

Paving the Path for Eco-Friendly Education in Bangladesh: Integrating Environmental Heroes, Tree Plantation, and Waste Management as Academic Credits in the Curriculum

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ABSTRACT

From Cape Chelyuskin to Cape Horn, we live in an era where the environment and ecological systems lie at the heart of global politics. The whole world is committed to and actively engaged in addressing critical challenges regarding climate change. Existing environmental crisis, rooted in reckless activities and shortsighted decisions, has spurred the rise of new ideologies like environmentalism, economic frameworks such as green and blue economies, and innovations in renewable energy. In response to these global concerns, Bangladesh has launched initiatives like the *National Adaptation Programme* to build a climate resilient nation. At this crossroads, education can be used as a powerful tool for cultivating environmental awareness and promoting sustainable action. The paper intends to initiate the transformative potential of eco-friendly education in Bangladesh, proposing the integration of environmental heroes in primary and secondary level, tree plantation, and waste management into the academic curriculum as credit-bearing components. By introducing the achievements of environmental heroes all over the world, students can draw inspiration from real-world examples of ecological resilience and advocacy. Practical activities like tree plantation and waste management, when incorporated into pedagogy, offer experiential learning opportunities that instill environmental stewardship and responsibility. This approach enhances the curriculum while equipping students with knowledge, experience and skills needed to address pressing environmental challenges. By aligning with global sustainable development goals and addressing Bangladesh's unique ecological concerns, this model bridges the gap between theoretical learning and actionable initiatives. It aims to foster a generation prepared to mitigate climate hazards, ensuring a sustainable future for Bangladesh and beyond.

Introduction

As climate change intensifies across the globe, countries like Bangladesh are grappling with its harshest realities—rising sea levels, devastating floods, and shifting weather patterns. Despite this urgent environmental context, the national education system often presents ecological issues in abstract, fragmented ways, offering little connection to students' lived experiences. To build a generation capable of responding to these challenges, environmental education must move beyond theory and foster genuine eco-literacy grounded in action and relevance. Scholarly works and literary narratives from around the world have long highlighted the deep relationship between humans and the environment, emphasizing sustainability, justice, and responsibility. These texts, along with the inspiring efforts of environmental heroes—activists, educators, and youth leaders—demonstrate how knowledge, when paired with purpose, can drive real change. Their stories can play a vital role in reshaping educational models, making them more responsive to the pressing demands of the climate crisis. This paper proposes that integrating waste management as an academic credit in the national curriculum offers a powerful way to bridge knowledge and practice. Through hands-on experiences like recycling initiatives, composting, and community projects, students can develop both environmental awareness and civic responsibility. Such an approach ensures that education does not merely inform—it equips and empowers.

The Climate Crisis and Bangladesh: A Nation at Risk

The climate crisis and changes in the global climate are no longer unfamiliar to us. Bangladesh has been constantly confronting heat waves, tropical cyclones, floods and droughts for decades, primarily due to its geography and low-lying delta topography (Haq, Khan, Islam, Mirza, 07). Numerous studies echo at the same concern regarding Bangladesh's acute vulnerability to climate change. Md. Nurul Islam, director of Bureau of Manpower Development and Training, also highlights the country's geographical position and widespread poverty as key factors contributing to its susceptibility to rising sea-levels and natural disasters. Projections suggest that by 2100, approximately 10.9% of Bangladesh's land could be submerged, displacing millions of people and exacerbating food shortage. Elahi and Khan (2015) emphasize that rising temperatures and sea levels are already affecting agriculture, health, and displacing coastal communities. Khan and Mirza further explain that changing rainfall patterns, salinity intrusion, and frequent cyclones are damaging vital sectors, although Bangladesh is actively adapting through national strategies like BCCSAP (Bangladesh Climate Change Strategy and Action Plan). Similarly, Islam and colleagues argue that Bangladesh's poverty, high population density, and reliance on natural resources intensify its exposure to climate risks, despite efforts in resilience-building through sustainable development initiatives.

National Curriculum: Eco-literacy in Bangladesh

Bangladesh's national curriculum acknowledges the importance of environmental education, yet significant gaps remain in fostering true eco-literacy among students. Several researchers have expressed concern that the curriculum lacks depth and practical engagement in this area.

Intellectuals have noted, The physical geographical aspects of the environment have been the main focus of the textbooks, environmental problems such as natural resources degradation and depletion including topics like biodiversity, energy, and urbanization are not well represented. The only major environmental problem which is well covered in the text is natural disasters in Bangladesh. Emerging environmental issues such as climate change and human adaptations, however did not receive any attention at all. (Chowdury, Sarwar, Muhibullah, 30)

Similarly, Khatun's study on eco-literacy in post-colonial Bangladesh emphasizes the enduring legacy of colonial influences, which continue to shape the delivery of environmental education and limit its effectiveness. She advocates for a more integrated, experiential approach that connects environmental knowledge with practical, community-based activities. Awal and Haque present a different perspective, highlighting disparities in environmental knowledge. According to their research, urban students generally demonstrate higher levels of awareness due to better access to resources. However, rural students show stronger conservation attitudes, suggesting the need for context-specific eco-literacy programs. These findings collectively argue for a reform of the curriculum that moves beyond theoretical learning to include experiential, locally relevant environmental education. This would foster an eco-literate generation capable of addressing Bangladesh's environmental challenges.

Eco-education in Action: Bridging knowledge and practice

As discussed in the previous section, eco-education must extend beyond theoretical discourse to connect with the lived realities of learners. Smith and Williams argue that truly transformative ecological education requires an integration of local culture, environmental understanding, and school practices. They emphasize that students should engage directly with their surroundings to develop environmental ethics and social responsibility. Their advocacy for place-based education that links curriculum with community needs and ecological contexts. Echoing this perspective, Riordan and Klein document how Expeditionary Learning Schools enable teachers to immerse students in real-world environmental problem-solving through fieldwork, expert interviews, and community action projects. Recent discussions in Bangladesh about environmental education reflect similar concerns. These discussions emphasize the need for youth engagement in climate action. Motiur Rahman, writing in the Financial Express, underscores that importance of equipping students with ecological awareness and practical skills to build a climate-resilient generation. His article features several youth-led initiatives - such as tree plantations, climate marches, and school-based sustainability programs- that demonstrates the potential of student activism.

However, to have immediate result in Bangladesh, it is crucial to target our secondary school curriculum. This level offers a key opportunity to involve secondary-level students in real-life environmental stewardship. Effective strategies might include organized city clean-up drives, where students not only contribute to waste reduction but also learn about civic responsibility.

Tree plantation projects can further encourage meaningful participation, allowing students to identify deforested or neglected urban areas and take initiative in restoring greenery of our country. Integrating youth in localized waste management efforts -such as school-based recycling campaigns or composting programs- can instill eco-conscious habits early on. The curriculum could even offer academic credit for such projects to promote fair participation and sustained involvement. These forms of practical engagements bridge the gap between ecological theory and action, fostering a generation that is both eco-literate but also environmentally proactive.

Worldwide Eco-Education Models

To develop an ecofriendly curriculum for our nation, we can draw insights from global eco-education models. Globally, several countries have integrated practical eco-education directly into their national curricula, promoting hands-on learning and environmental responsibility among students. In Sweden, sustainability is embedded across all subjects, with activities like outdoor learning, recycling projects and local environmental audits forming part of regular instruction (Sundqvist, 2020). Australia's national curriculum includes sustainability as a cross-curriculum priority, encouraging practices such as school gardening, energy monitoring, and outdoor bush learning (Australian Curriculum, Assessment and Reporting Authority, 2012).

Japan incorporates Education for Sustainable Development (ESD) into its formal education system through nature excursions, disaster preparedness drills, and community clean-up projects, fostering civic responsibility (Kagawa, 2007). In Canada, especially in provinces like Ontario and British Columbia, eco-education includes Indigenous land-based learning, outdoor classrooms, and student-led greening projects (Government of Ontario, 2017). South Africa's national policy integrates environmental education through water conservation initiatives, biodiversity programs, and eco-audits in schools, often in collaboration with environmental NGOs (Department of Basic Education, 2011). Finland emphasizes phenomenon-based learning that connects students with real-world issues, supporting environmental projects, energy tracking, and outdoor education (Korhonen, 2016). These countries demonstrate that practical eco-education -rooted in experiences, community engagement, and policy support- is a key strategy in shaping environmentally responsible global citizens (UNESCO, 2014)

Placed-based Education Curriculum

In placed-based curriculum, instead of abstract concepts, students engage with real environmental challenges. It fosters collaboration between schools and communities, turning education into a shared effort to protect local environments. It can make environmental education more meaningful by addressing each divisions' unique need stipulate. In Dhaka city, students need to more focus on urban challenges like waste management, air pollution, and rooftops gardening, engaging in recycling initiatives and urban greening. Chattogram Divisions, with its hills and coastal zones, can emphasize hill tract biodiversity, landslide awareness, marine conservation through forest preservation campaigns and coastal clean-up efforts. In Khulna, curriculum could center on mangrove forest ecology, salinity issues, and tiger-human conflict, with activities like salt-tolerant farming and ecosystem education. Barisal Division, prone to flooding and erosion, would benefit from hands-on learning about wetland protection, floating gardens, and riverbank stabilization. In Rajshahi, a drought-prone region, students could explore tree plantation, water conservation, and organic farming. Rangpur Division may focus on afforestation, cold-resilient agriculture, and the environmental impact of poverty, fostering community-based greening efforts. In the hilly and bio diverse Sylhet Division, eco-education can include tea garden ecosystem preservation, water source protection, and reforestation.

Finally, Mymensingh Division could prioritize floodplain management, sustainable agriculture, and local biodiversity, incorporating seed banks and bird conservation. By aligning local curriculum with environmental realities, this approach fosters deep ecological understanding and empowers students as stewards of their own environments.

Waste management as an Academic Credit

Introducing waste management as an academic credit course in secondary schools offers students the opportunity to develop essential environmental awareness and practical problem-solving skills. The course will aim to teach students the different types and sources of waste, including organic, plastic, industrial, and electronic waste. Students will explore the environmental and health impacts of improper waste disposal, while also gaining practical knowledge in waste segregation, recycling, and composting. Special emphasis will be placed on real-life local issues, such as the worsening drainage problem in Dhaka city, where household waste is frequently thrown into drains. This irresponsible disposal practice leads to clogged drainage systems and contributes heavily to urban waterlogging during the rainy season. By addressing this issue, students will better understand the direct consequences of poor waste habits and the urgency of sustainable urban waste management. This paper proposes a twelve-week syllabus that blends theory with practical engagement to teach waste management effectively. Students begin by exploring the concept of waste through a school audit and then examine its sources and environmental impacts using case studies and creative activities. The course covers the 3Rs- reduce, reuse, and recycle- alongside DIY projects, waste segregation, and site visits to local facilities. Topics like plastic waste, composting, e-waste and community waste systems are addressed through hands-on activities and expert sessions. Beyond classroom knowledge, the course will promote civic responsibility by involving students in real-life activities such as school clean-up campaigns, community awareness programs, and localized waste management projects.

Tree Plantation as an Academic Credit

Introducing tree plantation as an academic credit course in secondary education provides a practical and impactful way to engage students in environmental conservation while instilling values of responsibility, patience, and care for the planet. The course will teach students about the ecological, social, and economic benefits of trees, including their roles in carbon absorption, air purification, water retention, biodiversity preservation, and urban cooling. Students will also learn about native tree species, planting techniques, soil types, seasons, and long-term care of trees. The program aims to build not only environmental knowledge but also foster empathy for nature and a strong sense of civic engagement. Tree plantation will be positioned not as a one-time activity but as a continuous and thoughtful process, involving planning, planting, maintenance, and monitoring. Students will reflect on their role in mitigating climate change, especially in urban areas like Dhaka where rapid urbanization and pollution call for urgent reforestation efforts. The course can be designed for twelve weeks. Early weeks will cover tree functions, types, planting methods, and environmental threats like deforestation. Mid-course, students will plan and execute a plantation project on school or community grounds. Later weeks will focus on tree care, progress tracking, and awareness campaigns. Important issue like assessment can be based on a 100-mark scale. We can allot marks on attendance, written tasks, hands-on planting and care, group project documentation, and a final presentation. This ensures students are rewarded for both theoretical understanding and active participation in environmental work.

Implementation Challenges (Bangladesh)

Implementing tree plantation and waste management as academic credits in Bangladeshi schools may face both structural and social challenges. On a practical level, limited space, lack of proper tools, and insufficient budget can make it difficult to carry out plantation or waste-handling activities, especially in overcrowded or under-resourced schools (UNESCO, 2021). Teacher training gaps are another concern; many educators may lack environmental knowledge or view these subjects as less important, treating them as routine tasks rather than transformative learning opportunities (Rahman & Hossain, 2020). Additionally, parental attitudes could pose significant obstacles. Some snobbish or status-conscious parents may see these subjects as “unrespectful” or irrelevant to their children’s future, while others may be uninformed or indifferent, failing to motivate their children to take part (Kabir, 2019). On the student side, some may look for shortcuts or treat these courses as less demanding, reducing their seriousness and impact (Ahmed & Karim, 2022). Without strong institutional support and community engagement, these programs risk being sidelined or tokenized, rather than embedded as meaningful components of education (Chowdhury, 2021).

Strategies for Green Education

To overcome the challenges in implementing tree plantation and waste management as academic credits, several solutions can be employed. One effective approach is to integrate the stories of environmental heroes into lesson planning. By highlighting global and local figures such as Greta Thunberg, Wangari Maathai, and Dr. Muhammad Yunus, students can be inspired by individuals who have made significant contributions to environmental causes. These role models demonstrate that one person's actions can have a transformative global impact, encouraging students to take ownership of their environmental responsibilities. This approach can foster a sense of agency and motivation among students, helping them see that their actions matter. Additionally, incorporating literature into the curriculum can deepen students' understanding of environmental issues. Some works by Bangladeshi authors which have addressed nature and environmental concerns, can evoke emotional connections with the environment. They can help students engage with environmental issues on a personal level, making the subject more relatable and meaningful. Moreover, schools can form partnerships with local environmental organizations to provide necessary resources and expert guidance, addressing budget and infrastructure challenges. These organizations can support schools with tools, saplings, and educational materials, as well as assist in organizing field trips or practical activities. Teacher training programs focused on environmental education will also be crucial in ensuring that educators are equipped with the knowledge and confidence to teach effectively. Lastly, involving students in community-based environmental projects—such as local tree planting initiatives or waste management campaigns—can connect theoretical knowledge with real-world impact. These hands-on activities not only improve the environment but also foster collaboration, problem-solving, and civic responsibility among students.

Conclusion

Incorporating tree plantation and waste management as academic credits in Bangladeshi schools holds great potential for fostering environmental awareness and responsibility among students. While challenges such as limited resources, parental attitudes, and teacher training need to be addressed, the solutions discussed—such as integrating environmental heroes into lessons, incorporating literature into the curriculum, and fostering community partnerships—can significantly improve the implementation of these programs. By actively engaging students in both theory and practical environmental action, schools can cultivate a generation that not only understands the importance of sustainability but also feels empowered to contribute positively to their communities and the planet. With the right support and commitment, eco-education can play a pivotal role in shaping a more environmentally conscious and responsible future for Bangladesh.

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