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**Assignment Title: Tourism-Induced Soil Pollution in the Chittagong Hill
Tracts: Environmental Challenges and Sustainable Solutions**

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Introduction

Soil pollution in the Chittagong Hill Tracts (CHT) is a growing environmental hazard due to rising tourism activities. The various hill soils of this area show a diverse fertility which is helpful to determine anthropogenic activities.

Background of Chittagong Hill Tracts

The Chittagong Hill Tracts (CHT) occupy south eastern Bangladesh and despite only covering 13295 sq kms (5100 sq miles) is typically hilly. The British in the 19th century divided the region into three Circles: Chakma, Mong and Bohmong. The colonists made divisions in order to handle the citizens in the other areas.

Thesis Statement: Impact on Soil Pollution

The Chittagong Hill Tracts (CHT) has caused soil pollution due to tourism that generates waste and causes land degradation. Due to the entry of tourists in large numbers, the infrastructure is set up. But, the infrastructure lacks waste management systems, leading to soil contamination. The area's ability to produce food suffers as a result of this development.

Understanding Soil Pollution in Chittagong Hill Tracts

Soil pollution in CHT happens mostly of deforestation, soil erosion and depletion of fertility in soil. These factors have been greatly responsible for land degradation in this region ([Hassan et al., 2017](#)).

Sources of Soil Pollution

Soil pollution is a severe issue of the Chittagong Hill Tracts (CHT) of Bangladesh due to deforestation, soil erosion, and jhum or shifting cultivation. As a result of these activities, land degradation occurs when soil fertility and organic matter are diminished. The soils of the region are poor in nutrients including nitrogen, phosphorus and potassium ([Hassan et al., 2017](#)). Tourism takes these issues to new heights as man acceleration leads to deforestation, soil erosion, and upgrading the soil quality of CHT.

Specific Pollutants Found in CHT Soil

Soil pollution is a prominent environmental issue faced by Bangladesh especially in the Chittagong Hill Tracts (CHT). Heavy metals are the main toxic pollutant that has contaminated the CHT soil. In the region, cadmium (Cd) is recognized as a significant ecological risk factor. These metals are not biodegradable. Because of this, they can be toxic. ([Barua et al., 2023](#))

Environmental Regulations and Enforcement

The application of ecological rules and regulations in the Chittagong Hill Tracts (CHT) is not adequate, resulting in more soil pollution. Not having proper policies has caused land use problems like shifting cultivation which causes soil erosion and damage.

The Rise of Tourism in Chittagong Hill Tracts.

The rise of tourism in the Chittagong Hill Tracts (CHT) has been quite a remarkable one after The CHT Peace Accord was signed in 1997 to rehabilitate the region. This development has caused both stabilization and destabilization, which means it has created economic opportunities while also escalating socio-political tensions and land disputes

Growth of Tourism Industry: A Historical Perspective

The tourism industry has grown through history, which is a complex phenomenon that dates back centuries. At first, only a wealthy elite could afford to travel. In fact, the seventeenth and The eighteenth-century Grand Tour was a rite of passage for young aristocrats. This era marked the start of organized travel to places like Italy and France. In the nineteenth century, spas and seaside resorts were built. With that, leisure travel became possible for larger groups of society. The period is said to mark the emergence of health tourism as people desire the cure of mineral waters and sea air. The Industrial Revolution introduced many new vehicles, which included the railway. As a result, travel became possible for the masses which also gave rise to tourism. The historical records of tourism show how dynamic it was and how social, economic and technical changes shaped it.

Types of Tourism Activities and Their Prevalence

The variety of tourism opportunities of Chittagong Hill Tracts (CHT) makes it attractive. Kaptai Lake is best for peaceful boating experiences and trekking routes to Boga Lake and Nafakhum Waterfall for adventures. These endeavours attract tourists and influence the local culture and environment ([Sofhor Tourism, n.d.](#)).

Economic Benefits vs. Environmental Costs

There are economic opportunities in the Chittagong Hill Tracts (CHT) tourism to focus on local economic development and create jobs. But these benefits are achieved at the environmental cost of soil pollution which keeps increasing by tourism. Heavy rush of tourists leads to improper waste disposal and land degradation adversely affecting the ecological balance of this area. ([Haider, 2024](#))

Direct Impact on Soil Pollution

In the Chittagong Hill Tracts, tourism contributes to soil pollution through the construction of houses and deforestation of hill slopes. To build the necessary tourism facilities, land is cleared and this leads to soil erosion and degradation. The soil pollution problem worsens due to waste generated by increasing tourists. According to Sajib (2023), the landscape and ecology of the area has been affected due to these activities.

Waste Management Issues at Tourist Sites

The growing tourist industry that is taking place at the Chittagong Hill Tracts (CHT) is causing soil pollution as waste is not being disposed of in these areas. The escalation of tourism is producing solid waste that is difficult to collect and dispose of. Similar to Mount Kilimanjaro and other tourist places, the situation is complicated (Kaseva & Moirana, 2010). With increasing tourism, solid waste generation has witnessed a sharp rise which is straining waste management. Research on Mount Kilimanjaro reveals that environmental pollution can be reduced through the implementation of an effective waste management system such as trash-in-trash-out (TITO). Insufficient waste management infrastructure has resulted in soil pollution in CHT. Often enough, waste has never been collected or disposed of in an improper way. People are throwing in waste that could be reused with proper recycling and resource recovery systems that are not present here. The key to reducing soil pollution in tourist areas would be implementing more sustainable waste management practices including recycling and re-use. These measures are not only effective in eliminating waste but also aid in environmental conservation and sustainability.

Deforestation and Soil Erosion Due to Infrastructure Development

Infrastructure development has resulted in a substantial level of deforestation and erosion of soil in CHT. Continuous and illegal deforestation and erosion often occur due to agricultural developments damaging the environment. The socio-political dynamics of the region are further complicated by the interaction of these activities. The clearing of forests degrades the land and causes a greater frequency of landslides and flash floods that are harmful. ([Nadiruzzaman et al., 2025](#))

Impact of Tourist Activities on Soil Composition

Different human activities have changed the soil composition of the Chittagong Hill Tracts (CHT) by tourism. The growing number of tourists has prompted rising deforestation and over farming which results in soil erosion and degradation. When soil erosion occurs due to such activities, it leads to a loss in soil fertility, which ultimately enhances the susceptibility to landslides.

Chemical Runoff from Hotels and Resorts

The increased number of hotels and resorts in the Chittagong Hill Tracts is causing soil contamination by chemicals. The maintenance and landscaping in these places often involve the use of various chemicals which may seep into the soil. This runoff can contaminate the environment with harmful substances like pesticide, detergent, and many others that aggravate the soil degradation.

Indirect Consequences and Long-Term Effects

Soil pollution in the CHT will have indirect effects that will seriously disrupt the balance of nature and harm human health. Lead, cadmium, nickel and other heavy metals present in soil can pose a high non-carcinogenic and carcinogenic risk to the people ([Barua et al, 2023](#)). The long-term effects of life threatening diseases could affect biodiversity and enhancement of health effects. Therefore, steps must be taken on a priority basis by policymakers ([Barua et al., 2021](#)).

Impact on Local Agriculture and Livelihoods

Soil pollution in the Chittagong Hill Tracts (CHT) of Bangladesh, a biodiversity hotspot and unique topography, is very alarming for the agriculture sector in the area. Soil degradation increasingly threatens agricultural systems in this region which predominantly depend on the fertility of hill soils. Pollution exacerbates this degradation (of soil health) by changing the composition of the soil which impacts crops and food security. As revealed by Hassan et al. (2017), soil fertility variation in hill tracts is one of the main constraints on agricultural production. According to the study, various government plans have done little to change the pattern of use of agricultural land, and there should be proper measures to counter soil pollution and its effect on agricultural land ([Hassan et al.,2017](#)).

Threats to Biodiversity and Ecosystems

Over the years, the Chittagong Hill Tracts (CHT) has been suffering from soil pollution mainly due to tourism and unsustainable agricultural practices. The area's biodiversity is declining as a result of land degradation due to inappropriate agricultural activities that result in the erosion of soil and biodiversity (Rasul, 2009). Tourism has raised the pressure on wildlife by polluting the environment along with destroying their habitat due to human invasion. The money that is earned from tourism and cash crops may be economically attractive, but it comes with a heavy environmental cost, like loss of carbon sequestration and biodiversity. To tackle these issues, land-use practices must be given financial resources to keep the environment intact.

Water Contamination and its Link to Soil Pollution

The quality of soil pollution causes water contamination and these two factors have a direct link to CHT (Chittagong Hill Tracts) in Bangladesh. Due to leaching from the soil and particularly due to the tourism waste and activity, the water in these parts is being polluted with microbes. Local communities face serious health hazards due to the pollution ([Chowdhury et al., 2014](#)).

Mitigation Strategies and Sustainable Tourism

Efforts to stop soil pollution in CHT involve halting hill cutting, relocating vulnerable people and enforcing robust policies on the sectors. Sustainable tourism can play a crucial role. It can build awareness and help with conservation activities locally. Environmental sustainability can reduce the impact of tourism on soil quality ([Mia, Sultana, & Paul, 2015](#)). According to Hasan, Sarmin and Miah (2020), scenario-based land use planning based on environmental protection priorities can also help mitigate soil degradation through expansion of forestry area and controlling land use change.

Implementing Sustainable Waste Management Practices

Given the tourism-induced pressures in the CHT region, the implementation of sustainable waste management practices by the tourism sector is essential to reduce the soil pollution as a result of tourism activities. According to an estimate, the tourism business leads to the generation of severe waste that has an impact on the environment. It is crucial to adopt sustainable waste management practices to promote environmental sustainability. One way to promote sustainability in waste management is to reduce the waste produced at the source of generation. We can encourage the use of reusable things and less plastics to minimize waste production. Hotels and resorts in tourist areas, for example, can establish policies to use refillable containers for toiletries and utilize bulk dispensers for food and beverages to reduce packaging waste ([Perkumienė et al., 2023](#)). With such measures, not only will the volume of waste reduce but it will also enhance the environmental image and attractiveness of tourism facilities. Not only do we need to remove waste but also improve its collection and disposal. They ensure correct and timely collection and disposal of waste so that it doesn't cause accumulation or harm in the environment. Setting up community-based waste management programs in CHT will work if the infrastructure is not there. According to [Giurea et al. \(2018\)](#), the programs cause local communities to become involved in waste collection and segregation activities so that the communities feel invested as well as responsible. Also, composting and recycling can play a crucial role in waste management. It can reduce the amount of organic material and recyclable material that goes to forks. One of the major components of sustainable waste management in tourism is education and awareness. Waste management campaigns can change behavior and curb littering when properly designed. In particular, educating tourists and locals on how to reduce waste and proper disposal practices can be beneficial. In tourist areas and educational

workshops, for example, informative signs can raise awareness of the negative effects of waste and the positive effects of sustainable waste management ([Perkumienė et al., 2023](#)).

In short, implementing sustainable waste management practices in tourism need to incorporate waste reduction, strategies for better collection and disposal and education and awareness promoting the importance of waste management. By following these measures, the Chittagong Hill Tracts can protect themselves from the negative environmental impacts of tourism, particularly soil pollution.

Promoting Eco-Friendly Tourism Initiatives

The Chittagong Hill Tracts (CHT) is a portion of land located in Bangladesh. It is a place with distinct topography and diversity. However, it's facing soil pollution which is right now on the rise due to tourism. The higher volume of waste created by tourists has a negative effect on soil quality when not managed properly. Particularly troubling given the region's dependence on agriculture and natural resources for livelihood. It's essential to promote eco-friendly tourism activities to reduce these impacts. Eco-friendly tourism, or ecotourism, minimizes the ecological footprint of tourism while enhancing the livelihood of the local population. In CHT waste management systems It can be eco-lodges, community-based tourism where local tribes have a decision-making role. By reducing pollution and providing alternative sources of income, they empower local communities. Additionally, the linking of traditional systems with modern sustainability can provide greater resilience to the ecosystem and communities. To achieve eco-friendly tourism, participation from government, community and private sector is required. We need policies to support sustainable tourism infrastructure, including waste recycling facilities and green transport. If tourists are aware of the environmental and cultural importance of CHT, they will act responsibly. Thus, it will contribute to the sustainable development of CHT.

Community Involvement and Education

Education and community involvement can play a vital role in controlling soil pollution in the CHT. Community-conserved areas have encouraged local people to take part in environmental conservation efforts. Community stewardship of these areas promotes sustainable land use and pollution prevention with an eye toward natural resource protection. More than 200,000 people have migrated from the lowland to CHT. This calls for community-based action to face the environmental challenges. Projects of this kind not only make communities aware of their environment but also enable them to save it.

Policy Recommendations for Sustainable Tourism Development

A comprehensive approach including modern infrastructure development is essential for sustainable tourism development in Chittagong Hill Tracts (CHT). The government should create favorable policies to encourage entrepreneurs to invest in infrastructure. These initiatives can improve the image of CHT as a destination. It promotes sustainability.

Conclusion

Soil pollution in the Chittagong Hill Tracts (CHT) is a complex and worsening issue due to Upcountry hill tourism development. In this section, we have noticed how tourism has a significant tie-up with pollution. Due to the increase in human activities, pollution is increasing. As more tourists arrive, hotels and roads are becoming more active, and soil erosion is taking place due to the reduction of flora and deforestation along with the generation of more waste. Soils are contaminated with plastic and heavy metals, among other substances, through unregulated development without proper environmental planning. Soil pollution of CHT calls for sustainable tourism which ensures environmental development, conservation, protection, and improvement. The way tourism development is happening now will do damage not just to the soil quality but also to the ecological balance of the area. If eco-friendly waste management systems and responsible tourism are adopted, some harmful impacts could be negated. Furthermore, incorporating local communities into the decision-making process of these strategies will only improve effectiveness, ensuring that tourism development does not come at the cost of environmental degradation. This analysis is expected to provide an indication that the problems CHT faces are far from unique. In fact, they share these challenges with many other destinations around the world. This means that environments should be included as a part of planning and developing tourism policies across the world. By taking a more balanced approach that combines growth with the preservation of natural resources, CHT should not only be able to protect themselves but also find avenues for tourism development. To conclude, soil pollution issues of Chittagong Hill Tracts require a collective effort from all stakeholders, the government, local communities, and the tourism industry. Through participatory approach and sustainable development, the negative impact of tourism on soil quality can be reduced in the area. This case study illustrates the need for greater development measures in the context of developmental issues due to environmental degradation and pollution. Through the years, case studies help in highlighting these issues.

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