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Submission date: 14-Oct-2025 02:21PM (UTC+0300)
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Research Proposal on

Implementation of the Miyawaki Method to Enhance Environmental Sustainability in Bangladesh

MST. Rasme Aktar

Sociology Department

University of Dhaka

Senior Category

Registered Country: Bangladesh

E-mail: riyarasme@gmail.com

Date of Submission: 30/09/2025

Title: Implementation of the Miyawaki Method to Enhance Environmental Sustainability in Bangladesh

Introduction:

The urban areas and cities in the fastest developing countries (such as Bangladesh, India) are experiencing a rapid decline in forest cover and green space because of rapid urbanization, population growth and rural-to-urban migration and dealing with man-made and natural disasters such as floods, droughts, pollution and the escalating threat of rising sea levels which have adverse effects on local communities and climate change. [1] [2] Reports from the Ministry of Environment, Forest and Climate Change (2021) suggest that the total forest area of Bangladesh is 2.32 million hectares which is nearly 17 % of the total land area of the country and has a declining trend of dense and very dense forests. [3] To check this alarming issue and to ensure environmental sustainability immediate and effective measures have to be taken. While traditional urban planning solutions have mostly concentrated on infrastructural developments and overlooked the importance of integrated green solutions, the concept called Miyawaki forest method offers a unique solution. In the 1980s, the famous Japanese botanist Akira Miyawaki introduced a new and innovative approach with the aim to maintain global environment, reducing climate change, restore indigenous ecosystems and prevent disasters. [4]

Miyawaki is an afforestation and reforestation technique for planting fast-growing native species, which aims to create dense and biodiverse urban forests. It results in up to 30 times denser and 10 times faster tree growth than traditional methods. This model is suitable for creating green spaces in cities as a Miyawaki forest requires a minimum of 30 square feet of space and its size may vary depending on the areas and available spaces. This method is implemented in several countries and it has shown promising results in Thailand, Malaysia, India and other parts of the world. In the case of Bangladesh, Miyawaki method has been implemented successfully in Mirasarai, Chattogram, and the Bashundhara residential area, Dhaka, to ensure environmental sustainability in these areas. Environmental sustainability in this context refers to the ability to maintain the living conditions of the people and other species (e.g., clean water and air, a suitable climate), the livability and beauty of the environment in the cities, the reduction of pollution and disasters. [5] This research aims to find out that the effective implementation of the Miyawaki method in the cities, of Bangladesh can protect the cities which are gradually losing their biodiversity, ecosystems, and sustainability.

Research Objectives:

The general objective of this research is to investigate the effectiveness of implementing the Miyawaki method in enhancing environmental sustainability in cities of Bangladesh.

Specific Objectives:

To evaluate the benefits of the Miyawaki method, including reduce environmental problems, lessening natural and man-made disasters, and pollution.

To assess the role of Miyawaki forests in increasing the living quality of people and other species, as well as increasing biodiversity and green spaces.

To identify the challenges in implementing and maintaining Miyawaki Method in the cities of Bangladesh.

Research Questions:

How using the Miyawaki method in the cities of Bangladesh dose help to improve environmental sustainability?

Is it effective to implement the Miyawaki method in these cities for improving living quality, increasing biodiversity, and adding more green spaces?

How effective is Miyawaki method to lessen environmental-related problems in the cities of Bangladesh?

Literature Review:

Bangladesh's first Miyawaki forest has been created in the Sonapara area of Mirasarai, Chattogram, through private initiative. In the 4,400 square feet area, approximately 120 species of native trees were planted, and after 13 months it became a small forest with a collection of

hundreds of species of trees, vines, and shrubs. The natural condition of the area was degraded because of hill cutting, deforestation before establishing the Miyawaki forest as well as brick kilns causing air pollution and fertile lands were hollowed out for establishing industries which contributed to worsening the situation. To protect the environment, local communities, and tourism the Miyawaki method has been implemented. As it was a successful attempt, this method can be implemented throughout the country for creating both large and small forests with indigenous species of trees. [6]

In Bangladesh, the Miyawaki method also has been implemented in the city. The Rangs Properties Limited launched Miyawaki Forest in their new housing project in the Bashundhara residential area, Dhaka. In the Rangs Pingal project, multiple Miyawaki forests were created on the roof of a 14-story building in an area of 4 by 3 meters by planting indigenous and exotic plants with the aim to increase the beauty of the building, keep the temperature low during the unbearable heat, and reduce the nuisance of mosquitoes and insects. This project also aims to reduce the temperature by at least 1 degree Celsius, which aligns with the notions of Sustainable Development Goals. SDG 13 (Climate Action), SDG 11 (Sustainable Cities), and SDG 15 (Life on Land) can be achieved by improving the urban environment, reducing air pollution, and supporting biodiversity by planting various types of shrubs and trees on the roofs of houses, large balconies, or small unused spaces in the lobby. By implementing the Miyawaki method, a forest-like environment can be created in the cities of Bangladesh. [7]

The Miyawaki technique of developing forests is being used successfully across the globe, and an organization based out of Mumbai, India, has recognized this method as 100% organic, wild, fast-growing and self-sustainable. According to the report of the organization, this method contributes to the conservation of natural resources such as air, water, and soil, checks climate change and global warming, and supports the overall well-being of the planet. An organization, Acacia Eco in Ahmedabad, India, has the vision to implement this method for faster and more sustainable growth. Afforest, an organization based in New Delhi, India, established in 2011 as a profitable social enterprise with the vision of bringing back the native forest by the Miyawaki method. European specialists believe that it takes about 200 years for a forest to recover by its own, but with the Miyawaki method, a similar result can be achieved in 20 years. [8]

The first successful implementation of the Miyawaki method was in Nippon Steel Corporation, Oita, Japan in the 1970's. Since then, over 1300 sites in Japan have benefitted from this approach. Apart from the Asian countries including, Malaysia and Thailand, Italy, Chile and the Mediterranean countries have also had success with this method, allowing quick environmental restorations of strongly degraded areas. [9]

As the Miyawaki method is successfully implemented both in cities and rural areas across the world, so its effective implementation in the cities of Bangladesh will enhance environmental sustainability in these areas. And it also can be implemented in the rural and forest areas of Bangladesh to ensure community development and protect biodiversity and ecosystem.

Research Methodology:

This research will adopt a mixed-method research design for both data collection and data analysis to illustrate the complex and multidimensional aspects and impacts of the implementation of the Miyawaki method to enhance environmental sustainability in the cities of Bangladesh.

Proposed study area:

The study will be conducted in the two largest and most prominent cities in Bangladesh: Dhaka and Chattogram. By focusing on these cities this research will aim to collect important information related to the study from the Miyawaki Forest sites and examine the impacts and effects of this method in enhancing environmental sustainability in these areas so that it can be implemented throughout the country.

Sampling and Data Collection:

Primary Data:

In the qualitative phase, snowball sampling methods will be used to select respondents. A face-to-face interview will be conducted by using the Semi Structured Interview Method for collecting in-depth qualitative data from the directors, workers, entrepreneurs, planners, of the Miyawaki Forests and from the local officers, and researchers of the cities. Among those, around 60 respondents will be selected to answer the questionnaire. The questionnaire will explore the possible effects and impacts of the Miyawaki method on the environment, public health, biodiversity, and ecology in the areas of the cities. As well as it will investigate whether this method has any disadvantages or negative impacts.

For the quantitative phase, respondents will be selected from the locals by using multi-staged and random sampling techniques to ensure a comprehensive and representative sample. The sample size is 427 by considering the buffer of 10% non-respondent rate. (Stratified Random Sampling Technique) Thus, primary data will be collected through interviews and surveys.

Secondary Data:

Secondary data will be collected from newspaper articles, television and online reports, content from social media, books, and journals to support primary data and provide contextual insight.

Data Analysis:

After collecting and processing, data will be analyzed. For qualitative data, Thematic coding will be conducted to describe possible similarities, themes, and repetitive patterns among the respondents. For quantitative data analysis, statistical measurements such as the Paired t-test, Shannon-Weiner Index, and Parson's correlation analysis will be used.

Expected Outcome:

Result of this research is expected to provide a comprehensive evaluation of the impacts of implementing Miyawaki method to enhance environmental sustainability in the cities of Bangladesh. It will provide insight into both positive and negative effects of this method on public health, biodiversity, ecology and local communities and how it can be implemented effectively.

Potential limitation:

This study may not completely describe the results and impacts of the effective implementation of the Miyawaki method and its ability to enhance environmental sustainability in the rural area settings of Bangladesh.

Conclusion:

To analyze the possible impacts of implementing the Miyawaki method in other cities in Bangladesh, the collected data from two big cities of Bangladesh can be used. It may contribute to policy development for increasing urban green space, protecting biodiversity and ecosystems, reducing air pollution, and lessening disasters.

Project Practicalities:

This project will take 11 months to complete. The first 4 months will be used in collecting data and preprocessing, subsequently data analysis will take the next 5 months. The last 2 months will be reserved for writing the final report.

During the research, ethical considerations will be maintained. While collecting data permission will be sought from the respondents, and detailed information about the research objectives will be provided. Voluntary participation of the respondents, their privacy, and confidentiality will be ensured and maintained. All kinds of deception and misinterpretation will be avoided during the research.

Post-program Plan:

Findings will be published through academic publications and journals after completing the research. Moreover, this study will remain open to further investigations to address the possible research gaps and discover new findings.

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