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Spatializing the Sustainable Development Goals (SDGs): the role of urbanization in SDGs localization across spatial scales

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ABSTRACT

This paper examines the question of localizing SDGs by linking them to the variegated spatialities of urbanization. The guiding hypothesis is that the processes underlying SDGs are connected to dominant urbanization processes that characterize subnational regions, i.e. processes of concentrated, or extended urbanization, according to the Planetary Urbanization literature. It focuses on the relationship of a selection of 6 Sustainable Development Goals and 52 associated targets with the scales and landscapes produced through concentrated and extended urbanization processes, aiming to contribute to a systematic understanding on the degree to which they can be effectively monitored and achieved at subnational levels. As these processes are inherently multiscalar, and connect variegated landscapes across and within territories, the implementation of SDGs would need to acknowledge, contextualize, and transform this diversity of scales and landscapes. The paper develops a theoretical and conceptual apparatus for comprehending and assessing the relationship of SDGs with core urbanization processes that largely shape the production of space and its social and ecological inequalities, thus spatializing, and 'urbanizing' them in order to question the capacity for localizing them.

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Sustainable Development Goals (SDGs); spatialization; localization; planetary urbanization

Introduction

SDGs and the spatialities of urbanization

What happens when SDGs 'touch the ground' and are confronted with the multiscalar, and very often uneven nature of the production of space? The development of the Sustainable Development Goals (SDGs) has followed a rather top-down trajectory, with one of the core claims being that they can encapsulate universal, shared goals for humanity (United Nations Environment Programme [UNEP], 2016). Monitoring and eventually implementing SDGs, requires their more elaborate 'grounding' into both national and – especially – sub-national contexts. But although SDGs are expected to be embedded into specific and variegated spatial contexts, their framing has very little direct, or indirect, reference to scales or spatial conditions. Out of the 17 SDGs, only SDG 11 (Cities and Communities), and SDG 14 and 15 (Life Below Water, Life on Land) refer to types of spaces and geographies (cities, terrain and water bodies). At the same time, references to subnational

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spatial scales (such as the regional scale), are found only in some targets under goals 1 (no poverty), 2 (zero hunger), 9 (Industry, innovation and infrastructure) and 17 (partnerships for the goals).[1] In parallel, an increasing number of local governments are engaging with the SDG framework through Voluntary Local Reviews (VLRs), which provide grounded insights into how urban areas operationalize and monitor sustainable development objectives within their specific spatial and governance contexts (Ciambra et al., 2023; Stamos et al., 2024). This happens in a seemingly unsystematic and arbitrary way, without assessing the role, importance, differences, or associations of different spatial scales and contexts. A significant question emerges: which are the meaningful scales, and spatial contexts at which to both monitor and eventually achieve SDGs?

Addressing this question requires a more elaborate understanding of the relationship between SDGs and the production of space. Urbanization plays a significant role in spatial development. It is also widely recognized as one of the keys to achieving sustainable development (Berry et al., 2008; Satterthwaite & Bartlett, 2016; Seto et al., 2010). Still, the effects of urbanization across multiple scales and territorial typologies are inadequately understood: the 'urban' is often seen as a delineated unit of analysis corresponding to a specific spatial typology (the city, or urban region). This is evident by the fact that 'sustainable cities and communities' constitute a distinct SDG (11). By dedicating a specific SDG to cities, the United Nations recognize the pivotal role that urban areas play in sustainable development and seems to imply that 'sustainability' is something that can be adequately achieved at the level of the city. However, sustaining and transforming cities generates a set of geometabolic interdependencies – systemic and spatial linkages through which urban areas depend on their wider hinterlands for the extraction, circulation, and disposal of material and energy flows such as food, water, energy, and waste that sustain urban life. These flows tie cities to vast rural, peri-urban, and global landscapes that support their concentrated populations and economies (Barles, 2019). It is because of these extended geometabolic interdependencies that, to slightly paraphrase Rees and Wackernagel, cities cannot be sustainable, but they are also a key to sustainability, and thus to achieving the SDGs (Alvarez-Risco et al., 2020; Rees et al., 2008). As **urbanization becomes planetary** – meaning that urban processes shape not just cities but also remote, rural, and infrastructural landscapes across the globe – these geometabolic interdependencies underpin socially and economically uneven development that is produced and reproduced across scales (Harvey, 1996; Lefebvre, 2003). How can SDGs be localized within this context?

In this paper, we argue that localizing SDGs requires spatializing them; and spatializing them requires 'urbanizing' them: bringing them in dialogue with the multifaceted spatialities of urbanization, in a way that avoids the limited perception of a city-centric definition of urbanization. This requires an understanding of urbanization as a form of geographical organization, which is linked to the uneven processes of the production of space, not only within, but also beyond cities. Planetary Urbanization offers a useful framework for developing such an understanding (Brenner, 2014; Brenner & Katsikis, 2020; Brenner & Schmid, 2015; Katsikis, 2016; Katsikis, 2018). According to this framework, urbanization does not only concern what are conceived as processes of concentrated urbanization (concentrations of population, economic activity, infrastructure, capital investment), normally associated with in cities and urban areas; it also involves processes of extended urbanization (the broader metabolism of cities in food, water, energy, materials, waste), transforming a multiscalar web of operational landscapes of primary production, circulation and waste disposal (Katsikis, 2014). Spatializing SDGs would mean understanding how they are interwoven with the dialectical relationship between concentrated and extended urbanization, and the broader patterns of socially and ecologically uneven development that characterize them.

In terms of methodology, this paper adopts a conceptual and literature-based approach, grounded in a spatial reading of urbanization and urban metabolism. Rather than empirical case studies, the analysis offers a synthetic interpretation of six SDGs, whose targets are especially entwined with material flows and extended urbanization processes. These goals are examined not as an exhaustive list, but as illustrative examples to advance a broader theoretical claim: that effective SDG localization requires grappling with the multiscalar and interconnected nature of urbanization itself. Following this introductory part, the first two sections of the paper develop a theoretical framework, first, offering an extensive introduction to the concepts of concentrated and extended urbanization, key concepts of the Planetary Urbanization framework; and second, pointing to the need of understanding SDGs and urbanization beyond the city centric perspective of SDG 11 (concentrated urbanization), highlighting the link of 6 specific SDGs to the broader spatialities of extended urbanization: Hunger, Water and Sanitation, Affordable and Clean Energy, Responsible Consumption and Production, Life Below Water, Life on Land. The next section examines the relationship of the 6 selected goals and associated targets to the dialectics of concentrated and extended urbanization, followed by the discussion part, which reflects upon this overview linking it to potential policy recommendations.

Materials and methods

The multiscalar metabolisms of planetary urbanization

Over the past decades, debates around the agenda of planetary urbanization have helped illuminate how urbanization transforms a multitude of landscapes that are not limited to cities. In most of the literature, urbanization processes are associated with the growth and restructuring of cities, through a largely population centric view: mainstream debates highlight the percentage of population living in cities over the total population inhabiting smaller settlements or dispersed patterns, while the dynamics of urbanization are typically associated with the growth (or decline) of city population, which often is connected with the depopulation of non-city areas, as part of a rural to urban migration (Brenner & Schmid, 2014; Champion, 2001). This leads to the very limited perception, that urbanization processes do not pose intense issues in areas where the rate of population growth in cities is low (or zero) or even declining, as is the case in almost all European countries, where the rate of urbanization in this sense is rather static (Moonen et al., 2019; United Nations, 2019).

But, according to planetary urbanization scholars, the concentration of population and economic activity in dense urban centers is only one dimension of the urbanization process: concentrated urbanization. Equally fundamental is the process that make urban life possible through vast, interconnected landscapes transcending cities limits: extended urbanization. This refers to the far-reaching landscapes – rural, infrastructural, and ecological – that support cities through the provision of resources, labor and waste absorption. Cities can only sustain high densities of population, capital investment, infrastructures, and economic activity if they are adequately connected to a much more extensive network of operational landscapes – zones of primary production, circulation, and disposal – which form the material foundation of urban life (Katsikis, 2018).

Extended urbanization is a concept that aims to grasp the complex webs of material and energy flows and the extensive spatial footprint of urban life beyond the city. Similar concerns underpin the development of the concepts and frameworks of urban metabolism and urban ecological footprint. Urban metabolism framework conceptualize cities as systems that consume, transform, and dispose of resources – much like living organisms – typically analysing the flows of energy, water, food, construction materials, and waste as they move through cities (Barles, 2010). The urban ecological footprint, on the other hand, refers to the environmental impact of a city in terms of its resource use and waste generation, typically measured through land use, energy consumption, carbon emissions, and ecological demands. It accounts for both direct impacts within city boundaries (e.g. infrastructure, transport, buildings) and indirect impacts arising from the production and consumption of goods and services beyond the city, translating these into abstract spatial metrics (Wackernagel & Rees, 1996). Urban metabolism and urban ecological footprint studies typically break down the metabolic systems of cities in four sets of flows: water, energy, nutrition (food), and other materials (such as construction materials and household and industrial commodity consumption other than water, food and energy), with waste often being monitored as part of the transformation of the above, including emissions (Ibañez & Katsikis, 2014; Kennedy et al., 2007). Urban metabolism studies emphasize the need for developing interspatial approaches in an interconnected world and typically highlight three to four scales of analysis, often corresponding to units of quantitative information of trade and material input and output: the local scale that includes the immediate boundary of the urban ecosystem (ranging from a city to an urbanized region); the regional (ranging from the region to the country); the country; and the global scale (Kissinger & Stossel, 2019). It is striking to note that although the urban metabolism and urban ecological footprint concepts have already developed concrete methodological frameworks for the study of urban sustainability before the turn of the twentieth century, they have not yet been adequately reflected in the list of SDG goals and targets. This reaffirms that approaches that highlight the multiscalar nature of urban sustainability are largely absent for the consideration of SDGs

Although urban metabolism and urban ecological footprint studies offer systematic accounts of the material ecologies of cities within a multiscalar network of more-than-city spaces, the social and ecological construction of these spatialities is largely obscured. The existence of a set of landscapes from which resources are produced imported or exported, is often abstracted, considered as points of origin or destination of flows, or calculated as an abstract acreage (in terms of urban ecological footprint studies) (Swyngedouw, 2006). These limitations stem partly from the persistence of the **city – hinterland model**, which imagines a straightforward, linear relationship between a city (often reduced to a point on a map) and its surrounding supporting region. Such models struggle to grasp the uneven and dispersed geographies of contemporary urbanization (Brenner, 2013; Brenner & Schmid, 2015). To address this, the framework of **concentrated and extended urbanization** offers a more dynamic and relational view. Concentrated and extended urbanization are not opposing or exclusive spatial categories. Instead, they represent interrelated processes that link socio-spatial configurations in densely populated and economically active areas (concentrated urbanization) with those in expansive landscapes involved in production, extraction, waste management, and circulation, which can even include remote regions such as deserts, the atmosphere, and oceans (extended urbanization) (Brenner, 2013; Brenner & Schmid, 2015). Crucially, these are not fixed spatial categories but processes that interact dialectically. They shape a complex matrix of operational landscapes and agglomeration landscapes linked by connectivity infrastructures and global supply chains. This perspective challenges the conventional idea that each city has a discrete and adjacent hinterland. Instead, it recognizes that urban sustainability depends on transcalar and translocal interdependencies. By foregrounding these interrelations, the framework emphasizes the need to consider SDGs spatially, questioning where ‘the urban’ begins and ends, and who or what is included in their sustainability calculus (Brenner, 2013; Brenner & Schmid, 2015).

The way the dialectical relationship between concentrated and extended urbanization is historically resolved, is directly connected to the patterns of production and circulation of social and ecological value, and as a result the associated patterns of socially and ecologically uneven development that characterize it (Katsikis et al., 2022). As processes of extended urbanization that were more regionally linked to specific cities, become increasingly embedded in global supply chains, the direct connection to local consumption is lost and the circuits of circulation of social and ecological value broken. The proliferation of capital-intensive, interconnected production system, driven by the commodification of both human and ecological resources, leads increasingly to 'metabolic rifts' (Katsikis, 2023). These rifts exhaust ecological surpluses that traditionally supported urban life, often turning primary production zones into 'ecological sacrifice zones', resulting in unstable hinterland infrastructures that may become obsolete even before their full economic potential is realized.

Examining the localization of SDGs through the dialectical framework of concentrated and extended urbanization, could allow to highlight how monitoring SDGs in one location and scale, might obscure the broader implications of the processes that underlie it in other locations or scales, allowing to also reveal the risks of how efforts to achieve SDGs 'myopically' in one location or scale might have a series of negative effects across the broader territorial landscape of its interconnections.

The Agenda 2030 and the question of localizing SDGs

The Agenda 2030 is a comprehensive plan of action adopted by the UN member countries in 2015, aimed at addressing global challenges such as poverty, inequality, climate change, and environmental degradation. It sets the vision and principles for sustainable development in the twenty-first century and provides a roadmap for countries to achieve a more sustainable and equitable future by 2030. Forming the core of Agenda 2030, the SDGs are a set of 17 specific and interconnected goals, along with their 169 associated targets, that provide a detailed plan of action for achieving sustainable development and addressing the various challenges outlined in the Agenda 2030. At this initial framing, SDGs do not refer to specific scales, and moreover, there is no direct reference to the question regarding spatial development, that is, which Goal and target shall be monitored and achieved at which scale (and why), nor to the multiscalar relationships of territories and areas that influence monitoring and implementing of the SDGs.

Within this framework, the discourse on localization has become crucial to the implementation of the Agenda 2030, aligning with the recent focus on place-based spatial development policies. Localization approaches underscore the importance of adapting SDGs to local contexts through multilevel governance and strategies that leverage unique territorial strengths. This approach is meant to foster community empowerment and context-sensitive interventions, driven by local knowledge and needs. Despite the recognized importance of localization to enhance the relevance and effectiveness of SDGs, this process faces substantial challenges. These challenges are linked to both scale – and space-related barriers, reflecting the complexities of aligning global ambitions with local realities.

Scale-related challenges are primarily associated with identifying the appropriate level of government and managing the complexities of multilevel governance required to address the inherently multiscalar nature of SDG policy goals. Different SDGs necessitate actions at various scales – local, regional, national, and even transnational – making it difficult to align these scales with the appropriate levels of administrative governance. The challenges are compounded by inherited territorial boundaries, the availability and quality of disaggregated data at the local level, and the capacity of local actors to effectively collect, analyse, and utilize data. Furthermore, achieving effective coordination and partnerships among different governance levels – while essential – is often hindered by conflicting agendas, resource constraints, and mismatched scales of action, creating significant barriers to the coherent implementation of the agenda.

Spatial challenges associated with localizing the SDGs stem from the complex ways development patterns shape space. These challenges are not just local – they are deeply entangled with broader global processes of urbanization. In particular, they are shaped by the interaction between the two dimensions of concentrated and extended urbanization. This interdependence means that even place-specific challenges are not isolated. Rather, they are connected across scales and geographies through a multiscalar web of social, ecological, and economic relations (Moore, 2000). As such, the challenge of 'localizing' SDGs is not just a matter of scale (national, regional, local); it is fundamentally a **spatial** question – one that involves different types of landscapes, infrastructures, and flows. However, the spatial aspects of SDGs, although central to their localization, remain rather underexamined, leaving a critical gap in effectively addressing the interconnected (spatial) nature of sustainable development challenges (Chen et al., 2022; Medeiros, 2021; Rabiee, 2019).

Recent experiences with VLRs provide relevant empirical entry points into how local governments operationalize SDGs in real-world contexts. While first-generation VLRs (roughly between 2016 to 2021) reflect city-centric approaches focused on concentrated urbanization (see for example the ones of Bonn in 2020 and Bristol in 2019, or all 3 Buenos Aires VLRs until 2021), others begin to acknowledge the spatial complexity of territorial development, including regional interdependencies and extended urban flows, although always limited to a (more or less) contiguous territorial hinterland (see Istanbul in 2022 or Barcelona in 2023). These emerging efforts clearly show the struggle of local (and regional) governments to implement SDGs in ways that account for more-than-city spaces, systemic interdependencies, or cross-scale impacts.

Fully localizing SDGs would require treating places as spatially and ecologically discrete, which is largely incompatible with the reality of **planetary urbanization** – a condition in which urban processes are increasingly globally interconnected. To put it simply, achieving fully SDGs in local contexts, would require these contexts to be relatively disconnected biogeographically from the rest of the planetary geographies, something that largely defies the current state of planetary urbanization. Of course, not all SDGs relate to urbanization processes in the same ways, and thus not all of them are equally 'sensitive' to the dialectics of concentrated and extended urbanization. The constructive hypothesis of the rest of the paper is thus not to explore 'if' SDGs can and should be localized (which also relates to policy imperatives), but 'to what extent', based on the interpretation of their spatialization through the concentrated – extended urbanization concepts.

Out of the 17 SDGs, only one refers directly to cities and the 'urban': SDG 11 on Cities and communities. The goal aims to make cities and human settlements inclusive, safe, resilient, and sustainable, emphasizing the importance of cities as hubs of innovation, economic growth, and social development, while also highlighting the need to address challenges such as slum growth, inadequate housing, environmental degradation, and lack of basic services in urban areas. With its focus on human settlements, SDG 11 is limited to processes of concentrated urbanization. However, settlements spaces, in their different forms and sizes, cover not more than 3-4% of the planetary surface, and no more than 5% across Europe (European Commission, Joint Research Centre [JRC], 2019). The majority of the planetary terrain (almost 70%), as well as the majority of the European land area, consists of more-than-city landscapes that support urban life: landscapes of primary production, circulation and waste disposal (Katsikis, 2018).

Numerous studies have confirmed that the connotation and scope of action of urbanization are not only equivalent to SDG11 but also have interlinkages with other SDGs (Anwar et al., 2022; Elmqvist et al., 2019). A quite systematic approach within this context is offered by Chen et al, in their effort to chart the interlinkages between urbanization and SDGs (Chen et al., 2022). While extending the understanding of urbanization beyond SDG11, such interpretations are still based on what we can refer to as a 'mainstream' understanding of urbanization: urbanization is seen as a process of transformation of human production and lifestyles from rural to urban areas, including population concentration, non-agricultural activities, and drastic landscape changes. In short, while not specifically limited to the spatialities of cities, these interpretations still deal with processes of concentrated urbanization. What is lacking is an understanding of the spatialities of SDGs not only in relation to processes of concentrated, but also of extended urbanization.

Which of the SDGs can thus be more directly related to the processes of urban metabolism that characterize extended urbanization? It is necessary to first briefly position the full set of 17 Goals in relation to the spatial and metabolic processes of urbanization. The SDGs vary significantly in how directly they relate to the spatial dynamics of urbanization, particularly in relation to the framework of concentrated and extended urbanization. For analytical purposes, the Goals can be broadly grouped into three intersecting categories based on their connection to material flows, socio-spatial processes, and enabling governance infrastructures. The first group comprises those Goals that are most directly linked to the material flows and metabolic processes that underpin urbanization. These include SDG 2 (Zero Hunger), SDG 6 (Clean Water and Sanitation), SDG 7 (Affordable and Clean Energy), SDG 12 (Responsible Consumption and Production), SDG 14 (Life Below Water), and SDG 15 (Life on Land). Each of these Goals corresponds to fundamental dimensions of urban metabolism: food systems, water cycles, energy flows, material throughput, and the ecological substrates of terrestrial and marine environments. Their relevance to the spatialities of extended urbanization is particularly pronounced, as they concern the extraction, circulation, and transformation of resources across operational landscapes that sustain urban life. These six goals are thus selected for detailed analysis in the subsequent section of the paper.

The second group consists of Goals that primarily address social, economic, and institutional dimensions of development – such as poverty reduction, health, education, gender equality, and inclusive governance. These include SDG 1 (No Poverty), SDG 3 (Good Health and Well-being), SDG 4 (Quality Education), SDG 5 (Gender Equality), SDG 8 (Decent Work and Economic Growth), SDG 10 (Reduced Inequalities), and SDG 16 (Peace, Justice and Strong Institutions). While these are undeniably central to the overall agenda of sustainable development, their connection to the spatial and material logics of urbanization is more indirect. Their implementation outcomes are shaped by spatial inequalities and territorial disparities, but they do not themselves target the biophysical or metabolic processes that define extended urbanization. Finally, the third group includes those Goals that serve more as enabling or integrative frameworks. These focus on infrastructural, institutional, and governance-related conditions that support implementation across the SDG framework. This group includes SDG 9 (Industry, Innovation and Infrastructure), SDG 13 (Climate Action), and SDG 17 (Partnerships for the Goals).

Based on this categorization, the six selected Goals – SDG 2 (Zero Hunger), SDG 6 (Clean Water and Sanitation), SDG 7 (Affordable and Clean Energy), SDG 12 (Responsible Consumption and Production), SDG 14 (Life Below Water), and SDG 15 (Life on Land) – are those that most clearly intersect with the conceptual framework of urban metabolism and the dialectics of concentrated and extended urbanization. The objective of the paper is not to suggest that these are the only

SDGs relevant to urbanization, but rather to illustrate how a spatialized understanding of SDG implementation can be meaningfully developed through this subset. This approach highlights the ways in which urbanization – and particularly extended urbanization – conditions the achievement of sustainability goals, while also shaping the landscapes across which those goals are pursued. The next part, examines the specific SDGs through the dialectics of concentrated and extended urbanization, with the aim of revealing their connection to urbanization processes happening at the local, regional, and global scales.

SDGs and the dialectics of concentrated and extended urbanization

The purpose of this section is not to present new empirical case studies but to develop a conceptual mapping of how SDG targets interact with the spatial processes of urbanization – particularly through the framework of concentrated and extended urbanization. This approach is qualitative and literature-based by design, drawing on urban metabolism and planetary urbanization to build a spatial interpretation of six selected SDGs. These six SDGs are chosen because they are most directly linked to direct material flows or biophysical processes (e.g. food, water, energy, materials, land, and marine ecosystems) that are central to the concept of urban metabolism and therefore are inherently tied to the spatial logic of extended urbanization. This provides a coherent basis for exploring how SDG implementation depends on multiscalar spatial interdependencies, rather than discrete local contexts. The goal is not to prove a correlation between extended urbanization and specific SDGs, but to illustrate a spatial reading of the SDG framework that is currently missing from dominant policy and research narratives. The discussion is structured around two questions: i. does the specific SDG and targets resonate more with processes of concentrated, or extended urbanization? ii. to what extent they suggest a multispatial interdependency? Table A1 (see ANNEX) offers an overview of the 6 selected goals and the associated targets, as well as an initial effort to highlight their connection to processes of concentrated and extended urbanization.[2]

- SDG 2 aims to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture. Understanding the interrelationship between the dialectics of concentrated and extended urbanization and SDG 2 involves considering how urbanization, rural development, and their interactions impact food systems, agricultural productivity, food access, and nutrition outcomes (Tacoli et al., 2013; Cohen & Garrett, 2010; Satterthwaite et al., 2010; World Health Organization [WHO], 2023). More than city, 'rural' areas are typically the primary sites for agricultural production and food supply chains. The urban metabolism of nutrition refers to the systems and processes by which cities acquire, distribute, consume, and dispose of food. The main processes can be classified as: input flows, pointing to the production sites and the sources of food supply, including local agriculture, regional farming, and global trade; consumption, focusing on areas of concentration of population and economic activities, as consumption of food happens by individuals, businesses, and institutions, varying widely based on factors like socio-economic status, cultural preferences, and dietary habits; and finally waste, with nutritional waste generated at multiple points in the food supply chain, including during production, transportation, retail, and consumption. The key concerns in terms of the changing nutritional metabolism of cities, are the reliance of cities upon increasingly distal network of nutrient producing areas, and the associated low levels of nutrient recycling between urban centers and their surrounding regions. For example, Sabine Barles extensive studies of the nutritional metabolism of Paris, have shown how the city has become gradually delinked from its regional agricultural hinterland and increasingly linked to more distant national, but also international landscapes of food production, either directly or indirectly: the Great West of France for example, which has supplied around 30% of the animal protein consumed in the greater Paris region, was heavily dependent on importing around one third of animal feed from South America (Barles, 2009). The 8 targets of SDG 2 refer to processes of both production (input) and consumption of food. Targets 2.1 and 2.2 directly concern consumption aspects, while targets 2.3, 2.4, 2.5 and 2.a focus more on the production side of the food system. Targets 2.b and 2.c focus on trade and commodity markets and as such affect both production and consumption. From this quick overview of the SDG2 targets, it becomes apparent that accomplishing SDG 2 requires the synergy between both agglomeration landscapes of consumption and processing of food, and operational landscapes of food production and circulation.

- SDG 6 concerns access to clean water and sanitation. Understanding these targets in relation to the dialectics of concentrated and extended urbanization requires considering both the conditions of supply and circulation of water as well as the consumption and waste patterns (Barrios, 2000; Kaika, 2004; McDonald et al., 2014; Swyngedouw, 2004). The water aspect of urban metabolism involves understanding the entire lifecycle of water, including: water sources, such as rivers, lakes, reservoirs, groundwater, and in some cases, desalination plants; the associated infrastructures of extraction and circulation through which water is captured, treated, and stored through, such as dams, water treatment plants, pipelines, and reservoirs; water consumption, including residential, commercial and industrial use, as well as public services, and finally wastewater, including not only residential, commercial, and industrial effluents, but also stormwater (rainfall and surface runoff generate stormwater). In urban metabolism, water is by far the most significant component in terms of mass (Wolman, 1965). The impact of water on urban sustainability extends beyond ensuring a reliable supply for residents. As cities grow, they often transition through stages that alter their interaction with underlying and surrounding aquifers, draining increasingly distal resources, while polluting their immediate ones. While water supply systems of cities remain relatively more geographically contiguous than other metabolic systems, they are also significantly upscaled. For example, in a historical analysis of the changing metabolism of Brussels, Athanassiadis et al. discuss that more than 95% of the water supply of the city comes from the Walloon region (Athanassiadis et al., 2017). Moreover, within the broader lifecycle analysis of water the concentrated water consumption of cities, concerns not only direct water flows, but also indirect water consumption through the water embedded in consumed commodities, such as food (Esculier et al., 2019). The 8 targets of SDG 6 refer to all three processes of extraction, consumption and waste management. Targets 6.1 and 6.2 focus more directly on consumption patterns, while target 6.3 highlights wastewater pollution issues, and targets 6.4 and 6.5 focus on water extraction and management. Target 6.6 expands even more the dimensions of water management, highlighting the need of conservation of the major hydrological devices such as mountains, forests etc. while targets 6.a and 6.5 highlight the importance of both international collaboration and local community engagement. Similar to the SDG2 targets, this short overview of SDG6 targets makes apparent that accomplishing them requires the synergy between both agglomeration landscapes and operational landscapes across scales.
- SDG 7 concerns access to affordable and clean energy, having again a clear connection to both concentrated and extended urbanization (Dodman, 2009; Ghosn, 2011; Grubler, 2012; Seto et al., 2014; Sijmons, 2014). Areas of concentrated urbanization include places of intense energy

consumption, which consume energy mostly produced beyond their cores, across operational landscapes of energy production, with these flows of energy linking processes of concentrated urbanization directly to processes of extended urbanization (the more population, economic activity etc., is concentrated, the more energy consumption intensifies, creating the need to extension of infrastructural connections and production landscapes). Urban metabolism of energy focuses on how cities consume, manage, and transform energy resources to support their functions and sustain their populations, encompassing the entire lifecycle of energy: sources of energy include fossil fuels (oil, coal, natural gas), nuclear power, and renewable resources (solar, wind, hydro, geothermal), with the mix of energy sources depending on regional availability, technological infrastructure, and policy decisions; the infrastructures for energy generation (power plants, wind farms), transmission (power lines, pipelines), and distribution (local grids, substations); energy consumption, both residential and commercial and industrial, but also energy used for transportation; and finally energy waste and loss, during generation, transmission, distribution and consumption. Significant shifts in energy sources and technologies have led to significant changes in the energy metabolism of cities and their relationship with energy producing landscapes. Kraussman offers an overview of the historical metabolism of Vienna which reflects broader energy transitions seen across Europe (Krausmann, 2013). Initially, the city's energy system was predominantly based on biomass, particularly wood, largely sourced from the Danube region, shifting to coal by the late 19th and early 20th centuries. Coal use peaked around the 1920s, and the post WW2 years saw a dramatic shift towards oil and gas. Energy consumption tripled between the 1950s and the end of the twentieth century when it stabilized, while the energy hinterlands of the city expanded from the accessible zones around the Danube to make it part of a global system of energy commodities. SDG 7 includes 5 targets, with target 7.1 referring to the consumption side, emphasizing the need for access to energy, and target 7.2 focusing on the production side. Target 7.3 highlights energy efficiency and can be translated to include both the production, distribution, and consumption of energy, while targets 7.a and 7.b emphasize on the development of energy infrastructures. Similar to SDG2 and SDG6 targets, addressing energy questions across agglomeration landscapes directly impacts conditions across the operational landscapes that support them and vice-versa.

- SDG 12 focuses on ensuring responsible consumption and production patterns and is probably the one that allows to fully consider the multiple scales and landscapes of the contemporary material economy (Baccini & Brunner, 2023; Gandy, 2004; Hodson & Marvin, 2010; Ibañez & Katsikis, 2014; Kennedy et al., 2007; Seto et al., 2012; Swyngedouw, 2006). The metabolism of urbanization considers cities as major points of material processing and consumption, and waste expulsion, with these materials being largely extracted, and sequestered beyond the rather limited footprints of cities. While considered productive in terms of economic outputs, the economies of concentrated urbanization do not produce materials, but rather transform and circulate them. It is the across the vast operational landscapes of primary production that most of the material basis of the economy is produced. At the same time, these operational landscapes need extensive inputs in order to perform these operations (in the form of energy, capital resources etc.), becoming themselves consumption landscapes. The more processes of concentrated urbanization intensify, the more pressure they apply upon operational landscapes of primary production to support their metabolism amplifying processes of extended urbanization. Likewise, the more processes of extended urbanization try to supply these resources, the more inputs they require from agglomeration landscapes, in the form of capital investment, manufactures, knowledge and information production etc. The urban metabolism of materials is concerned with the overall flow of aggregated materials through cities (such as cement, plastic, wood, etc.) and can be considered to examine the following areas: sourcing, with urban areas importing raw materials extracted from natural resources, imported goods, and recycled materials (construction materials, consumer goods, and industrial inputs); the connectivity infrastructures ensuring the delivery of materials to cities involving supply chains and infrastructure such as transportation networks, warehouses, and distribution centers; the residential, commercial and public sector consumption of raw materials, intermediate goods and finished commodities; and finally the material waste and disposal. Following the flows of materials through the urban environment offers useful and sometimes unexpected insights. For example, in her study of the metabolism of Paris, Sabine Barles notes that the per capital material consumption in Île-de-France, remains lower than the national average, highlighting the differences in the type of materials consumed and their processing across supply chains: unlike other parts of the country, Île-de-France extracts, produces, and processes fewer raw materials (Barles, 2009). These activities, which occur upstream, often lead to higher emissions, waste, and ultimately greater material consumption values. Cities typically produce less than they consume, but they also consume goods that require far more material consumption to be produced than is reflected in their final form. This apparent material efficiency of cities is thus concealing the extensive amounts of material and land needed to supply them and complicates the question of sustainable production and consumption patterns. SDG12 and its targets highlight in the most evident manner the dialectical relationship between concentrated and extended urbanization, and thus the direct link of SDG12 goals to both. From the 11 targets, target 12.1 is a quite generic call to action. Target 12.2 is about the production of raw materials, pointing to conditions across operational landscapes of primary production, while targets 12.3, 12.4 and 12.5 mostly focuses on waste, not only on the final consumption side, but through the whole supply chains and production networks, so cutting across agglomeration and operational landscapes. Targets 12.6, and 12.7 refer to economic and public actors and lack spatial specificity, while target 12.8 in the same manner emphasizes on the importance of information dissemination across scales. Targets 12.a emphasizes technological and scientific diffusion, and target 12.b focuses on tourism landscapes, which can be considered a form of landscape consumption. Finally, target 12.c concerns the production and consumption of fossil fuels, dealing with the role of subsidies.

While SDGs 2, 6, 7 and 12 can be seen to correspond to the main processes of urban metabolism, that is food, water, energy and material production consumption and circulation, the final two SDGs included in this investigation can be seen to refer broadly to the terrestrial and oceanic spaces through which the above take place.[3] SDG 14 goals focus on the hydrosphere, and SDG 15 on the planetary terrain. While referring directly to specific zones of the planet, their spatialization is challenging and their relation to urbanization processes often indirect.

- SDG 14 focuses on conserving and using the oceans, seas, and marine resources for sustainable development. Urbanization often leads to coastal development, including infrastructure projects, tourism facilities, and industrial activities near coastal areas (Couling & Hein, 2020; Halpern et al., 2008; Islam & Tanaka, 2004; Von Glasow et al., 2013). Unplanned settlement growth and improper waste management in cities can result in marine pollution, habitat destruction, and degradation of coastal ecosystems. Studies on aiming to reveal the anthropogenic pressures on coastal regions, reveal that more than 90% of coastal areas have at least one major anthropogenic stressor, with human population density strongly correlating with coastal footprint scores (Allan et al., 2023). But the most important drivers of oceanic degradation and in general hydrological problems are linked to processes of extended urbanization. The high input metabolism of operational landscapes of agriculture contributes to excessive agricultural runoff, deforestation, and land-use changes contributing to marine pollution through sedimentation, nutrient loading, and pesticide runoff into rivers and coastal waters (Hufnagl-Eichiner et al., 2011). Moreover, beyond the land, unsustainable fishing practices, overfishing, illegal, unreported, and unregulated fishing, and habitat destruction threaten marine biodiversity and fisheries sustainability. The hydrosphere of SGD 14 can be thus broadly conceived to be part of the multiscalar operational hydrosphere of urbanization, but SGD 14 targets mostly have an emphasis on ecological conservation. Out of the 10 targets of SDG 14, 14.1, 14.2, 14.3 and 14.5 focus on reducing pollution and enhancing marine conservation. Targets 14.3, 14.6 and 14.b are concerned with fishing practices, either through regulation or subsidies, the main anthropogenic activity across the oceans, together with the impact of global maritime trade, which is surprisingly missing. Target 14.7 is specific geared towards the future of small island states. Finally targets 14.a and 14.c are spatially generic goals around positive impact through technological, scientific and legal means. Thus, SDG14 concerns more predominantly processes of extended urbanization.

- Finally, SDG 15 focuses on protecting, restoring, and promoting sustainable use of terrestrial ecosystems, managing forests sustainably, combating desertification, halting and reversing land degradation, and halting biodiversity loss. Urbanization often leads to land conversion from natural habitats and agricultural lands to built-up areas, infrastructure, and urban sprawl (Bren d'Amour et al., 2017; Elmqvist et al., 2013; Grimm et al., 2008; Seto & Reenberg, 2014; Stokes & Seto, 2016; Zucca et al., 2012). This expansion is often observed to fragment ecosystems, reduce biodiversity, and contribute to habitat loss for wildlife species. However, settlement spaces, no matter how much they expand or sprawl, cover only 4% of the planetary terrain (Katsikis, 2018). What is much more significant for the transformation of terrestrial landscapes and ecosystems are landscapes of primary production, circulation and waste disposal connected to processes of extended urbanization, operationalizing almost two thirds of the total land surface of the planet and are key for establishing a sustainable relationship with terrestrial ecosystems. Unsustainable agricultural practices, such as excessive use of agrochemicals, deforestation, and land degradation, can degrade soil quality, reduce ecosystem services, and threaten biodiversity. In the same way, extractive industries, such as forestry, mining, can have a significant effect on ecosystem services and biodiversity loss. Similar to SDG 14, SDG15 and its associate targets concerns more conservation practices. Out of the 12 targets, 15.1, 15.2 and 15.3 concern the conservation of specific types of habitats (freshwater ecosystems, forests, mountains), while 15.3 is focused on soils. Target 15.5 is focused on biodiversity loss and species extinction, with roughly similar focus for 15.7 and 15.8 emphasizing the importance of controlling trafficking of protected species and expansion of alien invasive species. Target 15.5 is concerned with the utilization of genetic resources, a target very much connected to SDG 2 through agricultural practices. Targets 15.9, 15.a, 15.b and 15.c aim to mobilize financial, institutional and educational resources and besides an emphasis on local communities and developing countries, remain quite generic in their spatial and scalar connections.

SDG 14 and 15 goals are clearly focused on more-than-city environments and are affected by processes of extended urbanization. They are thus not only connected with SDG11, but also with the first 4 goals discussed here, that link SDGs to the metabolic processes of food, water, energy and material production, consumption and circulation.

Discussion

Localization through urbanization: challenges and opportunities

This paper has argued that a meaningful localization of the SDGs must be grounded in an understanding of urbanization as a multi-scalar and spatially differentiated process. Through our examination of six SDGs closely tied to urban metabolic flows, we have shown how their implementation and monitoring are shaped by the dialectics of concentrated and extended urbanization. However, the current framing of the SDGs does not fully engage with how urbanization extends beyond city boundaries, influencing other-than-urban landscapes in interconnected ways. This lack of recognition limits the agenda's ability to address the spatial interdependencies and broader geographies that are critical for sustainable and equitable development.

The localization approach to the SDGs further complicates this issue, as it often narrows policy attention to specific local contexts, overlooking the complex web of spatial interdependencies and interconnected geographies that underpin the goals. By focusing on localized interventions, there is a risk of fragmenting the understanding of how various landscapes and scales are interlinked, which can obscure the larger systemic dynamics at play. Moreover, localization promotes the idea that each place, with its unique characteristics and resources, can independently contribute to achieving the SDGs while simultaneously aligning with broader global ambitions. This perspective assumes that places inherently possess the necessary attributes to foster sustainable development, overlooking the profound structural inequalities and dependency that shape these places. As a result, localization may inadvertently create a fragmented approach to sustainable development, where progress in one area might mask failures or generate unintended negative impacts elsewhere. This is why VLRs offer useful, yet to an extent and at this moment, limited evidence for assessing how spatially aware or constrained, SDG implementation strategies actually are.

While localization is often promoted as a mechanism for enhancing relevance and accountability, it may also act as a vehicle for reproducing uneven development – managing rather than transforming the contradictions it purports to resolve. This raises concerns about whether localization merely 'sells' the possibility of achieving SDGs without fully addressing the deeper, interconnected challenges that define spatial development in a globalized world.

This critique does not dismiss the value of local initiatives; on the contrary, we acknowledge that local actions are crucial in achieving SDGs, as the unique characteristics of each place actively shape socio-spatial development processes. Our intention is to expand our understanding and strategies to integrate the broader spatial dynamics that influence and are influenced by local interventions. Recognizing the specificity of each locale, we advocate for solutions that are deeply rooted in local knowledge, needs, and potentials. However, this must go hand in hand with a critical examination of how local actions interact with wider spatial processes, understanding that local interventions do not occur in isolation. It calls for interventions that not only empower local communities but also recognize and address their role and responsibility within the variegated landscapes and geographies impacted by it.

Solutions that emphasize multilevel governance are particularly relevant in ensuring coherence and mitigating the unintended impacts that local interventions may have on interconnected territories. In this context, regional authorities – situated between national and municipal levels – could play a critical role. Their intermediate position provides them with a potentially unique capacity to coordinate across scales, engage with more-than-city spaces, and align territorial development with the complex logics of extended urbanization. However, two significant issues arise. First, the planetary nature of the forces and processes shaping urbanization and development often transcend traditional territorial governance structures, rendering them inadequate for managing these complex interdependencies. Second, the policy goals that are being localized often lack an inherent understanding of these interdependencies, failing to account for the broader, cross-scalar connections that influence outcomes.

The task ahead, then, is not simply to improve the mechanics of localization but to interrogate its underlying spatial assumptions. A more radical localization would begin by recognizing that no territory exists in isolation – that sustainability in one place depends on relations with many others. Only by re-embedding SDG strategies within the spatial logics of urbanization – concentrated and extended, local and planetary – can the goals of the Agenda 2030 begin to confront the uneven geographies they seek to transform.

At the same time, the conceptual framework employed here – centered on concentrated and extended urbanization – should not be treated as exhaustive. Planetary Urbanization framework's emphasis on global flows and material infrastructures, while illuminating, may at times risk flattening the heterogeneity of governance arrangements, institutional agency, and localized spatial imaginaries that shape development practices. Moreover, while it offers an important lens through which to understand spatial interdependencies and metabolic flows, it must also be situated in dialogue with other critical traditions in urban theory, political ecology, and territorial governance. Without such contextualization, there is a risk that this framework may appear self-referential or detached from the governance challenges it aims to illuminate. Thus, its descriptive power must be matched by normative clarity: how does understanding these metabolic and scalar interdependencies lead to better governance, more just outcomes, or actionable pathways?

Given these challenges, it is essential to reflect on the future direction of the Agenda 2030, particularly regarding the spatial dimensions of the SDGs and the approach to localization. How can SDGs can more effectively integrate the multiscalar dimensions of urbanization, recognizing the complex spatial interdependencies and socio-spatial contradictions that shape development outcomes across scales? Is localization of the Agenda 2030 truly the most effective approach for guiding policy interventions and monitoring progress, or does it, in fact, serve to 'institutionalize' and justify the uneven and unjust nature of current spatial development? While localization is often presented as a means to make global goals more relevant and actionable by adapting them to the specificities of local contexts, it risks reinforcing the existing disparities and power dynamics inherent in contemporary urbanization and capitalist development.

Therefore, it is crucial to critically reflect on whether the current emphasis on localization genuinely empowers communities and fosters sustainable development or if it merely repackages global ambitions in a way that justifies and perpetuates the status quo. The question remains: Does localization enable meaningful progress toward the SDGs, or does it simply reinforce the spatial and social inequalities it aims to overcome, offering a vision of development that is more about managing existing contradictions rather than fundamentally transforming them?

Notes

1. Reference to spatial scales and specifically the regional level can be found in selected targets under Goals 1, 2 9 and 17.
2. The aim of this table is not to attempt a precise classification or suggest an exact correspondence, but rather offer a basis for evaluating the challenges of isolating them spatially and delineating them scalarly. As it is discussed below, most SDGs include goals that are connected to both concentrated and extended urbanization processes.
3. It is important to note here the obvious absence of goals and targets referring more directly to the atmosphere, meaning that important questions such as CO2 and NOx emissions can be addressed only indirectly through the other goals as well as the broader SDG 13 (Take urgent action to combat climate change and its impacts).

Disclosure statement

The scientific output expressed in this article does not imply a policy position of the European Commission. Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use that might be made of this publication. For information on the methodology and quality underlying the data used in this publication for which the source is neither Eurostat nor other Commission services, users should contact the referenced source. The designations employed and the presentation of material on the maps do not imply the expression of any opinion whatsoever on the part of the European Union concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

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ANNEX

Table A1. Relationship overview of 6 selected SDGs and Targets with Concentrated and Extended Urbanization (darker color signifies more direct connection).

Goals	Targets	Concentrated	Extended
Goal 2: Zero Hunger	2.1 By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious, and sufficient food all year round.		
	2.2 By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women, and older persons.		
	2.3 By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists, and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets, and opportunities for value addition and non-farm employment.		
	2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme		

(*Continued*)

Table A1. Continued.

Goals	Targets	Concentrated	Extended
	weather, drought, flooding, and other disasters, and that progressively improve land and soil quality.		
	2.5 By 2020, maintain the genetic diversity of seeds, cultivated plants, and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional, and international levels, and ensure access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed.		
	2.a Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development, and plant and livestock gene banks to enhance agricultural productive capacity in developing countries, in particular, least developed countries.		
	2.b Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round.		
	2.c Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, to help limit extreme food price volatility.		
Goal 6: Clean Water and Sanitation	6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all.		
	6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.		
	6.3 By 2030, improve water quality by reducing pollution, eliminating dumping, and minimizing the release of hazardous chemicals and materials, halving the proportion of untreated wastewater, and substantially increasing recycling and safe reuse globally.		
	6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.		
	6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.		
	6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers, and lakes.		
	6.a By 2030, expand international cooperation and capacity-building support to developing countries in water – and sanitation-related activities and programs, including water harvesting, desalination, water efficiency, wastewater treatment, recycling, and reuse technologies.		
	6.b Support and strengthen the participation of local communities in improving water and sanitation management.		
Goal 7: Affordable and Clean Energy	7.1 By 2030, ensure universal access to affordable, reliable, and modern energy services.		
	7.2 By 2030, increase substantially the share of renewable energy in the global energy mix.		
	7.3 By 2030, double the global rate of improvement in energy efficiency.		
	7.a By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency, and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology.		
	7.b By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and landlocked developing countries, in accordance with their respective programs of support.		
Goal 12: Sustainable Production and Consumption Patterns	12.1 Implement the 10-Year Framework of Programs on Sustainable Consumption and Production Patterns, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries.		
	12.2 By 2030, achieve the sustainable management and efficient use of natural resources.		
	12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.		
	12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international		

	frameworks, and significantly reduce their release to air, water, and soil in order to minimize their adverse impacts on human health and the environment.		
	12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling, and reuse.		
	12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle.		
	12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities.		
	12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.		
	12.a Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production.		
	12.b Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products.		
	12.c Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities.		

Goal 14: Life Below Water	14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.		
	14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience and taking action for their restoration in order to achieve healthy and productive oceans.		
	14.3 Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels.		
	14.4 By 2020, effectively regulate harvesting and end overfishing, illegal, unreported, and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics.		
	14.5 By 2020, conserve at least 10 percent of coastal and marine areas, consistent with national and international law and based on the best available scientific information.		
	14.6 By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported, and unregulated fishing, and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation.		
	14.7 By 2030, increase the economic benefits to small island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture, and tourism.		
	14.a Increase scientific knowledge, develop research capacity, and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries.		
	14.b Provide access for small-scale artisanal fishers to marine resources and markets.		
	14.c Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in UNCLOS, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of 'The future we want'.		
Goal 15: Life on Land	15.1 By 2020, ensure the conservation, restoration, and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains, and drylands, in line with obligations under international agreements.		
	15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests, and substantially increase afforestation and reforestation globally.		

15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought, and floods, and strive to achieve a land degradation-neutral world.		
15.4 By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development.		
15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity, and, by 2020, protect and prevent the extinction of threatened species.		
15.6 Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources, as internationally agreed.		
15.7 Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products.		
15.8 By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species.		
15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies, and accounts.		
15.a Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems.		
15.b Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation.		
15.c Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities.		