurinen and Bonnedahl (Heikkurinen & Bonnedahl, 2019, pp. 294–295) have argued that three pillars should drive any attempt and sustainable change: sufficiency, effectiveness and efficiency. Of these, sufficiency is the most important one: producing and consuming in a scale that is relevant for well-being, to meet (inclusive) needs. Effectiveness is necessary to produce the *right* things for meeting these needs, while ensuring a fair distribution in alignment with the biophysical needs of the Earth. Efficiency is required to produce and consume better, using fewer resources per unit. Together, these pillars could orient societies to cultivate autonomy.

Autonomy, in the context of strong sustainability, should be understood as collective autonomy in the form of democratically and deliberatively decided self-limitations (Brand et al., 2021). Reaching autonomy through sufficiency, effectiveness, and efficiency will facilitate that reaching the conditions for living a good life do not inflict upon others' (both human and non-human) ability to do the same at this point in time and in the future (Brand & Wissen, 2021; Kallis, 2019).

2.2. Deurbanization: The concept of the de-urban design field

De-urban design is an emerging field of studies that applies design techniques, methods, and mindsets to reimagine cities so that they become aligned with their biophysical surroundings. The key concept in this field is deurbanization, which seeks to remedy the harms caused by urbanization processes in ecological, social, and economic fields. From the perspective of de-urban design, urbanization has dismantled the strong social solidarity systems of cities and turned "the resilient, interconnected, and harmonious life of our planet to a vulnerable, disconnected, and unharmonious one" (Sadri & Zeybekoglu, 2018a, p. 206). The field identifies several problems intrinsically linked to urbanization, such as acceleration of social dynamics that disarticulates social ties and drives the emergence of inequalities, the destruction and exploitation of the natural world fostered by construction and consumption systems, increased vulnerability against natural disasters, and dependency on the external ecological systems to fulfill the needs of an urban settlement's inhabitants (Sadri & Zeybekoglu, 2018a).

As a response to these problems of urbanization, the field proposes the idea of deurbanization: a transdisciplinary project that takes as its object of study a specific type of sustainability transition (from urban spaces to *de*-urban ones), and an end-state for sustainable cities (human settlements that are neither urban nor rural, aligned with the biophysical capacities of natural ecosystems) (MacCarthy & Hurtado Hurtado, 2020). Deurbanization entails "eliminating the ecological, ethical, social, cultural harms that urbanization imposed on the planet, natural ecosystems, and human settlements; and regenerating and transforming these human settlements into eco-communities and permanent habitats" (Sadri & Zeybekoglu, 2018a, p. 212). In this regard, what deurbanization aims at achieving is the redesign of human settlements so that human needs are met while maintaining the integrity of the surrounding ecosystems as much as possible.

Crucially, the deurbanization vision focuses on freeing the redesigned habitats from any kind of oppression, hegemony, and violence. Human settlements would be comprised of "independent, communal, and collective communities where people can work, produce, and enjoy their lives in solidarity rather than competition" (Zeybekoglu & Sadri, 2019, p. 415). They would also instill an ethos of harmony with nature while cultivating civic and human values (Sadri & Zeybekoglu, 2018b).

Cities still constitute the core focus of the deurbanization proposal. From the perspective of de-urban design, rural settlements are mostly suited for agrarian societies, and – as a whole – human civilization has moved away from these kinds of dynamics. The modern world has also led to rural areas being affected by many of the same problems of urban ones: capitalist structures and relations, unsustainability due to the use of fossil fuels, agricultural production with big industrial machines and processes, etc. De-urban design considers cities as centers of cultural production and where most of the advances in political culture are taking place in the contemporary world. Hence, the idea for cities under the de-urban design perspective is to transform them into producers of food, water, and of fertile ecological spaces as well. This would allow the needs of producers/consumers to be resolved, since the residents of deurbanized cities would become sustainable prosumers.

2.3. Methods

Because this paper attempts to synthesize previous research on deurbanization and de-urban design and establish deurbanization's vision as one of strong sustainability for human settlements, no empirical methods are used. Instead, two qualitative approaches are used to illustrate how deurbanization *might* work as a human- and nature-centered approach to the design of cities:

1) Theory-building through integration. With what we call in this paper theory-building through integration, we seek to incorporate different concepts and identified practices that are relevant for the deurbanization concept into a whole. This is intended to outline in more detail what sorts of practices are envisioned for deurbanized cities and are compatible with strong sustainability. This was done through a literature review.

2) *Design case study*. What is presented as a case here is not something that already exists as a whole, but a *proposal for designing* a deurbanized city, as well as some ideas highlighted by that proposal. In this case, the proposal is for a deurbanized city center in Dumfries, Scotland.

3. Results – Concepts, practices, and illustrative proposal of deurbanization

3.1. Concepts and practices constitutive of deurbanization

3.1.1. The restoration of ecological and communal life

For restoring ecological and communal life, deurbanization suggests that the development of *local intelligence* is vital for the harmonization of human activity and the biophysical surroundings. Development of local intelligence involves developing a sense of place and of community, and of recognising places as living systems. Studies in built environment have addressed the centrality of viewing socio-cultural and ecological systems as partnered (Cole et al., 2013), and if the members of a specific community are skilled in identifying patterns of nestedness and of interaction, they are more likely to be able to redesign their settlements to adapt to their surroundings.

Deurbanization also promotes the idea of *shrinking cities*, because decreasing the population of the cities can also decrease the pressure on the biophysical surroundings of the city. But deurbanization does not simply suggest the decrease of a city's population, but emphasizes the key aspects of cultivating *leadership, networks, learning, and trust* (Herrmann et al., 2016).

Some of deurbanization's proposals for restoring ecological and communal life are most appropriate in shrinking cities, such as *community-supported agriculture* and *urban food-gardening* (Bloemmen et al., 2015; Zoll et al., 2018). Regenerative food systems that are able to operate at small spatial scales, such as *Agroecological Symbiosis* (AES), are also compatible with de-urbanization's vision because they reintegrate all forms of waste into food and energy production (Helenius et al., 2020; Koppelmäki et al., 2019). These alternatives combine the strong sustainability in food production with a focus on meeting human needs and strengthening networks in a given location. Moreover, *anthropics* uses human waste to feed plants, the natural nitrogen cycle decomposes human waste, which plants absorb as nutrients through their roots – by doing so water is also purified (Sánchez, 2015).

The aforementioned concepts and practices are representative of strong sustainability's principles of aligning human societies with the Earth and cultivating autonomy. Community-supported agriculture, urban gardening, and AES, enabled by the development of local intelligence and occurring in shrinking cities, contribute to the well-being in coexistence of human and non-human beings by fostering collaboration and the emergence of prosumer subjects, simultaneously reducing the stress on neighboring ecosystems.

3.1.2. Political, social, and economic organisation in deurbanized cities

Urban settlements in contemporary societies foster alienation and instrumental relations among its human inhabitants. Deurbanization seeks to remedy this by advocating for small cities where all its inhabitants can participate in meaningful decision-making practices. The goal of deurbanization on this theme is to orient a city's inhabitants to establish "local economies, governmental, social, cultural, educational institutions (invisible structures); and last but not least, ethically connect to each other" (Sadri & Zeybekoglu, 2018a, p. 213).

Because of the local scope of deurbanized cities, *economic democracy* is vital for ensuring strong sustainability's goal of meeting inclusive needs. Small-scale local agroecology cooperatives, which display economic democracy in their decision-making processes, have the best potential for achieving degrowth goals (Boillat et al., 2012), and it stands to reason that this potential can be translated into the context of deurbanization. *Diverse economic practices* that escape the hegemony of capital and contribute to well-being in coexistence, such as barter markets, time banks, intentional communities, and local currencies, among others (Gibson-Graham & Dombroski, 2020), are also suitable for deurbanized cities and can fulfill deurbanization's aspiration for greater ethical interconnection among a city's residents.

On this theme, deurbanized cities embody strong sustainability principles because participation in meaningful decision-making processes, economic democracy, and diverse economic practices can more effectively lead to deciding the *right* things to produce, and how to produce them efficiently, distribute them equitably, and only at a relevant-scale for well-being.

3.1.3. Key spaces for human-nature interaction

Deurbanization envisions two key spaces for human-nature interaction, while ensuring that additional space is left free of human intervention so that natural ecosystems can thrive. The first space for human-nature interaction are *food forests* which, properly managed, would be able to generate socio-cultural, environmental, and economic benefits. These include, but are not limited to: meaningful and safe employment with a social purpose, contributions to the well-being of the community, water conservation and soil formation, increase in biodiversity, economic viability, and shared ownership and decision-making (Albrecht & Wiek, 2021, p. 94).

The second space are *border zones*, spaces of intermediate habitats where human beings and wildlife would be able to come into contact without one invading the residing area of the other. These border zones could manifest in multiple ways: in holistic community parks, rewilded corridors in the periphery of the city, or the aforementioned food forests. Border zones are inspired by literature on ecotones, in this case also considering human beings as part of a zone's biodiversity (Brownstein et al., 2015).

Deurbanization, however, emphasizes the need to preserve *sacred sites*: natural locations untouched and unaffected by human activity. These need to be previously demarcated and known by a deurbanized city's inhabitants, so that they are respected and free from human intervention.

3.2. Vision for a deurbanized Dumfries

3.2.1. Overview

In the west of Scotland, the center of Dumfries has been experiencing social, economic, and environmental deterioration since 2011, as seen in Figure 1. As people are seeking affordable housing and green spaces in other areas of the city, the buildings are left vacant, hence, the streets and the city core have also lost their livability.

We elaborated the initial stages of a de-urban design project for the regeneration of Dumfries center, with the intention to revitalize derelict and underutilized areas of the town, and provide benefits in health, education, local economy, and mutual aid. These would build on the local intelligence of Dumfries' inhabitants. The proposal is expected to lead to community-supported agriculture practices in Dumfries and economic democracy, once they are consolidated. Other aspects of deurbanization, such as Urban Food Forests and Sacred Sites, are not illustrated here because of the scope of the project (Dumfries city center). It is important to emphasize that what is shown here is not the complete deurbanized vision of Dumfries, but only an initial stage.

Figure 2 shows the installation of urban food gardens and food containers throughout the neighborhood, as well as the rewilding of peripheral areas of the center. This follows deurbanization's idea of reaching well-being in coexistence by minimizing invasive-destructive interventions and regenerating green areas.

3.2.2. Self-sufficient community and social sustainability

The regenerative concept of urban food gardens would promote new, alternative economic dynamics that would help Dumfries' residents engage in more sustainable lifestyles and promote a transformation of the city towards inclusive and socially conscious sustainability.

Through urban food gardens, residents would organise and support each other to grow organic food with a skilled gardener overseeing the dynamics and training locals. Moreover, urban food gardens could foster democratic decision-making, which contributes to a sense of belonging and ensures the social sustainability of interventions.

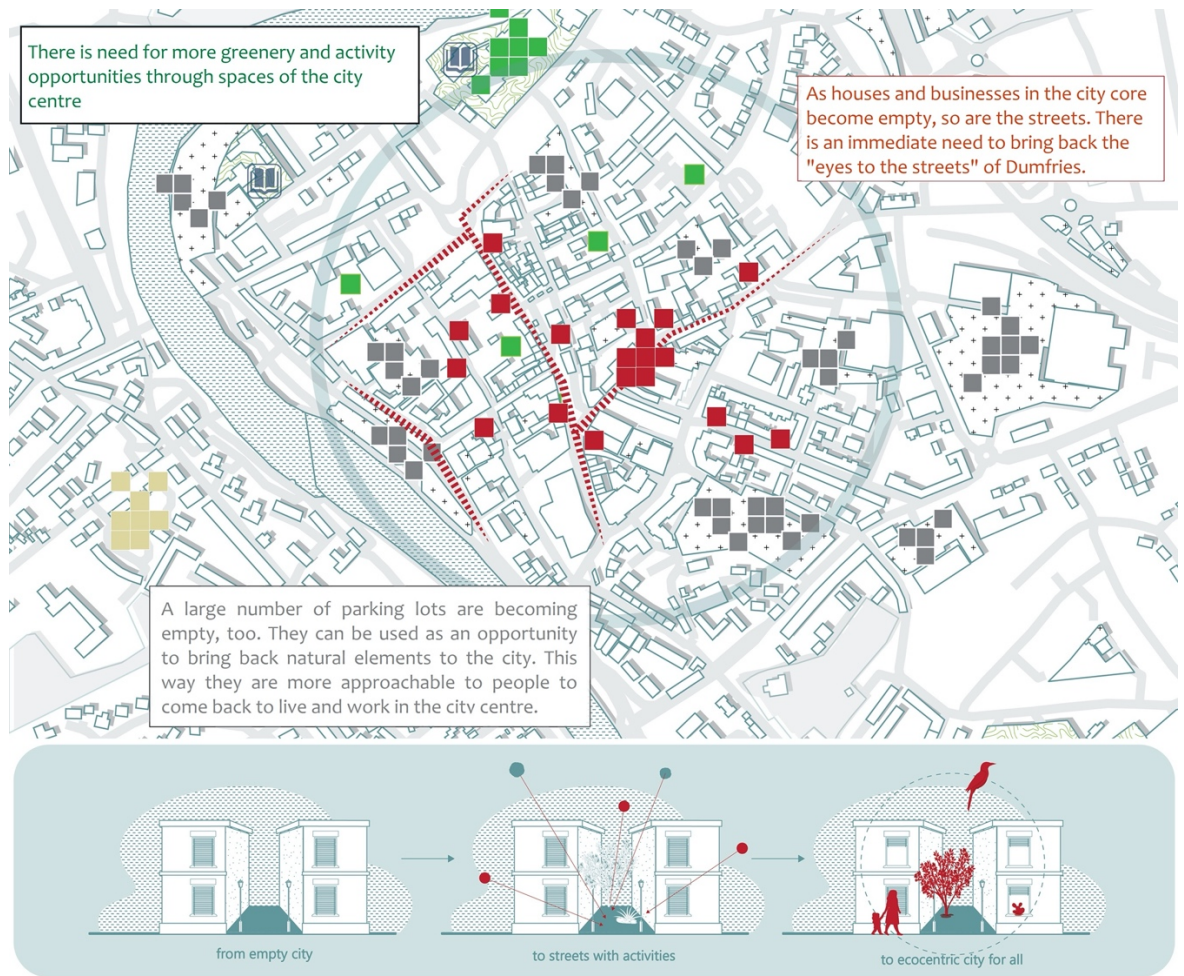


Figure 1. Green spaces, empty houses, parking lots, and residential areas in Dumfries.



Figure 2. Initial stage of deurbanized Dumfries city centre.

4. Discussion: Deurbanization as a strongly sustainable vision for human settlements

The results in the previous section highlight how deurbanization is a proposal for re-designing human settlements, specifically cities, to become strongly sustainable. What this means is that such settlements would be aligned with the biophysical conditions of the surrounding environment, would seek to reach the well-being in coexistence notion by building up the resilience in ecosystems and meeting inclusive needs (both of humans and

of non-humans), and would encourage sufficiency, effectiveness, and efficiency practices to cultivate the autonomy and self-management of the city.

In this regard, deurbanization is both human-centered and nature-based, as the focus on meeting inclusive needs implies. For human beings, it would meet the integral needs of the individual (such as basic necessities like food, water, shelter, and emotional and social necessities like trust, care, and meaningful participation) and it would cultivate some needs of the post-human subject, such as empathy, rich affective life, and interconnectedness (Braidotti, 2013).

For the non-human beings of natural ecosystems, deurbanization's focus on building up resilience of locations where humans intervene in (such as in food forests) and maintaining the integrity of locations where humans should avoid going into (such as the sacred sites) would ensure that reaching conditions for living a good life in a deurbanized city does not inflict upon the well-being of non-human others at present and in the future. Ultimately, the current tensions in urban centres between humans and nature would mostly disappear because the deurbanized city would constitute a *renaturalized* human settlement: the city would function as a space for healthy nature-culture relations where mutualistic relationships between people, animals, and the land are strengthened.

Though only an initial-stage proposal, the Dumfries design case establishes some deurbanization elements that could expand and become consolidated if the project were to be consolidated. These include urban food gardens and its associated practice of community-supported agriculture. Economic democracy could also take place by developing the local intelligence and allowing a neighborhood's residents to make decisions on how food is to be produced and economic initiatives are going to be developed.

Based on the outlined practices of deurbanized human settlements and their application in the Dumfries case, we argue that these proposals are strongly sustainable for two reasons. The first is that deurbanization views the non-human natural world as equally valuable and necessary for life to flourish, and designs cities accordingly. The second reason is that notions of justice and fair-share, visible in sufficiency, effectiveness and efficiency practices, and replace the imperative of material accumulation and expansion characteristic of contemporary urban settlements.

5. Conclusions

One of the most important and common attitudes promoted for intervention of urban development is adopting sustainable strategies with the intention to respect and safeguard the environment and its relationship within human beings. However, mainstream sustainable interventions adopted in green urbanism often do not consider maintaining the integrity of the natural environment nor integrating social and political dimensions into their proposals.

This paper argued that deurbanization is a strongly sustainable vision for human settlements, specifically cities. It outlined some concepts and practices that are constitutive of deurbanization. These include the development of local intelligence, trust, networks, and learning; community-supported agriculture; urban food gardens; Agroecological Symbiosis; economic democracy; diverse economic practices; food forests; border zones; and sacred sites, among others. These practices embody the principles of strong sustainability, mainly the alignment of human societies with the Earth, the ambition to reach well-being in coexistence and meet inclusive needs, and the integration of sufficiency, effectiveness, and efficiency in the dynamics of human settlements.

Ultimately, the vision of deurbanization is one about valuing both human and non-human life equally and designing human settlements so that all kinds of life are able to flourish. However, as deurbanization is relatively new and certainly unknown to the general population, future research could address this gap by conducting interviews and questionnaires with citizens to find out their attitudes towards de-urbanizing the spaces they live in and changing their lifestyles.

Contributor statement

1. Joshua Hurtado Hurtado - *Supervision, Conceptualisation, Methodology, Writing-Original Draft*
2. Marzia Sangio - *Methodology, Writing-Original Draft, Review & Editing, Visualization*
3. Andres Fernandez - *Writing-Original Draft, Resources*
4. Arta Bytyqi – *Review & Editing, Visualization.*

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