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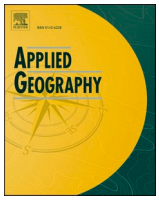

Smart shrinkage solutions? The future of present-day urban regeneration on the inner peripheries of Europe

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1. Introduction

The publication of *No Growth*, Edgar Rust's (1975) seminal study of the urban boom and bust cycle was hardly noticed, at first. Yet, having coincided with the large-scale municipal bankruptcy of New York City in 1975 (Shefter, 1992), that volume has pioneered a brand new strand of social research. The latter has focussed on the growing phenomenon of urban decline, first manifested as out-migration and population loss in cities across Western Europe and North America (Bradbury, Downs, & Small, 1982), before being spotted in Eastern Europe (Barasheva, Leng, Barashev, & Bukhtoyarov, 2021; Mykhnenko & Turok, 2008), East Asia (Iwasaki, 2021; Matanle & Rausch, 2011), and further across the Northern Hemisphere (Oswalt, 2005). Overall, over the past four decades, urban shrinkage has gradually become a major international phenomenon (Oswalt & Rieniets, 2006; Harry W. Richardson & Nam, 2014). Population loss, socio-economic decline or stagnation have had a profound impact on thousands of municipalities across the globe. In Europe alone, according to the most recent study, nine in ten major metropolitan areas lost population in 2020, with as many as 63 out of 100 cities, overall, experiencing population loss today, as the result of the sudden shock of COVID-19 combined with pre-pandemic chronic stressors (Wolff & Mykhnenko, 2023).

At the same time, as Karp, Bagchi-Sen, and Rogerson (2022) and others (Haase, Bernt, Großmann, Mykhnenko, & Rink, 2016) have argued, shrinking cities are often unalike: the variegated nature of urban population decline suggests that urban policy response cannot be developed as a one-size-fits-all regeneration strategy to tackle an allegedly uniform urban crisis (Florida, 2017). To note, urban regeneration (also known as urban revitalisation, renewal, revival, and renaissance) as a metaphor in itself is rather problematic, being infused with the feeling of hope, common in many religious traditions and political ideologies (Furbey, 1999). Urban regeneration is particularly thorny, when accompanied by such normative and loaded attributes as 'success', 'successful', 'smart', or 'solution' (Rogers, Castree, & Kitchin, 2013; Rossi, 2020). For the purpose of this paper, the term will be understood as any attempt aimed at restoring profitability and repopulating a city deemed to be in decline through various strategies targeting 'people', 'business', and 'place' (Turok, 2005). Definitions of urban regeneration success and how it is measured are no less controversial and subject to heated debate (Guimarães, Nunes, Barreira, & Panagopoulos, 2016; Mallach, 2012; Porter & Shaw, 2009). According to Tallon (2013) and others (Holcomb & Beauregard, 1981; Liebmann & Kuder, 2012; Temelova, 2007), in terms of people, regeneration success includes enhanced skills, capacities, and aspirations, enabling urban dwellers to participate in and benefit from opportunities. Regeneration success also includes improved economic competitiveness in terms of business performance, and the creation of more local jobs and prosperity. Finally, to attract both people and business, a market-oriented regeneration policy aims to improve the general appeal and attractiveness of a place (van den Berg, 1999). In theory, people, business, and place elements of urban regeneration combined ought to secure the positive upward trajectory of a city in a long-term and sustainable manner (Cheshire, Nathan, & Overman, 2014; Marra et al., 2016; Niemann & Schadler, 2012; Tallon, 2013). Given the above, the overall rationale of this study is to fill the evident lacunae of different – especially effective – regeneration policies being applied in diverse local and national contexts of urban shrinkage.

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2. Background

2.1. Shrinking cities, left behind places, and levelling up

The original conceptualisations of urban shrinkage in its complexity have ranged from post-Keynesian macroeconomic models of urban and regional cumulative decline (Friedrichs, 1993; Hoekveld, 2012; Richardson, 1978) to various theories of structural and temporal change based around the metaphors of stages, product cycles, and waves (Cheshire & Hay, 1989; Hall & Hay, 1980; van den Berg, 1982). Consequently, the older conceptualisations have been supplanted by a heuristic model of urban shrinkage (Haase, Rink, Grossmann, Bernt, & Mykhnenko, 2014), encompassing both the social *structure* and human *agency* elements of the multi-scalar urban development. According to this widely accepted model, the phenomena of urban shrinkage can be caused by any of the following five exogenous (regional and/or global) drivers, including: i) economic decline (e.g., de-industrialisation), ii) demographic change (e.g., lowest-low fertility), iii) suburbanisation (e.g., the so-called white flight), iv) contentious political change (e.g., wars), and v) natural disasters (e.g., earthquakes and volcanic eruptions). These five drivers of shrinkage are purported to result in a whole series of direct and indirect *negative* consequences for urban development, including population ageing, the underuse of infrastructure, housing vacancies, reinforced segregation, unemployment, disinvestment, tax deficits, and so on.

In reality, various drivers of shrinkage seldom overlap in place and time, and the resultant experience of many shrinking cities contradicts the vicious cycle of decline logic inherent in the heuristic (Martinez-Fernandez, Audirac, Fol, & Cunningham-Sabot, 2012; Rieniets, 2009; Weaver & Holtkamp, 2015). Indeed, a rich body of urban studies literature highlights the diversity of shrinking cities observed in Europe (Alves, Barreira, Guimarães, & Panagopoulos, 2016; Haase et al., 2016; Wolff & Wiechmann, 2018), North America (Hartt, 2018; Ribant & Chen, 2020), and across the world. For instance, in Spain (Fernandez & Hartt, 2021), Japan (Döringer, Uchiyama, Penker, & Kohsaka, 2020; Flüchter, 2012; Lima & Eischeid, 2017), and elsewhere (Pallagst, Fleschurz, Nothof, & Uemura, 2019), local planning cultures have continued to foster physical expansion of cities experiencing population loss. Moreover, shrinking *and* prosperous, economically growing cities of all sizes can be found in abundance across as diverging geographical political economies as the United States and China (Hartt, 2019; Li & Mykhnenko, 2018).

Understandably, though, the urban regeneration debate primarily concerns shrinking cities and peripheral urban economies suffering from persistent low productivity and low income. These urban policy concerns have become overtly political with the electoral ascendance of radical and populist right-wing politics across Western Europe and North America, culminating in 2016, in the British referendum to exit the European Union and the presidential election of Donald Trump in the USA. Many political scientists and economic geographers have declared the so-called *left behind* – older, working-class, poorly-educated white voters and the areas they populate – as the primary explanatory variable driving this "radical-right revolt", also known as a "revenge of the places that don't matter" (Dijkstra, Poelman, & Rodríguez-Pose, 2020; Ford & Goodwin, 2014; Goodwin & Heath, 2016; Rodríguez-Pose, 2018; Tubadji & Nijkamp, 2019). Whilst some have stressed this phenomenon was primarily a right-wing protest vote against the liberal-left metropolitan elites and the cultural values associated with them, others have firmly put the blame on globalisation and free-market economic policies, claiming the poorest left behind rallied against prolonged economic abandonment and social injustice (Doane, 2016; Elliott, 2016; MacLeod & Jones, 2018). The latter hypothesis has been widely contested by in-depth, evidence-based research (Abreu & Öner, 2020; Antonucci, Horvath, Kutiyski, & Krouwel, 2017; Crescenzi, Di Cataldo, & Giua, 2020; Daniel Dorling & Tomlinson, 2019; Danny Dorling, 2018; Gordon, 2018). Nonetheless, the attention of the mass media and politicians across the West have firmly zoomed in on the "Left Behind: How to Help Places Hurt by Globalisation" (Anon, 2017).

A flurry of national and supra-national strategies for 'left-behind places' and 'forgotten towns' has followed, some of which included explicit blueprints for countering the 'geography of discontent' (European Commission, 2022; Sandbu, 2020; Skelton, 2019; Venables, 2021). Most commentators have agreed that the scale and nature of the economic policy challenge of levelling up left behind places are mammoth (Martin, Gardiner, Pike, Sunley, & Tyler, 2021). There has been no consensus, however, as to what the most effective levelling up policy on offer is – place-based, people-centred, or, even, *laissez-faire* (Beer, McKenzie, Blažek, Sotarauta, & Ayres, 2020; Grover, Lall, & Maloney, 2022; Leunig & Swaffield, 2007; McCann, 2016; Mykhnenko & Wolff, 2019; Rodríguez-Pose & Ketterer, 2020). What is clear is that questions of place and the state of the place in which people live are crucial to both an individual sense of wellbeing and electoral behaviour (Tomaney & Pike, 2020).

2.2. Positionality and research practice

Despite undoubtedly good intentions of the people involved in the academic and policy debates on inner peripheries and left-behind places, one cannot fail to notice a few controversial underlying assumptions, particularly evident in the mass-media representation of shrinking cities. To an outsider, it may appear as if the urban areas concerned over the past forty years have done nothing but wallowed in self-pity, unwilling to adjust to the colossal structural changes happening all around them, all the while desperately awaiting paternalistic guidance from above (Domokos, 2018). Often, the heavy structuralist and/or radical Marxist thinking permeating this debate denies left-behind places their agency. The current discussion on levelling up left-behind places in the Anglo-American literature also presupposes a near total – market, state, and governance – failure of whatever regeneration effort these cities might have attempted. On many an occasion, the noise of sympathetic policy advice seems to have drown the voice of left-behind places themselves. Furthermore, the emerging literature on the left-behind places has so far ignored most of what has been done already about the problem by the shrinking cities themselves, despite many rich case- and comparative studies on offer (Aalbers & Bernt, 2019; Bernt, 2009; Han, Mykhnenko, Peng, & Mi, 2022; Hartt, 2021; Li, Hui, Long, Chen, & Lang, 2021; Mallach, 2012; Ryan, 2012; Sousa & Pinho, 2015; Zhou, Koutský, & Hollander, 2022). Yet, as one angry letter to a major national daily newspaper has pointed out, the left behind "do not wish to be pigeonholed as victims and deserving of sympathy" (Culley, 2021).

In this context, building upon the work of Audirac (2018), Beauregard (1993), and Wacquant, Slater, and Pereira (2014), one ought to raise the question of whether the terms like the 'left behind', 'places that don't matter', 'shrinking cities', and 'urban shrinkage' might be counterproductive in themselves, socially constructing and reinforcing spatial and territorial stigma, and being increasingly at odds with the declared aims of progressive community development. Thus, the broader purpose of this study is to confront some of the misrepresentations and stigmatisations of the cities mentioned above, and to fill the evident lacunae of positive urban regeneration examples therein.

In so doing, the research aim of this paper is three-fold. First of all, by offering a critical yet sympathetic reflection on their most favoured home-grown solutions to the problem of urban shrinkage, this paper gives voice to shrinking cities and left-behind places. By focussing on seven inner peripheral urban areas across Europe, this paper showcases how cities experiencing long-term population decline could make effective attempts at regeneration. Secondly, this paper pioneers in applying the Urban Futures Method to test the likely performance of the economic, social, cultural, physical, environmental, and governance-related regeneration projects, policies, and interventions uncovered in seven shrinking cities across Europe against a series of possible future

scenarios in the year 2060. By engaging in participatory rather than conventional methodologies, this study shifts the location of power in the research process towards local knowledge and perspectives (Chevalier & Buckles, 2019). Finally, the paper assesses the probability of future success of different approaches to urban regeneration and of different types of urban regeneration policies implemented in Le Havre (France), Łódź (Poland), Maastricht (Netherlands), Porto (Portugal), Stoke-on-Trent (United Kingdom), Timişoara (Romania), and Zonguldak (Turkey) over the past two decades, and, thus, provides a valuable, evidence-based evaluation of complex activities designed to improve the long-term condition of shrinking cities.

In the following section, I describe this paper's empirical and ethical foundations, fieldwork materials, data, and the participatory research methodology. Consequently, I present the results of the study, including 22 regeneration projects discovered during 36 months of collective fieldwork on which the paper is based. Finally, I analyse the probability of these projects' long-term future success, providing the necessary breakdown by city, type of intervention, and urban regeneration approach undertaken. In conclusion, this study offers a number of avenues for future participatory action research and urgent changes to the policy, practice and process of urban regeneration and levelling up, in the context of population decline. It is contended that what is required for urban regeneration to succeed is to empower shrinking cities to be bold, creative and experimental, and to avoid obstructing locally-produced ideas or derailing home-grown initiatives.

3. Data and methodology

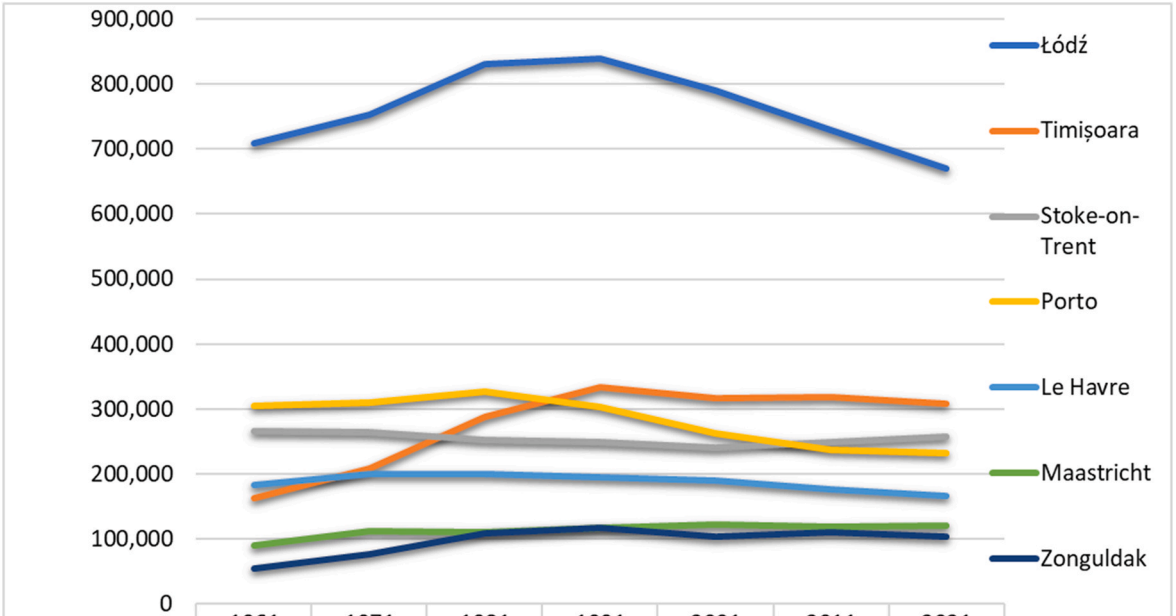
This paper is the outcome of *Smart Shrinkage Solutions: Fostering Resilient Cities in Inner Peripheries of Europe (3S RECIPE)* – an international research consortium, compising a *trans*-disciplinary group of well over 20 human geographers, urban planners, civil engineers, city sociologists, and creative artists. During its duration (2017–2020), the project had targeted the key three chronic stress-type socio-economic causes of urban shrinkage – deindustrialsiation, suburbanisation, and demographic decline – searching for feasible sustainability actions in urban regeneration, which could enhance the role of long-term strategic spatial planning. With the explicit intention to ensure the relevance of today's actions in the future, *3S RECIPE* was based on the co-production of urban regenaration practices in close regular collaboration with local stakeholders (Mykhnenko, Bontje, et al., 2021).

3.1. The comparative methodology

Urban policy and practice evidence for this paper was gathered over 36 months of fieldwork activities in seven shrinking cities on the inner peripheries of Europe, including Le Havre in France (FR), Maastricht in the Netherlands (NL), Łódź in Poland (PL), Porto in Portugal (PT), Timişoara in Romania (RO), Zonguldak in Turkey (TR), and Stoke-on-Trent in the United Kingdom (UK; see Fig. 1). The comparative perspective was chosen as a basis for examining patterns of similarities and differences because of a number of inherited structural commonalities between these cities such as the high concentration of ceramics, coal mining, textile manufacturing, and other labour-intensive industries, including once commercially successful deep harbour ports. Averaging at 250,000 inhabitants, overall, these shrinking cities differ in size, ranging from Łódź, with 671,000 inhabitants, to Zonguldak, with 103,000 inhabitants (see Fig. 2). Nonetheless, all seven cities are situated either on the geographical periphery (e.g., Porto, Le Havre, Maastricht, Timişoara, Zonguldak), or in close proximity to much more powerful centres of economic growth and cultural vibrancy, having to exist in the growth shadow – on the inner periphery – of regional, national, and global developmental trends (ESPON et al., 2013; Pike et al., 2016). For example, Stoke-on-Trent is 72 km (45 miles) equidistant from Birmingham and Manchester, Britain's two largest metropolitan areas outside of London, whilst Łódź is located just 140 km (87 miles) away from Poland's capital city of Warsaw.

Historically, these cities have struggled to stabilise or recover from significant population losses sustained over two to five decades, which were caused by the chronic stresses of (i) economic restructuring, when work has shifted away from labour-intensive industries and the manual handling of goods; (ii) natural demographic decline; and (iii) suburbanisation, with its impact on the inner-city living environment (for more details about these cities, see Bellandi, De Propris, & Santini, 2018, Boom & Mommaas, 2009, Hoekveld & Bontje, 2016, Turşie, 2017, Martinez-Fernandez, Kubo, Noya, & Weyman, 2012, Pallagst, Bontje, Cunningham-Sabot, & Fleschurz, 2022, Voiculescu & Jucu, 2016, Walker, 1993, Özatağan & Eraydin, 2020). Thus, within the remit of comparative methodology, this study employs the "most similar systems design", where a number of theoretically significant differences found among similar social systems can be used in explanation for potentially divergent outcomes (Przeworski & Teune, 1970; Ragin, 2014).

Fig. 1. Seven shrinking cities on the inner peripheries of Europe: a map of data collection.



	1961	1971	1981	1991	2001	2011	2021
Łódź	709,700	752,700	830,800	838,367	789,318	728,892	670,642
Timișoara	162,931	209,454	287,543	334,115	317,660	319,279	308,500
Stoke-on-Trent	265,800	263,610	252,300	249,400	240,400	248,719	258,369
Porto	305,445	310,437	327,368	302,472	263,131	237,591	231,800
Le Havre	183,776	199,509	199,388	195,854	190,905	176,059	165,830
Maastricht	91,157	112,465	110,232	117,417	122,163	119,664	121,151
Zonguldak	54,010	77,135	109,044	117,975	104,276	110,043	103,079

Fig. 2. Seven shrinking cities on the inner peripheries of Europe: population trajectories, 1961–2021.

3.2. Participatory action research in a transdisciplinary context: the Urban Futures Method

The comparative research outlook adopted in this paper is reinforced by a participatory, action-focussed, local priorities-driven approach to the qualitative data collection (Chevalier & Buckles, 2019; Cornwall & Jewkes, 1995). In contrast with conventional research, which prioritises disciplinary conventions, analytical objectivity, and scientific truth, participatory action research (PAR) methodologies are aimed at achieving the empowerment of those involved via mutual learning, where data collection, interpretation, and analysis is carried out by local participants, utilising local knowledge, concepts, and frameworks, cognizant of the nature of their environment, and where the presentation of findings is locally accessible, useful to action, and integral to the process. As stressed by many proponents (Bennett, 2019), the ultimate goal of PAR is the improvement of the lives of the people involved, with the core beneficiaries of the research being the members of the community itself, rather than academics: "Affirming that people's own knowledge is valuable, [PAR] approaches regard people as agents rather than objects: capable of analysing their own situations and designing their own solutions. A central thread which runs through these approaches is an emphasis on changing the role of the researcher from director to facilitator and catalyst" (Cornwall & Jewkes, 1995, p. 1670).

Public participation in this scientific research was deliberately designed through a *collaborative* framework, one of the five typical models of PAR (Cargo & Mercer, 2008; Shirk et al., 2012). The project was generally conceived by academic researchers, operating within the usual constraints and limitations associated with external grant funding, and for which members of the public provide data, but also help refine project design, analyse data, and disseminate findings. Effectively, each of the seven cities – through their local stakeholders – were asked to put forward, debate, and decide on what *they* considered to be the 'best' local intervention, policy, project, or other type of urban regeneration action taken or implemented in the city between 2000 and 2020, within each of the three following policy domains:

(a) Local economy and municipal finance: initiatives for achieving a resilient urban economy and a sustainable municipal fiscal base;
(b) Compact and connected city: improvements in connectivity and accessibility, and schemes aimed at combating urban sprawl, increasing density, fostering agglomeration economies, and creating a compact built environment; and
(c) Liveability: projects and policy instruments for generating attractive and engaging urban neighbourhoods, creating a better quality of life, and establishing affordable and sustainable housing markets.

Pursing PAR in this context has meant arranging, advertising, and guiding 4 half- to full-day inclusive workshops in each of the seven cities, resulting in 28 workshops carried out between May 2017 and March 2020, in total. Both openly advertised and personally invited, the participation of local stakeholders has included city councillors, municipal executive officers, provincial governors, entrepreneurs, business associations, charities, trade unions, and other civil society organisations, urban planners and practitioneers, activists, artists, academics, faith community leaders, and many others. The first series of workshops were pilots, whereas the other three rounds focussed on each of the above-mentioned policy domains, respectively.

The data collection, analysis, and interpretation process was conducted through the applied social research adaptation of the *Urban*

Futures (UF) method, developed in the 2010s by a *trans*-disciplinary collective of civil engineers, urban planners, and geographers from the Universities of Birmingham, Birmingham City, Coventry, Exeter, and Lancaster (Hunt, Rogers, & Jefferson, 2013; Lombardi, Leach, Rogers, & Aston, 2012; Rogers & Hunt, 2019; Rogers, Lombardi, Leach, & Cooper, 2012). During a typical UF method-based workshop, the participants are asked to follow five consequential steps: 1) to identify urban regeneration solutions successfully implemented in their city and to list their intended benefits; 2) to recognise the necessary conditions, which need to be in place for the benefits to occur; 3) to determine the performance of the necessary conditions in the future; 4) to verify the resilience of the urban regeneration solution-benefit pairs to future change; and 5) to decide on whether the implemented solution is robust, vulnerable (but feasible), or unimplementable in the present form, thus, requiring an adaptation or an alternative solution to be found.

3.3. Future-proofing urban regeneration: accuracy and limitations

The UF method-based future-proofing is centred on four archetypes of the future (see Fig. 3), which were distilled from well over 450 futuristic scenarios appearing in the literature over the past few decades (Hunt et al., 2012; Hunt et al., 2013). The first scenario – New Sustainability Paradigm – describes a society based on equality and driven by a profound behavioural change towards sustainable development and preservation of the earth's resources at the expense of economic growth. The second scenario – Policy Reform – is a society, where the state promotes economic growth but imposes a much more equitable distribution of resources and a more environmentally sustainable way of living via comprehensive intervention and regulation. In the third scenario – Market Forces – competitive, open global markets prioritise economic growth and drive societal development in a laissez-faire fashion, responding to demands and wishes of mass consumerism. The fourth scenario – Fortress World – depicts a future, where rich and powerful elites own and control the world's resources, and are able to protect their enclaves of prosperity from the impoverished masses by fully utilising the state apparatus of coercion and violence.

To stress, the UF Method does not assess the current viability of the solution to deliver urban regeneration benefits today, as its performance is strongly context dependent. Nor does it define city regeneration priorities, which form part of the local context. The task of deciding about what presently works in a particular shrinking city is fully entrusted to the local stakeholders. Here lies the main limitation of the method itself – both the quantity and the quality of the data gathered are very sensitive to the people present in the room, with larger size and more diverse groups of the workshop participants, and more inclusiveness in the selection-invitation-advertising processes securing more reliable evidence to be collected. What the UF Method does best is verifying the resilience of a certain urban regeneration solution-benefit pair to future change, helping to decide on whether the proposed solution is robust, vulnerable but feasible, or unimplementable in its present form. For example, Table 1 demonstrates a test of the future performance of the necessary conditions underpinning the success of *Üzülmez Cultural Valley* – a regeneration project re-cycling Zonguldak's industrial heritage and re-purposing a coal-mining brownfield site as a hub for creative arts (Mykhnenko, Özatağan, & Eraydin, 2021) (see also Supplementary Files).

To quantify the resilience of individual urban regeneration solutions to future change and assist with basic probability analysis, the value of 0.0 was assigned to the necessary condition highly *un*likely to continue in the future (coloured red in the grid, see Table 1); the value of 0.5 was assigned to the condition being at risk in the future (coloured amber); and the value of 1.0 was assigned to the necessary condition that is highly likely to continue in the future (coloured green). The resilience formula developed here defines the likelihood of the solution to deliver its intended benefits in the future. The formula to calculate the probability of the solution to perform well in the future is equivalent to the ratio of the sum of existing necessary conditions to the total number of all potential necessary conditions highly likely to continue in all the four future scenarios. Whilst probabilities always range between 0 and 1, the general resilience formula can be expressed as: resilience = number of necessary conditions occurring/total number of highly likely necessary conditions possible, expressed in percentage terms. To achieve a 100% resilience to future change, an urban regeneration solution-benefit pair, that depends on a single necessary condition, have to ensure high likelihood of the necessary condition continuing in each of the four alternative urban futures. In the case of *Üzülmez Cultural Valley* (see Table 1), the sum of the necessary conditions present equals 8.5 out of 16 possible (4 conditions x 2 highly likely x 4 alternative urban futures), thus, producing a 53.125% probability for this solution to continue delivering its benefits in any future eventuality. Analogous tests were carried out for all the 22 urban regeneration projects concerned, resulting with the average future resilience score of 56.99%, in total. The results presented in the next section were rounded up to whole percentages to avoid suggesting a level of accuracy and specificity that is unwarranted by such qualitative measurement.

4. Results

4.1. Twenty-two chosen projects to revive shrinking cities

This study has discovered literally hundreds of initiatives and interventions which the local stakeholders in the seven cities have put forward for further discussion amongst themselves, and, eventually voted down to the most popular single example in each of the three policy realms. To reiterate, in line with the PAR philosophy and the UF Method applied, the judgement on what constitutes urban regeneration success in each city was entrusted to the local residents, rather than being imposed on by the outsiders, i.e., academic researchers in charge of the project's UF workshops. Addressing the first urban regeneration question – how a shrinking city can (re-)build a growing economy, with a sound municipal fiscal base – the research participants in Le Havre have selected *Le Havre Développement*, a new public-private economic development agency tasked with co-ordinating and integrating regeneration efforts in the city-region (Dubeaux, Cunningham Sabot, & Mykhnenko, 2020a). In Łódź, the local stakeholders have decided on *The Integrated Development Strategy for Łódź 2020+*, a three-pillared comprehensive regeneration plan for the city's economy and infrastructure, society and culture, and space and environment (Ogrodowczyk, Pielesiak, Marcińczak, & Mykhnenko, 2020). In both Maastricht and Zonguldak, the local stakeholders have stressed the role of the higher education institutions, praising the expansion of the two local universities, respectively, for either dampening population decline or mitigating its negative impact (Hochstenbach, Bontje, & Mykhnenko, 2020a; Nadolu, Dincă, Lucheş, Raceanu, & Mykhnenko, 2020a). In Porto, the local stakeholders have chosen the renovation and conversion of two traditional indoors farmers' markets into modern multifunctional consumption spaces centred on gourmet food courts and fresh local produce (Sousa, Rodríguez-Barcón, & Mykhnenko, 2020a). In Stoke-on-Trent, it is *Smithfield* – a mixed-used central business district real estate development – that was chosen as the top initiative in this policy realm (Mykhnenko & Badyina, 2020a). In Timişoara, the research participants have hailed the city's attractiveness to greenfield foreign direct investment and clustering of export-orientated manufacturing plants as the key economic regeneration tool (Nadolu et al., 2020a).

Responding to the second urban regeneration question as to how a shrinking city can create a more compact and connected urban environment for their remaining inhabitants, the stakeholders in Le Havre have selected the redevelopment of sea port-related brownfield sites into a new mixed-use city quarter at *Dumont D'urville* (Dubeaux, Cunningham Sabot, & Mykhnenko, 2020b). Similar type brownfield regeneration projects, albeit on a far larger scale, were also chosen in Zonguldak, where the derelict coal-shipping port facilities and adjacent areas have

New Sustainability Paradigm (NSP)

Key driver: Equity and sustainability

Settlement pattern

Description

An ethos of 'one planet living' facilitates a shared vision for more sustainable living and a much improved quality of life. New socio-economic arrangements result in changes to the character of urban industrial civilisation. Local is valued but global links also play a role. A sustainable and more equitable future is emerging from new values, a revised model of development and the active engagement of civil society.

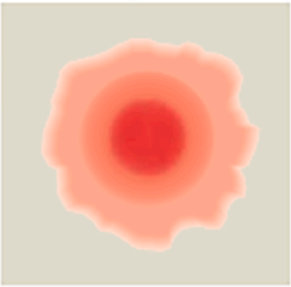
Philosophy

The worldview of the *New Sustainability Paradigm* has few historical precedents, although John Stuart Mill, the nineteenth century political economist, was prescient in theorising a post-industrial and post-scarcity social arrangement based on human development rather than material acquisition (Mill, 1848).

Policy Reform (PR)

Key driver: Economic growth with greater equity

Settlement pattern



Description

Policy Reform depends on comprehensive and coordinated government action for poverty reduction and environmental sustainability, negating trends toward high inequity. The values of consumerism and individualism persist, creating a tension with policies that prioritise sustainability.

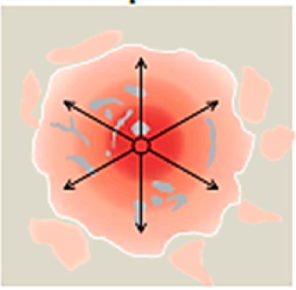
Philosophy

In *Policy Reform*, the belief is that markets require strong policy guidance to address inherent tendencies toward economic crisis, social conflict and environmental degradation. John Maynard Keynes, influenced by the Great Depression, is an important predecessor of those who hold that it is necessary to manage capitalism in order to temper its crises (Keynes, 1936).

Market Forces (MF)

Key driver: Competitive, open global markets

Settlement pattern



Description

Market Forces relies on the self-correcting logic of competitive markets. Current demographic, economic, environmental, and technological trends unfold without major surprise. Competitive, open and integrated markets drive world development. Social and environmental concerns are secondary.

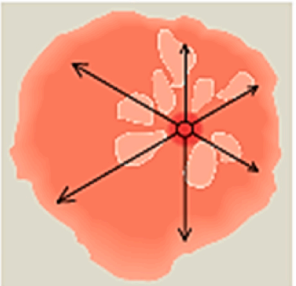
Philosophy

The *Market Forces* bias is one of market optimism, the faith that the hidden hand of well-functioning markets is the key to resolving social, economic and environmental problems. An important philosophic antecedent is Adam Smith (1776), while contemporary representatives include many neo-classical economists and free market enthusiasts.

Fortress World (FW)

Key driver: Protection and control of resources

Settlement pattern



Description

Powerful individuals, groups and organisations develop an authoritarian response to the threats of resource scarcity and social breakdown by forming alliances to protect their own interests. Security and defensibility of resources are paramount for these privileged rich elites. An impoverished majority exists outside the fortress. Policy and regulation exist but enforcement may be limited. Armed forces act to impose order, protect the environment and prevent a societal collapse.

Philosophy

The *Fortress World* mindset was foreshadowed by the philosophy of Thomas Hobbes (1651), who held a pessimistic view of the nature of man and saw the need for powerful leadership. While it is rare to find modern Hobbesians, many people believe, in their resignation and anguish, that some kind of a *Fortress World* is the logical outcome of the unattended social polarisation and environmental degradation they observe.

Fig. 3. A summary of the four *Urban Futures* methodological scenarios. Note: Based on Lombardi et al. (2012): 23.

Table 1
Determining the performance of the necessary conditions in the future: *Üzülmez* Cultural Valley, Zonguldak, circa 2060.

Necessary Conditions	New Sustainability Paradigm	Policy Reform	Market Forces	Fortress World
Institutional co-ordination between central and local governments, and collaborative work between relevant public sector institutions and NGOs	Collaborative work, co-production, and co-ordination of sustainable urban development initiatives aimed at repurposing industrial heritage is part of the everyday toolbox of participatory planning and active community engagement	The importance of co-ordination between different central government bodies is recognised in policies. However, central government actors still dominate new urban development and regeneration projects and could override local concerns and ignore local voices	High deregulation of planning policy hinders government co-ordination attempts. Market drivers dominate new urban development and regeneration projects, side-lining public bodies and local communities	The fortress world is highly fragmented and segregated to allow for cross-boundary collaboration. The rich will protect access to arts and cultural facilities for private use. The poor have no voice in decision-making
Adequate **public funding** by the central government	Post-industrial rehabilitation is highly valued, with local community engagement ensuring cost-effective use of public funds. However, small local authorities and individual volunteers have to rely on external financial backing even for a medium-scale project, potentially competing with numerous other sustainable urban development initiatives	Long-term investment into urban infrastructure and services is publicly funded and supported by policy to boost demand, accelerate economic growth, and help maintain party-political support	Public infrastructure investment is limited due to strong budgetary constraints. Almost no public investment is made available to small peripheral cities. Market forces may play an active role in urban regeneration based on re-use of industrial heritage, if the private sector considers such projects commercially viable	All investment is poured into prime 'winner' locations and sucked out of struggling urban areas. The rich have no interest in celebrating industrial heritage and the working-class history. Poor communities chronically lack even the most basic of local amenities. None are provided by the state
High quality architectural design with attractive features for different user groups	Building standards and construction practices conform to high spatial and ecological design requirements. Locally sourced materials are prioritised	Redevelopments are driven to enhance the urban quality of life and retain residents. However, municipal planning policies force the issue of generic, basic standard provision, with people having to choose whether to use them. Only some community needs for arts and culture amenities are met	There is no policy enforcing or supporting the promotion of better spatial and ecological design and/or higher environmental standards. Market may demand it, nonetheless, for commercially attractive developments	Strong enforcement of policy that supports better design and higher environmental standards for the rich. For the poor, many buildings and spaces are very run-down and unsafe, due to poor design and lack of maintenance
Timely **project delivery and good management** of the area of intervention	Local community members effectively manage and maintain public spaces, buildings, and shared facilities. However, smaller communities may lack sufficient municipal resources even for a medium-scale investment and have to rely on central government grants, and on charitable donations and voluntary contributions from the outside to deliver such projects. This could lead to frequent delays in the project's completion.	Existence of planning policies to ensure management and maintenance of open public spaces and shared facilities. Yet a state interventionist approach may suffer from frequent discontinuities and serious changes in government direction, leading to intermittent funding and a high degree of turnover of senior management	Private-led management is based on willingness to pay, hence, a modern arts gallery or high-end museum might be well maintained, depending on the fee-paying strength of its customer base	The rich support management and maintenance of their spaces and buildings; for the poor, many buildings and spaces are unsafe due to poor design and limited/no resources for management and maintenance

Key: condition highly unlikely to continue in the future; condition is at risk in the future; condition highly likely to continue in the future

been transformed into a long coastal area recreation zone (Özatağan, Eraydin, & Mykhnenko, 2021), and in Timişoara, where large post-communist city centre brownfield sites have been redeveloped as high-quality retail, hospitality, and entertainment hotspots (Nadolu, Dincă, Lucheş, Raceanu, & Mykhnenko, 2020b). In Łódź, the 10-year *Plan for the Sustainable Development of Public Transport* was selected as the city's most significant effort in strengthening the priority of public transport over private, including the expansion of bus, tram, and railway networks (Pielesiak, Ogrodowczyk, Marcińczak, Bartosiewicz, & Mykhnenko, 2020). Similarly, in Porto, the local stakeholders have chosen the construction and further expansion of *Metro do Porto* – the city-region's light rail network – as the most successful project in this policy realm (Sousa, Rodríguez-Barcón, & Mykhnenko, 2020b). In Maastricht, *Meer stad, meer land* ("More city, more country") – a programme of increasing density in city-centre neighbourhoods, while preserving the surrounding leafy communities further in the countryside – has received most votes by the local workshop's participants (Hochstenbach, Bontje, & Mykhnenko, 2020b). In Stoke-on-Trent, the title of the most popular intervention was shared between (i) a major road infrastructure upgrade on A50/A500, including a public transport interchange (Mykhnenko & Badyina, 2020b), and (ii) the creation of a distinct *University Quarter*, formed around the central campus of Staffordshire University (Mykhnenko & Badyina, 2020c).

With regard to the third regeneration question concerning urban liveability and city attractiveness – the Le Havre stakeholders have chosen the revival of local small independent shops on the high street, *rue de Paris*, *Quartier Perret* (Dubeaux, Cunningham Sabot, & Mykhnenko, 2020c). In Łódź and Porto, the local stakeholders have highlighted major public renovation and modernisation programmes aimed at up-grading housing, transport, and infrastructure in deprived and rundown parts of these cities, including *The Urban Renewal Programme for Łódź 2026+* (Pielesiak, Ogrodowczyk, Marcińczak, & Mykhnenko, 2020) and the 2021 *Porto Municipal Master Plan* (Sousa, Rodríguez-Barcón, & Mykhnenko, 2020c). The Maastricht stakeholders have prioritised the municipal policy of social mixing in disadvantaged neighbourhoods, creating more balanced communities by targeting the pockets of multiple deprivation (Hochstenbach, Bontje, & Mykhnenko, 2020c). In Stoke-on-Trent and Zonguldak, the research participants have focussed on re-purposing rich industrial heritage – pottery and coal-mining – and regenerating the legacy brownfield sites, *Spode* Works and *Üzülmez* Colliery, respectively, as spaces for creative arts' design, production, and consumption (Mykhnenko & Badyina, 2020d; Mykhnenko, Özatağan, & Eraydin, 2021).

4.2. Future-proofing 'smart shrinkage solutions'

A crucial part of the UF research process has focussed on the resilience of 'smart shrinkage solutions' – 22 individual urban regeneration initiatives being implemented in seven shrinking cities – to future change. Table 2 lists the individual probability scores calculated for each project, rounded to the nearest ones place. In turn, Table 3 groups the results by types and approaches to urban regeneration. In terms of the individual city performance, Łódź, with 69%, in total, and Le Havre (57%) have achieved the highest – and above average – scores across the board; the other five cities have lagged well behind, with Stoke-on-Trent coming last, with 54%, in terms of long-term sustainability and future resilience of its current regeneration projects (see also Supplementary Files).

Dividing the 22 projects by their adopted approach to urban regeneration as either targeting (a) people, (b) places, or (c) businesses and organisations, the findings reveal business and organisation-orientated projects to be the most resilient to future changes (at 60%, on average), followed by place-orientated projects (58%), with people-orientated projects demonstrating below average outcomes (54%). In terms of different dimensions to urban regeneration, the projects aiming at economic improvements appear to be the most resilient (at 62%), closely followed by governance-related interventions (60%), and physical and environmental projects (58%). At the same time, social and cultural projects have been found to be the least resilient, with the below average value of 54%, in total.

Table 2
Projects adopted by the seven shrinking cities in 2000–2020 and their resilience to future change *c.* 2060, based on probability analysis (%, rounded to the nearest ones place).

City	Policy realm: the target of interventions	Resilience to future change
Resilient urban economy & municipal finance		***60%, in total, of which:***
Le Havre (FRA)	*Le Havre Développement* (LHD): an integrated co-ordination mechanism for economic regeneration	63%
Łódź (POL)	*The Integrated Development Strategy for Łódź 2020+* : a public policy	68%
Maastricht (NLD)	Expansion of the University of Maastricht	60%
Porto (PRT)	Renovation of traditional indoors farmers' markets (*Bom Sucesso* and *Bolhão*)	60%
Stoke-on-Trent (GBR)	*Smithfield*: a central business district development in Hanley	58%
Timişoara (ROM)	A region-wide foreign direct investment-driven growth strategy	62%
Zonguldak (TUR)	Expansion of *Zonguldak Bülent Ecevit University*	53%
Compact and connected city		***56%, in total, of which:***
Le Havre (FRA)	*Dumont D'urville:* a redevelopment of the sea port warehousing site into a new mixed-use city quarter	54%
Łódź (POL)	*The Plan for the Sustainable Development of Public Transport*: a public policy	70%
Maastricht (NLD)	*Meer stad, meer land* [More city, more country, in Dutch]: a public policy creating leafy neighbourhoods	50%
Porto (PRT)	*Metro do Porto*: The Porto Metro Light Rail Network	50%
Stoke-on-Trent (GBR)	The A50/A500 transport corridor: a series of road infrastructure upgrades	53%
Stoke-on-Trent (GBR)	*UniQ*: a distinct university quarter, expanding Staffordshire University	63%
Timişoara (ROM)	Redevelopment of large industrial brownfield sites in the city centre into high-end mixed-use neighbourhoods	50%
Zonguldak (TUR)	The *Harbour (Coastal Area) Recreation Project:* a redevelopment of the sea harbour for leisure and tourism	55%
Urban liveability and attractiveness		***55%, in total, of which:***
Le Havre (FRA)	*Rue de Paris, Quartier Perret*: regeneration of local independent shops and city centre retail on the high street	55%
Łódź (POL)	*The Urban Renewal Programme for Łódź 2026+* : a public policy	69%
Maastricht (NLD)	Mixing socially disadvantaged neighbourhoods to create more balanced, mixed income-level communities	48%
Porto (PRT)	Urban rehabilitation area projects in *Corujeira* and *Azevedo*, as part of the *2021 Porto Municipal Master Plan*	58%
Stoke-on-Trent (GBR)	*Spode Works*: repurposing an industrial brownfield site into a creative arts venue, design workshops & studios	46%
Timişoara (ROM)	*Smart City Timişoara*: a digital platform, modernising the access to and usage of local public services	57%
Zonguldak (TUR)	*Üzülmez Culture Valley*: repurposing a coal-mining brownfield into a creative arts venue, workshops & studios	53%
TOTAL	**22 smart shrinkage solutions: urban regeneration projects, policies, and interventions across 7 cities**	**57%**

Table 3
Classification of projects adopted by the seven shrinking cities in 2000–2020 by approach to urban regeneration, and their resilience to future change *c.* 2060, based on probability analysis (%, rounded to the nearest ones place).

Type by orientation	No of projects & resilience to future change	Type by dimension	Concerns	No of projects & resilience to future change
People	6, at 54% on average	Social/cultural	Quality of life, health, education, crime, housing, quality of public services	6, at 54% on average
Business/ Organisation	3, at 60% on average	Economic	Job creation, income, employment, skills, employability, development	1, at 62%
		Governance	Nature of local decision-making, engagement of local community, involvement of other groups, style of leadership	2, at 60% on average
Place	13, at 58% on average	Physical/ environmental	Infrastructure, built and natural environment, transport and communications	13, at 58% on average

5. Discussion and conclusions

Often, a discussion about the fate of shrinking cities and left-behind places conjures up images of ghostly, dilapidated ex-industrial buildings, and a continuous outflow of young(er) working age people. Given the economic legacy of heavy industries and maritime shipping, such images exist in abundance in the seven cities exhibited here (Mykhnenko, 2021). Nonetheless, in many urban areas, which are widely considered left behind and revolting politically, one finds ample positive examples of regeneration based on local creativity, experimentation, and home-grown initiative. The twenty-two urban regeneration projects designed and implemented in Le Havre, Maastricht, Łódź, Porto, Timișoara, Stoke-on-Trent, and Zonguldak over the past twenty years represent just a fraction of the available novel and tangible solutions to the complex problem of urban shrinkage. To uncover those, scholars and policy-makers have to invest substantial time and effort into extensive and concrete fieldwork in left-behind places themselves. Given that the local context matters, any place-based solution developed as the result has to be firmly grounded in the experience of each of the left-behind places.

The evidence presented in this paper shows that shrinking cities are not mere victims, requiring paternalistic guidance. Despite being left behind ostensibly by either liberal metropolitan elites or neoliberal globalisation, these cities have continuously sought capacities to help themselves in the face of dramatically changing circumstances. Moreover, having considered in detail future changes in society, technology, economy, environment, and policy that the shrinking cities are faced with, the paper has found a 57% probability, overall, of their present-day urban regeneration endeavours delivering benefits in forty years' time. Indeed, only two out of 22 projects have had a below 50% chance of succeeding in the future (see Table 1). Therefore, whilst recognising the heavy structural odds stacked against the left-behind places across the Northern Hemisphere, they must not be patronised and denied agency, particularly by the people intending to make a difference.

In addition, this paper has demonstrated the value of *trans*-disciplinary participatory action research, combined with the methodological innovations of the *Urban Futures* Method, for fostering a research culture built around mutual learning, respect, and community engagement. This study has shown that the UF method can be used throughout the lifetime of an urban regeneration project to assess not only the resilience of the sustainability solutions being put in place, but also of the policies and regeneration programmes that are already in place and functioning. The local stakeholders involved in this research have stressed the merit of incorporating the UF method into their decision-making process for testing both proposed urban regeneration initiatives and those already past the implementation stage. Getting a critical evaluation of a project's realistic probability to survive in the future serves as a valuable check against unabashed boosterism many municipal governments are naturally prone to.

This study has found the urban regeneration initiatives targeting business and economic improvements to be the most resilient to future change, with the people-centred, social and cultural interventions to be the least resilient, on average. And yet the biggest policy lesson emerging from this research lies in the importance of identifying a unique local feature and building one's regeneration efforts on it. *Every successful recipe needs to have a local ingredient: every shrinking city ought to try turning its legacy into an asset that it can re-use, re-cycle, re-work.* At the same time, external actors – regional, national, and supra-national authorities – need to let local stakeholders from the public, private, and civil society sectors to experiment, and to avoid obstructing home-grown ideas or derailing grass-roots regeneration initiatives in progress.

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Appendix A. Supplementary data

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