Bangabandhu Sheikh Mujib Medical University Journal 2026;19(1):e88689
ISSN 2074-2908 | eISSN 2224-7750 |

EDITORIAL

The carbon footprint of thesis production: Advocating for academic reform at Bangladesh Medical University

M Atiqul Haque[1] | Shahinul Alam[2] | M Mostafa Zaman[1]

[1]Department of Public Health and Informatics, Bangladesh Medical University, Dhaka, Bangladesh
[2]Department of Hepatology, Bangladesh Medical University, Dhaka, Bangladesh

Correspondence
M Atiqul Haque
atiqulm26@bsmmu.edu.bd

Publication history
Received: 26 Mar 2026
Accepted: 26 Mar 2026
Published online: 29 Mar 2026

Keywords
carbon emission, carbon footprint, thesis

As the global climate crisis worsens, all sectors, including education, must address their carbon footprints. Universities are not just centres of knowledge; they also act as moral and institutional entities whose routine practices impact the environment. One such often overlooked practice is the paper-based submission of students' theses. Many universities worldwide, including some in the Global South, have already transitioned from the traditional paper-based theses to digital formats. The Bangladesh Medical University (BMU) needs to reconsider this long-standing academic practice to be more accountable to the nation's commitments to reducing carbon emissions in line with Sustainable Development Goals [1].

Environmental protection is not optional for universities; rather, it is a global mandate. Paper production contributes to deforestation, water pollution, and greenhouse gas emissions. Discarded paper generates methane in landfills, compounding its climate impact [2]. Reducing paper consumption is therefore a moral, legitimate and effective climate mitigation strategy.

National policy landscape on carbon emissions in academia

Several universities in Bangladesh have adopted institutional climate or sustainability policies aligned with the Sustainable Development Goals. Notable examples include the University of Chittagong [3], American International University Bangladesh [4], BRAC University [5], East West University [6], University of Liberal Arts Bangladesh [7], Dhaka University of Engineering and Technology [8], Noakhali Science and Technology University [9], and Southeast University [10], all of which emphasise reducing campus greenhouse gas emissions and integrating climate awareness into education and research.

Despite increasing policy attention, a significant gap persists. Most university policies focus on energy, transport, buildings, and waste, while paper use in core academic processes receives little scrutiny. Although some institutions discourage unnecessary printing [6], none explicitly address thesis submission as a source of avoidable carbon emissions, nor do they require low-carbon alternatives, such as default digital submission or limited hard-copy requirements for theses and other work.

This disconnect is striking, considering Bangladesh's commitment to cut emissions by 21.8% by 2030 under its 2021 Nationally Determined Contributions and its extreme vulnerability to climate change, despite contributing only 0.56% of global emissions [11]. This is primarily because of the absence of explicit low-carbon policies for students' theses to align routine academic practices with national climate commitments.

BMU context of carbon footprint

The BMU is the country's leading public university for postgraduate medical education, enrolling over a thousand students annually across MD, MS, MPH, MPhil, and PhD programmes. Sadly, it maintains the tradition of relying solely on physical documentation

Key messages

Paper-based thesis practices at Bangladesh Medical University generate substantial avoidable carbon emissions, undermining national climate commitments and Sustainable Development Goals. Excessive printing adds environmental harm with limited additional academic benefit relative to its environmental cost. Simple reforms, like double-sided printing, concise formatting, and fewer copies, can reduce emissions. Transitioning to digital submission offers a scalable, low-carbon solution aligned with sustainability goals and responsible academic practice.

as the most reliable method for record-keeping and thesis evaluation. The entire process of thesis documentation requires numerous full-volume prints of protocols and theses. A typical master's thesis at BMU averages around 114 pages, with only half containing core scholarly content. Single-sided printing, generous margins, repetitive formatting, and multiple mandatory hard-copy submissions significantly increase paper consumption.

A review of BMU's thesis submission requirements, supported by verification from recent graduates and examination of completed theses, reveals that a single postgraduate student prints approximately 2,974 A4 pages over the course of thesis completion. This includes protocol submissions to ethics committees, drafts for supervisors, printouts of literature, examination copies, and final bound volumes.

When scaled to BMU's annual postgraduate output of approximately 1,000 students, thesis-related printing amounts to an estimated 2.974 million pages each year. Assuming standard 80 gsm A4 paper (approximately 5 g per sheet), this corresponds to about 14.84 metric tons of paper annually. Using published life-cycle emission factors for copying paper and pulp-and-paper production, the associated emissions are estimated to range from approximately 9.6 to 23.5 tons of CO_2e per year, depending on methodological assumptions, system boundaries, and material recovery scenarios. These estimates are based on established life-cycle emission factors reported in the literature (approximately 0.648–1.58 kg CO_2e per kg of paper) [12, 13]. These figures do not include electricity use, toner, transport, storage, disposal, deforestation, and methane emissions from paper waste in landfills. While academic requirements are necessary, the significant carbon emissions it produces provide no additional educational benefit.

Simple solutions are available

Simple procedural changes would deliver immediate impact. Mandating double-sided printing alone would halve paper consumption overnight. Enforcing concise, standardised formatting would further reduce volume without compromising scientific rigour. Structured tabular presentation of literature reviews, now standard in systematic research, can replace dozens of narrative pages while improving clarity and quality. These are not radical reforms, but common-sense adjustments already adopted by universities worldwide.

Digital thesis submission and archiving offer additional benefits. They streamline administration, reduce student costs, improve accessibility, preserve scholarly work in durable formats, and expand global visibility of Bangladeshi research. As the leading public medical university, the BMU should discontinue paper-intensive systems in light of viable digital alternatives.

An opportunity for institutional leadership

BMU has a straightforward pathway to reducing its institutional carbon footprint through low-cost yet high-impact reforms. Simple measures such as mandating double-sided printing for all thesis-related documents and enforcing a concise and standardised format would reduce paper use by more than half. The next step is shifting to digital submission, review, and archiving to substantially reduce carbon emissions without compromising academic rigour. The destination should be a manuscript-based thesis submission process practised in many developed and developing countries.

Conclusion

Current thesis submission practices at BMU produce an estimated 9.6 to 23.5 tons of avoidable carbon emissions annually due to paper consumption. This burden is unnecessary, outdated, and misaligned with national and global aims to lessen carbon emissions. By modernising the thesis submission system, BMU can demonstrate that excellence in medical education also entails responsibility for the planet.

Acknowledgments

We acknowledge the use of Grammarly for assistance with English language editing. We used prompts to improve the structure of sentences that we deemed could be further improved. The prompts improved clarity by refining grammar and the choice of vocabulary. All suggestions were critically reviewed and revised to uphold the intended message of this editorial.

References

1. United Nations. Transforming our world: the 2030 agenda for sustainable development. New York: United Nations; 2015 [cited 2026.3.12]. Available at: https://sdgs.un.org/2030agenda. [Accessed on 28 Mar 2026]
2. Gemechu E, Butnar I, Gomà-Camps J, Pons A, Castells F. A comparison of the GHG emissions caused by manufacturing tissue paper from virgin pulp or recycled waste paper. Int J Life Cycle Assess. 2013;18:1313-25. doi: https://doi.org/10.1007/s11367-013-0597-x
3. University of Chittagong. Annual SDG-13 climate action report. Chittagong: University of Chittagong; 2024 [cited 2026.3.28]. Available at: https://cu.ac.bd/wp-content/uploads/2023/12/SDG-13.pdf. [Accessed on 28 Mar 2026]
4. American International University-Bangladesh. Climate action plan. Dhaka: American International University-Bangladesh; 2019 [cited 2026.3.28]. Available at: https://www.aiub.edu/sustainability/aiub-climate-action-plan. [Accessed on 28 Mar 2026]
5. BRAC University. Advancing SDG 13: climate action at BRAC University. Dhaka: BRAC University; 2026 [cited 2026.3.28]. Available at: https://www.bracu.ac.bd/climate-action. [Accessed on 28 Mar 2026]
6. East West University. Sustainability/climate action policy and campus greening policy. Dhaka: East West University; 2024 [cited 2026.3.28]. Available at: https://www.ewubd.edu/storage/app/media/Policies/Sustainability%20Cimate%20Action%20Policy.pdf. [Accessed on 28 Mar 2026]
7. University of Liberal Arts Bangladesh. Climate action policy. Dhaka: University of Liberal Arts Bangladesh; 2023 Jul 31 [cited 2026.3.28]. Available at: https://ulab.edu.bd/sites/default/files/Climate-Action-Policy-ulab.pdf. [Accessed on 28 Mar 2026]

8. Dhaka University of Engineering and Technology, Gazipur. Climate change and sustainable policy. Gazipur: Dhaka University of Engineering and Technology; 2026 [cited 2026.3.28]. Available at: https://www.duet.ac.bd/climate-change-sustainable-policy. [Accessed on 28 Mar 2026]
9. Noakhali Science and Technology University. Sustainability and climate action plan. Noakhali: Noakhali Science and Technology University; 2026 [cited 2026.3.28]. Available at: https://nstu.edu.bd/Sustainability-and-Climate-Action-Plan.html. [Accessed on 28 Mar 2026]
10. Southeast University. Sustainable climate action policy. Dhaka: Southeast University; 2026 [cited 2026.3.28]. Available at: https://seu.edu.bd/sustainable-climate-action-policy. [Accessed on 28 Mar 2026]
11. Muralidharan S, Khasru SM. Bangladesh's energy transition journey so far. United Nations Bangladesh. 2024 Feb 17 [cited 26.3.22]. Available at: https://bangladesh.un.org/en/260959-bangladesh%E2%80%99s-energy-transition-journey-so-far. [Accessed on 28 Mar 2026]
12. Ananth A, Prakash A, Kumar S. Decarbonization in the Indian pulp and paper industry. IPPTA Q J Indian Pulp Pap Tech Assoc. 2023;35(E1):62-5. Available at: https://ippta.co/wp-content/uploads/2023/03/62-65.pdf. [Accessed on 28 Mar 2026]
13. Yue W, Cai Y, Su M, Tan Q, Xu M. Carbon footprint of copying paper: considering temporary carbon storage based on life cycle analysis. Energy Procedia. 2017;105:3752-7. doi: https://doi.org/1016/j.egypro.2017.03.870