



Resilience and Resource Efficiency *in Cities*

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■ Foreword

Improving resilience was at the heart of the Third United Nations Conference on Housing and Sustainable Urban Development (Habitat III) held 17 - 20 October 2016 in Quito; and this was reflected in its outcome document, the New Urban Agenda. The New Urban Agenda recognized “environmentally sustainable and resilient urban development” as one of three transformative commitments to make the vision of a resource efficient city a reality. In paragraph 71 of the New Urban Agenda, world leaders outlined their commitment to, “strengthening the sustainable management of resources – including land, water (oceans, seas, and freshwater), energy, materials, forests, and food, with particular attention to the environmentally sound management and minimization of all waste, hazardous chemicals...in a way that considers urban-rural linkages and functional supply and value chains...” This report responds directly to Paragraph 71, the concepts behind it, and its implication in improving overall city resilience.

As a technical contribution to the Habitat III process, UN Environment and The Rockefeller Foundation co-lead a series of meetings involving experts from around the globe to define and refine ‘resilience’. What came from this process is a ‘marriage’ of the concepts of resilience and resource efficiency. The two have traditionally had different audiences and consequently different narratives, metaphors, and tools for understanding and shaping urban development. Resilience is often linked with the climate change adaptation perspective while resource efficiency – often looking into sustainable transport and mobility, energy, and resource efficiency – is seen more from a mitigation perspective.

The expert discussions highlighted that while there are differences, and at times tensions, between the two concepts, they are complementary. For example, latent stresses such as flaws in the food system and water supply, are not always prioritized within short political timelines, but are essential to city resilience. Integrating the resilience and resource efficiency agendas into the planning of a city can therefore help it withstand shocks and stresses, and enhance the safety, security, and survival of its citizens.

UN Environment believes that understanding the connections between resilience and resource efficiency helps cities in developing integrated solutions towards sustainable urbanization. It reinforces the need for horizontal (across sectors) integration and vertical (across different levels of governance) collaboration to harness benefits for people and the planet. Linking both concepts also supports countries in achieving the different milestone agreements that were recently concluded: the Sustainable Development Goals, the Sendai Framework, the Paris Agreement and the New Urban Agenda, all of which recognized the critical role of urbanization and action at the city-level.

Our hope is that this report contributes to a positive trend towards successful implementation of the New Urban Agenda and other international agreements while supporting urban practitioners in building and managing low carbon, resilient, and resource efficient cities.



Ligia Noronha

Director, Economy Division, UN Environment

■ Executive Summary

Rationale for the Report

Urban areas accounted for 54% of the total global population in 2014. Yet activities in cities account for 70-75% of natural resource consumption, with significant impacts for resource availability and ecosystems in areas far beyond urban boundaries. Cities are also disproportionately susceptible to a range of environmental hazards due to their concentration of people, infrastructure and economic activity; their exposure to risk is likely to further increase with climate change. The resource efficiency and resilience of cities will become even more significant as urban population and economic growth continues: the global urban population is projected to increase by approximately 1.84% every year between 2015 and 2020, with 90% of this growth occurring in Asia and Africa.

The major global challenges of the 21st century – urbanisation, climate change, resource scarcity and poverty – therefore have huge implications for urban planners and policymakers. This report looks at the relationship between building the resilience of cities in the face of global environmental change, and increasing the resource efficiency of cities to reduce their harmful impacts on the environment. It provides examples of effective ways to address these agendas, as well as the potential and challenges for integration. This speaks strongly to global policy agendas, including the Sustainable Development Goals, the Paris Agreement and the New Urban Agenda.

A focus on cities

Although cities are home to just over half the world's population, they generate more than 80% of global GDP. Cities require substantial inputs to support this level of economic activity. Local resource scarcity can require cities to import resources from far beyond their boundaries, constructing complex infrastructure systems to transport essentials such as water, food and energy. The social and ecological impacts of urban areas therefore stretch far beyond city boundaries.

Cities can also be hotspots of vulnerability, as illustrated by the growing number of urban dwellers in hazard-prone areas such as deltas and coastlines. Their exposure and susceptibility to risk is mediated by urban forms and functions, which often give greater access to resources to certain parts of the population at the expense of others. Low-income and other vulnerable urban residents (for example, women, children, elderly, migrants and people living with disabilities) are therefore likely to be particularly vulnerable.

In the face of both resource scarcity and environmental hazards, cities are strategically positioned to be leaders of change. Placed at an intermediary scale between individuals and nation-states, cities can take actions which affect other scales through a ripple effect. City governments often have relevant powers over (for instance) spatial planning, solid waste management and building standards; although their institutional, technical and financial capacity to address these varies greatly. The density and proximity of urban areas reduce the economic and environmental costs of providing most infrastructure and services. As hubs where people and economic activities are concentrated, they are important sites for knowledge sharing and policy experimentation.

Key Messages

- **A resilience agenda can help cities become more resource efficient by being more flexible and by being better able to learn and respond to changed circumstances.** The process of building resilience can therefore simultaneously offer opportunities to build resource efficiency.
- **A resource efficiency agenda can help cities to become more resilient by reducing exposure to the risk of shortfalls in essential inputs.** Various inputs addressed in a resource efficiency agenda (materials, products, water, energy, food) are all essential for urban functioning. The outcome of achieving greater resource efficiency can contribute to a city becoming more resilient, because it will rely less heavily on the systems that provide resources.
- **A number of areas of action are common to both concepts, therefore providing ground for mutual reinforcement.** City leaders aiming to achieve both resilience and resource efficiency can adopt measures for each with the potential to contribute to the achievement of both objectives.
- **Possible tensions between resource efficiency and resilience may also exist.** Redundancy and modularity may help cities to be more resilient to shocks and stresses, but could also be framed as representing inefficient use of resources. Overcoming these potential conflicts will require more integrated and responsive urban planning and governance.
- **Achieving resilience and resource efficiency at city-level can help meet broader sustainability objectives.** The urban resilience and resource efficiency concepts have overlapping objectives and both aim at addressing major challenges such as climate change and pressure on natural resources. They are concerned not only with short-term achievements, but also with providing key tools for the long-term sustainable development of cities.

Structure of the Report

The report has three main sections: on resilience, on resource efficiency, and on the nexus between the two. For each concept, it explores the state-of-the-art in understanding and implementation – looking at definitions, characteristics, benefits, limitations and practical applications. It then explores the links between the principles, objectives, and initiatives associated with urban resilience and resource efficiency.

This report draws on theoretical and grey literature. More importantly, however, it is informed by the inputs of city officials from Africa, Asia and Latin America at a series of workshops on resource efficient cities held in 2013 and 2014. The case studies presented here – largely initiated by city officials – show how urban areas around the world are grappling with the different ecological and social challenges, and indicate potential avenues for other towns and cities to achieve the transformative commitments of the New Urban Agenda.

The report concludes that resource efficiency is an essential element to urban resilience, and that resource efficiency can be accomplished more effectively when it is built in the context of a resilient system. The conceptual analysis and case studies make it clear that considering these issues together can help planners to address global challenges, such as climate change and poverty.

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