United Nations Environment Programme

MetMUNC XLVIII

Topic: Displacement of Species Due to Urbanization

Chairpeople: Kasha Bhatia, Jasbina Sabharwal, and Jenna Rabin

---

Urbanization is an increase in population in cities and towns versus rural areas. It is directly correlated to an increasing population. In 2008, the United Nations announced that 50 percent of the world's population now lives in urban areas, a milestone in demographic history.[1]

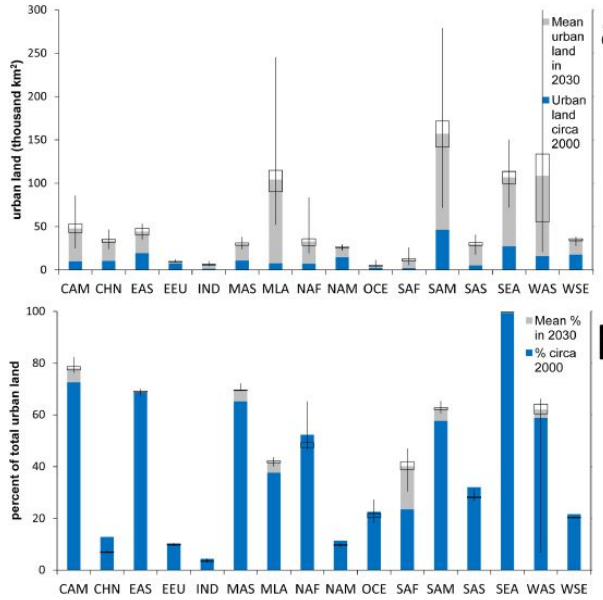


Figure 1: This graph shows the amount of urbanized land in locations throughout the world.

Urbanization is continuing to increase exponentially, and by 2050, 66% of the world's population is projected to be urban. For example, Nigeria is projected to get an additional 212 million urban dwellers by 2050, China approximately 292 million, and India 404 million.[2] The rate of urbanization is alarming; for example, in the city of Concepción, Chile, where 1734 hectares of wetlands and 1417 hectares of agricultural land, forest and scrub was lost to urban development

[1] https://www.prb.org/urbanization/

[2]http://theconversation.com/how-rapid-urbanisation-is-changing-the-profile-of-wildlife-in-cities-58818

between 1975 and 2000. This unprecedented rate of urbanization poses a major threat to biodiversity. [3]

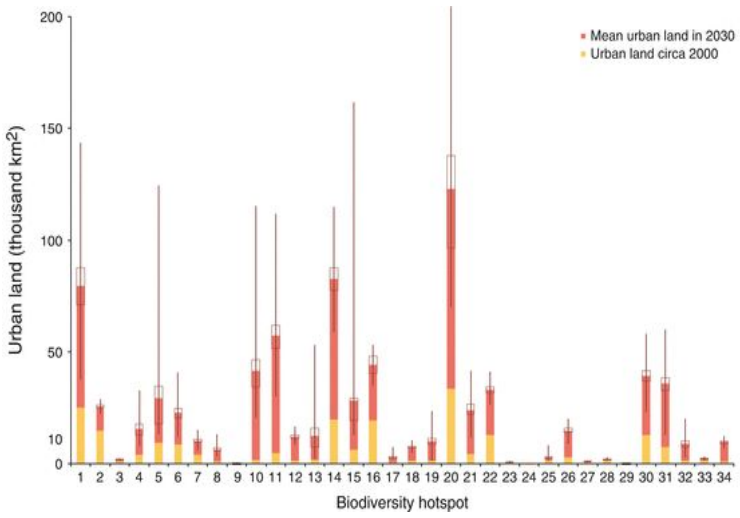
Urbanization impacts biodiversity both directly and indirectly. Physical transformations such as habitat loss, degradation, and modified soils are all directly caused by the expansion of urban areas. Indirect impacts include changes in water and nutrient availability, increases in air pollution, increases in competition from non-native species, and changes in predation rates. Urbanization also leads to habitat fragmentation, wherein larger continuous habitats are divided into smaller unconnected patches which are not big enough to support complex ecological communities. This fragmentation can result in genetic or demographic isolation of native species and cause dispersal of native species through changes in habitat composition and connectivity. As well as fragmentation, humans influence ecosystems in a way that is a fundamental principle of ecology. The most basic energy for life comes from the sun, and via photosynthesis is stored in plants. This energy is then passed through food chains to herbivores and carnivores. As energy is lost at each exchange between organisms at different levels, there is less energy available at higher levels of the ecosystem. This negatively impacts wildlife because humans use a vast amount of energy too—an estimated 20-30% of all energy available to ecosystems, which is predicted to rise to approximately 40%.[4] Urbanization is also a threat to endemic species, which are any species whose range is restricted to a limited geographical area, due to increased colonization by newly introduced species. Since the endemic species have distinctive features for a particular geographic habitat, urbanization forces them into new habitats where they cannot adapt. In the newly urbanized habitats, species may become endangered, or even locally extinct

[3] http://repositorio.uchile.cl/handle/2250/119969

[4]https://www.ukessays.com/essays/environmental-sciences/effects-of-urbanisation-on-animals-and-birds-environmental-sciences-essay.php

as natural habitats are replaced by urban infrastructure. In the United Kingdom for example, an increasing human population density and the resulting increase in urban development were found to be the cause of 35% of scarce plant species extinctions in the counties surrounding urbanized areas. Similarly, in the United States, urbanization has been found to be directly responsible for the endangerment of 275 species.[5] The rising human population leads to the expansion of urban areas and an increase in the demand for natural resources such as timber and fossil fuels. This inevitably leads to habitat destruction, which has been called "the largest factor contributing to the current global extinction event." Numerous studies have found that both the diversity and abundance of native species including plants, mammals, insects and amphibians decrease in response to urbanization. Animal populations are further inhibited by air pollution, toxic fumes from vehicles, and the loss of food source.

Figure 3: This chart illustrates the relationship between urban land area and the proliferation of biodiversity hotspots.



In general, urbanization can support fewer species. For example, a number of studies tried to determine the changes that occur in bird communities by comparing an urbanized site to a more forested site. The investigators found that urbanization decreased the species diversity of the avian community, and while it favored the dominance

[5]https://ecologicablog.wordpress.com/2011/11/06/how-does-urbanization-affect-biodiversity-part-one/

of a few species, it led to the loss of sensitive species and a shift in the species composition of bird communities.[6]Species cannot survive in the conditions of their newly urbanized habitats, and those who cannot adapt are forced to find a new habitat. Another study in Algeria looked into lead contamination in urban environments and how environmental pollutants might affect breeding performance. The results were higher lead concentrations in urban birds, but no direct correlation between elevated lead levels and nestling conditions. Nevertheless, vandalism was responsible for a low breeding success, which shows the direct effect of human disturbance on urban birds.[7]

Although urbanization creates huge economic opportunities for the residents residing in the countries, the advantages are not being capitalized on. To solve this, it is first crucial to understand the ecological impact of pollution and urbanization on wildlife. To solve the urbanization issue itself, there have been several proposed solutions. By promoting economic development and job creation, it is possible to combat poverty. Therefore, in order to protect animal species, it is imperative to implement solutions in the countries where excess urbanization is negatively impacting the animals of the nation. Habitat loss is also a cause of the displacement of species, as degradation, climate change, and water scarcity leads to the forced movement of species. UNEP has proposed urban environmental planning as a system that encourages communities to prioritize the welfare and stability of plant and animal species, and greatly minimizes the negative effects of infrastructure on a community's poorest residents. The use of sustainable, nature-derived solutions to restore ecosystems affected by biodiversity loss is also

[6] https://link.springer.com/chapter/10.1007/978-3-319-91689-7_13

[7]https://www.researchgate.net/figure/Urban-extent-in-biodiversity-hotspots-circa-2000-and-as-forecasted-in-2030-1-Atlantic_fig4_285307035

consistent with UNEP's vision of urban planning, as it has the potential to hugely preserve the environments of species pressured by detrimental modern activities such as logging and mining.

The goal of this committee is to discuss the displacement of species due to urbanization and how this issue may be combated. This committee will create solutions regarding the effects of urbanization on various species.

Questions to Consider:

1. Has urbanization in your country increased in the past few years?
2. What effect is urbanization having on animal species of your country?
3. Has your country taken any protocols or established laws regarding urbanization?
4. What species are the most affected by urbanization in your country?
5. How can your country help the species being affected by urbanization?

Helpful Links:

- https://ecologicablog.wordpress.com/2011/11/06/how-does-urbanization-affect-biodiversity-part-one/
- https://www.ukessays.com/essays/environmental-sciences/effects-of-urbanisation-on-animals-and-birds-environmental-sciences-essay.php
- https://www.prb.org/urbanization/
- http://theconversation.com/how-rapid-urbanisation-is-changing-the-profile-of-wildlife-in-cities-58818