Rooftop Farming as Climate Adaptation and Its Legal Framework for Sustainable Urban Living in Bangladesh

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ABSTRACT

The most significant cities in Bangladesh are heating very fast. It is not only because of climate change, but also because of a phenomenon called the "Urban Heat Island" effect. It refers to where concrete buildings and roads trap heat, which creates massive problems. It makes people sick and drives up electricity bills from using more AC and other cooling electronics. Moreover, it creates hardship for people to work, especially the poor, who cannot afford cooling. While everyone is discussing big-picture climate solutions, there is a simple and effective solution called rooftop farming (RTF). This method involves transforming flat rooftops into small gardens with soil and plants, which is a great way to fight the heat. Significant research indicates that plants and soil absorb heat, which reduces the local temperature by a few degrees and may even help mitigate the effects of air pollution. On top of that, these RTFs are contributing to our food security by providing fresh vegetables for families. Unfortunately, this significant initiative is not prioritized that much. However, several international laws increasingly encourage RTF as part of sustainable development and climate adaptation. Although the National Agriculture Policy has recognized it, significant policy gaps and legal lacunae remain. So, the government is yet to take the initiative to raise awareness among people, which leaves them blind folded. By following the qualitative method, this research emphasizes that there is a need for government initiatives through legislation and policy to encourage RTF and make urban areas more livable and sustainable.

Key Words: Urban Heat Island (UHI), Rooftop Farming (RTF), Climate Change, Sustainable Urban Living, Bangladesh.

INTRODUCTION

People around the world are feeling the effects of rising heat because of the rise in global temperature. The most significant cities in Bangladesh are warming rapidly. People often experience extreme heat because of the mass of buildings that are built from concrete, glass, and asphalt (Safayet et al., 2017). Climate change raises average background temperatures, but urban design and construction make cities hotter compared to their surrounding areas. This is known as the urban heat island (UHI) (Dewan et al., 2021). It generally works as buildings and roads absorb heat during the day and release it slowly at night, so evenings remain hot, and relief is brief (US EPA, 2014b). An analysis from the World Bank shows that the temperature of Dhaka is increasing day by day, and it increased from roughly 33°C to 34.6°C between 2000 and 2019, and surprisingly, the "feels-like" temperature can be about 4.5°C higher than the surrounding areas because of UHI (*Dhaka on the Boil: Urban Heat Islands, Health Risks, and Economic Costs Mount in Bangladesh, Warns World Bank - OneWorld SouthAsia*, 2025).

In this context, it is essential to find solutions that can help cool buildings and streets near where people live and work simultaneously. A simple but powerful solution exists, namely, the rooftop farming (RTF) (Safayet et al., 2017). It makes the environment cooler below the soil and the surrounding areas (US EPA, 2014b). Moreover, it also fulfills the requirement of the fruits and vegetables of a family, which also contributes economically in the densely populated cities like Dhaka (US EPA, 2014a). Eventually, these changes demonstrate how RTF can play a meaningful role in creating a cooler, greener, and more sustainable urban future.

Meanwhile, Bangladesh is already pointed in this direction. Looking into Article 18A of the Constitution of Bangladesh, the state commits to protecting and improving the environment and biodiversity (*The Constitution of the People's Republic of Bangladesh*, 1972). In addition, courts have interpreted the right to life to include a safe and healthy environment (*Farooque vs. Government of Bangladesh, WP 998 of 1994*, 1994). Some national climate strategies have been taken, namely the updated Nationally Determined Contribution (NDC, 2021), the National Adaptation Plan (NAP, 2023–2050), and 29 new projects under the Climate Change Trust Fund (BCCTF) (2025), which are all for resilient and nature-based solutions (Begum et al., 2021). As far as RTF is concerned, the National Agriculture Policy (2018) explicitly recognizes rooftop agriculture under the heading "Specialized Agriculture"(*National Agriculture Policy – 2018 (English) – Bangladesh Biosafety Portal*, 2018). These create both a legal duty and a policy umbrella for urban greening and RTF. The more challenging part is to convert those commitments into ordinary building design, permits, and incentives in Dhaka, Chattogram, Khulna, and other cities.

Unfortunately, some pieces are in place but not connected. A few years back, the government of Bangladesh (GoB) announced a nationwide 10% holding tax rebate for RTF to encourage urban greening (*Bangladesh Announces 10pc Tax Discount for Rooftop Gardening | The Financial Express*, 2023). Moreover, Dhaka North City Corporation (DNC) also understands the benefits of the RTF. Subsequently, the DNC announced a 5% rebate in its jurisdiction to encourage more planting (*Homeowners with Rooftop Gardens to Get 5% Tax Rebate: DNCC | The Daily Star*, 2025). But the execution process was not clear enough. The lacks are found in the Bangladesh National Building Code (BNBC 2020) for their ambiguous decision-making regarding the designs and approval. It does not even prioritize the RTF explicitly. As a result, the householders and engineers are not aware of this concept.

Thus, this research is being conducted. First, it identifies the gaps in existing literature. After that, this research focuses on the significance of the RTF for sustainable climate adaptation. The research explores the international safeguards regarding RTF for the protection of the environment. With this analysis, this research scrutinizes the national laws and their implementation by institutional practice. This research also visualizes some model countries that have established the RTF in their community, as well as in their policy. This research delves into finding further analysis from a legal perspective.

Research Objective

This research aims to investigate the RTF as one of the most essential criteria for sustainable environment and climate adaptation in Bangladesh. RTF is a significant contributor to the violation of environmental rights. The objective of this research is to identify the adequacy, implementation, and effectiveness of national and international legislation and policies regarding environmental protection through RTF. Then, the research objective is to find out the best practice in analyzing the countries which have taken the RTF to the extent of their policy making. Moreover, the objective of this research is to scrutinize the alliance of international laws with the national laws in Bangladesh. This research also assesses the institutional practices in protecting the environment, implementing the RTF initiative, because non-implementation of this initiative amounts to discrimination against environmental rights.

LITERATURE REVIEW

According to a 2022 UN-Habitat report, the global population in urban areas is expected to grow from 56% in 2021 to over 68% by 2050. However, about one-eighth of this population lives in 33 megacities, each with more than 10 million people in highly urbanized areas (Cepei, 2020). The UHI effect establishes several challenges in many rapidly urbanizing cities, such as Dhaka and Chittagong (Sultana et al., 2024). The researchers are conscious of the current global warming and environmental issues. Several studies have been conducted to address these major crises and improve the standard of living for people living in cities. However, most of the research has been based on environmental development.

Research on UHI and green infrastructure has grown quickly over the past decade. An international journal article (Soltanifard & Amani-Beni, 2025) analyzed how the parks and gardens cool cities by providing shade, promoting evapotranspiration, and increasing surface reflectivity, which reduces heat absorption and lowers

temperatures. Similarly, in another article (Begum et al., 2021) highlighted that roofs with plants or green covers stay cooler, and less heat gets into the top rooms of the building compared to uncovered roofs. So, integrating green roofs and cool roofs, along with other green infrastructure, offers a promising and effective solution to mitigate the UHI effect and reduce urban heat.

Particularly, research on air temperature around concrete buildings has gained attention for the vulnerable situation of the environment. However, the extent of the cooling effect depends on various factors, such as building height, wind, and the overall amount of greenery on the roof (Tariq, 2023). Different types of research are being conducted in the major cities, such as Dhaka and Chittagong (Nahar et al., 2024). In recent case studies, it has been proven that widespread use of green roofs could reduce average urban air temperatures by about half a degree (Tariq, 2023). In a recent case study in the Bashundhara residential area of Dhaka city, conducted by (Khan et al., 2024), RTF has an impact on decreasing the temperature and improving the air quality. Additionally, the air above green roofs and adjacent streets could experience cooling of a couple of degrees during peak heat periods (Sultana et al., 2024). Some researchers meticulously observed that it helped to decrease the temperature by approximately 3.26(±2.31)◦C on average at the time of the sun's zenith hours, and from an architectural perspective, the indoor environment remained cooler on average by 2.14 (±1.46)◦C, which saved almost 10,000 BDT annually in electricity costs. (Khundu et al., 2023).

Based on this, a practical strategy for Bangladesh could involve using green roofs where the building structure and maintenance allow for it. Moreover, the consumers get more benefits with a considerable portion of natural foods, and a source of money from selling those foods (Nahar et al., 2024). The people who live in major cities like Dhaka, Chittagong desire the support of the GoB in enhancing RTF (Uddin, 2016). These findings align with the global reviews showing that RTF improves diet diversity, reduces food costs, strengthens community bonds, and helps mitigate urban heat.

Several researchers emphasized the significance of RTF from a sustainable living and agricultural development basis. The author found that there is an inadequate number of legal research emphasizing RTF. If the GoB makes a change in the legislative level regarding RTF, it will be a role model for the other states. The following sections will discuss the benefits of RTF, international protection, best practices, and the national situation.

Conceptual Framework: The Impacts of Rooftop Farming (Rtf) In the Urban Environment

RTF is a compact and cost-effective way to make the building cooler. It assists in reducing global warming in the urban areas. RTF covers the roof with plants, and the soil absorbs the surface heat and radiation (Sultana et al., 2024). Trees absorb the CO2 from the environment and provide Oxygen to us (Begum et al., 2021). As a result, people can get rid of the excessive heat with these compact initiatives. When the roofs are cooler, the rooms also remain cooler, that's creating living standard. Subsequently, the excessive use of the air conditioner will be reduced. Moreover, it will also save electricity and money. Due to global warming, people suffer from various diseases like cold and allergies (Sultana et al., 2024). When the weather is cooler than usual, it will at least provide some relief. Ultimately, people living in the urban areas will get rid of this crisis. GoB, at the same time, will be able to ensure the health rights of the people, which is also connected with the right to life. Bangladesh must understand the significance of the RTF by which the GoB can fulfill the essential human rights obligated by international laws. The discussion provides a comprehensive way to protect the environment. RTF assists in technological development also. Bio-solar shapes environmental protection in a different way. Proper design with the concept of RTF can make the building infrastructure an intellectual idea of the architecture and make the buildings livable as well.

RTF also ensures the source of natural food. It is beneficial for urban people to harvest vegetables and fruits on the rooftop. Moreover, it is also making an impact on the preservation of local birds, helping them to create shelter (Partridge, 2023). So, this initiative of RTF upholds biodiversity, promoting a healthy life in urban areas. However, this process may not be able to feed an entire town. But the impact on the food supply of urban areas is enormous (Nahar et al., 2024). Growing vegetables and fruits on the rooftop within the metropolitan area helps to minimize the need for transportation from rural farms, which helps lower carbon emissions (Safayet et al., 2017). So, RTF not only benefits the environment by reducing greenhouse gases but also supports more sustainable farming practices right in the heart of urban areas.

With these concepts, several international laws recognize this right and encourage the state parties to enact and implement these. Especially for the developing countries, having legislative protection is a must to ensure the rights of the people. The following sections will discuss the International legal protection of RTF for sustainable environmental protection and the national legal protection in alignment with the international guidelines.

International Legal Framework: Obligating Rooftop Farming As Climate Adaptation

International law now recognizes that the right to the environment is fundamentally linked to fundamental human rights. Several international laws affirm it as a fundamental human right. Moreover, it is connected with the other rights such as the right to life, and the right to health, which also improve the living standard. Utilizing the RTF, people can access all these rights. As a result, RTF is also indirectly obligated by these core laws broadly, such as the Universal Declaration of Human Rights (UDHR), the International Covenant on Civil and Political Rights (ICCPR), and the International Covenant on Economic, Social, and Cultural Rights (ICESCR). These human rights instruments do not explicitly mention the RTF, but it may be interpreted as a practical and innovative tool for the realization of several protected rights, as the RTF serves all those rights of the people. For example, General Comment No. 36 of the UN Human Rights Committee on ICCPR obligates the states to protect the lives of people, along with addressing environmental degradation and climate change (*OHCHR | General Comment No. 36 on Article 6: Right to Life*, n.d.). This concept aligns with right to life, which includes efforts that can mitigate environmental challenges, such as creating livable urban cities and ensuring clean air. Similarly, ICESCR promises rights, which include the right to health, clean water, and adequate food, effectively. Moreover, General Comment No. 12 of ICESCR explicitly promises to protect the right to food (*E/C.12/1999/5*, n.d.). RTF is a vital source of natural food in the urban areas. So, it is fulfilling the promise of General Comment no 12 of the ICESCR.

Several international laws updated new ideas to protect it, along with the core principles. Thus, they have taken the RTF in a legislative way to fulfil the promises of the major laws in a narrower way. Specifically, the United Nations Framework Convention on Climate Change (UNFCC) urges the developed countries to provide financial and technological support to the developing countries (*What Is Technology Development and Transfer? | UNFCCC*, n.d.). This principle illustrates that Bangladesh can take such support from the developed countries as an affiliated country of UNFCC to deliver a healthy environment to the people of Bangladesh. Hence, the economic barrier to implementing RTF in urban areas is not a big problem. Furthermore, according to Article 7 of the Paris Agreement, the states are required to strengthen their adaptive capacity to protect and environment, and RTF can be used as a supportive measure to fulfil the broader adaptation obligation under the International Climate Law (*The Paris Agreement | UNFCCC*, n.d.). This Paris Agreement shows its strictness and sensitivity about the environment with this principle.

Moreover, the two most significant declarations, such as the Stockholm Declaration on the Human Environment (1972) and the Rio Declaration on Environment and Development (1992), commonly known as the Stockholm Declaration (1972) and the Rio Declaration (1992), promise to make a sustainable environment and promise to shape state responsibility. Furthermore, both declarations include the "no-harm" principle (Stockholm Principle 21 / Rio Principle 2) (Respicio, 2024). This means that countries must not harm the environment, neither their own nor others'. It encourages nations to prevent and minimize environmental damage (Handl, 2012). Consequently, issues like urban heat islands, air pollution, and stormwater runoff may start locally, but they affect a larger area. Greening cities and using permeable roofs are recognized methods to address these problems and reduce their impact. Subsequently, progress has gone even further. In 2021, the Human Rights Council declared the right to a clean, healthy, and sustainable environment as a human right (*The United States Recognizes the Human Right to a Clean, Healthy, and Sustainable Environment*, 2023). Then, in 2022, the UN General Assembly confirmed this right and urged countries to create policies and share successful practices to uphold it (*With 161 Votes in Favour, 8 Abstentions, General Assembly Adopts Landmark Resolution Recognizing Clean, Healthy, Sustainable Environment as Human Right*, 2022). This recognition makes a stronger case for urban green infrastructure as one of the means of human rights in city planning.

The Convention on Biological Diversity (CBD) and the Kunming-Montreal Global Biodiversity Framework now include an explicit urban focus. According to Target 12 of this convention, there is a need for cities to include nature in their planning, especially by adding more green and blue spaces in crowded areas. RTF can

play a significant role by offering cooling, creating homes for wildlife, and giving people a chance to enjoy nature. Moreover, recent CBD decisions also encourage urban green infrastructure with climate resilient native species, which aligns with edible roof gardens and multifunctional green roofs (*Target 12*, n.d.). The 2030 Agenda's SDG 11 (Sustainable Cities) asks countries to improve cities for safe living with targets on green public space and climate resilience for a sustainable environment. RTF helps meet SDG 11 by cooling buildings, storing rainfall, improving food access, and creating small public or communal green spaces (*Goal 11: Sustainable Cities and Communities - The Global Goals*, n.d.)

Finally, the International Court of Justice issued an advisory opinion in July 2025, confirming that states have legal obligations regarding climate change and that failing to act can breach international law (Berg & Withers, 2025). While not binding, it carries weight and reinforces due diligence duties to prevent environmental harm, supporting practical local measures such as RTF that reduce heat and flood risk. So, we can observe that different international treaties and policies deliberately give their concern to protect the environment in various ways. RTF is one of the solutions that will give sustainable urban life to the people of urban areas.

Country Insights: Best Practices Countries in Implementing Rooftop Farming

RTF has earned an escalation for mitigating the conflict between urbanization and environmental hazards and is acknowledged as a global initiative for sustainable living and climate adaptation. Several countries have adopted this approach to achieve a sustainable environment and improve their standard of living. They have taken RTF strictly. In fact, they have enacted and implemented several guidelines regarding this. Therefore, this research explores the following countries to determine the best practices for Bangladesh.

Singapore

Singapore is known as a role model of RTF. In Singapore, skyrise greenery is considered a vital issue for not only the climate issue but also food policies. The National Parks Board (NParks) has a program called the Skyrise Greenery Incentive Scheme (SGIS), which helps to pay a considerable portion of the cost to install rooftop and vertical greenery on existing buildings. In fact, it pays 50% of the cost to some extent. There are limits on how much can be funded per square meter, but the goal is to help make the city more climate adapted, boost the environment, and improve the community (*Skyrise Greenery Incentive Scheme*, n.d.).

Similarly, in another program, called LUSH (Landscaping for Urban Spaces and High-Rises), developers are encouraged to replace some ground level greenery with rooftop terraces, planters, and gardens. Under LUSH 3.0, developers can even dedicate some rooftop space for urban farming. On the other hand, as far as food is concerned, the Singapore Food Agency and the Housing & Development Board have started allowing commercial farming on the rooftops of multi story car parks(Chin (Ms), 2017). This institutional practice visualizes the critical thinking of the government towards its people to provide a healthy environment.

Japan (Tokyo)

Japan is another country that is excessively cautious about its environment. Japan took the RTF initiative for its sustainable and peaceful living. Since 2001, and with stricter regulations in 2009, the Tokyo Nature Conservation Ordinance has required many new or large buildings to have 20-25% of their roofs covered with plants. Japan provides assistance to its people for implementing RTF("Nature Conservation Ordinance Is Greening Tokyo's Buildings," 2015). Thus, it is successfully implemented on the rooftops and indoors too. It reflects that the developed countries are cautious about the environment despite having many resources. GoB should definitely take these initiatives urgently.

Germany (Hamburg and Berlin)

The City of Berlin, Germany, initiated the Biotope Area Factor (BAF). BAF ensures that a minimum green area is mandatory for the new buildings(Landschaftsarchitektur & Friedel, 2022). The interesting thing is, BAF requires it not only for the roofs but also for the walls and courtyards (Landschaftsarchitektur & Friedel, 2022).

Another city, Hamburg, targeted 100 hectares of green on the roofs and they successfully implemented it. They also offered 30-60% of the total cost (Landschaftsarchitektur & Friedel, 2022).

Switzerland (Basel)

One of the cities of Switzerland, Basel, aims to have a green environment for its environmental sustainability (Grosser, 2020). The authority of Basel mandates green in the new and modernized flats (Grosser, 2020). They established some architectural policies to ensure a green environment among their constructed buildings. These initiatives illustrate the process of thinking about the environment even in urban areas.

France:

France established some unique ideas through its legislation. They proposed two criteria for the new buildings, which are either greenery or solar panels(France-Presse, 2015). This initiative helps to keep the environment cooler. Even though the government of France is working on this, the environmental activist proposes that the green system be made mandatory (France-Presse, 2015). This discussion visualizes the effects of legal research and its implementation by the governments. In Bangladesh, such things can protect the environment with some effective initiatives.

USA (New York City)

New York City establishes a more unique idea for the RTF in a commercial approach. Property owners can get a tax abatement of $10 per square foot for green roofs, with an enhanced $15 per square foot available in specific areas. To qualify, at least 50% of the roof must be covered with plants, and the vegetation must be well-maintained. The program also helps reduce heat in the city and manage stormwater. It is a great way to invest in both the environment and save on taxes (*Green Roof Tax Abatement*, n.d.).

National Legal Framework: Adapting Rooftop Farming In Alignment With The International Guidelines

The various global agreements and guidelines, such as the ICCPR/ICESCR comments, the UNFCCC/Paris commitments, the Stockholm and Rio's "no-harm" principle, the endorsement of UN about right to a healthy environment, urban target of CBD, and the SDG/Sendai frameworks, all point towards the same conclusion that countries should adopt reasonable, evidence-based measures to minimize environmental risks and safeguard human health and life. In large cities, rooftops provide one of the quickest and least disruptive ways to achieve these goals. By turning rooftops into green spaces and, when appropriate, into productive areas for growing vegetables, herbs, or seedlings, cities can fulfil their adaptation duties.

The legal basis for expanding RTF has already been established. Article 18A of the Constitution of Bangladesh requires the government to protect and improve the environment and biodiversity (*The Constitution of the People's Republic of Bangladesh*, 1972). The Constitution of Bangladesh protects several rights, such as the right to life, the right to security, and the standard of living, under articles (31,32, 15,18). These rights are related to environmental rights. That means when there is any harm or violation of environmental rights, it violates the right to life, health, and the right to security of life.

Under the obligation of the international laws and the Constitution of Bangladesh, the Environmental Conservation Act, 1995 (ECA) was incorporated. Unfortunately, this act is more active about industrial pollution. There has been no such provision regarding the greenery initiatives for the RTF. However, this act promises the protection of the environment and to make an improved environment for the future. So, ECA broadly protects the RTF. On the other hand, the RTF also lacks in the Environmental Conservation Policy, which was amended in 2023. This rule focuses on industrial pollution. As a parent, it was expected that laws regarding environmental protection would have some explicit words in these laws and policies. As a result, lacking in legislation, the cities are facing discrimination, which is a mass violation of the right to the environment.

Dhaka faced an increased number of temperatures, which ranged from 33°C to 34.6°C, and the "feels like" temperature, which was 4.5°C higher than the surrounding areas because of UHI (Contributor, 2025). These sufferings increased for the people who work at the grassroots level ("'My Body Is Burning,'" 2025). It also increases peak electricity demand and strains the grid during heat waves, when power is needed most. Furthermore, all of this translates into huge family costs and gradually affects the broader economy (*Bangladesh Faces Health and Economic Risks from Rising Temperature: World Bank*, 2025).

National climate policies, such as NDC and NAP are working ahead for environmental protection. They urge to mitigate climate issues through nature-based initiatives. They call for the actions that will mitigate the heat crisis effectively (Safayet et al., 2017). But no initiative has been taken regarding the RTF program by them. Moreover, the Bangladesh National Building Code (BNBC) sets policies for the approval of building structures through an inspection process (Hoque et al., 2024). BNBC has a major role in implementing the RTF program for the betterment of sustainability and peaceful living. Unfortunately, BNBC lacks in taking this initiative, which is a failure to make such a vital program. With these GoB is making discrimination against the people living in urban areas and against the environment also.

However, despite so many legal gaps GoB also took some initiatives to make the RTF accessible and encouraging. GoB announced the 10% tax rebate for people who have gardens on their rooftop (Mosharrof, 2025). Unfortunately, there was complexity. Bangladeshi verification process through for the eligible criteria made a step back, complex and costly for the people(Mosharrof, 2025). As a result, the proportion of the benefit was not enough to make such an initiative happen.

METHODOLOGY

This legal research follows the qualitative methodology, which investigates RTF as a right to climate adaptability and compliance with Bangladeshi laws based on primary and secondary resources. The primary resources are collected from international and national legislation, conventions, and policies. The secondary resources are collected from statistics, reports, books, and journal articles published by prominent authors to analyze the effectiveness of the implemented legislation among the target areas. The primary and secondary data were selected based on their relevance, such as RTF, climate adaptation, urban sustainability, including international instruments such as the UDHR, ICESCR, Paris Agreement, and different national policies of Bangladesh. By using a thematic approach, this paper first analyzes the concepts of RTF and its effect on human life, and its relationship with several human rights protections. In this way, this research explores the International human rights laws and guidelines, including their resolutions. It also analyzes the explicit laws regarding environmental protection, particularly those related to RTF. Bangladesh, being affiliated with the international guidelines, is obliged to follow them. Thus, this research scrutinizes the compliance of Bangladeshi laws with international instruments to find the national legal gaps. This research also explores the best practices of cities for rooftop farming, from which Bangladesh can take initiatives. The analysis translates those mechanisms to the context, emphasizing the feasibility, safety, and equity of Bangladesh.

FINDINGS

This section summarizes the findings of the research. It finds that despite being a crucial initiative for the standard cooling system in a natural way, RTF is not prioritized adequately. However, international and national legislation emphasizes environmental protection broadly.

RTF is a credible urban adaptation for Bangladesh. Evidence from reviews and modelling shows that green roofs lower roof temperatures, reduce heat entering the building, and cut cooling energy. In contrast, near-roof and pedestrian-level air temperatures fall by up to a few degrees in hot periods. City-scale studies indicate that with sufficient coverage, average ambient temperatures can drop meaningfully. It is a very significant initiative for the sustainable future, which is cost-effective, and it also reduces the food crisis.

In the international guidelines, the UDHR, ICCPR, and ICESCR broadly protect environmental rights and are related to the major human rights such as the right to life, health, and food. Through implementing RTF, the violation of these rights can be erased, and the standard of living through these obligations can be increased far

ahead. Moreover, under these core laws, there are several international environmental laws, such as the Paris Agreement, the Stockholm Declaration 1992, and the Rio Declaration 1992, which protect environmental rights, particularly obligating state parties to comply. Bangladesh, as a state party, is bound to enact the guidelines and implement them accordingly. Bangladesh, as a developing country, has a special obligation under the Stockholm Declaration and the Rio Declaration not to cause any harm to the environment. This is because, as a developing country, it already faces so many fundamental crises that exacerbate its standard of living. In this context, RTF will be counted as one of the initiatives that will fulfil those obligations.

Bangladesh understands the significance of these protections, and its legal and policy framework already supports action. Article 18A and the right to life jurisprudence provide a normative base for environmental protection and public health measures. Unfortunately, the major legislation, ECA, 1995, does not explicitly mention any provision regarding RTF. The NDC, NAP, and Plan call for climate-smart, resilient cities and nature-based solutions. The National Agriculture Policy recognizes rooftop agriculture as a legitimate activity worthy of support. In combination, these instruments justify national and city programs to scale RTF now.

Moreover, the main implementation bottleneck lies in the building code. While BNBC 2020 has been formally adopted, it lacks explicit standards for RTF and green roofs. The BNBC doesn't provide any clear rules for structure, waterproofing, drainage, safety, and maintenance, which makes the work slow. A dedicated chapter and annex would remove this uncertainty. Due to the lack of action in this segment, global warming is increasing, especially in urban areas. In recent case studies, it has been proven that widespread use of green roofs could reduce average urban air temperatures by about half a degree. So, GoB should take this initiative, which will help to translate more comfortable homes in the hottest months.

Additionally, this research concerns incentives and delivery. The nationwide 10% holding tax rebate announced in 2023 and the announcement of the DNC of 5% rebate are promising but inconsistent. Clear, uniform rules and easy verification are needed. Partnerships such as Dhaka North's "Tree Hospital" support and demonstrate how hands-on training can sit beside financial incentives. However, due to a lack of strict legislation, practical implementation, and public awareness, the cities continue to suffer from excessive heat. As a result, the existing measures are also kept in a grey area due to the lack of proper legislation and their implementation, and the GoB must take it as a failure. Hence, the GoB should understand the significance of these measures.

Furthermore, research finds international practice offers a usable template for the next step. Tokyo shows that mandates embedded in development control are administratively workable. Singapore shows that co-funding and planning tools create strong, aligned incentives. Similarly, Hamburg shows the value of a city strategy with grants and coverage targets, and New York City shows how a per-square-foot abatement can drive private investment when tied to simple eligibility and maintenance rules. A Bangladeshi framework can combine these elements while adjusting thresholds and amounts to local conditions.

CONCLUSION

Bangladesh can convert thousands of flat, sun-exposed roofs into a living network of small climate solutions that people can see and feel in their daily lives. RTF cools buildings, softens the worst heat of summer nights, and provides fresh fruits and vegetables which are just a few steps from the kitchen. The legal duty to protect the environment and the right to a healthy life, set out in the Constitution and developed by the courts, align perfectly with this practical measure. National climate plans call for resilient, climate-smart cities and nature-based solutions, and the National Agriculture Policy already recognizes rooftop agriculture as a part of that vision. A clear, dedicated chapter in the BNBC 2020 should set standards for structural loads, wind and edge conditions, root-resistant membranes and protection layers, controlled drainage and overflow, safe access and guardrails, and fire safety separations. The lack of the ECA and its policy also makes the situation worse. Lack from both perspectives, building infrastructure and environmental protection laws makes urban living people discriminated against their peace and standard of living. Bangladesh must understand the significance of the RTF by which the GoB can fulfill the essential human rights obligation under the international laws. Enacting proper laws regarding the RTF and implementing them properly, Bangladesh can be a role model, ensuring the rights, including climate adaptability, for other states.

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