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### URBAN GROWTH AND BIODIVERSITY

*Note by the Executive Secretary*

#### INTRODUCTION

1. The Conference of the Parties to the Convention on Biological Diversity (CBD) has recognized the important role of cities for the Convention since its ninth meeting in 2008. In decision IX/28, the Conference of the Parties noted the accelerated rate of urbanization, particularly in developing countries, and the opportunities for managing better the consumption of resources that impact on biological diversity. In the same decision, the Conference of the Parties noted that cities and local authorities play a critical role in designing and implementing land-use and zoning planning tools, urban development and infrastructure guidelines, investment promotion, and consumer awareness campaigns, all of which have direct effects on biodiversity. The importance of cities for the Convention and sustainable development has continued to be highlighted in subsequent decisions, including decisions XII/9 and XIII/3.
2. The Cities and Biodiversity Outlook,<sup>1</sup> released in 2012, notes that more than 60 per cent of the area projected to be urban in 2030 has yet to be built. Furthermore, with 70 per cent of projected infrastructure to be built in and around cities, urban expansion from 2017 to 2030 has the potential to have a significant impact on areas that are both crucial for urban well-being as well as of global biodiversity significance. Recent estimates of population growth and urban development project significant expansion of urban areas over the next several decades, particularly in developing countries.
3. If urban growth is not carefully planned to address such potential impacts, this rapid urban growth is likely to degrade natural systems, imperilling such areas and the key benefits they provide.
4. On the other hand, cities are uniquely positioned to make choices that can contribute to the achievement of global, regional and national biodiversity and sustainable development commitments. Cities are platforms for knowledge, incubators for innovation and engines for systemic, transformative change. It is important therefore to involve cities in research, policy development and actions designed to improve the utilization and management of biodiversity and ecosystem services in fast-growing cities and the regions surrounding them. The importance of the potential impact of expanding urban areas has been recognized in the outcomes of numerous key international processes, including the New Urban Agenda that was adopted at the Habitat III meeting that took place in Quito, in 2016. Discussions as part of the seventh replenishment under the Global Environmental Facility (GEF) include possible continuation of a programme on Sustainable Cities that was started in GEF-6 (2014-2018), under which is proposed the

\* CBD/SBSTTA/21/1.

<sup>1</sup> Secretariat of the Convention on Biological Diversity (2012) *Cities and Biodiversity Outlook*. Online at [www.cbobook.org](http://www.cbobook.org).

inclusion of support to urban planning that incorporates biodiversity and ecosystem services considerations. The details of this programme are still under development and discussion. Against this backdrop, the Secretariat of the Convention on Biological Diversity, ICLEI,<sup>2</sup> Future Earth,<sup>3</sup> the Stockholm Resilience Centre,<sup>4</sup> and The Nature Conservancy (TNC)<sup>5</sup> are cooperating in the development of an initiative, “Natural Systems and Sustainable Cities”, that has relevance for the topics of mainstreaming biodiversity that will be considered by the Subsidiary Body on Scientific, Technical and Technological Advice at its twenty-first meeting, the Subsidiary Body on Implementation at its second meeting and the Conference of the Parties at its fourteenth meeting, particularly regarding infrastructure.

5. The “Natural Systems and Sustainable Cities” project proposes to assess areas where projected urban growth could greatly impact biodiversity and ecosystems that provide key services, and to support, in cooperation with national, subnational and local governments, the use of tools and most effective practices to minimize impacts and protect ecosystem processes in urban development, planning and management in these “urbanization and biodiversity” priority areas, while taking stock of existing efforts and other relevant issues such as climate change resilience, such that more integrated approaches to urban planning are utilized. Four phases of the project are envisioned, while recognizing that some efforts are already ongoing and that the various aspects may not necessarily be entirely sequential. The phases are as follows:

(a) Phase I (assessment) will focus on identifying priority areas and cities where urban expansion will most significantly affect biodiversity, by compiling and processing relevant data and overlapping urban expansion forecasts on areas of biodiversity importance. It will also take stock of expected impacts on biodiversity of urban expansion, and identify existing most effective practices in urban planning – how biodiversity and ecosystems can be mainstreamed into urban expansion;

(b) Phase II (design, consultation, engagement and planning) will mobilize a critical number of national, subnational and local governments as well as key partners among the areas prioritized above, to identify existing plans for urban expansion that integrate biodiversity and ecosystems in sustainable urban development, or propose their development, as appropriate;

(c) Phase III (implementation) will focus on the operationalization of the action plans/projects prioritized in each of the selected cities, including demonstration components where project funds will match local investments, followed by the monitoring of results according to agreed indicators;

(d) Phase IV (publication of lessons learned and capacity-building activities) will focus on compilation of data and case studies, editing and peer review of reports and guidelines, and publication and dissemination of the resulting toolbox through webinars and training events. Its outcomes, predicted for 2020 and beyond, include the publication of tested approaches and case studies to relevant user communities and at significant meetings, building the capacity of a critical number of decision-makers able to implement the toolbox.

6. Project partners held a workshop that brought together more than 20 global experts on 26-27 October 2017 at the offices of Future Earth in Montreal, Canada to map out the approach that will be used for Phase I of the project. As part of this first phase, an initial survey of relevant studies has been

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<sup>2</sup> ICLEI-Local Governments for Sustainability is the leading global network of more than 1,500 cities, towns and regions committed to building a sustainable future.

<sup>3</sup> Future Earth is an international research program for global sustainability with a mission to support and coordinate research worldwide to generate new knowledge and solutions in close partnership with decision-makers and practitioners.

<sup>4</sup> The Stockholm Resilience Centre (SRC) is an international centre of excellence for resilience and sustainability science, established in 2007 through a joint initiative between Stockholm University and the Beijer Institute of Ecological Economics, to contribute to a world where social-ecological systems are managed to enhance human well-being. As a knowledge interface on resilience and development at SRC aiming to enable knowledge generation, dialogue and exchange between practitioners, policymakers and scientists, SwedBio is also a member of the project’s Steering Committee.

<sup>5</sup> The Nature Conservancy (TNC) is one of the leading conservation organizations working to protect ecologically important lands and waters for nature and people, established in 1951 with a mission to work with local governments, communities, and partner organizations to share science-based and collaborative methods to protect the lands and waters on which all life depends.

undertaken, with additional work to follow. Some of the key findings of relevant published research are summarized in the following section, with literature listed in section IV.

## **I. IMPACTS OF URBAN GROWTH ON BIODIVERSITY**

### **A. Urban expansion, natural habitat loss, and biodiversity**

7. As urban population growth continues, urban land cover is projected to dramatically expand (1, 3, 8). Global urban land cover is projected to increase between 430,000 km<sup>2</sup> and 12,568,000 km<sup>2</sup> between 2000 and 2030 (8), with an estimate of 1,527,000 km<sup>2</sup> more likely, nearly tripling the global urban land area circa 2000 (9).

8. Eight per cent of terrestrial vertebrates on the Red List of Threatened Species of the International Union for Conservation of Nature (IUCN) are already imperilled largely because of the direct impact of urban growth (7). Projections indicate that the more a range of species is associated with urban regions, the higher its risk of extinction. For example, if 30 per cent of a species' range is urbanized, there will be a 37 per cent chance that it will be classified in the IUCN "near threatened" category or worse (7). In the tropics, annual loss in vegetation with high probability to result from urban expansion is estimated at 5 per cent of emissions from tropical deforestation and land-use change (9). However, protecting just 6 per cent of the forecasted urban expansion area could protect 76 per cent of endemic species threatened by high risk of urban expansion in 24 priority ecoregions. As an added benefit, such protection would reduce green-house gas emissions by an amount worth USD47.3 billion (5).

9. Many publications are already highlighting areas of highest urban expansion into natural environments (1, 3, 9, 12). Current mapping capacities allow for finer identification of "urbanization and biodiversity hotspots". Some hotspots<sup>6</sup> threatened by urbanization include the Eastern Afromontane, the Guinean Forests of West Africa (4), the Western Ghats (India), and the Sri Lankan lowland rain forests (9). The most significant urban expansion into biodiversity hotspots is forecast to occur in South America (3).

### **B. Urban expansion and impacts on protected areas**

10. A review of documented impacts of urban areas on protected areas (6) describes 22 different types of impacts, which extend different distances from the urban area. A general guideline suggested in this review was that protected areas within 50km of an urban area are likely to have some impact on biodiversity or ecosystem function.

11. Projections from 1995 to 2030 indicate that the median global distance from a protected area to an urban area of at least 50,000 inhabitants will have decreased on average from 44 to 38 km. In other words, the majority of protected areas globally are close enough to cities that there has been, and will be, some effect on biodiversity or ecosystem function (5, 7). Trends differ in each region: in Africa, this reduction in median distance will be from 81 to 54 km, in Asia from 47 to 36 km, while in Europe it will be maintained at 22 km. In the Caribbean and Central America, this will go from 41 to 32 km; in South America from 115 to 108 km; in North America reduction will only go from 74 to 63 km; whereas in Australia, New Zealand and Oceania the median distance will be reduced from 110 to 93 km (6).

12. The amount of urban land (all sizes) within 50 km of all protected area boundaries is projected to increase from 450,000 km<sup>2</sup> circa 2000 to 1,440,000 +/- 65,000 km<sup>2</sup> in 2030 (3). China is projected to experience the largest increase in urban land near protected areas, with 304,000 +/- 33,000 km<sup>2</sup> of new urban land to be developed within 50 km of protected area boundaries (3, 9).

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<sup>6</sup> A biodiversity hotspot is a biogeographic region with significant levels of biodiversity that is threatened with destruction. The term "biodiversity hotspot" specifically refers to 25 biologically rich areas around the world that have lost at least 70 per cent of their original habitat.

### C. Indirect impacts via teleconnections

13. The magnitude and accelerating rate of contemporary urbanization are reshaping land use locally and globally in ways that require a reexamination of land change and urban sustainability. An emerging area of research (2, 9, 10) looks at “teleconnection”, how cities can affect land use and ecosystems far from their boundaries.

14. One key impact is the effect that urban natural resource use (e.g. food and timber production) has on the surrounding landscape (2). Urban dietary choices, for instance, have large land-use consequences.

15. Another key impact is the effect that energy generation has on the surrounding landscape. One study of the United States found that by 2040, over 200,000 km<sup>2</sup> of additional land (beyond the current footprint of energy production) will be affected by new energy development. Much of this new energy development is driven by increased urban demand for energy, due to a projected increase in urban population and per-capita consumption of energy. For contrast, in 2011 the total urban land area of the United States was around 450,000 km<sup>2</sup>, according to the National Land Cover Database (11).

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