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## **Will We Care for the Soil Surrounding Us? An Analysis of Legal Framework for Soil Protection in Bangladesh**

by Zelina Sultana & Nasrin Akter

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## Will We Care for the Soil Surrounding Us? An Analysis of Legal Framework for Soil Protection in Bangladesh

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### ABSTRACT

Soil as natural resources, is an amazing gift of nature and all living and non-living things are influenced by the soil in which it is imbibed. At present soil is highly polluted, contaminated and degraded mainly by different anthropogenic activities in Bangladesh. Until recently, the Government of Bangladesh had not enacted any law, policy or action plan to safeguard its soil in conformity with environmental conservation mandate detailed in its Constitution. Soil pollution has already crossed all borders and its protection is crucial to meet the contemporary global goals including achieving SDGs. Therefore, this article is an attempt to analyse present legal regime related to prevention of soil pollution, contamination and degradation (PCD) that results from different human activities such as industrialisation, unsustainable urbanisation, waste dumping, unsustainable soil use and management in Bangladesh. It finds that, soil PCD for such causes have already been addressed directly or indirectly in some legal instruments but those were insufficient, generic in nature and carried on along with lack of monitoring, accountability and implementation. However, if properly implemented, those measures might help to reduce soil PCD. Furthermore, soil PCD control is not possible without establishing accountability of the implementing authority, mass awareness and the enactment of legislation solely to protect the soil. Therefore, we argue that the implementation of existing law along with risk control policies and scientific guidelines are crucial to ensure soil management and protection. Finally we argue that impediments to the filing of suits in environmental courts should be lifted so as to ensure that common people have access to environmental justice in order to conserve the soil resources, achieve SDGs, and maintain a healthy natural world.

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## I. Introduction

Soil, the world's most useful natural resource, covers the earth surface in mainly as combination of types of weather-beaten rock particles that make up the soil such as sand, silt, and clay.<sup>1</sup> However, each square meter of soil is very unique in terms of its composition, structures and the life it contains and supports. In addition, it is the source of water from which, the process of natural purification of the water starts on its path towards groundwater.<sup>2</sup> Polluted soil is as dangerous as polluted water or air since it has a direct effect on humans and their environment. Both the rural and urban soils are polluted as a result of expanding human activities, necessitating an integrated approach for its protection.<sup>3</sup>

Currently soil resource is under threat due to industrialisation, urbanisation, waste dumping, unsustainable soil management and pesticide use in agriculture.<sup>4</sup> Hasty and unsustainable use of soil accounts for contamination, which is responsible for depletion of its nutrients. Soil pollution has affected the ability of soil in ensuring ecological balance, degraded the lands, hindered the production of safe and sufficient food, compromising global food security.<sup>5</sup> Even though soil is fundamental to the continued existence of all living beings, its importance to the environment remains highly underappreciated.<sup>6</sup>

The pollution of soil will continue to have a negative impact on the health of plants, animals and humans unless there is a change in the manufacturing process and consumption methods, as well as a strong governmental devotion to the upkeep of sustainable environmental management and respect for natural components.<sup>7</sup> Soil being a key component of land and degraded soil remediation is multifarious and expensive; therefore, soil pollution would make it more difficult to achieve a number of contemporary global goals.<sup>8</sup> These goals include the SDGs, which call for the restoration of ecosystems; UN Decade on Ecosystem Restoration; the forthcoming Post-2020 Global Biodiversity Framework; the United Nations Food Systems Summit; UN Conferences on Climate Change and global Zero Net Land Degradation.<sup>9</sup>

Prior studies have advocated for the enactment and implementation of national/regional legal measures to protect soil resources and further contended that presence of global environmental legal framework with the objective of protecting soil resources (being a soft law) could be a good source to provide instructions, to regulate certain behaviour, to achieve definite goals, to guide national legal framework, to set proper implementation institutions, to ameliorate overwhelmed objectives in global scale, to protect and manage soil resources.<sup>10</sup> The UN Convention to Combat Desertification (UNCCD) is the only international agreement to which protection of soil from degradation can be linked. Many developed countries have already taken necessary advance legal steps, spatial planning regulations, efficient land use as a priority and scientific strategies to protect soil against pollution, contamination and degradation (PCD) at their national level rather than waiting for distinct global legal framework.<sup>11</sup>

<sup>1</sup> Anusree Mohan and Jyothi Sajayan, "Soil Pollution-A momentous Crisis" (2015) 3 (1) *International Journal of Herbal Medicine* 45, 47.

<sup>2</sup> Anonymous, "Land and Soil Pollution Widespread, Harmful and Growing" (*European Environment Agency*, 15 October, 2020) <https://www.eea.europa.eu/signals/signals-2020/articles/land-and-soil-pollution>

<sup>3</sup> Petra Stankovics, Gergely Toth and Zoltan Toth, "Identifying Gaps Between the Legislative Tools of Soil Protection in the EU Member States for a Common European Soil Protection Legislation" (2018) 10 (8) *Sustainability* 1, 17 <https://www.mdpi.com/2071-1050/10/8/2886/pdf?version=1534488541>

<sup>4</sup> Rajesh Kumar Mishra, Naseer Mohammad and Nilanjan Roy Choudhury, "Soil Pollution: Causes, Effects and Control" (2016) 3 (1) *Van Sangyan* 1, 14.

<sup>5</sup> FAO and UNEP "Global Assessment of Soil Pollution: Report" (FAO and UNEP, 2021) <https://www.fao.org/documents/card/en/c/cb4827en>

<sup>6</sup> Stankovics, Toth and Toth (n 3) 1.

<sup>7</sup> FAO and UNEP (n 5) IX.

<sup>8</sup> Akemi Ori, "Soil Pollution Countermeasures in Japan" (1993) 6 (1) *Environmental Claim Journal* 15.

<sup>9</sup> Saskia Keesstra and others, "Soil-related Sustainable Development Goals: Four Concepts to Make Land Degradation Neutrality and Restoration Work" (2018) 7 (4) *Land* 1, 20 <https://www.mdpi.com/2073-445X/7/4/133/pdf?version=1542165791>

<sup>10</sup> Arif Ahmed and Md Jahid Mustofa, "Role of Soft Law in Environmental Protection: An Overview" (2016) 2 (2) *Global Journal of Politics and Law Research* 1, 18; FAO and UNEP (n 5) IX; Stankovics, Toth and Toth (n 3) 2; Mishra, Mohammad and Choudhury (n 4) 13; Mohan and Sajayan (n 1) 47.

Bangladesh has enacted several laws, which are mainly generic in nature and not suitable for initiating effective soil management system. Natural resources pollution and contamination are sometimes of trans-boundary nature and necessitates regional understanding to manage them.<sup>12</sup> Thus, national and regional soil pollution prevention and management policies are essential but are overlooked and neglected in Bangladesh and also at the regional level. The track record that Bangladesh has had in the past with resource-based laws, such as the one regarding water (the Bangladesh Water Act 2013), has resulted in a failure to safeguard water resources due to a lack of implementation, coordination, and efficient water administration.<sup>13</sup> In order to safeguard its soil from PCD via legal means, Bangladesh has to exercise a higher degree of caution than in the past, taking into account both the severity of soil PCD and the experience gained from other resource-based regulations. Implementing a comprehensive soil management system that incorporates well-crafted laws, goal-oriented action plans, strict regulations, risk control rules (control standards), and scientific guidelines might be advantageous.<sup>14</sup>

This paper examines the existing regulatory and policy instruments in Bangladesh that protect and maintain soil from pollution, contamination and degradation caused by diverse reasons and to identify legal gaps in soil PCD prevention as well as implementation barriers. So, the research is addressing the two following questions: Are there adequate legal provisions for soil protection in Bangladesh? How could Bangladesh en-

sure improved soil protection as well as its management?

Prior to delving into the more in-depth discussion, it is necessary to go through the relevant academic studies on this issue. The threats of soil PCD on human health elaborately discussed by Brevik et al.,<sup>15</sup> while impacts on ecology and agro-economy have been analysed broadly in many scholarly publications published both in national and international level.<sup>16</sup> These papers tend to place only a moderate amount of emphasis on durable legislative safeguards. In their research paper, Babu and Riadduzzaman correctly noted many types of soil pollution as well as its effects.<sup>17</sup> Their analysis, on the other hand, took more of a broad approach and did not examine the various legal provisions of legislation and policies for the prevention of soil PCD in Bangladesh.<sup>18</sup> Although the growing bodies of scientific research have provided evidence of soil pollution, degradation and contamination, very few academic studies have focused on the existing legal framework in Bangladesh addressing soil PCD.<sup>19</sup> Therefore, the remaining knowledge gaps make it important to do this re-

<sup>11</sup> Tianku Li and others, "Soil Pollution Management in China: A Brief Introduction" (2019) 11 (3) Sustainability, Environmental Law for Sustainability 1 < <https://www.mdpi.com/2071-1050/11/3/556/pdf?version=1548127118>; Stankovics, Toth and Toth (n 3) 3.

<sup>12</sup> Yuanzhao Ding, "Heavy Metal Pollution and Trans-boundary Issues in ASEAN Countries" (2019) 21 (5) Water Policy 1096, 1106 <https://iwaponline.com/wp/article/21/5/1096/69048/Heavy-metal-pollution-and-transboundary-issues-in>

<sup>13</sup> ASM Abdul Baten, "Protecting Our Rivers and Water Bodies for a Sustainable Future" *The Daily Star* (Bangladesh, 12 February 2020) <https://www.thedailystar.net/supplements/29th-anniversary-supplements/governance-development-and-sustainable-bangladesh/news/protecting-our-rivers-and-waterbodies-sustainable>

<sup>14</sup> Li and others (n 11) 2.

<sup>15</sup> Eric C Brevik and others, "Soil and Human Health: Current Status and Future Needs" (2020) 13 Air, Soil and Water Research, Sage Journals 1, 23 <https://journals.sagepub.com/doi/pdf/10.1177/1178622120934441>

<sup>16</sup> Nazmun Nahar, Sanjida Mahiuddin and Zakaria Hossain, "The Severity of Environmental Policy; Environmental Awareness Environmental Pollution in the Developing Countries and Its Remedial Measures" (2021) 2 Earth 124,139; Jayanta K Shaha and others, "Soil Pollution-an Emerging Threat to Agriculture" (2017) 10 Springer 1; Mishra, Mohammad and Choudhury (n 4) 7; Mohan and Sajayan (n 1) 46.

<sup>17</sup> Kudrat-e-Khuda (Babu) and Md Riadduzzaman, "Soil Pollution- A Consequence of Environmental Misdeeds: Bangladesh Context" (2020) 39 Suppl. Issue, S7, S11 [http://www.envirobiotechjournals.com/article\\_abstract.php?aid=10844&iid=319&jid=4](http://www.envirobiotechjournals.com/article_abstract.php?aid=10844&iid=319&jid=4)

<sup>18</sup> Md Rezaul Karim and others, "Assessment of an Urban Contaminated Site from Tannery Industries in Dhaka City, Bangladesh" (2013) 17 (1) Journal of Hazardous, Toxic and Radioactive Waste 52, 61; *ibid* 57; Nahar, Mahiuddin and Hossain (n 16) 124.

<sup>19</sup> M Moninul Islam and others, "Heavy Metal and Metalloid Pollution of Soil, Water and Foods in Bangladesh: A Critical Review" (2018) 15 (12) International Journal of Environmental Research and Public Health, 2825 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6313774/>; Saiful Islam, Kawser Ahmed and Shigeki Masunaga "Potential Ecological Risk of Hazardous Elements in Different Land-use Urban Soils of Bangladesh" (2015) 512, Science of The Total Environment 94, 102; Karim and others (n 18) 52.

search on the legal protection of soil PCD in Bangladesh.

This research is carried out using a legislative and policy analysis methodology. This strategy has been shown to be an effective way to uncover previously unnoticed and unrecognised legislative gaps.<sup>20</sup> Bangladesh's environmental laws, policies, as well as both scientific and legal literatures are explored in this study. During the course of this research, we came across a lacuna in terms of the scope and extent of possible collaborative efforts aimed at preventing soil PCD in South Asian context. This calls for additional research and strategies to mitigate transitional soil PCD.

This article is structured into six sections:

- I. Introduction;
- II. Soil Health in Bangladesh Context;
- III. Regulatory Instruments for Soil Protection in Bangladesh;
- IV. The Necessity for Specialised Legislation on Soil Protection in Bangladesh;
- V. Way Forward; and
- VI. Concluding Observation.

The following part offers a concise summary of the existing situation in Bangladesh regarding the health quality of its soil.

## II. Soil Health in Bangladesh Context

Global Assessment Report (launched by FAO-UNEP) found that soil pollution has momentous impact on agro-food and population health given the increasing use of pesticides (75 per cent than previous), plastics in farming (708000 tons only in EU), production of industrial chemicals (estimated double 2.3 billion tons), and waste production (2 billion tons yearly).<sup>21</sup> The Soil Re-

source Development Institute (SRDI), an institute created under Ministry of Agriculture Bangladesh, prepares records for land and soil resources to create exact locality database, planning for land use, monitoring the fertility and salinity of soil, expanding suitable ameliorative measures for saline and degraded soils, soil test and fertilizer use and management on crop demand. Additionally, it publishes an annual report, with a specific focus on soil.<sup>22</sup> The soil ecosystem and nutrients of Bangladesh are deteriorating as highlighted in the findings of SRDI in both 2017-2018 and 2018-2019 annual report.<sup>23</sup>

Organic matter of the soil is often referred to be the “life power of a soil” as well as the “storehouse of plant nutrients” but soil is lessening its nutrients.<sup>24</sup> Lack of organic soil substances and nitrogen, inconsistency in phosphorus, potassium, calcium, magnesium, manganese, sulphur, boron and a lower pH value have all been proven as essential for the country’s agro-product.<sup>25</sup> The ideal organic matter content for agricultural soil is around 2 per cent, while most soils in Bangladesh vary from 1.5 to less than 1 per cent organic matter.<sup>26</sup> Approximately 65 per cent of the total net cultivable land has a deficiency in the amount of organic matter that it contains.<sup>27</sup> As the time advances, organic matter content in soil declines.<sup>28</sup> Presently, there is no national data available on Soil Organic Carbon (SOC). However, according to global statistics presented in Bangladesh's National Report on Land Degradation Neutrality Target Setting Programme 2019, the average SOC loss in 2000 was 56 tonnes per hectare from just two land use/cover groups, namely “forest to cropland” and “forest to shrubs, grasslands, and sparsely

<sup>20</sup> Loraine Busetto, “Wolfgang Wick and Christoph Gumbinger” “How to Use and Assess Qualitative Research Methods” (2020) 2 (1) Neurological Research and Practice 1, 10 <https://www.researchgate.net/publication/341672281>

<sup>21</sup> Eduardo Sonnewend Brondizio and others (eds) “The Global Assessment Report of The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services” (IPBES secretariat, 2019).

<sup>22</sup> Soil Resource Development Institute (SRDI), Ministry of Agriculture, Annual Report 2018-2019 (2019) 50, 100.

<sup>23</sup> Soil Resource Development Institute, Ministry of Agriculture, Annual Report 2017-2018 (2018) 1, 107 <http://srdi.portal.gov.bd>; *ibid* 55.

<sup>24</sup> Department of Environment (DoE), Bangladesh National Action Programme for Combating Desertification, Land Degradation and Drought 2015-2024, 3, 42.

<sup>25</sup> Annual Report 2017-2018 (n 23) 21.

<sup>26</sup> DoE (n 24) 37

<sup>27</sup> *ibid* 2.

<sup>28</sup> *ibid* 2.

vegetated areas”.<sup>29</sup> The overall loss of SOC from the depth of 0-30 cm during a 10-year period is about 379, 269 tonnes, or 0.052 per cent of the total SOC stock in the nation.<sup>30</sup>

Currently, the most harmful use of soil is seen in the manufacturing of raw bricks and the area where brick kilns are located in Bangladesh. Each year, a large amount of arable soil is utilised to make bricks, putting cultivable lands across the country in jeopardy.<sup>31</sup> The growing population accounts for increasing urbanisation, development projects and construction, which stimulates the production of a large quantity of bricks in Bangladesh.<sup>32</sup> The SRDI conducted a survey in 2017-18, which found that Bangladesh manufactures 50 billion bricks each year, which necessitates 150 billion kg of fertile topsoil of agricultural land.<sup>33</sup> Scholarly writings confirms that brick kiln manufacturing has a detrimental effect on nearby arable land/soil, air, water resources, human health and the overall ecosystem.<sup>34</sup> In Bangladesh, the majority of arable land is utilised to build brick kilns, while up to 9-inch soil strata/top soil is used to make bricks.<sup>35</sup> Top soil is very significant for agriculture and it is rich in nutrients, which helps in crop production.<sup>36</sup> Soil PCD and loss of arable land reduce agricultural yield and have an influence on agriculture

and agro-economy of Bangladesh and food shortage. Furthermore, the present environmental, resource reduction and food scarcity issues are inextricably linked to soil PCD.<sup>37</sup> Unfortunately, many brick kilns in ecologically critical areas (three hill districts)<sup>38</sup> are operating to meet the current demand of bricks without receiving Environmental Clearance Certificate from the Department of the Environment (DoE) and thereby are operating by ignoring the provisions of existing laws.<sup>39</sup>

Currently widespread unplanned urbanisation in every city has accounted for the environment and land degradation, and harms the entire landscape of the area.<sup>40</sup> The waste disposal of city inhabitants' has now become the most pressing issue for its negative impact on the environment, land and eco-system.<sup>41</sup> According to a DoE report, urban areas generate 4.86 million tons of waste per year, with that figure expected to rise to 17.2 million tons per year by 2025.<sup>42</sup> Bangladesh is currently under pressure to manage large-scale waste, despite the fact that many developed nations have dumped a

<sup>29</sup> Department of Environment, Ministry of Environment, Forest and Climate Change (MoEFCC), “Bangladesh’s National Report on Land Degradation Neutrality Target Setting Programme” (2019) [https://doe.portal.gov.bd/sites/default/files/files/doe.portal.gov.bd/publications/1ae22f70\\_1056\\_475d\\_a238\\_cd08aa527222/2021-02-17-18-12-8195a3d0050a841544976bd4d42db7f9.pdf](https://doe.portal.gov.bd/sites/default/files/files/doe.portal.gov.bd/publications/1ae22f70_1056_475d_a238_cd08aa527222/2021-02-17-18-12-8195a3d0050a841544976bd4d42db7f9.pdf)

<sup>30</sup> *ibid* 37.

<sup>31</sup> Mohammad Alamgir Hossain and others, “Effect of Brick Kiln on Arable Land Degradation, Environmental Pollution and Consequences on Livelihood of Bangladesh” (2019) 6 (2) *Journal of Science, Technology and Environment Informatics* 474.

<sup>32</sup> Annual Report 2017-2018 (n 23) 2.

<sup>33</sup> *ibid* 75.

<sup>34</sup> Mohammed Khaliqzaman and others, “Thirty Years’ Quest for Emission Reduction and Energy Efficiency Improvement of Brick Kilns in Bangladesh” (2020) 8 (11) *International Journal of Environmental Monitoring and Analysis* 11, 12 <https://www.sciencepublishinggroup.com/journal/paperinfo?journalid=162&doi=10.11648/j.ijema.20200801.12>; Ram Proshad and others, “Apportionment of Hazardous Elements in Agricultural Soils Around the Vicinity of Brick Kiln in Bangladesh” (2017) 7 (2) *Journal of Environmental and Analytical Toxicology* 2161.

<sup>35</sup> Annual Report 2017-2018 (n 23) 75.

<sup>36</sup> Choyon Kumar Saha and Jahangir Hosain, “Impact of Brick Kilning Industry in Peri-urban Bangladesh” (2016) 73 (4) *International Journal of Environmental Studies* 491.

<sup>37</sup> Wu Dan, “Research Status and Trends of Soil Pollution From 1999 to 2018” (2021) 692 *IOP Conference Series: Earth Environmental Science*, IOP Publishing, <https://iopscience.iop.org/article/10.1088/1755-1315/692/3/032040/pdf>

<sup>38</sup> Jihyeon Lee and others, “Scalable Deep Learning to Identify Brick Kilns and Aid Regulatory Capacity” (2021) 118 (17) *Proceedings of the National Academy of Sciences* 1, 10 < <https://www.pnas.org/doi/epdf/10.1073/pnas.2018863118>>.

<sup>39</sup> Md Akhter Hossain Sarker and Asif Hossain Abir, “Role of Laws to Control Brick Manufacturing and Kiln Establishment in Bangladesh: Scope of Alternative Bricks” (2019) 35 (1) *VNU Journal of Science: Earth and Environmental Sciences* 112.

<sup>40</sup> Shilpi Roy and Others “Bangladesh: National Urban Policies and City Profiles for Dhaka and Khulna” (2018) Center for Sustainable, Healthy and Learning Cities and Neighbourhoods, UK (SHLC) <http://www.centreforsustainablecities.ac.uk/research/bangladesh-national-urban-policies-city-profiles-dhaka-khulna/>

<sup>41</sup> Nahela Nowshin, “Killing the Environment-Ignoring Environmental Woes will have Irreversible Consequences for Bangladesh” *The Daily Star* (Bangladesh, 3 October 2018) <<https://www.thedailystar.net/opinion/environment/news/killing-the-environment-1641610>>.

<sup>42</sup> Department of Environment, Ministry of Environment, Forest and Climate Change, Government of the People’s Republic of Bangladesh, “National 3R Strategy for Waste Management” (2010) 1.

variety of hazardous waste in Bangladesh.<sup>43</sup> As a result, in absence of legal measures protecting soil resources from this huge pile of waste poses a grave harm for soil nutrients.<sup>44</sup>

In addition, the excessive use of pesticides and chemical fertilizers on agricultural land degrades soil and crops.<sup>45</sup> Earthworms, often known as farmer's friends, are in danger of extinction due to the widespread use of pesticides, which is also harmful for the diverse soil biodiversity.<sup>46</sup> Pesticides contaminate the soil and food chain in the eco system, causing toxicity in plants and thereby farm produces.<sup>47</sup> Soil nutrients and different earthworms help to keep the soil alive, and their absence makes the soil lifeless.<sup>48</sup> Soil microbial communities which sustain different nutrient level of soil are also affected adversely by the persistence nature of pesticides and chemicals.<sup>49</sup>

Even though the risk of desertification is very low compared to other Asian countries, National Action Programme for Combating Desertification, Land Degradation and Drought 2015-2024 adopted by Bangladesh reported that around 64 per cent of the total land area of Bangladesh is already impacted by it.<sup>50</sup> Considering the rate of deterioration of soil health, the reviewed data from the annual report 2017-2018 prepared by the SRDI and some literatures suggested adopting policies through sustainable urbanisation

and waste disposal regulations, sustainable land use to care of soil and to protect agro-economy of Bangladesh.<sup>51</sup> In light of this, the next section takes a look at the Bangladesh's regulatory framework for soil protection that is currently in place.

### III. Regulatory Instruments for Soil Protection in Bangladesh

Bangladesh recognises a total of twenty-one different general soil types.<sup>52</sup> The general soil types may be broken down further into three distinct physiographic groups: floodplain soils, terrace soils, and hill soils.<sup>53</sup> Each of these sub-types has its own unique characteristics and uses. Despite the fact that the Bangladesh environmental regulatory regime does not provide a comprehensive definition of soil, multiple laws and policies as well as the definition of the word "Environment," in the Bangladesh Environment Conservation Act (BECA) of 1995<sup>54</sup> do make reference to the term "soil".

One definition of soil can be found in section 2(10) of the Sand Estate and Soil Management Act 2010 which defines soil as "all soils except fire clay and white clay". Using the term "soil" to determine which environmental or other laws and policies connect to it shows that multiple legislations and policies in Bangladesh have a role in the implementation of soil protection from PCD. According to the level of contributions they provide to the goal of soil protection, these laws are categorised into four groups, as shown

<sup>43</sup> Ibid 1.

<sup>44</sup> Rafia Afroz, Keisuke Hanaki and Rabaah Tudin, "Factors Affecting Waste Generation: A Study in A Waste Management Program in Dhaka City, Bangladesh" (2010) 179 *Environmental Monitoring and Assessment* 509.

<sup>45</sup> M A Uddin and others, "Studies on Pesticide Residues in Soils of Some Selected Spots of Coastal Region of Bangladesh" (2018) 27 (1&2) *Nuclear Science and Applications* 13.

<sup>46</sup> B Govindarajan and V Prabakaran, "The Effect of Pesticides on Reproduction Potential of the Earthworms: A Review" (2014) 1 (2) *European Journal of Molecular Biology and Biochemistry* 70.

<sup>47</sup> Uddin and others (n 45) 13.

<sup>48</sup> Mohammad Enayet Hossain, Saif Shahrukh and Shahid Akhtar Hossain, "Chemical Fertilizers and Pesticides: Impacts on Soil Degradation, Groundwater and Human Health in Bangladesh" in V P Singh and others (eds), *Environmental Degradation: Challenges and Strategies for Mitigation* (Springer, Cham 2022), 63.

<sup>49</sup> Ibid 63.

<sup>50</sup> DoE (n 24), 37.

<sup>51</sup> Annual Report 2017-2018 (n 23) 4; Mishra, Mohammad and Choudhury (n 4) 13; Golam Rasul and Gopal B Thapa, "The Impact of Policy and Institutional Environment on Costs and Benefits of Sustainable Agricultural Soil/Land Uses: The Case of the Chittagong Hill Tracts, Bangladesh" (2007) 40 (2) *Environmental Management* 283.

<sup>52</sup> DoE (n 24) 14.

<sup>53</sup> Ibid 14.

<sup>54</sup> Section 2 of the Environment Conservation Act of 1995 defines environment as "the inter-relationship existing between water, air, soil and physical property and their relationship with human beings, other animals, plants and micro-organisms".

in **Table 1** below. Specialised soil protection laws go under the first category, while primary supporting environmental laws and sectoral laws fall under the second and third tiers of the categorisation hierarchy. Lastly, Bangladesh's international obligations are reviewed.

The constitutional mandate to conserve and improve the environment and biodiversity is a significant point in the protection of soil, even though the soil is not explicitly mentioned.<sup>55</sup> Article 18A of the Constitution of the People's Republic of Bangladesh mandates that "the State shall endeavour to protect and improve the environment and to preserve and safeguard the natural resources, bio-diversity, wetlands, forests and wild life for the present and future citizens". According to this provision, it is the duty of the state to protect the natural world and the variety of its living creatures via the application of the law. Unfortunately, the environment and its protection are not a fundamental right of the citizens of Bangladesh and therefore is not justiciable as an individual right in the Court.

As there is not yet any specialised legislation that is designated to preserve soil, the protection of soil is connected to numerous legal provisions that are spread in many laws ranging from environmental laws to other sectoral laws and policies. In most situations, these legislations do not directly protect soil, but do so indirectly. For instance, following the constitutional requirement comes the primary supporting legislation, which is Bangladesh Environment Conservation Act (BECA) 1995. The objective of this legislation is to preserve the environment, develop environmental standards, and manage and reduce environmental pollution. Protection of the soil is not expressly addressed anywhere in the provisions provided by the Act; nevertheless, when a more holistic view of the Act's objectives is taken into consideration, a connection between the two might be established. The scenario is essentially the same in each of the listed (**Table 1**) pieces of legislation. However, only three of these pieces of legislation have referenced the

word "soil" in their provisions that are shown in **Table 2** below.

Even though the domestic environmental regulatory regime does not explicitly ensure the preservation of soil against PCD, Bangladesh's international obligation towards soil protection could be directly linked to combating land degradation under the United Nations Convention to Combat Desertification (UNCCD), which it ratified on 26 January 1996. Given the significance of soil as a component of land, the obligation of the state to preserve soil naturally comes within the scope of this responsibility. Two major policy documents were developed as part of Bangladesh's national attempts to meet UNCCD obligations: Bangladesh National Action Programme for Combating Desertification, Land Degradation and Drought 2015-2024 and National Report on Land Degradation Neutrality Target Setting Programme 2019.

In accordance with the UNCCD, each nation is required to develop a National Action Program (NAP) to address the issue of desertification. The most recent initiative, which is the Bangladesh National Action Programme for Combating Desertification, Land Degradation and Drought 2015-2024 (hereinafter, NAP 2015-2024), has been adopted by Bangladesh with the goal of execution of the UNCCD Strategy 2008-2018 at the national level. The Bangladesh National Action Plan 2015-2024 has five particular objectives listed as follows:

- a. Identifying new desertification, land degradation and drought (DLDD) related difficulties and the underlying causes of such issues
- b. Assessing national policies for NAP revision and alignment
- c. Assembling current state information to update nation baseline
- d. Identifying all key parties, their roles, and responsibilities for sustainable land management.
- e. Developing new NAP initiatives and programmes to mitigate land degradation and desertification.

<sup>55</sup> The Constitution of People's Republic of Bangladesh, art 18A [It was inserted by the Constitution (Fifteenth Amendment) Act, 2011 (Act XIV of 2011). It is inserted in the fundamental state policy part of the constitution. Though it is not enforceable by the court of law but it can create an obligation on state to protect environment and its particles.



Year	Law and Policies
<b>Specialised Soil Protection Laws</b>	
n/a	none
<b>Primary Supporting Laws / Environmental Laws</b>	
1972	The Constitution of the People’s Republic of Bangladesh
1995	Bangladesh Environment Conservation Act
1997	The Environment Conservation Rules (ECR)
2010	The Environment Court Act (ECA)
2018	National Environment Policy
<b>Sectoral Laws</b>	
1952	The Building Construction Act
1994	National Forest Policy
1999	National Water Policy
2000	Playground, Open Place, Garden and Natural Water Reservoir Conservation Act
2001	National Land Use Policy
2005	Coastal Zone Policy
2009	National Jalmoahal Management Policy
2010	3 R Waste Management Plan
2010	Sand Estate and Soil Management Act (hereinafter SESMA)
2011	National Urban Sector Policy
2013	Brick Manufacturing and Brick Field Establishment and (Control) Act (BMBFECA)
2013	National Agriculture Policy
2018	Chatragram Development Authority Act
2018	Khulna Development Authority Act
2018	Rajshahi Development Authority Act
2018	Barendra Bahumukhi Development Authority Act
2018	Bangladesh Ship Re-Processed Act
2018	Pesticides Control Act
2018	Bangladesh Agriculture Development Corporation Act
<b>International Agreements and National Efforts</b>	
1994	United Nations Convention to Combat Desertification
2015	The UNCCD 2018-2030 Strategic Framework
2019	National Report on Land Degradation Neutrality Target Setting Programme
no date	Bangladesh National Action Programme for Combating Desertification, Land Degradation and Drought 2015-2024

**Table 1:** Regulatory Instruments for Soil Protection in Bangladesh<sup>56</sup>

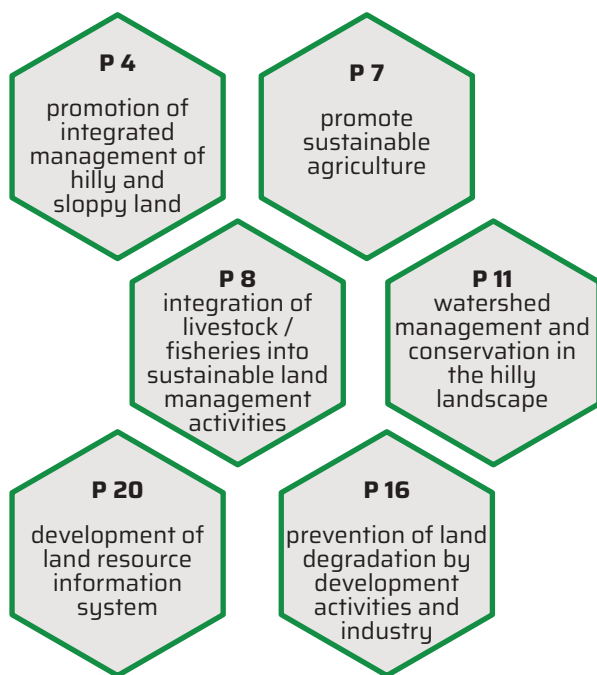
<sup>56</sup> Prepared by the Authors.

Legal Instruments	Existing Legislative Provisions Mentioning Soil
<p><b>Bangladesh Environment Conservation Act 1995 section 2 (b), 11 (1) and 20 (2a)</b></p>	<ul style="list-style-type: none"> <li>■ “Pollution” means the contamination or alteration of the physical, chemical or biological properties of air, water or <b>soil</b>, Including change in their temperature, taste, odor, density, or any other characteristics, or such other activity which, by way of discharging any liquid, gaseous, solid, radioactive or other substances into air, water or <b>soil</b> or any component of the environment, destroys or causes injury or harm to public health or to domestic, commercial, industrial, agricultural, recreational or other useful activity, or which by such discharge destroys or causes injury or harm to air, water, <b>soil</b>, livestock, wild animal, bird, fish, plant or other forms of life;</li> <li>■ “Environment” means the inter-relationship existing between water, air, <b>soil</b> and physical property and their relationship with human beings, other animals, plants and micro-organism;</li> <li>■ Director-General is empowered to collect from any factory, premises or other place any sample of air, water, <b>soil</b> or other substance for analysis;</li> <li>■ Determination of the standards of air, water, sound, <b>soil</b> and other components of the environment in relation to different areas for different purposes;</li> <li>■ No person can cut or raze hill or hillock which is under the control of government, semi-government, autonomous authority, or personal ownership without the consent of DoE;</li> </ul>
<p><b>Sand Estate and Soil Management Act 2010</b></p>	<ul style="list-style-type: none"> <li>■ <b>Soil</b> is defined as all soils except fire clay and white clay in section 2 (10);</li> <li>■ <b>Soil</b> cannot be harvested from ecologically critical area, hill, hillock and other areas specified by section 4;</li> <li>■ <b>Soil</b> cannot be collected from underground and river bed under section 5;</li> </ul>
<p><b>Brick Manufacturing and Brick Field Establishment and (Control) Act 2013</b></p>	<ul style="list-style-type: none"> <li>■ Brick means anything produce from <b>soils</b> by burning it in brick kiln under section 2 (e);</li> <li>■ Government can direct to manufacture hollow bricks and alternative block for construction to reduce the use of <b>soils</b> as raw materials of bricks under section 5 and government can mandatorily order to produce block for this;</li> <li>■ No brick field can be establis in any hill, hillock, arable land or ecologically critical area under section 8;</li> </ul>

**Table 2:** Existing Legislations that Mention Soil Explicitly<sup>57</sup>

<sup>57</sup> Prepared by the Authors.

The NAP listed 21 different programmes, which are designed to run for a period of 10 years, from 2015 until 2024. Many of these programmes have made direct references to the soil, and the ones that haven't done so have indirect connections to the conservation of the soil (Figure 1 below). Several activities have been developed with tentative budgets under each programmes. Among these activities, soil-related activities include the prevention of top soil erosion; the growth of organic matter content; soil erosion; soil cutting; the application of particular soil test-based fertilizer; the possibility of using animal waste for the purpose of soil rehabilitation; the determination of appropriate soil management; and the restriction of the use of top soil from agricultural land for the manufacture of bricks.



**Figure 1:** The NAP Listed Programmes that Directly Mentioned Soil<sup>58</sup>

At COP-12 of UNCCD, the global community agreed to achieve Land Degradation Neutrality (LDN) by 2030 along with the SDGs goal 15: (life

on land), to be more specific target 15.3, “By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world”. In order to reach LDN by the year 2030, National Report on Land Degradation Neutrality Target Setting Programme 2019 provided that Bangladesh has formulated its national voluntary LDN six targets (Table 3 below) in which first and fourth on the list of LDN targets particularly relate to protecting the soil, whereas the other targets are just connected to it in a more general way.

Furthermore, National Report on Land Degradation Neutrality Target Setting Programme 2019 designed an embedded organisational setting to ensure the programmes' execution in Bangladesh in 2019 (Figure 2 below). Land users and farmers have a voice in this process since it maintains a top-to-bottom approach from government entities to root level representatives.

In addition, the protection of soil is linked, either directly or indirectly, to ten of the Sustainable Development Goals (SDGs) and several of its targets. Goal 15 is concerned with life on land but it does not put any particular emphasis on the health of soil.<sup>59</sup> However, the protection and preservation of soil is particularly included in three goals of the SDGs, which are goals 2, 3, and 12 (Table 4 below). The preservation and protection of soil resources might make a major contribution to the achievement of the SDGs.<sup>60</sup> To achieve the SDGs, it is also important for the general public to be aware of how to utilise and manage natural resources sustainably, and ultimately to take steps to prevent the loss and deterioration of natural resources.<sup>61</sup>

<sup>58</sup> Prepared by the authors after studying NAP 2015-2024.

<sup>59</sup> Rattan Lal, Rainer Horn and Takashi Kosaki (eds) “Soil and Sustainable Development Goals” (Catena Soil Sciences Imprint of Schweizerbart Science Publishers, Stuttgart, 2018) 1, 189.

<sup>60</sup> Hakkı Emrah Erdogan and others, “Soil Conservation and Sustainable Development Goals (SDGs) Achievement in Europe and Central Asia: Which Role for the European Soil Partnership?” (2021) 9 (3) International Soil and Water Conservation Research 360.

<sup>61</sup> ibid 360.

## Land Degradation Neutrality (LDN) Targets of Bangladesh

<b>Target 1</b>	To improve soil fertility and Carbon stock in 2,000 km <sup>2</sup> of cropland area
<b>Target 2</b>	To reduce land use / cover conversation in 600 km <sup>2</sup> of forest area
<b>Target 3</b>	To reduce waterlogging in 600 km <sup>2</sup> area
<b>Target 4</b>	To reduce soil erosion in hilly areas in 600 km <sup>2</sup> area
<b>Target 5</b>	To protect non-saline land areas from salinity intrusion in 1,200 km <sup>2</sup> in the coastal areas
<b>Target 6</b>	To reduce riverbank erosion @100ha / year covering 100 km <sup>2</sup> areas

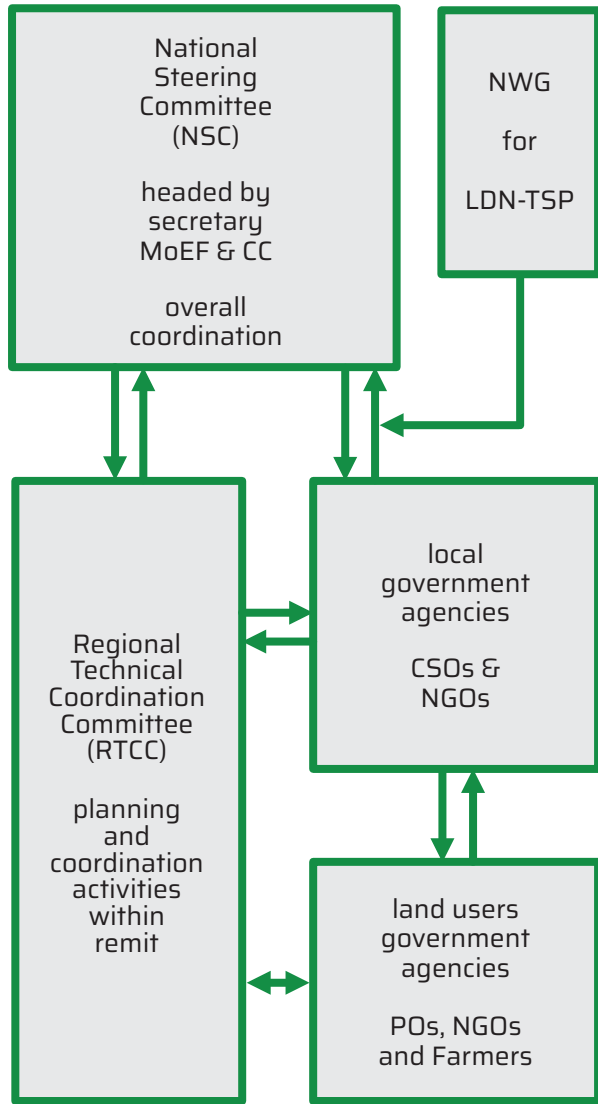
**Table 3:** Land Degradation Neutrality (LDN) Targets of Bangladesh<sup>62</sup>

Related Goals	Why Connected	Directly Mentioned in Specific Targets
<b>Goal 2 Zero Hunger</b>	Soil protection enhanced to achieving food security nutrition level and promote sustainable agriculture	2.4: By 2030, ensure sustainable food production systems and implementation resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality
<b>Goal 3 Good Health and Well Being</b>	Soil pollution control ensure healthy lives	3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination
<b>Goal 12 Responsible Consumption</b>	Good soil can ensure sustainable consumption and production patterns and vice versa	12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment

**Table 4:** SDGs and their targets directly related to soil protection<sup>63</sup>

<sup>62</sup> Department of Environment (DoE), Ministry of Environment, Forest and Climate Change (MoEFCC) National Report on Land Degradation Neutrality Target Setting Programme 2019, 17.

<sup>63</sup> Prepared by the Authors on the basis of SDGs and their targets.



**Figure 2:** LDN Organizational Setting<sup>64</sup>

The primary importance of addressing soil protection has relevance for the SDG goals related to hunger, water quality, climate mitigation, biodiversity preservation and for attaining several other goals and targets (Table 5 below).<sup>65</sup>

<sup>64</sup> *ibid* 14.

<sup>65</sup> Johan Bouma, Luca Montanarella and Gregory Evanylo, "The Challenge for the Soil Science Community to Contribute to the Implementation of the UN Sustainable Development Goals" (2019) 35 (4) *Soil Use and Management*, 538, 546.

This scenario presents Bangladesh with a potentially significant opportunity to provide domestic legislative measures that are aligned with SDGs for the protection and management of soil; yet, Bangladesh has not shown any particular focus towards the protection of soil.<sup>66</sup>

## IV. The Necessity for Specialised Legislation on Soil Protection in Bangladesh

The NAPs on combating desertification under the UNCCD umbrella are policy papers that address both land degradation and soil degradation. On the other hand, they do not carry the force of legal authority in many of the situations. In certain countries, governments have enacted specific laws on soil protection or laws stating that the NAP or other programmes connected to it constitute public policy.<sup>67</sup> For example, among Asian countries, Japan (Japan has enacted and implement Soil Contamination Countermeasures Act 2002 for Soil Protection) and China (China imposed retroactive liability for land contamination under its Soil Pollution Prevention and Control Law of the People's Republic of China, 2019) are notable to introduce sole soil protection legislation for assuring organised soil management and safeguard.<sup>68</sup> In South Asian region, Sri Lanka (Soil Conservation Act 1996) and Nepal (Soil and Watershed Conservation Act, 1982) have separate soil conservation legislation. Many countries are now in one-step ahead of thinking to ensure Right-to-Soil (RoS).<sup>69</sup> However, some nations have been using a combination of legal framework and scientific strategies to manage soil health.<sup>70</sup>

<sup>66</sup> FAO and UNEP (n 5) XI.

<sup>67</sup> Richard Byron-Cox, "From Desertification to Land Degradation Neutrality: The UNCCD and the Development of Legal Instruments for Protection of Soils" in Hadijah Yahyah and others, *Legal Instruments for Sustainable Soil Management in Africa* (Springer, 2020) 1.

<sup>68</sup> Huanhuan Wang, "Retroactive Liability in China's Soil Pollution Law: Lessons from Theoretical and Comparative Analysis" (2020) 9 (3) *Transnational Environmental Law*, Cambridge University Press 593.

Goals	Targets	Why Connected
Goal 1	Targets 1.1. & 1.4	Soil health is related to agriculture of Bangladesh and has impact on agro-income and poverty eradication to meet the goal no poverty.
Goal 2	Target 2.3	Soil protection enhanced to achieving food security and promote sustainable agriculture to mitigate hunger from world and Bangladesh.
Goal 6	Targets 6.1, 6.3, 6.6 & 6.a	Soil as water reservoir can ensure availability and sustainable management of water which possibly could ensure clean water goal.
Goal 8	Targets 8.1 & 8.4	Soil can promote and sustained, inclusive and sustainable agro-economic growth which can help to achieve the economic goal.
Goal 9	Targets 9.4, 9.a & 9.b	Sustainable soil can build resilient infrastructure, promote inclusive and sustainable industrialization and thus help to attain this goal.
Goal 11	Targets 11.3, 11.5, 11.6 11.a, 11.b & 11.c	Make cities and human settlements inclusive, safe, resilient and sustainable in which soil use can be ensured in a sustainable way.
Goal 12	Targets 12.1, 12.2, 12.3, 12.a & 12.c	Good soil can ensure sustainable consumption and production patterns and <i>vice versa</i> .
Goal 14	Targets 14.1, 14.2 & 14.4	Conserve and sustainably use the oceans, seas and marine resources for sustainable development which also reflects sustainable use of soil.
Goal 15	Targets 15.1, 15.2, 15.3, 15.4, 15.5, 15.8 & 15.9	Soil protection can assist to protect, restore and promote sustainable use of terrestrial ecosystems of the globe.

**Table 5:** SDGs and their Targets Indirectly Related to Soil Protection<sup>71</sup>

<sup>69</sup> Ratan Lal, "Right-of-Soil" (2019) 74 (4) Journal of Soil and Water Conservation 81A <https://www.jswnonline.org/content/74/4/81A/tab-references>

<sup>70</sup> Deyi Hou and Yong Sik Ok, "Soil Pollution-Speed up Global Mapping" (2019) 566 (7745) Nature 455 <https://www.nature.com/articles/d41586-019-00669-x>; Ori (n 8) 25.

They are achieving their national targets through implementing legal policies, action plans and regulations for soil protection.<sup>72</sup> Literature suggests that both of these kinds of initiatives appear to be neglected in Bangladesh.<sup>73</sup>

In order for a policy with respect to the conservation of soil to be successful, it has to be guided by science and in order for such policy to have actual authority; it requires the support of legislation.<sup>74</sup> Bangladesh has not yet established legal authority for the NAP or implemented specific legislation to safeguard its soil from pollution contamination and degradation. Despite the fact that the NAP and LDN targets have strong references, program-oriented activities, and soil preservation targets, they do not generate any legal responsibility on the part of the state to protect soil from PCD. Considering the rate of soil health deterioration in Bangladesh, voluntary soil protection measures are not sufficient to protect soil against PCD as well as to achieve contemporary global goals such as SDGs.<sup>75</sup> Many nations, however, have begun the process of developing national law, driven by the criteria for attaining sustainable development goals and the international framework for the same, such as UNCCD<sup>76</sup>, while Bangladesh is short of robust legal measures to address soil PCD. In addition to the points mentioned above, the following examination of the inadequacy of the legal provisions from multiple legislations related to soil protection that are now in place evidences that Bangladesh need a specialised piece of law for the protection of its soil.

Industries have grown and become the primary cause of soil contamination and land degradation in Bangladesh.<sup>77</sup> Chemicals and fuels are used in industries, resulting in toxin-containing effluents and wastes that are disposed of dir-

ectly in the soil or water.<sup>78</sup> Heavy metal and metalloid are accumulating in the soil, degrading soil quality and reducing crop yield.<sup>79</sup> Bangladesh has some provisions of laws, which relate to soil protection from industrial pollution, however, management of soil eco-system was not adequately addressed at all. Bangladesh has no specific regulations to limit industrial pollution and industrialisation remains a major cause of environmental pollution including soil PCD.<sup>80</sup> Bangladesh's industries, unlike those in industrialised nations, seldom-employed improved pollution prevention measures.<sup>81</sup> Unsurprisingly they often failed to meet the required waste and effluent disposal, or emission standards. Bangladesh has general legislation and rules for all industries and a specific law for ship industries for preventing industrial pollution, while pollution is continuing and soil is degrading. Except for ship breaking waste, Bangladesh currently lacks a comprehensive waste disposal management law.

Although the BECA has enhanced the environmental protection in general, it has been widely criticised for giving the Department of the Environment (DoE) extensive powers that sometimes supersede the power and jurisdiction of the environmental court.<sup>82</sup> Here, the courts are reliant upon the Inspectors' written reports, who are appointed from the DoE. The problem is there is no specified time to finalise the written report and submission of the report to the court. However, the reasonable expectations regarding the

<sup>71</sup> Prepared by the Authors on the basis of SDGs and their targets.

<sup>72</sup> Ruishan Chen and Chao Ye, "Resolving Soil Pollution in China" (2014) 505 (7484) *Nature* 483.

<sup>73</sup> Karim and others (n 18) 52.

<sup>74</sup> Ori (n 8) 25.

<sup>75</sup> *ibid*; Bouma Montanarella and Evanylo (n 65) 538.

<sup>76</sup> Ori (n 8) 25.

<sup>77</sup> Islam and others (n 19) 2825; Mishra, Mohammad and Choudhury (n 4) 3.

<sup>78</sup> Valérie Cappuyns and others, "Can Thermal Soil Remediation be Sustainable? A Case Study of the Environmental Merit of the Remediation of A Site Contaminated by a Light Non-aqueous Phase Liquid (LNAPL)" (2011) 8(2) *Journal of Integrative Environmental Sciences* 103.

<sup>79</sup> Yuanan Hu and others, "Assessing Heavy Metal Pollution in the Surface Soils of a Region that had Undergone Three Decades of Intense Industrialization and Urbanisation" (2013) 20(9) *Environmental Science and Pollution Research International* 6150; Islam and others (n 19) 2825.

<sup>80</sup> Shadika Haque Monia, "Environmental Impact Assessment Initiated to Mitigate Pollutions from Industries" (2020) 3(1) *International Journal of Management, Entrepreneurship, Social Science and Humanities* 56.

<sup>81</sup> Asadul Hoque and Amelia Clarke, "Greening of Industries in Bangladesh: Pollution Prevention Practices" (2013) 51 *Journal of Cleaner Production* 47; Karim and others (n 18) 52.

<sup>82</sup> Momtaz Salim, "Environmental Impact Assessment in Bangladesh: A Critical Review" (2002) 22 (2) *Environmental Impact Assessment Review* 163.

delivery of such reports should be as early as possible, but regular delay in submitting the written reports to the court by the Inspectors is the actual reality, and the court has to await inspector's written report for starting its proceedings.<sup>83</sup> According to the BECA, the punishment for offence is inadequate<sup>84</sup> and unsatisfactory when compared to the ability of the polluters and the level of pollution cost (loss and degradation of environmental particles).<sup>85</sup> The majority of the times, polluters who are also the owners of industries are wealthy and powerful individuals who lack the will to comply with existing standards and ignore the penalty imposed by the DoE.<sup>86</sup>

The Act also categories offences as: first offence and repeated offences in 10 types of offences under section 15 of the Environmental Court Act. There are no criteria specified for determining environmental loss in the first offence or imposing a penalty based on the gravity of the offense. In case of environmental degradation in an ecologically critical area, any wrongdoer will only be sentenced to jail: in the case of a first offence, imprisonment for up to two years and a fine of up to two lac Taka, or both, may be imposed which is certainly insufficient. In the case of a repeated offence, however, imprisonment for up to ten years and a fine of up to ten lac taka, or both, could be imposed.<sup>87</sup> In reality, the repeated offenders have been imposed lower fine or same fine as first offenders.<sup>88</sup> Thus, the Amendment of 2010 of BECA restricted imposing hard penalty to the offenders of the first in-

stance and failed to ensure severe penalty for the repeated offenders as well.<sup>89</sup> Moreover, penalties (environmental fines imposed by DoE) for environmental crimes are arbitrary, it should be based on the pollution harms and recovery costs incurred by industries and should be imposed more stringent sanctions and more effective mechanisms for penalising noncompliant parties.<sup>90</sup>

The Environment Conservation Rules, which was enacted to effectively implement BECA, established the requirements for waste from industrial units on irrigated land<sup>91</sup>, standards for sector-specific industrial effluent or emission<sup>92</sup>, and standards for other environmental particles, with the exception of the soil standard.<sup>93</sup> The exclusion of determination the soil standard by ECR indicated that Bangladesh failed to recognise the soil as a significant natural resource and undermine the ecological value of soil. Absence of soil standard denotes the absence of control standard (absence of risk control rules) which surely increases the soil PCD and the pollutants left behind.<sup>94</sup>

The BECA regulates the establishment of industries by providing an environmental clearance certificate (ECC)<sup>95</sup>, which is required for the issuance or renewal of industries. This ECC procedure is often disregarded due to a lack of oversight, coordination among decision-making authorities and infrastructure to assure its proper implementation.<sup>96</sup> For red category industries, location clearance comes first, followed by environmental impact assessment (EIA), and then ECC.<sup>97</sup> Presently, the EIA has evolved as a tool for project approval rather than an instrument for securing environmental sustainability

<sup>83</sup> Sarker Faroque and Nigel South, "Law-Enforcement Challenges, Responses and Collaborations Concerning Environmental Crimes and Harms in Bangladesh" (2020) 66 (4) *International Journal of Offender Therapy and Comparative Criminology* 389.

<sup>84</sup> The Bangladesh Environmental Conservation Act 1995, (BECA) s 15 (2010 amendment introduced the category of first offence and further offence and lessen the penalty accordingly).

<sup>85</sup> Md Mizanur Rahman, "Can Ordinary People Seek Environmental Justice in Bangladesh? Analyzing through the Lens of Legal, Policy, and Institutional Framework" (2021) 29 (2) *Bangladesh Journal of Public Administration (BJPA)* 15.

<sup>86</sup> Nabil Haque, "Exploratory Analysis of Fines for Water Pollution in Bangladesh" (2017) 18 *Water Resources and Industry* 1.

<sup>87</sup> BECA 1995, s 15 (2), Amendment 2010 (Previously it was Imprisonment not exceeding 10 years or fine not exceeding 10 lac taka or both. There is no criterion for First offender and repeated offender).

<sup>88</sup> Haque (n 86) 1.

<sup>89</sup> *ibid* 2.

<sup>90</sup> *ibid* 2.

<sup>91</sup> Environment Conservation Rules 1997 (ECR) sch 10.

<sup>92</sup> ECR 1997 sch 11.

<sup>93</sup> ECR 1997 schs 2, 3 and 4.

<sup>94</sup> Li and others (n 11) 1.

<sup>95</sup> BECA 1995, s 12 read with s 3 of ECR 1997.

<sup>96</sup> Salim (n 82) 163.

<sup>97</sup> ECR s 6.



of the proposed project in Bangladesh.<sup>98</sup> The DoE is in charge of EIA, but the provisions of EIA are employed to justify development projects rather than environmental protection.<sup>99</sup> ECC and EIA are renewed after some specified period based on the presumption that industries are in operating in conformity with legal provisions.<sup>100</sup> With the way the law is set up and how it is being implemented, soil protection by ECA and ECR is theoretically conceivable but practically impossible in Bangladesh.<sup>101</sup>

Despite those problems related to industrialisation, urbanisation is also uncontrolled and unplanned; for this degradation of soil is rife in Bangladesh.<sup>102</sup> Sustainable urbanisation requires a strong focus on urban design, large-scale waste disposal policies, construction planning, new infrastructure development, and economic development in order to protect soil and entire environment. Manoj Roy Habitat International<sup>103</sup> According to previous researches urban planning, on the other hand, should be sustainable for all growing cities, but not at the expense of agricultural land, forest, wetland areas or flood-prone areas.<sup>104</sup> Currently to meet the demand of growing population, agricultural land, forest, and wetland are being converted into urban areas in Bangladesh, resulting in the one of the lowest per capita availability of arable land.<sup>105</sup>

Bangladesh's present legislative frameworks for town development barely cover environmental degradation and particularly soil degradation. The open spaces, flood prone or agricultural areas are used for urbanisation now accounts for urban floods and environment-land-soil degradation.<sup>106</sup> The development-related Acts (listed in Table 1) have inadequate provisions for soil conservation and soil management from soil PCD.<sup>107</sup> Those Acts also lack to provide waste disposal and waste management in country-wide.

A key contributor to increasing soil and water pollution in Bangladesh is the lack of national policies and support for waste disposal plan and management, as stated in a DoE report.<sup>108</sup> As a result, protecting soil resources from this huge pile of waste appears to be unachievable without the implementation of strong soil safety and management regulations.<sup>109</sup> The development related Acts are silent on urban waste disposal, which has now become the most pressing issue for its negative impact on the environment and eco-system.<sup>110</sup> Except for ship breaking waste, Bangladesh currently lacks a waste disposal management law; nevertheless, the DoE began a 3R (Reduce, Reuse, and Recycle) waste management plan in 2010. Since the implementation of the 3R strategy is committed to the DoE, which is already struggling under a heavy workload, the strategy's intended outcome will remain elusive.<sup>111</sup>

Moreover, Bangladesh lacks implementation of the existing policies or provisions for sustainable soil management and soil uses, which is a major contributor to the significant loss of good soil, land degradation, loss of water-bodies and forest.<sup>112</sup> Bangladesh has enacted the *Eit Prostut*

<sup>98</sup> Tanvir Ahmed and Shakil Ahmed Ferdousi, "Evaluation of EIA System in Bangladesh" (2016) 36th Annual Conference of the International Association for Impact Assessment, Nagoya, Japan 11.

<sup>99</sup> Mohammad Golam Sarwar, "Felling Trees at Suhrawardy: Another "Justified" Case of Violation of Environmental Law?" *The Daily Star* (Bangladesh, 6 May 2021) <https://www.thedailystar.net/law-our-rights/news/felling-trees-suhrawardy-another-justified-case-violation-environmental-law-2089537>

<sup>100</sup> Haque (n 86) 2.

<sup>101</sup> Ahmed and Ferdousi (n 98) 3.

<sup>102</sup> Raju Rai and others, "A Synthesis of Studies on Soil/Land Use and Land Cover Dynamics During 1930–2015 in Bangladesh" (2017) 9 (10) *Sustainability*, 1, 20 <https://www.mdpi.com/2071-1050/9/10/1866/pdf?version=1508826242>

<sup>103</sup> , "Planning for Sustainable Urbanisation in Fast Growing Cities: Mitigation and Adaptation Issues Addressed in Dhaka, Bangladesh" (2009) 33 (3) 276.

<sup>104</sup> Masud Parves Rana, "Urbanisation and Sustainability: Challenges and Strategies for Sustainable Urban Development in Bangladesh" (2011) 13 *Environment Development and Sustainability* 237.

<sup>105</sup> Rai and others (n 102) 2.

<sup>106</sup> Nowshin (n 41) 5.

<sup>107</sup> *ibid* 4.

<sup>108</sup> National 3R Strategy for Waste Management (n 42) 22.

<sup>109</sup> *Ibid* 32; Afroz, Hannaki and Tudin (n 44) 509.

<sup>110</sup> Nowshin (n 41) 6.

<sup>111</sup> Md Ashiquzzaman and Md Hasan Howlader, "Sustainable Solid Waste Management in Bangladesh: Issues and Challenges" (2019) *Sustainable Waste Management Challenges in Developing Countries* 35.

and *Vata Sthapon (Niontron) Ain*, 2013 [if translated Brick Manufacturing and Brick Kiln Establishment (Control) Act (hereinafter BMBKECA)] and the *Balumahal abong Mati Babosthapon Ain*, 2010 [if translated Sand Estate and Soil Management Act (hereinafter SESMA)] for soil use in brick kilns and sand/soil management but neither legislations have adequate provisions to control soil PCD from unsustainable use. The BMBKECA has made some progressive provisions, such as requiring less soil to be used in brick manufacturing and delegating authority to the District Commissioner to prohibit brick kilns in his district within specified limits such as in ecologically critical areas (within 1 km), forests (2 km), residential areas (1 km), schools (1 km), hospitals (1 km), hilly areas (0.5 km), and agricultural land.<sup>113</sup> Currently, the Act can do little to stop the violations of its provisions and illegal establishment of brick kilns.<sup>114</sup> The brick kiln related legislation is struggling to prevent the use of arable soil for raw bricks production; lack of its implementation also encourages the wrongdoer to establish and continue illegal brick kilns (without environmental clearance certificate<sup>115</sup>) in whole of Bangladesh.<sup>116</sup>

The only Act, the SESMA, which also defines soil, has concentrated on sand and soil management on the sand estate, with no mention of soil management explicitly. The Act states that sand and soil cannot be exploited in ecologically critical areas such as tea gardens, hilly areas, rivers, and forests<sup>117</sup>, yet it failed to ensure monitoring the lessees' sand and soil harvesting. Again, the issue of identifying responsible leasing authority between the land ministry and the district commissioner (DC) has still remained complicated.<sup>118</sup>

<sup>112</sup> Rai and others (n 102) 2.

<sup>113</sup> BMBKECA 2013 s 8 (2).

<sup>114</sup> Mintu Deshwara, "Headache Called Brick Kiln, Operating in Residential Area, Adjacent to School" *The Daily Star* (Bangladesh, 9 February 2021) <https://www.thedailystar.net/backpage/news/headache-called-brick-kiln-2041497>

<sup>115</sup> Helemul Alam, "Brick Kilns Top Polluter, DoE Air Pollution Survey Finds N'ganj Most Polluted: Air Quality of 7 Cities' Severely Unhealthy" *The Daily Star* (Bangladesh, 14 February 2019) <<https://www.thedailystar.net/frontpage/news/brick-kilns-top-polluter-1701871>>.

<sup>116</sup> Hossain and others (n 31) 486.

<sup>117</sup> SESMA 2010 s 4.

The DC is given the right to dispose of all sand estate, except sand and soil from government-leased agricultural property, rivers, river ports, seaports, canals, and *beels*. While regulating lease of sand estate, the Act has taken a more economic approach rather than an eco-centric approach.

Besides environmental legislations for soil protection and management, Bangladesh has administrative and judicial authority such as the Department of Environment (DoE) and Environmental Courts respectively to implement the environmental laws for conservation of environment and to impose sanction for environmental crimes.<sup>119</sup> However, both the authorities have failed to protect environment and ensure environmental justice in Bangladesh.<sup>120</sup> Thus, in light of what has been discussed so far, the limitations that exist within the context of Bangladesh with regard to the protection and management of soil may be summed up using the three headings below:

## A. Extant Legislative Flaws

- **Firstly**, the most analysed laws, policies (Table 1) discussed above are insufficiently addressed the soil pollution issues and the preventive measures.
- **Secondly**, the existing limitations of non-categorisation of the soil resources standards like water, air by ECA and ECR, and failure to give grievous punishment to the offenders.<sup>121</sup>
- **Thirdly**, the legislations, government policies, and action plans that are either immediately or indirectly connected to the issue of soil protection continue to lack synergy with one another.<sup>122</sup>

<sup>118</sup> SESMA 2010 s 7.

<sup>119</sup> Faroque and South (n 83) 400.

<sup>120</sup> *ibid* 400.

<sup>121</sup> Staff Correspondent, "Bill Passed Increasing Punishment for Illegal Brick Manufacturing" *The Newage* (Bangladesh, 27 February 2019) <https://www.newagebd.net/article/65946/articlelist/323/index.php>

<sup>122</sup> Li and others (n 11), 2.

- **Fourthly**, extant legislations have inadequate facilities for monitoring of waste disposal and neglecting ECC conditions result increased soil PCD.
- **Fifthly**, the law itself gives immunity to the executive authority by inserting good faith clause<sup>123</sup> if they fail to perform their duties or injure to any person by their acts. “Good faith” term is used as an unclear and vague way, for this reason its application and extent remain ambiguous. The good faith provision is used as a safeguard to rationalise the activities of executive authorities even though their activities are irregular leading to misconduct and injustice towards the complainants.<sup>124</sup>
- **Sixthly**, the Environmental Court Act 2010 is silent on the judges'/magistrates' technical competence and abilities to handle environmental matters<sup>125</sup> alongside other civil and criminal proceedings.<sup>126</sup>
- **Seventhly**, it was intended to establish environmental courts in every district but it has not been implemented.<sup>127</sup> Only three courts cannot enhance ecological or environmental justice and as a result access to justice for common people suffers.<sup>128</sup>
- **Eighthly**, legislations like SESMA<sup>129</sup> and BMBKECA<sup>130</sup> have adopted trial of the environmental offences by the mobile court. However, the mobile court, led by the executive

magistrate has been questioned by the High Court Division of the Supreme Court of Bangladesh; because of its functions, is opposed to the rights to fair hearing, due process of law and natural justice guaranteed by the Bangladesh Constitution.<sup>131</sup>

- **Ninthly**, any aggrieved person can directly file compensation suit under section 15A, 17 of Bangladesh Environmental Conservation Act 1995 (amended in 2010), which is not consistent with the provisions of 6 and 7 (A) of Environmental Court Act 2010.

The above factors have led to a negative conclusion on whether or not Bangladesh's current laws are enough to protect soil from pollution, degradation and contamination.

## B. Current Environmental Authorities and their loopholes

As stated above, for implementing the environmental legislations and environment protection in Bangladesh, it has both executive and judicial authority. The major problem lies with the implementing authority, which is not committed to keeping the environmental laws alive and in effect.<sup>132</sup> The Department of Environment (DoE), being the prime authority, has been conferred with extensive powers without any liability or accountability of its assigned work or failure.<sup>133</sup> Furthermore, both the higher judiciary and lower judiciary have problems in upholding environmental justice for some inherent lacking.

- **Firstly**, the ample and unfettered powers of executive authority, especially DoE without being accountable, coupled with the shortage of manpower and logistic support affects its environmental activities.<sup>134</sup>
- **Secondly**, as stated environmental crimes are often tried by the mobile court (by the

<sup>123</sup> The ECA 1995 s 18.

<sup>124</sup> Mohammad Golam Sarwar, “Why do We Need Environmental Rule of Law” *The Daily Star* (Bangladesh, 5 June 2021) <https://www.thedailystar.net/law-our-rights/news/why-do-we-need-environmental-rule-law-2105169>

<sup>125</sup> Faroque and South (n 83) 399.

<sup>126</sup> Environmental Court Act, 2010 s 4(1).

<sup>127</sup> Faroque and South (n 83) 399.

<sup>128</sup> Abul Hasanat, “Environmental Courts in Enforcement: The Role of Law in Environmental Justice in Bangladesh” (2021) 21 (2) *Australian Journal of Asian Law* 85; Rizowan Ahmed, “Barriers to Environmental Justice” (*Dhaka Tribune* (Bangladesh, 30 June 2019) <https://www.dhakatribune.com/opinion/op-ed/2019/07/01/barriers-to-environmental-justice>; Sarwar (n 124) 8.

<sup>129</sup> SESMA 2010 s 15.

<sup>130</sup> BMBKECA 2013 s 21.

<sup>131</sup> Sarwar (n 124) 9.

<sup>132</sup> *ibid* 2.

<sup>133</sup> BECA 1995 s 4.

<sup>134</sup> Sarwar (n 124) 2; Haque (n 86) 8.

executive), the decisions of mobile court are less effective with limited impact on the prevention of environmental pollution in considering the nature of environmental wrongs; penalties are arbitrary and thus failing to establish environmental justice.<sup>135</sup>

- **Thirdly**, the written consent of executive of DoE is required to file a lawsuit in an environmental court for any sort of environmental PCD including soil.<sup>136</sup> This obstacle limits the judiciary's ability to guarantee environmental justice in Bangladesh.<sup>137</sup>
- **Fourthly**, the environmental court lacks *suo motu* and epistolary jurisdiction, and excludes international environmental principles such as polluter pays and precautionary principles.<sup>138</sup>
- **Fifthly**, the higher judiciary of Bangladesh has no original jurisdiction in environmental matters for environmental protection but it has issued historic judgments by applying its writ jurisdiction through public interest litigations (PIL) on environment related issues.<sup>139</sup> The present PIL system has flaws like costly, lingering and complex procedure and uncertainty in implementation.<sup>140</sup> Only in the year 2020, 15'225 petitions are pending including appeal in the Supreme Court of Bangladesh.<sup>141</sup> Moreover, the public interest environmental litigation's rulings are not properly implemented in Bangladesh.<sup>142</sup>

- **Sixthly**, the environmental defenders or authorities who work for ensuring justice through PIL, have to consider many challenges and threats like killing, abduction, physical assault, political harassment etc.<sup>143</sup>
- **Seventhly**, soil protection needs multidisciplinary actions by different authorities, but lack of cooperation among executive, legal, scientific authorities and other stockholders makes the soil condition more prone.

Thus, the authorities established by laws are functioning with lack of cooperation; coordination in performing their functions and the contradiction between BECA 1995 and ECA 2010 regarding suit filing hinders soil protection and access to justice in Bangladesh. It is evident that access to environmental justice relies on ensuring independent specialised environmental courts, adequate legal aid for environmental matters, public participation in environmental decision making and enacting comprehensive environmental legislation on right based approach.<sup>144</sup> However, the pre-requisites for insuring environmental justice are not met in Bangladesh.

## C. Public Non-compliance

The general public's noncompliance with laws is a constant source of concern in implementing environmental legislations in Bangladesh.<sup>145</sup> There is also constant neglect on court orders and rulings on environmental matters and non-

<sup>135</sup> *ibid* Haque 8.

<sup>136</sup> Environmental Court Act, 2010 s 6 and s 7(4).

<sup>137</sup> Rahman (n 85) 9; Haque (n 86) 7.

<sup>138</sup> Syeda Rizwana Hasan, "Application and Reform Needs of the Environmental Laws in Bangladesh" (2005) 9 (1 & 2) Bangladesh Journal of Law, BILIA 85.

<sup>139</sup> Dr. Mohiuddin Farooque v. Bangladesh & others (WP No.998/94) HCD of Supreme Court; List of PIL of BELA <https://belabangla.org/legal-cell/pil/list-of-pil/>

<sup>140</sup> Abu Noman Mohammad Atahar Ali and Zafrin Andaleeb, "Development and Problems of Public Interest Litigation in Bangladesh: A Critical Analysis" (2007) 7 Rajshahi University Law Review 17.

<sup>141</sup> "Supreme Court of Bangladesh: Annual Report of 2020" [http://www.supremecourt.gov.bd/web/?page=notices\\_all.php&menu=11&notice\\_type=5](http://www.supremecourt.gov.bd/web/?page=notices_all.php&menu=11&notice_type=5)

<sup>142</sup> Staff Correspondent, "Public Interest Litigation Supports Good Governance" Implementation of Rulings in Public Interest Litigation Cases will Ensure Democratic Continuity and Citizens' Fundamental Rights' *Pratham Alo* English (Bangladesh, 30 June 2021) <https://en.prothomalo.com/bangladesh/public-interest-litigation-supports-good-governance>

<sup>143</sup> Farhad Uddin Ahmed Bhuiyan, "Enforcement of Right to Life through Public Interest Litigation in Bangladesh and India: A Comparative Study" (2019) <https://lawyerfarhadahmedbhuiyan.com/enforcement-of-right-to-life-through-public-interest-litigation-in-bangladesh-and-india-a-comparative-study/>

<sup>144</sup> Abdur Rahman Khan, "Legal Aid to Ensure Access to Justice in Bangladesh" (SSRN, 2019) [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3945515](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3945515); Farid Ahmed, "Access to Environmental Justice and Judicial Independence - Case studies in Bangladesh" (2006); Rahman (n 85) 10.

<sup>145</sup> Nahar, Mahiuddin and Hossain (n 16) 126.

compliance with the fine imposed by the authority in Bangladesh.<sup>146</sup> To rectify such scenario, other nations have adopted strict legislation to limit the soil PCD on human health, plant growth, ecosystems, and economic development by awareness and participation of mass people, which is crucial for Bangladesh as well.<sup>147</sup>

Mass participation in environmental decision-making might create a responsibility of mass people towards soil and environment as well. However, establishing moral duty seems not so hard since the country's virtuous people believe that land is not only a source of tangible riches, but also a source of spiritual belief.<sup>148</sup> Soil is not just associated with environmental elements, Muslims' strong religious conviction that the substantial human body is formed of soil.<sup>149</sup> Right living is referred to as "dharma" in Hinduism, and it is based on the sustainable use of resources to meet requirements.<sup>150</sup> As stated, soil protection activities are complex and depend on multidisciplinary activities done by administrative, judicial, scientific and public community synergistically.<sup>151</sup> Potential maintenance of soils can contribute to sustainable development, while it is recognised that poorly managed, degraded or polluted soils may contribute negatively to SDGs.<sup>152</sup>

<sup>146</sup> Ibid 126.

<sup>147</sup> Brevik and others (n 15) 15; Ori (n 8) 26.

<sup>148</sup> Nadia Ahmad, "Recognizing the Role of Religion in Environmental Legal Norms" (2020) 32 St Thomas Law Review 24 Symposium.

<sup>149</sup> Abubakr Abmed Bagader and others "Environmental Protection in Islam" (IUCN Environmental Policy and Law 1994).

<sup>150</sup> Vandana Shiva, "Soil Not Oil: Environmental Justice in an Age of Climate Crisis" (2009) 35 (3) Alternatives Journal 18.

<sup>151</sup> Erdogan and others (n 62) 361.

<sup>152</sup> Pete Smith and others, "Soil-derived Nature's Contributions to People and their Contribution to the UN Sustainable Development Goals" (2021) 376 (1834) Philosophical Transactions of the Royal Society B; Keesstra and others (n 9) 1.

## V. Way Forward

Soil must be managed carefully to keep them healthy and capable of playing their vital role directly and indirectly connected with SDGs achievement, and other ecosystem services.<sup>153</sup> The implementation of extant legal regime may assist temporarily to protect soil from PCD but those are inadequate to accomplish the goals of soil protection and management as well as to attain the ongoing international obligations under UNCCD as well as other global goals such as SDGs. Bangladesh should ameliorate its legislative attention to protect soil, taking into account the following factors:

- a. Enacting specialised and strict legislation for the soil protection and management, with an emphasis on risk-based soil PCD prevention and soil health maintenance based with scientific guidelines and mass participation.
- b. Establishing accountability of executive authority and efficiency of judicial authority to ensure environment and natural resource protection with environmental justice.

With the legislative effort, Bangladesh should take steps to raise eco-centric understanding among the public about their moral obligation to conserve soil *vis a vis* ensure state responsibility for soil and environmental biodiversity protection. In addition, for effective access to justice for all environmental matters including soil the following provision of the ECA should be amended:

- a. The barrier of suit filing in environmental courts of special magistrate should be amended by amending the section 6 and the section 7(4) of the Environmental Courts Act 2010. And it should be amended in conformity with the provision of the s 15A and 17 of the Bangladesh Environmental Conservation Act 2010.

<sup>153</sup> Erdogan and others (n 62) 361.

## **VI. Concluding Observation**

This article examined the flaws in the current legislative framework for soil PCD in terms of industrialisation, urbanisation, waste dumping, unsustainable soil use and management. The solutions were proposed based on an analysis of documents relevant to soil pollution control, particularly materials connected to soil PCD and other developed countries' strategies of soil protection and management. It also reviewed current soil pollution regulations from various laws and effectively identified the lacks of existing legal regime, which hinders the prevention of soil PCD. The findings revealed that soil pollution prevention is impossible with implementing extant legal regime, as it requires management of soil with a comprehensive legal regime focused on risk-based control, responsible implementing authority, scientific guidelines, and directives action plan. It further stated that, Bangladesh would be able to readily safeguard soil resources by adopting comprehensive legal regimes based on scientific knowledge and duty based eco-centric principles. The article mainly focuses on implementation of the extant legal regime to halt the PCD of soil and step forward to draft and enact comprehensive legislation synergistically with action plans and policies that focus on soil monitoring, preserving soil health, and raising public awareness employing a duty-based ecological approach to attain forthcoming global goals. Evaluating the failure of current legal regime for environmental protection history in Bangladesh, it suggests ensuring accountability of environmental executive body for implementation of soil related legislation and the barrier of suit filing process in lower judiciary should be amended to entertain with all environmental suits. Otherwise, the vision of attaining sustainable development goals with global food security and biodiversity targets would be an imaginary tale for Bangladesh.

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