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SMART SHRINKAGE FOR MYKOLAIV? SUSTAINABLE DEVELOPMENT IN STAGNATING AND SHRINKAGE SCENARIOS

Agim Kërçuku[1*], Dimitris Manoukas[1], Austėja Makarevičiūtė[2], Ilaria Mariotti[1], Federica Rossi[1] and Audrone Sadauskaite[2]

Abstract

In Ukraine, with the Russian invasion that started in 2022 still ongoing, the issue of considering a controlled shrinking strategy has become increasingly urgent when looking at the possible population scenario identified by the Mykolaiv Masterplan. Rather than considering the best-case scenario, we must consider the worst-case and baseline scenarios of demographic change. Planning for stagnation and decline must be prioritised to reduce disparities and enable sustainable development.

This paper presents possible demographic scenarios for Mykolaiv after the war, along with their socio-economic effects. We have chosen the city of Mykolaiv because of its unique characteristics. It has emerged as a crucial defence city for Ukraine since 2014. In light of the Russian invasion of 2022, securing access to Odesa and the wider southern coastline is especially important. Furthermore, Mykolaiv has experienced ongoing demographic shrinkage; exacerbated by the war. Within this context, we map the geography of knowledge produced by smart shrinkage, and reflect on the leading causes, strategies, consequences, contradictions, and opportunities. Our research questions are whether and how these strategies can be applied to the mounting recovery challenges in Mykolaiv.

Keywords:

shrinkage, smart shrinkage, degrowth, post-war, Ukraine, Mykolaiv, scenario analysis

1* agim.kercuku@polimi.it
DAStU-Politecnico di Milano (Italy)
https://orcid.org/0000-0001-6120-825X

2 Visionary Analytics (Lithuania)

1. Introduction

This paper focuses on the city of Mykolaiv, a key urban community in southern Ukraine. It is central to the economic, social, and infrastructural fabric of the Mykolaiv region and the country. It is a naval and shipbuilding hub in the Black Sea. During the Tsarist and Soviet periods, it was a significant military-industrial city; renowned for its grain exports, mechanical engineering, and shipbuilding. It has also served as an important logistical hub because of its rail links, seaport, and river port. Having a high population density of 1,852.4 people per km^2, Mykolaiv has conventionally played the role of the region's industrial centre with shipbuilding, engineering, IT, and food processing having been the main branches that have substantially driven the local economy (UNECE, 2023). However, similar to many cities in Ukraine, Mykolaiv has been deeply influenced by long-term demographic trends and the devastating impacts of the ongoing conflict with Russia. Its population, which in 2021 reached 476,100 residents, has steadily declined over the last two decades due to factors such as an ageing population and low fertility rates; in part also impacted by delayed childbirth (UNECE, 2023). This ongoing demographic shrinkage has been further impacted by the war, and has led to massive displacement and population loss. By the end of 2022, about half of all the city's citizens had managed to flee; reducing the number of residents to between 220,000 and 230,000 people (Rokytna, 2022).

For the future of Mykolaiv within the context of the ongoing war, three demographic scenarios can be distinguished: (i) baseline, (ii) worst-case, and (iii) best-case. The most likely scenario, according to experts, suggests that there will be gradual return of displaced residents, and that this will be driven by an improving security situation and emotional/family ties to the city (Ueffing et al., 2023). However, the long-term population decline trend is expected to continue, following pre-war trends. In the worst-case scenario, further instability and war may crucially undermine any prospect of population recovery; further degrading Mykolaiv's social fabric, and discouraging residents and investors alike. In the best-case scenario, a peace treaty is signed, and integration into the European Union is achieved. Realisation of this scenario may result in economic regeneration that acts as a defence against long-term demographic decline through resident repatriation and an influx of new settlers into the city. These are considered optimistic projections, and given the geopolitical uncertainties of the current situation, the probability of this outcome is low.

All these demographic changes have huge repercussions in the socioeconomic sphere. Casualties, forced migration, and displacement are exacerbating the preexisting demographic challenges faced by Mykolaiv: an ageing population, gender imbalances, and a declining workforce. These factors can, combined, result in increased pressures on social services, health care, and public infrastructure; especially because of the growth, in percentage terms, of the city's older population (Ueffing et al., 2023). Moreover, the war has undermined economic activity in the city which was previously centred around a large and lively industrial base on now disrupted- trade routes and industrial production. However, economic recovery opportunities may exist through infrastructure rebuilding and a restart of industrial activities. This case is likely to be further encouraged especially if the population returns and international aid supports reconstruction efforts.

Many cities in Europe and North America have faced similar challenges, with strategies adopted including, amongst others, "smart shrinkage" and "controlled degrowth". These frameworks deal with population shrinkage by optimising living standards, repurposing vacant land, and creating sustainable environments even when and where populations are shrinking (Hollander & Nemeth, 2011). This paper explores the demographic scenarios and the potential strategies to be followed in the context of Mykolaiv's ongoing conflict and population changes, and suggests a vision for a post-conflict recovery.

The paper is comprised of five main sections. An exploration of existent literature on urban and smart shrinking follows the introduction. The third section then explores Mykolaiv's demographic profile and, in so doing, identifies past and present trends and introduces three scenarios for the future. The fourth section suggests possible socio-economic effects resulting from the demographic scenarios introduced. Thereafter, conclusions and policy implications are proffered.

2. Global views on urban shrinking, planning, and smart shrinkage

The amplified emphasis on urban shrinking in Europe and North America started in the 1990s and has attracted the interest of spatial researchers (Haase et al., 2014). Urban shrinkage denotes the conditions under which demographic decline is accompanied by a decrease in activities. It frequently includes neglect of soils and urbanised spaces, degradation of social capital, and disuse of the built environmental as well as infrastructural legacies (Pallagst et al. 2017).

Today the topic of urban shrinking has been dismissed and overlooked (Pallagst et al. 2017). The term urban shrinkage still potentially carries unambiguous and stigmatised meanings. The topic has dominated disciplinary and public discourses, and has affected many projects, plans, and policies. While some ideas look at cities and their issues through the lens of growth, others attempt to address urban shrinkage by overturning conventional growth models and mobilising terms such as *smart decline* (Hollander 2020) and *less is more* (Oswalt, 2005). Shrinking is not only a cause for sorrow but also a chance to change the ways in which we think about the future development of cities.

The degrowth debate emerged from the social movements of the 1960s and 1970s. The term décroisance was coined by sociologist André Gorz in 1972's Club du Nouvel Observateur in opposition to the growth dogma (Ariès, 2007). Additionally, the report The Limits to Growth triggered additional debate on the topic in the period between DATE and DATE (Burkhart et al. 2020). The concept of décroissance has also gradually spread to other European contexts: decrescita in Italy, degrowth in Anglo-Saxon contexts, decrecimiento in Spain, and Postwachstum in Germany. It has become a social project (Latouche, 2007), a slogan, and a social movement (Burkhart et al. 2020). Degrowth has become an alternative to the capitalist development model and the dominant economic paradigm of continuous growth (Liegey and Nelson, 2020). The concept has also emerged in spatial planning debates in North America (Beauregard, 2003; Ryan, 2012). Smart shrinkage has become an alternative planning model by which to downsize urbanised areas and ensure good quality of life under conditions of shrinkage (Hollander, 2020).

3. Mykolaiv's Demographic profile: past, present, and future scenarios

The city of Mykolaiv is a key urban community in the region of xx. Mykolaiv city has the highest population density within the district and the oblast, with 1852.4 people per km^2 which is 22 times greater than the district's average density and 41 times higher than that of the oblast. The industrial sector of the region, comprising 40% of the area's overall industrial activity, was primarily centred around key areas including engineering, shipbuilding, IT and telecommunications, food processing, and logistics (UNECE, 2023). Within the Mykolaiv region, Mykolaiv city serves as the primary employment place, with over half of the registered employees in the Mykolaiv oblast working in the city (55.2%) (strategic documents prepared by Mykolaiv City Council, 2023).

As per data from Mykolaiv city's municipality[3], Mykolaiv city housed 476,100 residents in 2021. Compared to the earliest available data, the population decreased by around 40.300 individuals, or 7.80%, from 2001 to 2021; a consistent downward trend primarily due to an ageing population, low fertility rates and a rise in the average age of women at first childbirth (UNECE, 2023). The full-scale Russian aggression against Ukraine prompted a significant evacuation in the country as well as Mykolaiv. Apart from numerous casualties, the military operations within Ukraine resulted in a significant number of internally displaced people, mainly in the Western regions. Even though Russian forces were reportedly expelled from the Mykolaiv region as of April 2022 (Ukrinform, 2022), active combat continued in nearby Kherson until November 2022. By the end of 2022 it is estimated that approximately half of the population of the city had fled, reducing the number of inhabitants from around 480,000 to approximately 220-230,000 (Rokytna, 2022). In 2023, there was a gradual return of some residents to Mykolaiv, as well as an influx of displaced people from Kherson. By May 2023, it was estimated that population levels had reached 90% of pre-conflict figures (Visit Ukraine, 2023).

3 2018 Statistical Yearbook of Mykolaiv and 2021 Statistical Yearbook of Mykolaivska region

A recent study on demographic scenarios for the Mykolaiv Masterplan, produced by the authors of this article, highlighted three possible scenarios built using the ARIMA model and then validated through workshops and a Delphi survey with local stakeholders and international demographics experts (see Table 1). The baseline and most likely scenario, assuming a deintensification of war (e.g., frozen conflict) and increased sense of safety would, combined with emotional ties to family connections and cultural identity (EUAA et al., 2022, Alarababa'h, 2020, drive a return of displaced residents in the short-term (Ueffing et al., 2023). Population return in the baseline scenario would also be somewhat driven by a slow and gradual revitalisation of economic supply and demand, including business activity and purchasing power (Kugler et al., 2013, LIUC, 2023), as well as efforts to reconstruct residential buildings and community facilities (EUAA et al., 2022). However, long-term population levels are expected to decline at a similar rate to that observed pre-conflict; driven by ageing population dynamics and further exacerbated by the likely continuation of decreasing foreign investments (LIUC, 2023); key drivers of economic and demographic growth (Kugler et al., 2013, Ueffing et al. 2023).

The worst-case scenario assumes a prolonged war and instability which deeply impacts population dynamics as potential returners and newcomers evaluate the risks of settling in a region marked by instability (EUAA et al. 2022, Belmonte et al. 2023, Ueffing et al., 2023). A prolonged war could continue to disrupt the social fabric of Mykolaiv both in the short and long term and thereby make it difficult for displaced residents to return home and rebuild their lives in their previous cities of residence (Alrababa'h, A. 2020, Al Husein & Wagner 2020, Belmonte et al., 2023). Security risks would likely further deter investors, while also stifling economic growth and reconstruction efforts (Bahar et al., 2019, Ueffing et al., 2023).

The best-case scenario assumed the signing of peace treaty in the immediate future that, all else being equal, would reduce the psychological impact of conflict, qualm fears related to the likely renewal of hostilities, and, combined with strong emotional ties, encourage the return of displaced individuals, as well as attracting new residents (Belmonte et al., 2023, Ueffing et al., 2023). Specifically, the reopening of shipping routes in the Black Sea is likely to provide a critical boost to the local economy, augment trade and commerce, and (re)position Mykolaiv as a developing economic hub; attracting both former residents and new settlers to the area (LIUC, 2023). Under the best-case scenario, Ukraine's integration into the EU would likely drive a revitalisation of the city's economy and demographics. The best-case scenario would evidence a slow but positive growth trend motivated by the stabilised security environment, a revitalised economy, strategic international aid, and the path towards EU integration; a scenario that would help to address and overcome long-standing baseline trends related to ageing and decreasing fertility rates. It should be noted, however, that realisation of optimistic scenario is quite unlikely.

Table 1 – Mykolaiv demographic scenarios

BASELINE SCENARIO	**WORST-CASE SCENARIO**	**BEST-CASE SCENARIO**
Continuation of the conflict on the territory of Ukraine in 2025 and in the first half of 2026, with the establishment of peace in 2027. Perceived safety level in Myokaliv is moderate.	Continuation of the conflict on the territory of Ukraine at least until 2027 with the establishment of peace in 2028. Perceived safety level in Myokaliv is moderately low.	Continuation of the conflict on the territory of Ukraine in 2024 with the establishment of peace in 2025. Perceived safety level in Myokaliv is moderately high.
Results	**Results**	**Results**
In the short term: very slow population growth during the projected ongoing conflict. Rapid growth after the conflict's resolution. Population does not converge to the pre-conflict level.	In the short term: slow population decline during the projected ongoing conflict. Slower growth after the conflict's resolution. Population does not converge to the pre-conflict level.	In the short term: slow population growth during the projected ongoing conflict. Quick growth after the conflict's resolution. Population converges to the pre-conflict level.

4. Potential socioeconomic effects of the demographic scenarios suggested for the Mykolaiv Masterplan

This section advances possible socioeconomic effects that could result from the demographic scenarios discussed in Section 2. These effects were identified based on a literature review and can be divided into the following categories: (i) Economic effects (optimistic or pessimistic scenario); (ii) Sociodemographic effects; and (iii) Effects on public administration.

4.1 Economic Implications: Aspects of Recovery

According to the optimistic scenario, the population's return, (and especially young people of working age as well as those with high levels of education), could stimulate the labour market by filling the labour force that was reduced during the conflict. Existent literature on reconstruction after natural disasters (Skidmore and Toya, 2002) and on post-conflict recovery (e.g., Bozzoli et al., 2011) indicates that while regions may initially see economic declines, they frequently see a phase of increased economic activity in the long run as the rebuilding process gets underway, particularly with regards to regions that enjoy high rates of return. A population rebound may increase demand for consumer products and services, housing, healthcare, and education. By stimulating local businesses and attracting investment, and particularly so in real estate, retail, and service sectors, such increased demand may eventually return economic development to pre-conflict levels.

However, such expansion has its drawbacks including the high initial costs of the conflict and the need to successfully reintegrate the returning population. Furthermore, disruptions in logistics, labour supply, and infrastructure availability may counteract the favourable benefits of population return on economic demand and supply; as highlighted in the study by Mamedov and Denysenko (2023).

In addition, a city's economic revitalisation is highly dependent on international macroeconomic conditions (i.e., foreign demands for goods, global supply chains, availability of foreign capital) and labour supply. Population growth combined with favourable macroeconomic circumstances can boost the labour market by bringing back the workforce that the city needs. A post-conflict economic recovery frequently sees a quick reintegration of returning populations into the labour market, which can give manufacturing, and metallurgy sectors the workforce needed to stimulate industrial growth and innovation, (Kushnirenko et al, 2023; Giacomo et al. 2023). Commenting further, Horoshkova and Sumets (2022) contend that reorganising logistics and placing a strong emphasis on digitalisation will be key components of Ukraine's post-conflict economic development, and will enable it to effectively integrate with European standards and regulations.

After the end of the conflict, Mykolaiv's economy may expand into new economic sectors given its strategic reprioritisation and policy goals, as well as the idea of its becoming a post-industrial metropolis. Specifically, the city's authorities have identified a few important prospective growth sectors: tourism, IT and digital services, and the production of (green) energy. Finally, remittances – money transferred to Mykolaiv by family members living abroad – as well as the savings of the returning population (accumulated, for instance, during their stay in European Union nations) could have positive impacts on issues of economic supply and demand. Savings and remittances can be used locally to raise demand for goods and services, or could alternatively be invested in new projects to encourage entrepreneurship (Bahar et al., 2019).

4.2 Economic Implications: Risks of Decline

Under the pessimistic scenario, unfavourable macroeconomic conditions combined with additional population decline – whether from prolonged displacement or further emigration following the conflict – would have a detrimental impact on economic supply and demand. Commenting upon such scenarios, Bereslavska et al. (2022) claimed that post-conflict population losses typically result in smaller labour forces, lower demand and consumption, and ultimately a general decline in economic activity. Moreover, Kozak (2022) contended that military conflicts can cause supply interruptions linked to logistics and infrastructure, as well as a notable declines in domestic demand. These interruptions may result in reduced export prospects and strained long-term logistics connections (Melnyk & Negoda, 2022). Such economic downturns are likely to result in high rates of inflation and decreased real incomes, as highlighted by Mavrina & Belopolskiy (2023).

The main industries in Mykolaiv, such as manufacturing and logistics, rely heavily on machinery and infrastructure, and much of this has been destroyed. This has had direct impacts on trade routes and supply side issues. It is also the case that this might have disastrous long-term economic effects; especially if combined with low population return rates (KPMG, 2022). Similar situations have frequently occurred in other post-conflict settings. For instance, industrial production fell to about 5% of pre-war levels by the end of the Bosnian War, with almost half (45%) of the country's industrial infrastructure having been destroyed (Effron & O'Brien, 2004).

Population decline combined with an unfavourable security and economic environment could also worsen labour shortages, and make it extremely difficult for manufacturing to sustain output levels (Voth et al., 2022). A declining population could also result in reduced demand for goods produced in the area; affecting the economies of scale that manufacturers depend on to retain their competitive advantage.

Finally, unemployment could become an issue. Husein and Wagner (2023) examined the consequences of the Syrian civil war, and pointed out that 78% of young people were unemployed following the war. High unemployment rates can have negative effects on job options, may a promote criminal activity, and deplete human capital; especially among young people. The UNHCR (2006) reported similar difficulties in the Balkan region, and noted that high unemployment rates and economic stagnation made it difficult for returnees and the remaining population to find work; severely impeding efforts to accelerate economic recovery. A degree of unemployment combined with labour shortages can happen as a result of skills mismatches, but the realisation of such a scenario of extreme high unemployment is improbable in the Ukrainian context given that the nation is already showing signs of recovery.

4.3 Sociodemographic Shifts and Urban Pressures

Within xxx scenario, the pre-conflict trends would be confirmed or even exacerbated: a slow but steady population decline and an ageing society due to low fertility rates and increasing life expectancy, as well as a gender distribution skewed towards women. Conflicts can result in additional age and gender imbalances which are skewed toward older and female populations; a consequence of the nature of war casualties, which are mainly young men (ref). Increasing demand by older adults could put additional burdens on social services and healthcare systems because of the demographic shift. The decline in working-age and young populations could make dependency ratios worse, and make it more difficult to maintain economic productivity and support for dependents (Ueffing et al., 2023).

The process of urbanisation is strictly linked to demographic trends. Indeed, conflicts induce forced migration, and push people to seek refuge in safer urban settings; such as relocating from rural to urban areas. This phenomenon, called 'war urbanisation' by Schulz (2015), brings with it significant challenges and implications for urbanisation patterns, such as pressure on urban infrastructure which may result in congestion, environmental degradation, and challenges in service provision. In addition, it could increase the urban-rural divide, thereby widening disparities in economic opportunities, employment prospects, access to services such as healthcare and education, infrastructure development, and quality of life and socio-cultural aspects more generally (Ueffing et al., 2023). With regard to the case study of Mykolaiv, these effects should be seriously considered since most refugees in the city come either from the nearby Kherson region (heavily affected by direct fighting) or from surrounding rural areas. It follows, that urban planning and new approaches to master planning are crucial to addressing regional development disparities and ensuring inclusive growth.

4.4 Public Administration and Infrastructure Stress

The last category of effects which may result from the demographic scenarios outline is focused on impacts on public administration. One of the most important factors influencing a city's future is the availability of essential social services, such as social housing, healthcare, education, and pensions. With regard to Mykolaiv, 68% of health centres and 53% of educational facilities have been damaged, with 10% experiencing destruction. Deterioration or destruction of infrastructure can also reduce the availability of essential services, including energy supply, sewage, and heat and water supplies. Furthermore, environmental crises may worsen without an efficient solid waste management system. Large amounts of garbage make living conditions unfavourable, and this emphasises the urgency of investment in public infrastructure. However, given limited public budgets, housing restoration, and infrastructure modernisation efforts may take many years

We can also distinguish between two scenarios in this case: an optimistic one, with a growing population; and a pessimistic one, with a shrinking population. In the case of growing population and the linked greater demand for social services, the healthcare, education, pension, and social housing systems will probably be severely strained. Specifically, there may be increases in demand for social housing, which would result in a scarcity of housing options and worsen homelessness. For example, the burden on Syria's already compromised infrastructure was exacerbated by the country's growing population following the conflict (Husein & Wagner, 2020). In addition, the need for basic services such as healthcare and education rises sharply when people move back to their hometowns. However, the economic revival, combined with a growing tax base brought on by population growth, might give the public administration more money to finance reconstruction. Given sufficient financial support – which would also incorporate foreign aid and investment and a clearly defined modernisation plan – public administration may have a strong ability to supply and improve public infrastructure.

A scenario characterised by a shrinking population could lead to inefficiencies and underutilisation of existing infrastructure networks (Hummel & Lux, 2007). Population decline may put pressure on technical infrastructures, especially in low-density population areas, increase operating costs, and make it more difficult to access essential services. Such considerations emphasise the need for strategic planning and investment to ensure the resilience of infrastructure services. Specifically, decline may put a strain on water supply systems. Furthermore, a surplus of housing supply may result in empty premises and contribute to urban deterioration (Hummel & Lux, 2007).

5. Conclusion

This paper has presented possible demographic scenarios for Mykolaiv after the Russian invasion, and then explored the contradictions and opportunities of these processes for urban and regional planning. The three scenarios presented were: (i) the baseline scenario; (ii) the worst-case scenario; (iii) the best-case scenario. The first suggests that a de-intensification of war and an increased sense of safety could drive the return of displaced residents in the short term. This would be driven by a slow and gradual revitalisation of economic supply and demand, including business activity and purchasing power. However, long-term population levels are expected to decline at a similar rate to that observed pre-conflict; driven by ageing population dynamics and decreasing foreign investments. The worst-case scenario assumes prolonged war and instability; factors that would deeply impact population dynamics as potential returnees and newcomers weigh the risks of settling in a region marked by instability. Finally, the best-case scenario suggests the signing of a peace treaty in the immediate future which would reduce the psychological impact of conflict and encourage the return of displaced individuals. However, this optimistic scenario appears quite unlikely at this juncture within the conflict (June 2025).

All three scenarios affect society and demography, issues of the economy, and public administration to different extents. With regards society and demography, the gender distribution would be biased towards women, there would be a slow but persistent population reduction, and an increasingly aged society because of low birth rates and rising life expectancy. Impacts on the economy are related to the post-conflict disruptions to production facilities, trading routes, and supply chains. In addition, international macroeconomic factors and labour supply are critical to the city's economic revival. It should also be noted, that, favourable macroeconomic conditions and population expansion might stimulate the labour market by reviving the workforce. Finally, the impact on public administration could centre upon issues related the availability of essential social services. In contrast, and with regard to population growth (optimistic scenario), the government might have more money to spend on reconstruction, and thus be able to invest further in public infrastructure, and a well-defined modernisation plan.

Planning and adjusting to stagnation and decline must be a top priority if we ignore the best-case scenario, and instead consider the worst-case and baseline-case scenarios where we identified staging and shrinking demographic conditions. With regard to urban shrinking, it is possible to view the decline in population, consumption, and needs in the case of Mykolaiv as clear social advantages. Finally, future research should focus on exploring whether and how Mykolaiv could become an example of a city using degrowth and shrinking techniques to propel operations related to controlled shrinkage and networked compactness.

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