

**BEYOND 2030: ADVANCING SUSTAINABLE DEVELOPMENT GOAL 13
(CLIMATE ACTION) THROUGH CLIMATE-RESILIENT URBAN PLANNING,
CIRCULAR ECONOMY, AND GLOBAL COOPERATION****Afra O. Al-Suwadi****ABSTRACT**

The United Nations Sustainable Development Goal 13 deals with climate change and focuses on initiatives to control and reduce its effects through resilient urban planning, sustainable resource management, and cooperation between countries worldwide. This paper shows the importance of adopting comprehensive policies and collaborative efforts to reduce the impacts of climate change before 2030. This paper discusses strategies, challenges, and opportunities in urban planning to achieve SDG 13 (Climate Action). Case studies from cities such as New York, Melbourne, and Dubai showcase innovative solutions to transform from a linear economy to a circular economy model, nature-based solutions, and investments in green infrastructure. Developed countries have achieved notable progress while developing countries are still struggling due to limited resources, and social, and economic challenges.

keywords:

SDG 13, Climate Action, Urban Development, Resilient Urban Planning, Circular Economy, Green Infrastructure, Nature-Based Solutions, Sustainable Resource Management, Climate Change Mitigation.

1. INTRODUCTION**Beyond 2030: SDG 13 (Climate action)**

Climate change is one of the most intricate and pressing issues of the twenty-first century. Climate change and the associated challenges are not only geographically localized but have far-reaching ecological, economic, social and political impacts on the world. Climate change, sea-level rise, biodiversity loss, extreme weather events, changing precipitation patterns and rising temperatures has placed unprecedented challenges on societies around the globe. The effects of climate change are no longer seen in the distant future, but in the form of more heatwaves, more floods, more droughts, more wildfires, and millions of people being displaced in various parts of the world due to climate change.

Over the past few decades there has been a great deal of progress in the science of climate change. The Intergovernmental Panel on Climate Change (IPCC) has also found that human activities, especially the burning of fossil fuels, industrial growth, land use and changes and unsustainable consumption patterns contribute most of the warming observed since the industrial revolution. Greenhouse gas (GHG) emissions have been increasing at a rapid pace and are affecting the Earth's climate system, with implications on public health, economic security, infrastructure sustainability and social equity other than environmental impacts.

The Industrial Revolution was an important turning point in human development. Although industrialization helped to improve the standard of living, technological progress helped economic growth and increased reliance on fossil fuels and resource-intensive production processes. Overall concentrations of GHG in the atmosphere have risen markedly due to urban expansion, industrial production, energy use, and transportation. Hence, cities as the engines of economic activity and population growth have been made both contributors to and victim of climate change.

Cities are especially at risk due to their heavy population densities, dense infrastructure networks, and reliance on intricate systems and subsystems for energy, transport, food and water. As more and more people move to urban areas, climate risks like extreme heat, flooding, coastal erosion and air pollution have become even stronger. The global urbanization rate is approximately 55% and is projected to rise in the next few decades. As a result, cities are emerging as a key climate change arena in which climate change mitigation and adaptation strategies are needed to be deployed.

There are challenges and opportunities arising from the urban development - climate change link. Improper urban planning can lead to larger and more intense heat islands, loss of natural habitats, increased emissions of greenhouse gases and increased vulnerability for disadvantaged populations. But with good urban planning strategies, cities can become powerful tools for climate action by integrating renewable energy, fostering

sustainable transport, building green infrastructure, practicing a circular economy and by implementing nature-based solutions.

The Sustainable Development Goals (SDGs) are a global initiative by the United Nations, adopted in 2015, that is part of the 2030 Agenda for Sustainable Development. The SDGs are a broad set of goals consisting of 17 interconnected goals to tackle global issues such as climate change, environmental degradation, inequality and poverty. The Sustainable Development Goal 13 (SDG 13): Climate Action has, amongst others, the goal of taking urgent action to combat climate change and its effects by increasing resilience, bolstering policies and laws, and strengthening international cooperation and awareness.

SDG 13 is a pivotal element of sustainable development as the impacts of climate change affect the attainment of almost all other SDGs. Climate-related disasters can for instance, negatively impact poverty reduction (SDG 1), food security (SDG 2), public health outcomes (SDG 3), access to clean water (SDG 6), and inequality (SDG 10). Thus SDG 13 not only serves as an environmental goal, but is also a prerequisite for the overall achievement of SDGs.

1.2 Climate action and international evolution of the law.

International climate action has been developed over decades of scientific research, diplomatic negotiations and policy development. International climate change debate started with the issue of pollution control and protecting the ecosystem; however, with the growing awareness about global warming, the attention of the international community turned to climate change mitigation and adaptation.

International climate cooperation has been one of the first key accomplishments, achieved with the adoption of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992. The UNFCCC established an international arena for countries to work together in order to reduce GHGs and mitigate climate risks. This system later facilitated a number of key treaties, such as the Kyoto Protocol of 1997 and the Paris Agreement of 2015.

The Paris Agreement was a game-changer in international climate governance, by putting into practice a more flexible framework grounded on nationally determined contributions (NDCs) that enable countries to define their climate commitments reflecting local conditions, and by emphasizing that developed countries would hold the same standard as developing ones.

Nevertheless, despite advances in international climate cooperation, global emissions are still at problematic levels. Several countries have committed to reaching a net zero, and there are implementation obstacles. Some of these problems are reliance on fossil fuels, lack of climate finance, technological hurdles, political differences, and differences in capacity between developed and developing countries.

The consequences of climate change are also bringing environmental justice to the fore. Developed economies are found to have a higher share of cumulative GHGs, because they have been industrialised for centuries. On the other hand, some of the greatest impacts of climate change are occurring in developing countries that are emitting less than their industrial counterparts. This has sparked discussions about who is responsible, how much support is required, how to transfer the technology, and how to achieve fair climate action.

Climate justice is a concept that has enabled to highlight the need to take social and economic inequalities into account in climate policies, and to protect vulnerable communities. Adaptation to the climate should not only be about mitigating environmental hazards but also on other factors like poverty, resource access, displacement, and community engagement.

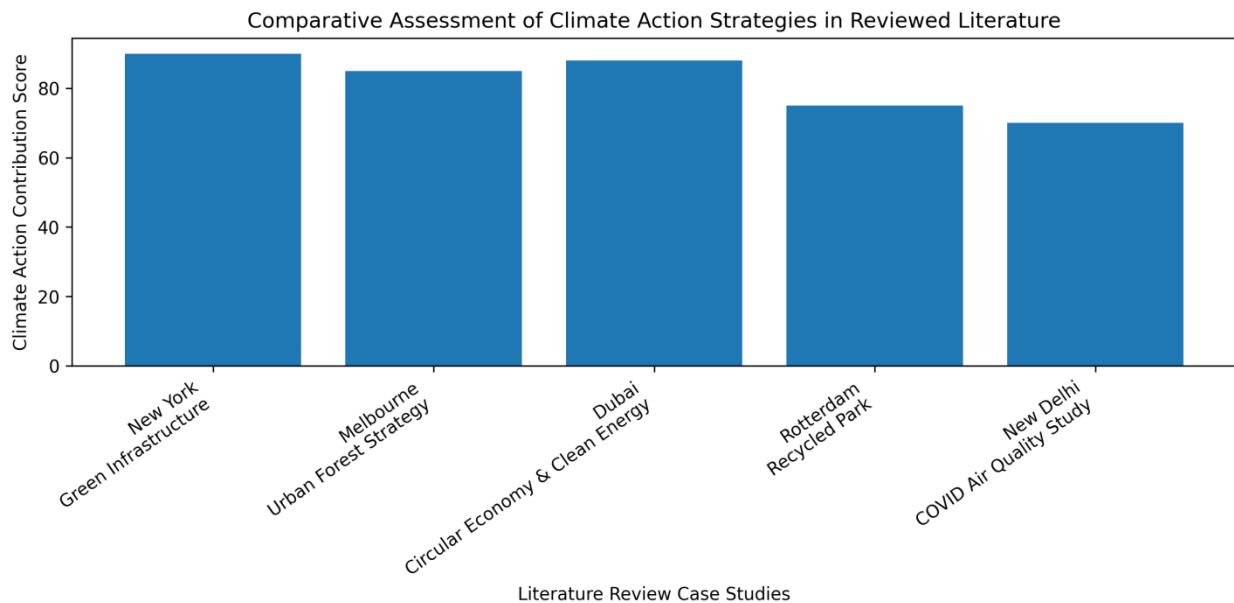
1.3 Importance of SDG 13: Climate Action.

SDG 13 was added to inspire action now and action that is transformative when it comes to climate change. While specific SDG targets will be in certain sectors, SDG 13 is a cross cutting objective that will have an impact on economic development, urban planning, energy systems, social policies etc. It will need to be implemented through a coordinated effort of governments, industry, scientists, and local and international groups.

LITERATURE REVIEW

Many cities have implemented innovative SDGs 13 programs and projects. As an example, New York City has launched the Green Infrastructure Program, which has introduced more than 13,000 sustainable assets, including rain gardens, green roofs, and permeable pavements. Together, these programs manage 2,363 acres of stormwater within combined wastewater system areas to reduce combined wastewater overflow by 1.67 billion gallons by 2040. With over \$1 billion already invested and an additional \$3.5 billion planned by 2045, the program significantly supports SDG 13 by strengthening New York City's resilience to climate change. Through measures that mitigate flood risks, enhance water quality, and decrease greenhouse gas emissions (GHGs) (*NYC Green Infrastructure*, 2023).

A remarkable case study is the climate change adaptation strategy implemented in Melbourne, Australia, which integrates a comprehensive approach to adapt to the changing climate and establishes a detailed risk assessment to highlight the priority areas for climate action (City of Melbourne et al., 2017). In addition to the "urban forestry strategy 2021 - 2045" which was established to reduce the impacts of climate change, including rising temperatures, and to manage water resources during severe floods. Urban forestry strategy aims to double the city's green areas, which will help reduce the impact of extreme heat and urban growth (ACT Government, 2021). The COVID-19 pandemic came with unexpected environmental benefits, which included a worldwide decrease in greenhouse gas (GHG) emissions and a rise in investments in sustainable mobility and urban green infrastructure. For instance, during the lockdown period in New Delhi, India, air pollution levels decreased by almost 60%, allowing residents to see clear skies and even distant mountains in a city where fog is all that is visible (Chaudhary et al., 2021). Similarly, over 1,500 trees were planted during the pandemic in Melbourne, Australia, due to the adoption of the Urban Forest Strategy, which provided long-term climate resilience as well as mental health relief (City of Melbourne, 2012). Economic recovery packages, such as Germany's €130 billion investment in green energy and electric vehicle infrastructure, created jobs while aligning with SDG 13 (climate action) (Walton & Jonker, 2020). These initiatives show how urban climate action during the pandemic addressed immediate challenges while building a sustainable future.



METHODOLOGY

This research paper uses a qualitative methodology, combining case studies, document analysis, and comparative analysis to achieve Sustainable Development Goal 13 (Climate Action) before 2030, through practical strategies to mitigate climate change.

Table 1. Research Methodology Framework

Method Component	Description	Application
Research Approach	Qualitative analysis of climate action strategies.	Examines SDG 13 implementation approaches.
Research Design	Case study and comparative analysis.	Reviews climate initiatives in selected cities.
Data Sources	Academic papers, UN reports, and policy documents.	Provides evidence for climate adaptation and mitigation strategies.
Case Studies	Selected based on climate innovation and SDG 13 relevance.	Includes New York, Melbourne, Dubai, Rotterdam, and New Delhi.

Analysis Method	Thematic and comparative analysis.	Identifies key themes: resilience, green infrastructure, circular economy, and climate finance.
Evaluation Focus	Assessment of climate action effectiveness.	Measures contribution toward SDG 13 goals.

FINDINGS AND DISCUSSION

With only six years remaining to achieve the UN Sustainable Development Goals (SDGs) by 2030, global progress remains uneven, and just 17% of the SDGs targets are on track (United Nations, 2024). This shows a huge gap between developed and developing countries in achieving the goals. This gap is mainly caused by unequal access to critical life support systems. Since the adoption of the SDGs in 2015, the world has faced unpredicted challenges, including the Russia-Ukraine war, the Palestine-Israel war, pandemics, and other man-made disasters. These events have significantly threatened the achievement of the SDGs, with a specific severe impact on SDG 13 (Climate Action), showing the urgent need for global cooperation to overcome these challenges. According to the 2024 sustainable development goals report, there is a huge difference in how countries are progressing toward SDG 13 (Climate Action). As mentioned in (UN DESA, 2023), the leading countries and highest-scoring countries are Finland, Sweden, Denmark, and Norway. By placing strong emissions reduction laws in the country and investing in green infrastructure, these nations were able to achieve high scores, which reached more than 85% in the 2024 UN SDG report. On the other hand, because of low funding, poor infrastructure, and political instability, countries such as Afghanistan, Haiti, and Chad are finding it difficult to meet UN SDGs and climate targets. Globally, the UAE ranked 70th, with a national climate neutrality strategy and futuristic targets to reach net-zero emissions by 2050. Although the UAE still depends on fossil fuels and oil, the country is progressing with other sustainable energy projects such as the Mohammed bin Rashid Al Maktoum Solar Park in Dubai and other clean energy and carbon capture initiatives that support SDG 13 goals (UN DESA, 2023).

To mitigate climate change effects, we need to coordinate actions at the international, local, and regional levels. Decision makers must start by reviewing current laws and regulations to establish a working framework that supports the transition to a net zero emission future. Countries that align with international standards can be rewarded, while those that fall short must be penalized. Environmental sustainability needs to be at the center of urban development. Considering that this is an essential step in reducing the effects of climate change. Countries must start by developing climate neutrality plans, adding more green space, and integrating sustainable building practices into their building codes to accomplish SDG 13 (climate action).

A key factor in achieving SDG 13 (climate action) is based on the shift from a linear economy model, which is mainly focused on consumption and disposal (cradle to grave), to a circular economy model, which reuses resources until the end of their lifecycle (cradle to cradle). By reducing waste and reducing resource depletion, a circular economy model can mitigate the effects of climate change. The United Arab Emirates has adopted several initiatives and projects to promote this transition. For example, according to Dubai Municipality (2022), Dubai has established green building regulations that aim to reduce energy consumption, promote renewable energy use, and reduce waste production, aligning directly with SDG 13 targets. Another example, mentioned in Dubai Electricity and Water Authority (2023), is Dubai's Waste to Energy Plant, one of the world's largest Waste to Energy facilities, which converts solid municipal waste into energy. This project aims to reduce landfill numbers and contribute to cleaner energy solutions. These initiatives show how to balance urban growth and climate goals, promote environmental sustainability to create green jobs, advance the local economy, and enhance the quality of life.

Urban green areas play an important role in achieving SDG 13 (climate action). These areas can serve as climate regulators, recreational spaces, and carbon-positive contributors (Lorenzo-Sáez et al., 2021). For example, Yogyakarta, Indonesia has reached 10.93 m²/person of urban green areas, which is considered low (Aditya & Ningam, 2021). Moreover, evaluating urban green areas can be done in various ways, such as remote sensing and GIS analysis reports. To measure and assess urban green areas, some of the key indicators include canopy size, cover percentage, and per capita rates. These indicators are important to track SDGs progress and to forecast the future (Polat, 2017; Aditya & Ningam, 2021). In addition, countries must implement conservation efforts by creating natural reserves, monitoring species populations, and implementing rules and regulations for urban growth and biodiversity preservation. Projects such as the Hatta Ecotourism Plan under Dubai's 2040 Master Plan reflect how cities can balance biodiversity conservation with sustainable development to achieve environmental harmony (Dubai Municipality, 2022).

Green infrastructure (GI) and nature-based solutions (NbS) should be combined and adopted by countries to enhance climate resistance and overcome environmental urban challenges. Strategies such as the 2021 EU Adaptation Strategy highlight the role of GI and NbA approaches, which are cost-effective and can benefit the environment and the public. The public often neglects the role of design in reducing climate change, but those methods can be in the form of green roofs, spaces for wildlife, or rain gardens to collect rainwater, which can then be used for irrigation purposes. Those techniques will improve the country's climate resilience and air quality and enhance public health. By using these techniques, cities can reduce the effects of climate change and move closer to achieving the 2030 Agenda for Sustainable Development (Raffa, 2023).

Energy transition is another important aspect to reduce climate change effects beyond 2030. Cities should focus on adopting clean energy solutions to reduce energy consumption. For instance, Dubai's Biogas to Energy Plant project shows that efficient waste management can reduce emissions. The plant produces enough electricity to cover half of its operational needs (Dubai Municipality, 2022). In addition, countries must support sustainable transportation practices by investing in non-motorized transit infrastructure, such as creating more walking and cycling paths. As well as expanding the electric fleet and encouraging the integration of renewable energy sources into the national transportation system.

Efficient waste management systems should be implemented across the globe. Countries must prioritize projects that contribute to landfill closure, such as recycling projects, waste-to-energy projects, and landfill gas capture projects. For instance, the Recycled Park project in Rotterdam, Netherlands, which converted plastic waste into 1500 square meters of green spaces, serves as a walking area for residents and a habitat for animals (Designboom, 2018). Through the implementation of similar innovative projects worldwide, countries can reduce the negative impact of waste, mitigate climate change effects, ensure the achievement of SDG 13 (Climate Action) in the long term, and create a sustainable future beyond 2030.

The creation of the Loss and Damage Fund (L&D) in COP27 is considered a huge improvement in climate finance. This fund aims to help countries to recover from climate change events. However, there are still arguments about how to distribute the funds between countries (Huber & Murray, 2023). For example, loss and damage funds can be used in the urban planning of cities through the application of principles such as the "build back better" principle that helps in improving infrastructure and creating disaster-resilient urban systems. The success of the L&D fund depends on overcoming challenges such as accessibility of funds and political resistance from donor countries. Urban planners can use this fund to design climate-resilient cities to align with the SDG agenda beyond 2030 (7 *Recommendations on Loss and Damage for Informal Urban Settlements*, 2024). Improving forest and land management can contribute up to 20% towards Paris Agreement goals, increasing community and ecosystem resilience. On the other hand, forest actions are only dedicated to 3% of climate finance (Louman et al., 2019).

CONCLUSION

To conclude, achieving SDG 13 (Climate Action) targets and goals requires a collaborative effort from all levels international, national, and local. To create cities that are resilient against climate change, this paper highlights the importance of reimagining urban areas through sustainable planning investment in green infrastructure and adoption of circular economy practices. Although developed countries have achieved significant results, the gap must be addressed by ensuring that the developing countries are receiving adequate funding from the lost and damaged agreement, fair policies, and needed technologies to close the gap. For governments to achieve the right decision-making, there must be proper reporting and monitoring systems (Okisatari & Khalid, 2023).

Rafa (2023) discusses the role of investing in green infrastructure through a strong partnership between communities, businesses, and governments that can bring major improvement. However, countries can adopt creative approaches to climate disaster risk management, such as integrating climate disaster risk evaluation in planning, which is especially important to protect vulnerable populations. We need to develop new frameworks that reflect the current environmental, social, and economic situation as the climate crisis develops. To ensure equitable results for those most impacted, climate justice must remain at the heart of these efforts. Countries should combine green infrastructure and nature-based solutions for communities to be resilient, sustainable, and livable.

By prioritizing environmental sustainability in planning and international partnerships, countries can better protect themselves from increasing climate risks. Beyond the 2030 agenda, we all should commit to climate so that all countries, no matter how rich or poor, can contribute to a more resilient and sustainable future.

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