

Effects of Urban Growth and Industrial Expansion on Climate Change

Sk. Tanjim Jaman Supto ¹, Ettahad Islam Adib ², Dewan Reza Hamid Karzai ²

¹ Department of Environmental Research, Nano Research Centre; Sylhet; 3114; Bangladesh

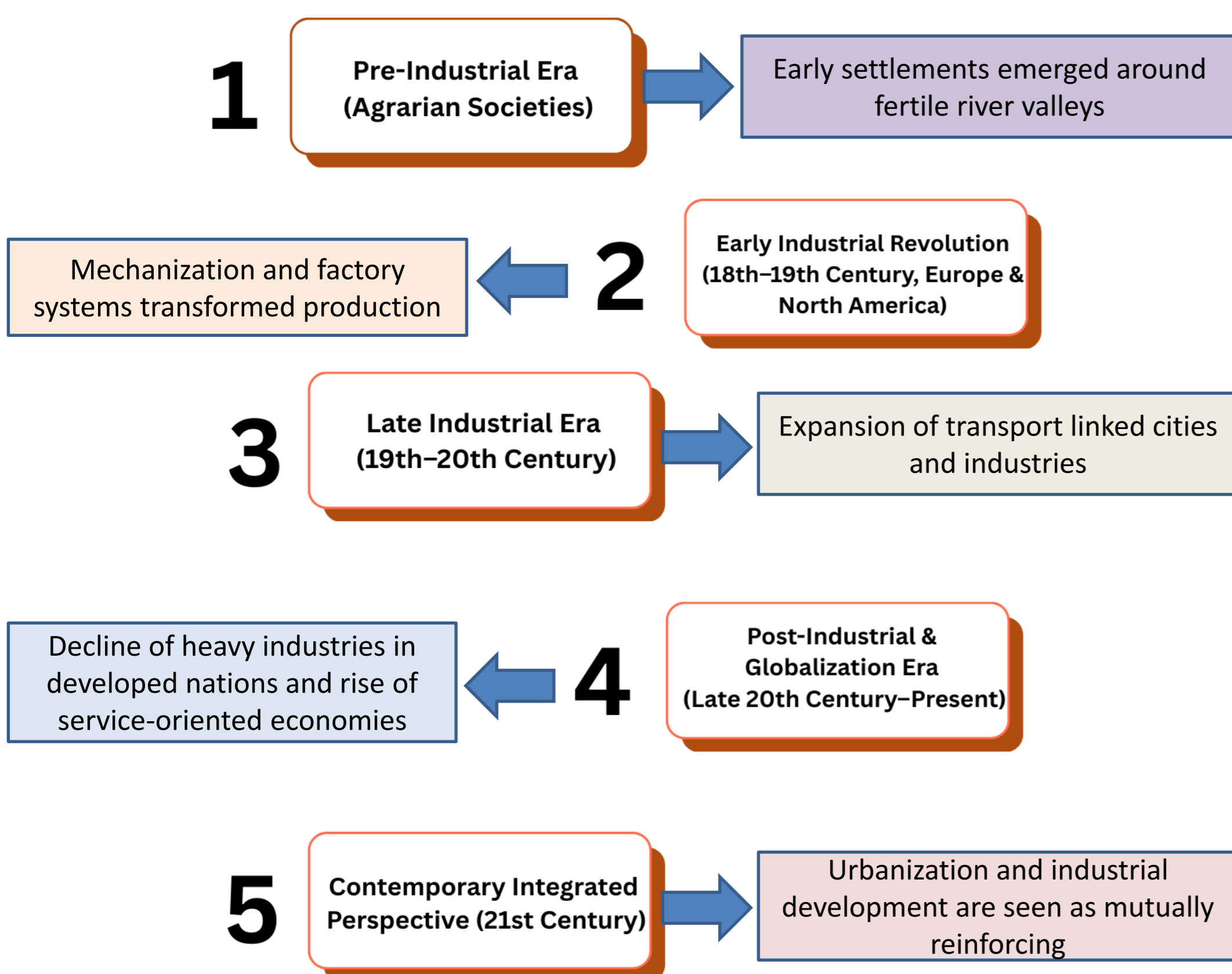
² Department of Industrial and Production Engineering, Shahjalal University of Science and Technology, Sylhet-3114, Bangladesh

Corresponding author email: sksupto7@gmail.com

INTRODUCTION

Cities are the centers of human social economic activity. With the advancement of science and technology under the development of human civilization, the lifestyle and livelihoods of urban residents have been simultaneously modified. Starting from the appearance of ancient primitive settlements and continuing until the boom of modern cities and urban mega-regions, cities have increased in both number and size. Meanwhile, the functions of cities have increasingly become richer and more diverse. This research paper focuses on the effects caused by urban growth and industrial expansion

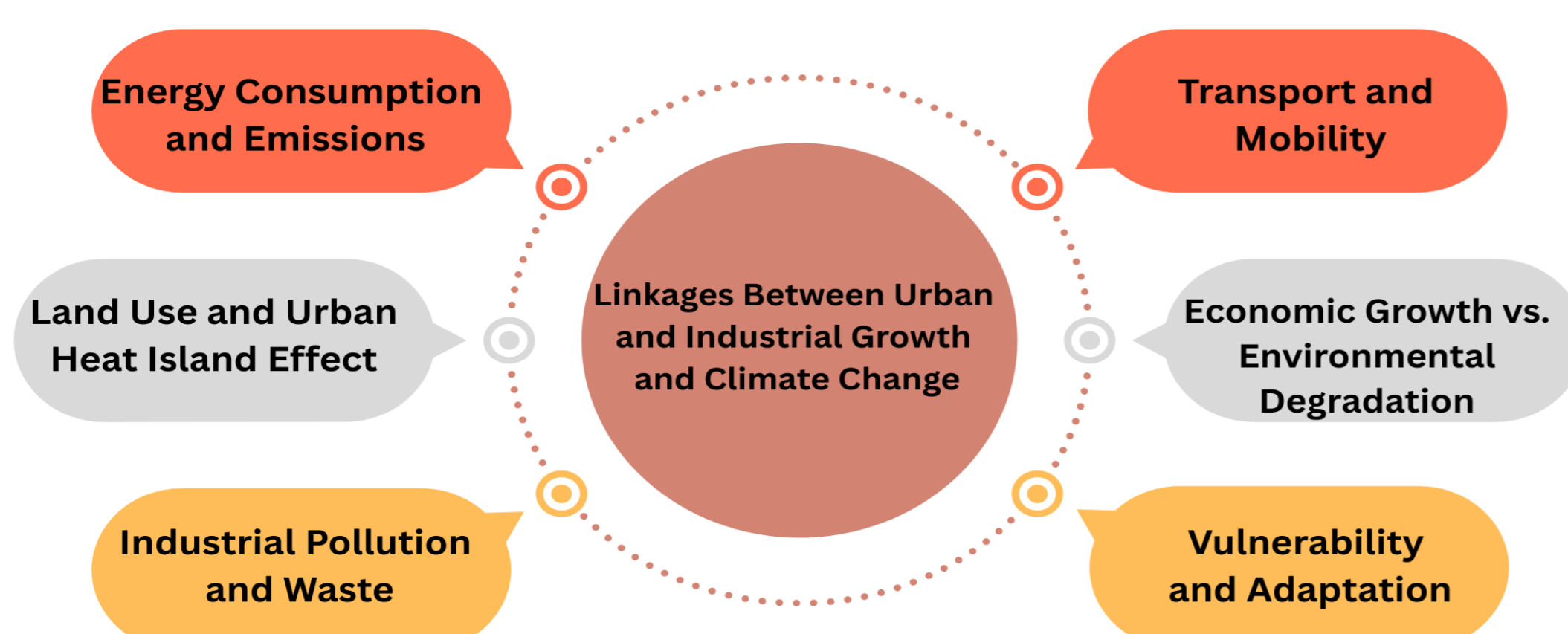
URBANIZATION AND INDUSTRIAL DEVELOPMENT



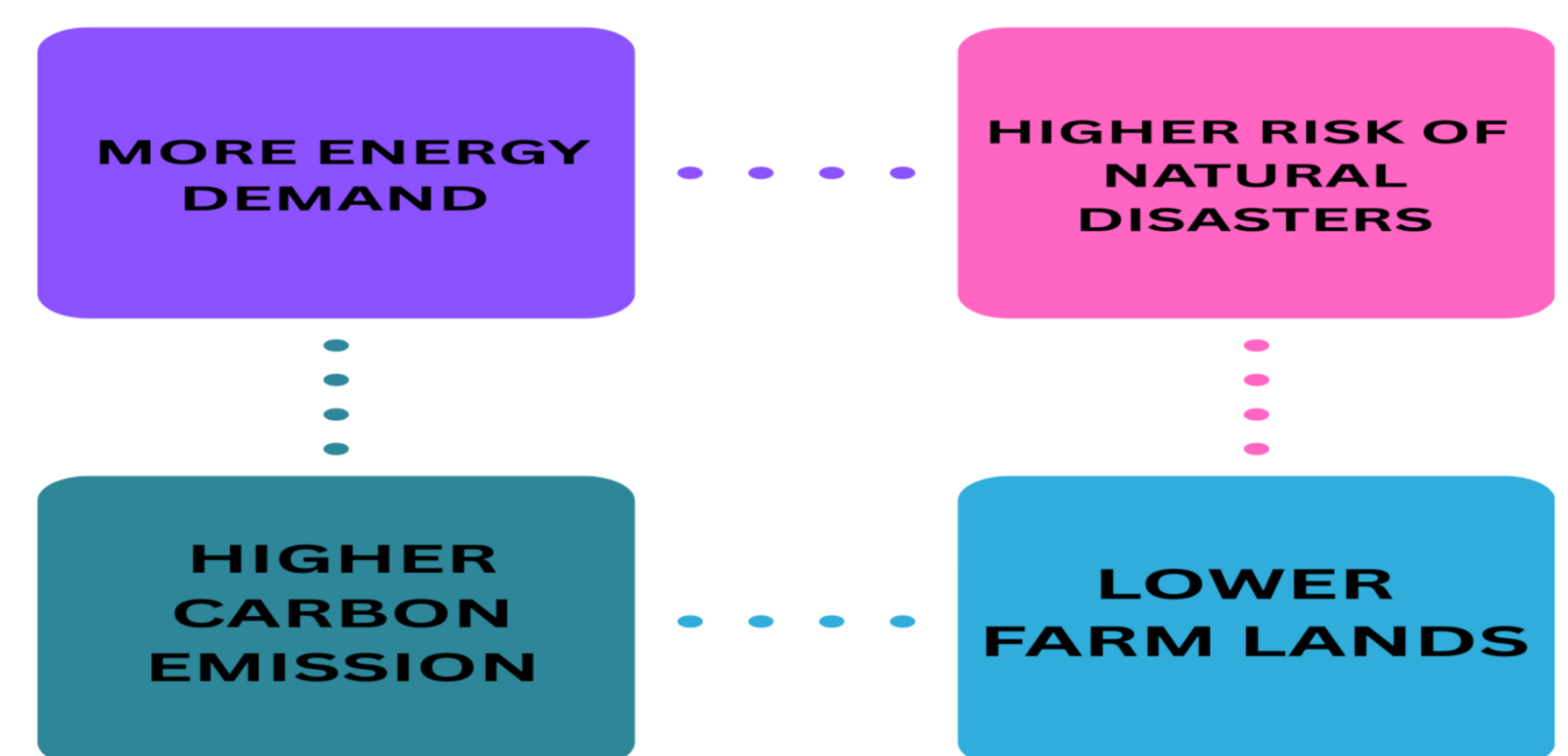
SUSTAINABLE URBAN AND INDUSTRIAL PLANNING

A city is the most dramatic manifestation of human activities on the environment. This human-dominated organism degrades natural habitats, simplifies species composition, disrupts hydrological systems and modifies energy flow and nutrient cycling. Sustainable urban development (SUD) is seen as a panacea to minimize these externalities caused by widespread human activities on the environment. The concept of SUD has been around over a considerably long time as the need to adopt environmentally sustainable behaviors made the international community commit to it.

URBANIZATION INDUSTRY AND CLIMATE CHANGE



URBAN–INDUSTRIAL IMPACT ON CLIMATE



ADAPTATION AND MITIGATION STRATEGIES

Resident lifestyles have played an important role in driving global and local GHG emissions on both the production and demand sides. Although production-based low-carbon strategies have been seen as the main solution to climate change mitigation, demand-side mitigation options on household lifestyle changes can provide the necessary leeway to accomplish climate goals and to maintain UN Sustainable Development Goals (SDGs).

CHALLENGES FOR SUSTAINABLE DEVELOPMENT



CONCLUSION

Urban growth and industrial expansion play a critical role in exacerbating climate change, primarily through increased greenhouse gas emissions and the intensification of urban heat island effects. These trends disrupt local climates and contribute to broader environmental challenges. Despite ongoing mitigation efforts, the pace of urbanization and industrialization often outstrips the capacity for meaningful change. As such, adopting integrated strategies that prioritize sustainable urban development and low-carbon infrastructures is essential for reducing climate vulnerabilities and fostering long-term resilience.

REFERENCES

- Yigitcanlar, T.; Teriman, S. Rethinking Sustainable Urban Development: Towards an Integrated Planning and Development Process. *Int. J. Environ. Sci. Technol.* **2015**, *12*, 341–352, doi:10.1007/s13762-013-0491-x.
- Wang, F.; Harindintwali, J.D.; Wei, K.; Shan, Y.; Mi, Z.; Costello, M.J.; Grunwald, S.; Feng, Z.; Wang, F.; Guo, Y.; et al. Climate Change: Strategies for Mitigation and Adaptation. *Innov. Geosci.* **2023**, *1*, 100015, doi:10.59717/j.xinn-geo.2023.100015.
- Zhang, X.; Han, L.; Wei, H.; Tan, X.; Zhou, W.; Li, W.; Qian, Y. Linking Urbanization and Air Quality Together: A Review and a Perspective on the Future Sustainable Urban Development. *J. Clean. Prod.* **2022**, *346*, 130988, doi:10.1016/j.jclepro.2022.130988.
- Anzolin, G.; Lebdioui, A. Three Dimensions of Green Industrial Policy in the Context of Climate Change and Sustainable Development. *Eur. J. Dev. Res.* **2021**, *33*, 371–405, doi:10.1057/s41287-021-00365-5.