Pandemic urban development is leading us away from nature

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Abstract

Recovery plans in Europe in the COVID-19 pandemic era have stimulated construction-led development, which has eclipsed nature-based agendas in terms of scale, size and policy. One estimate is that only 0.3% of spending on urban infrastructure globally is directed towards various Nature-based Solutions and other ecosystem efforts supporting human well-being. In the future we will urgently need to employ nature-based approaches in crisis management for the power and potential of nature to be fully employed in pursuit of urban recovery. We strongly recommend that nature-based approaches be an explicit requirement to secure funding for future recovery plans.

Keywords: Nature-based solutions; COVID-19 Pandemic; Recovery plan; Sustainable urbanization; Health; Human well-being

1. Introduction

We are living in challenging times. For many, the certainties of yesteryear have faded away and a 'toxic reality' has emerged shaped by gross wealth imbalance, political and social unrest, violent conflicts, hostility towards migrants, species extinction, climate change, diminishing natural capital and a public health crisis. The COVID-19 pandemic, *in primis*, has challenged numerous expectations in terms of sustainable development, and many young people are now afraid for their future (Konle-Seidl and Picarella, 2021). The economic consequences of COVID-19 have been particularly severe and persistent. In Europe alone, employment and total hours worked have declined at the sharpest rates on record. In the Eurozone, 5.2 million fewer persons were employed in the second quarter of 2020 than at the end of 2019 (Anderton et al., 2020). The World Trade Organization estimates that global trade has dropped by about 27%

during the period of the pandemic, whilst the global economic growth rate has decreased to 3% (Wang and Huang, 2021). Furthermore, a number of the United Nation's Sustainable Development Goals (SDGs) have been negatively impacted by the pandemic (Wang and Huang, 2021). In keeping with the economic sector, for instance, SDG 8 – "Decent Work and Economic Growth" was negatively affected as described in "Economic growth derailed" (Wang and Huang, 2021).

Faced with these challenges, the European Union (EU) has responded with a package of initiatives, including the Recovery Plan for Europe (EU, 2022), developed in collaboration with major European governments. The sums involved are truly enormous. On 27 May 2020, the European Commission proposed a massive package of EU financing to support this recovery in addition to the EUR 4.2 trillion advanced by the EU and Member States (EU, 2021a). Furthermore, the European Council agreed on a total funding of EUR 1.8 trillion, bringing together the EUR 750 billion NextGenerationEU instrument and a revised EU budget of EUR 1.074 trillion for the 2021–2027 timeframe (EU, 2021a). The leitmotif of this Recovery Plan for Europe is 'emergency' and the need for speedy recovery actions.

Concurrent with these announcements are policies on a range of 'green' issues. In 2020, the European Commission (EC) announced a transformative policy known as the European Green Deal (EC, 2019), which acknowledges the shift from a linear economy to a circular one and promotes changes in policy frames (Galanakis et al., 2022). This initiative consists of policies which aim to set Europe on the path toward a 'green transition'. Notable actions include an extension of Europe's Natura 2000 programme ~~(Sundseth, 2008)~~, a network of protected areas covering valuable and threatened species and habitats, and a pledge that in delivering the EU Biodiversity Strategy for 2030 at least 3 billion additional trees will be planted in full respect of ecological principles (EC, 2021a). A further hopeful innovation is the arrival of various 'nature-

based approaches' covering both products and services. The International Union for Conservation of Nature (IUCN) has specifically been advocating 'Nature-based Solutions' (NBS), calling them "…actions to protect, sustainably manage, and restore natural and modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits" (IUCN, 2020). In this perspective, the United Nations has advanced the concept of constructing sustainable and resilient buildings using local materials in an indicator for SDG 11, which aims to "Make cities and human settlements inclusive, safe, resilient and sustainable" (Sharma et al., 2021). In 2022, a global definition for NBS was approved at the fifth session of the United Nations Environment Assembly (UN, 2022) – the assembly "decides that nature-based solutions are actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services, resilience and biodiversity benefits."

Given the above pronouncements, an important aspect to consider on a practical note is how NBS can actually assist in recovering from COVID-19's devastating effects on society and the economy, and whether there are any general principles or guidelines for NBS recovery plans. Moving in this direction, we refer to the European Commission, which has drafted a number of documents guiding the implementation of NBS throughout the European territory. For example, the 2030 Biodiversity Strategy, together with the European Green Deal mentioned earlier, are among the main pillars of Europe's growth strategy (EC, 2020) with economic and environmental benefits and by strengthening the territory's resilience. Benefits of the EU Natura 2000 nature protection network, also mentioned, are valued at between EUR 200-300 billion per

year. Investing in nature, such as nature restoration, urban agriculture, and in green and blue infrastructure will generate as many as 500,000 additional jobs (EC, 2020

In addition, several Horizon 2020 and Horizon Europe (R&I) projects have produced principles and guidelines for applying NBS to address socio-economic and environmental challenges. For example, the ongoing CLEARING HOUSE project (2019-2024) seeks to analyse and develop the potential of urban forestry as a NBS to enhance the adaptive capacity and resilience of cities facing major ecological, socio-economic, public health and human wellbeing challenges across Europe and beyond (e.g., China), all achievable by developing guidelines and decision support tools (Davies et al., 2021). Additional guidelines have been established by the World Health Organization (WHO, 2017) for data collection methods to identify and assess the value of NBS for human health and well-being.

In the sphere of scientific publications, propositions for adopting NBS to assist in resolving environmental and societal challenges, such as pandemics, are given in the studies by da Schio et al. (2021), Haase et al. (2021), Derks et al. (2020), Lafortezza and Sanesi (2019), and Kabisch, et al. (2017), to name a few.

The major focus of this communication is to invigorate the nature-based concept for the development of sustainable healthy cities and awaken the scientific and political communities by stimulating an energetic debate globally. We argue that to bring NBS to the frontline for a sustainable urbanisation it is necessary for policymaking to urgently reverse the pandemic-driven, development-led trend and prioritize above others the policies, programmes and projects that have been previously instituted or are in the pipeline that deal with a range of nature-based issues. It is also of paramount importance to design recovery plans that incorporate NBS as a requirement of every urban development programme to offset the consequences of potential socio-economic crises and mounting climate change. Indeed, climate change associated with a

lack of strategic environmental planning, like NBS, at this time of recovery could generate higher future costs than the emergency we are currently facing.

This communication, although focused on the European continent, is addressed to other parts of the world since the issues presented are global, and Europe is certainly not a unique case (Khatri, 2022; Chen and Chi, 2022; Čavoški, 2020; Zhongming et al., 2020). The construction-led planning system, for example, is a global trend, especially in emerging economies with greater income range and social inequalities (Chen and Chi, 2022; Khatri, 2022; Aalbers et al., 2020; Yang and Jin, 2011).

Amidst this backdrop, we illustrate the key example of Italy, which despite having received the largest portion of the EU recovery fund of EUR 191.5 billion (26.5%) (d'Alfonso, 2022), has not placed enough effort toward the adoption of a nature-based approach to contrast conventional urban construction-led development (Davies and Lafortezza, 2017).

2. Construction-led development

Whilst the policy words on 'green issues' are encouraging, there is however an uncomfortable truth in that far from European governments using the COVID-19 recovery plans to move to a greener and more sustainable society, the reverse may actually be true. European Member State governments have seemingly reverted to tried and tested urban construction-led development to propagate employment, even with the private sector, throughout the grey infrastructure supply chain (EU, 2021b; Zhongming et al., 2020). This is considered as leveraging economic activity in the politically volatile blue collar jobs sector and generates significant tax revenues. The latter is required to pay off the colossal budget deficits accrued through COVID-19 intervention measures and quantitative easing (Schwarcz, A., 2022).

Based on the above premises, handling of the recovery from the pandemic crisis in Europe has facilitated an acceleration of inappropriate and unsustainable urban development (EC, 2022). According to the European Construction Industry Federation (FIEC), among the European heavyweights in the housing construction sector, Italy was recorded as a main driver of growth at +12.05% for 2022, and its investment in new housebuilding is expected to rise by more than 10% (EU, 2021b). Whether this is voluntary negligence, forgetfulness, or ignorance of the European green policies and initiatives focusing on NBS is one perspective. Another is to view this in light of the 'Macchiavellian' expression "The ends justify the means", namely, that a speedy economic recovery from COVID-19 through leveraging and by using any means necessary is acceptable, even if the consequences include negative long-term environmental and social impacts.

A tangible example is the massive additional investment made in the world's 8th largest economy, Italy (Global PEO Services, 2022), through its 'Housing Plan' where developers are pushing forward with rapid urban development (Fig. S1 and supplementary material for further details). The subterfuge is to use a plan such as 'Piano Casa', originally intended to overcome a deficit in social housing, for a 'no-holds-barred' development-led boom. The 'green light' for this construction-led development was given by the EU in response to the Italian government's submission of the National Recovery and Resilience Plan (NRRP) on 30 April 2021, by granting EUR 191.5 billion; i.e., a 26.5% share of the total EU Recovery and Resilience Facility (RRF) (d'Alfonso, 2022). Also, in June 2022, Italy's grant allocation was revised slightly upwards of €69 billion (+0.2%). Through a mix of reforms and investments the NRRP is structured into six 'Missions'. Of these, Mission 2 (Component 3) – 'Energy efficiency and renovation of buildings' – specifically invests 8.0% (i.e., EUR 15.4 billion) of the Plan's budget. While other European countries are also benefitting from EU economic recovery funds pursuant to the

COVID-19 pandemic crisis (e.g., Spain was allotted EUR 69.5 billion, Poland €35.4 billion, The Netherlands EUR 4.7 billion [European Council, 2002]), Italy's Recovery and Resilience Plan is the largest under the unprecedented EU response to the crisis triggered by the coronavirus pandemic (d'Alfonso, 2022). Despite this largesse in EU recovery funding for Italy, none of it has been delegated to developing sustainable urban areas through NBS; instead, much of it has passed on to the construction sector.

Drawing from this example, the critical question facing European and global policy makers is, "Can the momentum towards nature-based approaches to infrastructure, including new housing, be reasserted at the end of the pandemic construction-led recovery"? A positive answer lies in re-establishing the considerable efforts made by the European Commission as featured in a number of documents, funding programmes (i.e., Work Programmes from 2014-2020 related to NBS thematic goals) and Horizon 2020 (R&I) projects, e.g., NATURVATION - 2016-2020, Nature4Cities - 2016-2020, NAIAD - 2016-2020, and CLEARING HOUSE - 2019-2024 (see Davies et al., 2021). In truth, that momentum was never lost but has simply been eclipsed by the vastness of COVID-19's impacts and responses. It only took 2 to 3 years, the time of the pandemic bubble (2020-2022), to take us back in time in urban development policy, as the governments in EU countries have prioritised recovery by stimulating urban development (see, e.g., EC, 2022; Nijkamp and Perrels, 2014). There is no reason, however, why the reverse cannot be equally true if the political and policy will exist at the continental, national and city level. Should this be the case, then what has happened was a 'blip', not a 'trend'. Certainly, there is no shortage of evidence to support the benefits of various nature-based approaches (e.g., Seddon, 2022: Hekrley, 2022; EC, 2021b; Cárdenas et al., 2021; Bayulken et al., 2021; Hobby and Grimm, 2020), particularly in the context of large and densely populated urban areas where

the functional role of trees is critical (Khatri, 2022; O'Briena, et al., 2022; McDonald et al., 2021; Bush, 2020; Jim et al., 2018; Wang et al., 2018; Sanesi et al., 2007).

However, there is far to go. According to one estimate, only 0.3% of urban infrastructure expenditure globally is directed toward a diversity of NBS and ecosystem efforts to mitigate pollution, reduce flood risk and storms and provide healthy air (Khatri, 2022). The same imbalance has been found with respect to carbon net zero (Andrijevic et al., 2020). However, in a more recent study (Falco et al., 2022), protective public health measures in view of pandemic risk were endorsed including strong governmental commitment of reforestation and air pollution reduction. For those willing to inquire, the importance of NBS was clearly understood during the lockdown period of 2020-2021 (see, e.g., Derks et al., 2020). Indeed, a national study demonstrated that green elements even in the home environment during the COVID-19 lockdown constitute a means to promote mental health and well-being (Spano et al., 2021). In their various guises NBS should be wholly integrated with urban development, whilst contributing to the creation of green jobs and more sustainable and livable urban environments.

3. Discussion and conclusion

It is unreasonable to expect that governments will not respond to crises such as the COVID-19 pandemic in ways that keep the economy thriving, but they should become aware that nature-based approaches allow them to do so more sustainably, whilst encouraging a growth in 'green' jobs and increasing urban resilience. We recommend that a starting point be partly a linguistic one: replacing terms such as 'green recoveries' with 'nature-based recoveries'; the latter term explicitly implies employing the properties that nature offers through normal biotic processes. A nature-based recovery requires new ways of doing business, too, and candidly there will be losers as well as gainers from this change process. Fund managers, in particular, should

see this sooner rather than later, as without a switch their investments will be made worthless through the combined impact of climate change and a social equality backlash. Perhaps delving further into the future students of business should present on their CVs qualifications in ecology and sustainability as well as normative ones in financial management and investment. Hence, knowledge of NBS should be a priority in professional training (e.g., apprenticeship schemes) as well.

According to a recent post by the EC (2022), built-up areas are expected to expand across most of the EU by 2030. Italy will see the largest absolute increase (+144,000 hectares). In this sense, our contribution, particularly through the example of the Italian 'Piano casa' construction-led scheme, has the ambition and immediacy to prove this current trend. We acknowledge that although the example we illustrate is not generalizable to all countries of the European Union, it still represents a timely testimony of construction-led policy.

Our purpose is to stimulate a debate in Europe and globally in favour of the nature-based concept for the development of sustainable healthy cities in the face of emergency responses. Whatever the reason recovery plan funding should be conditional on a nature-based approach, one which equally enables co-design with local communities. If COVID-19 recovery plans have derailed nature-based approaches leading us away from nature, then we must get back on track as soon as possible. Keeping the spotlight on nature-based approaches, whether they be NBS, plans, services, or other, to restore and renature cities facing socio-economic and sustainable development issues is not an option but a necessity. Otherwise, the end result will be a nature-depleted urban reality.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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