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Article

Group Inequality and Environmental Sustainability: Insights from Bangladesh and Kenyan Forest Commons

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Abstract: The paper contributes to understanding the interactions of environmental and social dimensions of sustainability in situations of acute group inequalities. Using case studies of Mount Elgon in Kenya and Chittagong Hill Tracts in Bangladesh it shows the importance of ethnicity based inequalities in defining sustainability outcomes. The paper explores, first, the mechanisms through which dominant ethnic groups are able to exert influence on resource management at the expense of less powerful groups; and second, the consequences of ethnic inequalities for resource uses within ostensibly democratic systems. It combines information from social and political history with remote sensing data to explore causes, processes and patterns behind spatial trends in the study of forests. The paper concludes that efficacy of national democracy and its institutions in achieving positive environmental outcomes depends on the power relations among social groups, particularly in historically contested contexts. Further, environmental and social

dimensions of sustainability cannot be treated separately and the issue of equity among groups, ethnic or otherwise, needs to be recognised in policies for sustainable development. The study points out the need for further research into integrating socio-political history with spatial data to better understand social and spatial distribution of policy impacts.

Keywords: ethnicity; sustainability; equity; democratic governance; forest commons

1. Introduction

There is a growing interest in the issue of how socio-economic inequalities impact on sustainability and development. In the mid-nineties, provoking a debate on the role of equality on environmental quality, James Boyce put forward an argument that political and economic inequalities result in more environmental degradation [1]. He proposed two related hypotheses: first, the extent of an environmentally degraded activity will depend on the balance of power between the winners and the losers; and, second, greater inequalities of power and wealth lead to more environmental degradation. In his later works, Boyce developed this argument further with theoretical reasoning and empirical evidence in support of his conclusion that greater power inequality leads to weaker environmental policies, and that weaker policies in turn lead to greater environmental degradation. Thus, he claimed, inequality was bad for the environment, and democracy and equity was a means to environmental protection [2,3]. This sparked a response from Lyle Scruggs who argued that equality may or may not be necessary to minimize environmental degradation, and, under some plausible conditions, greater inequality may even be conducive to lower degradation. According to Scruggs, economic equality and democracy do not do a good job in explaining variations in environmental quality. Environmental outcomes are due to the complex interplay of individual and group preferences and the institutional situations where these preferences are aggregated into social choices [4]. Scruggs stressed the importance of institutions and political power as explanatory factors, as opposed to distributional issues, and suggested that research on the political economy of environmental degradation should pay more careful attention to why and how individuals or groups promote environmental conservation, as well as how income and power are related to preferences for public goods [4] (p. 272). A later study by Scruggs and Rivera indicate that there is not much evidence to support the impact of democracy on overall national environmental performance [5]. Boyce's treatment of environmental degradation as a direct outcome of the interests of the rich and the powerful also attracted criticisms from Burkett [6] who contends that such an explanation must be rooted in production relationships in capitalist systems. Burkett suggests that from a Marxist perspective, one should ask "whether and why inequalities in wealth and power are systematically dependent on environmentally degrading activity" [6] (p. 215).

Following this debate, a number of studies were done in recent years that focused on the effect of democracy on environmental degradation. The environmental performance indicators that these studies explored are varied and often included, atmospheric and other pollutants pertaining to water and sanitation [5,7,8]; government commitments to different environmental treaties [9]; and a combination of indicators in the form of Environmental Sustainability Index [10–12]. A few studies also included impacts of democracy, and influence of "world polity" such as international NGOs or inter-governmental

organisations on forestation and land degradation [5,12–15]. Whitford and Wong [16] noted that environmental interests, development paths, and religious orientations produced varied effects across different measures of sustainability. Varied were also the indicators studies used to represent democratic status of a regime. They included large data sets on freedom in a country [5]; nature of civil and political freedom, and green or left party strength [7,17]; presence of environmental lobby and democratic participation [18]; forms of electoral system, *i.e.*, parliamentary or presidential, majoritarian or proportional [11]; and level of democratization and federalism [16]. Given the wide range of variations in definitions, indicators, data sets, time period considered, and scale of governance at which the analyses were carried out, it is difficult to compare the studies. The results are also mixed. Though the studies produce a set of statistical associations, no meaningful conclusion can be drawn and the findings remain contested.

Other studies follow a case study approach. Downey and Strife [19] use three case studies from the USA, *i.e.*, commodity chain networks, free trade agreements in agriculture, and, policy planning networks in energy sector to demonstrate how undemocratic and elite-controlled organizations, networks, and institutions play a critical role in degrading the environment and ensuring capital accumulation. They have developed an Inequality, Democracy and Environment (IDE) model that set out to explicitly link environmental degradation to the organizational, institutional, and network-based mechanisms through which the elites are able to monopolize decision making power, shift environmental and non-environmental costs onto others, shape individuals' knowledge, attitudes, values, beliefs, and behaviour, and frame what is and is not considered to be good for the environment. These mechanisms, they claim, form the basis of and critically shape the large-scale social structures and structures of accumulation that negatively affect the environment. A few other case studies, originating from the commons literature, have linked inequality to prospects of co-operation [20] or self-organization for collective action [21] among resource users for environmental sustainability. Baland and Platteau [22] discuss a number of critical factors that determine whether inequality promotes or discourages collective action, particularly those aimed at preventing overexploitation of natural resources. They find that the distribution of incentives among agents plays a crucial role. Increasing inequality, where some benefit while others lose out, redistributes incentives in different directions, thus having an ambiguous effect on the ability of users to take steps toward conserving their resources. The authors maintain this ambiguity in a latter article when they suggest that a more equal division of a given amount of income could speed the process of environmental degradation, if the poor value the preservation of the environment less than the rich do, or if the consumption patterns of the poor entail proportionally greater environmental degradation than that of the rich. However, they also contend that inequality may exacerbate environmental problems by making it more difficult for group cooperation to design and implement measures for protecting natural assets [23]. In a similar vein, Koop and Tole [24] investigate the role played by distributional factors in mediating the effects of growth and development on forest depletion in tropical developing countries. A key finding of their paper is the correlation that more egalitarian countries tend to have less deforestation. A study by Andersson and Agrawal [25] find that local governance and collective action matter in shaping how socio-economic inequalities affect forest conditions. They suggest that both inter-group and intra-group economic inequalities have consistently negative effects on forest outcomes, but effectively functioning local institutions for collective action could dampen these negative outcomes. The mixed, inconsistent, and sometimes

contradictory findings may partly have resulted from their varying underlying assumptions and socio-economic contexts, leading Naidu to stress the need for making these assumptions explicit in empirical literature [26]. Coleman and Andersson, who find that the effect of heterogeneity is sensitive to the types of heterogeneity considered, note that this area of research remains one of the great puzzles in the social sciences [27].

Indicators of heterogeneity and inequality among a population may be conceived in a number of ways. Charles Tilly suggests, "Large, significant inequalities in advantages among human beings correspond mainly to categorical differences such as black/white, male/female, citizen/foreigner, or Muslim/Jew rather than to individual differences in attributes, propensities or performances" [28] (p.7). Individual attributes can explain inequalities only by virtue of the nature of the social relations within which these individual attributes operate. Tilly terms the social relational inequalities of race, gender, ethnicity, class, age, citizenship and the like as categorical inequalities and contends that any satisfying explanation for inequality must begin by confronting the categorical rather than individual differences among people. Tilly [29] provides a sketch of the approach to explaining inequality in the following statements: inequality is a relation between persons or sets of persons in which interaction generates greater advantages for one than for another; paired and unequal categories, consisting of asymmetrical relations across a socially recognized boundary between interpersonal networks, recur in a wide variety of situations; and the usual effect of such arrangements of paired categories is unequal exclusion of each network from resources controlled by the other. Similar inequalities among groups are defined by Frances Stewart [30] as horizontal inequality. She observes that horizontal inequalities can prevail among culturally determined groups that have salience for their members and/or others in society, for example, among races, ethnic groups, religions, regions, and so on. These inequalities differ from "vertical" inequality in that the latter is a measure of inequality among individuals or households, not groups; furthermore, measurement of vertical inequality often is confined to income or consumption while horizontal inequalities are multidimensional, and interactions among the dimensions are an important factor determining their persistence. Dimensions of inequality can be economic (inequalities in access to and ownership of assets—including financial, human, natural resource-based); social (inequalities in access to a range of services, such as education, health care, and housing); political (inequalities in the distribution of political opportunities and power among groups); or, cultural status (disparities in the recognition and standing of different groups' language, religion, customs, norms and practices). Horizontal inequalities create poverty traps, affect well-being of group members, persist over a long time and can lead to violent conflict [31,32].

The emerging concept of categorical or horizontal inequality seems promising as an exploratory tool for a more complete analysis of how resource user attributes impact sustainability outcomes. However, there is very little research linking categorical or horizontal inequalities to environmental sustainability. This may be partly due to the fact that it is difficult to capture the diverse dimensions through which inequality can exist and the potentially diverse impacts of ecological outcomes, and to generate measures of inequalities and impacts [25]. In the case of categorical or horizontal inequality, its focus on the "social-relational" rather than on the "individual" compounds the difficulties of identifying indicators and measures as well as mechanisms through which these inequalities can impact outcomes. Research on categorical or horizontal inequalities has so far targeted organisational inequality [33], inequalities in personal earnings [34], inequalities in power relations [35], distribution of natural resource

revenues [36], violent conflicts [37–39], and income, well-being and political discrimination [40,41]. A few studies have looked at implications of gender and caste inequalities on natural resource management. Agarwal provided an account of how gender inequality influences the local management of forest protection measures through rule making and rule compliance. Her conclusion showed that despite considerable gender inequality, the environmental outcome was positive, but if gender equity were ensured in the institutions, the impact in terms of the costs incurred by women could have been lowered and efficiency in protection enhanced [42] (pp. 27–31). Agrawal and Chhatre [43] find that gender issues, defined as gender relations and gender conflict, have positive associations with resource conservation in Indian Himalayan villages. The authors explain that women as a group are typically charged with collection of forest products such as fodder and firewood, and are most affected by forest deterioration. Thus, if they are in leadership positions, they are more likely to create regulatory mechanisms for protection of forests. Women's acquisition of leadership positions in decision making is taken as proxy for improved gender relations. The explanation for positive association of gender conflicts with better forest conditions is that women are likely to be involved in decision making positions only after there is some conflict related to gender issues. Naidu's study that focuses on caste as a factor in social diversity, finds, on the contrary, that moderate levels of social diversity lead to lower collective action if it encourages the dominance of a particular caste, but high levels of social diversity reduce the likelihood of this dominance, and thus, people may not be averse to supporting collective goods that benefit diverse caste, ethnic, or other social groups [26] (p. 682). These studies show mixed results, and point out the need for further research on the nature of inequalities in question, the roles of mediating institutions, and the environmental outcomes commensurate with the above. This paper extends this body of research with a particular focus on ethnicity and seeks to gain a better understanding of its impact on environmental sustainability. We have undertaken two case studies, one in Kenya and the other in Bangladesh, where in both cases inequalities along ethnic lines are strongly manifested in influencing access to land and forest resources. The aim of the paper is two-fold: first, to explore the mechanisms through which dominant ethnic groups are able to exert their influence on resource management at the expense of less powerful groups; and second, to assess the consequences of ethnic inequalities in terms of unsustainable exploitation of forest resources within apparently democratic systems and institutions.

2. Methodology

The paper uses an integrated methodology that combines social and political history of local land use with spatial information gained from remote sensed data based on a "meta" analysis of secondary research material. This is found useful in providing information on the causes, processes and patterns behind the estimates of change in the environment that spatial data provide. However, we are aware that the cases on which we have based our analysis may not be fully representative samples of forest commons and that there may be a selection bias. Nonetheless, the qualitative analysis that follows has benefited from the authors' extensive knowledge of the study areas gained from their long research engagements in Mt Elgon and the Chittagong Hill Tracts. This has allowed critical scrutiny and assessment of the secondary information used in the paper. Qualitative and quantitative information are gathered from published sources, unpublished documents, and digital remote sensed maps on forest

conditions over a significant period of time. These combined sources provided a nuanced analysis of long term processes and mechanisms and contributed to an understanding of "if" and "how" ethnic inequality impacted upon environmental sustainability. However, before we proceed, we take note of the concepts of ethnicity and sustainability as used in the following analysis.

Ethnicity is often presented in the literature as a fluid concept with over-lapping identity categories that include common descent or ancestry, region of origin, culture, religion, language, history or a combination of the above [44–48]. Researchers differentiate between "ethnic structure" that refers to the distribution of descent-based attributes, *i.e.*, nominal identities; and "ethnic practice" that refers to the act of individuals employing one or more identities embedded in this structure to guide behaviour in a particular context, *i.e.*, activated identities [49]. Group identity based on ethnic structure and practice is also contested in the historiography of ethnicity. Berman writes, ethnicities are "ambiguous, constantly contested and changing results of cultural politics; they are the outcomes of an endless process in which they are always simultaneously old and new, they are grounded in the past and perpetually in the process of creation" [50] (pp. 311–312). Without getting into the rigour of defining ethnicity, which remains beyond our scope, we have used the perceived notions of ethnic identity as they appear in the source material and the political discourse of the contexts that we have described below. It may, however, be noted that the terms "indigenous" and "others" or "outsiders" as used in this paper refer to a growing body of literature on autochthony, following the French colonial discourse. It is shorthand for a naturalised claim to "belong" to a geographic space as "sons of the soil" (autochthon) compared to "others" or "outsiders" (allogène). Autochthony seems to retain a "self-evident" meaning and enjoys a "great popular appeal" in strikingly different situations despite studies showing that such identity can be fuzzy and easily redefined, and acquire violent implications [51–54].

Indicators used in this paper to define forest sustainability are dictated by data sources available, but we have tried to get as close as possible to that offered in forestry research. Unlike ethnicity, however, there is a moderate convergence of ideas among researchers and forest agencies on the broader principles of forest conservation. The Centre for International Forestry Research has produced a toolkit for guiding aspects of conservation for maintaining ecosystem integrity of forested areas [55]. They include: (a) maintaining biodiversity, e.g., maintaining landscape pattern, diversity of habitat, community guild structures, *etc.*; (b) maintaining ecosystem function, e.g., preventing chemical contamination to food chains and ecosystem, protecting ecologically sensitive areas and rare or endangered species, minimise erosion and other forms of soil degradation; and (c) conserving genetic variation, e.g., genetic diversity, genotypic frequencies, gene flow/migration, mating system [55] (pp. 19–24). In this paper, due to data scarcity we are unable to apply all of the above criteria, but available information from remote sensing techniques allows us to compare temporal changes in the case study forests on a number of vital indicators. In the Chittagong Hill Tracts, we analyse bio-mass trend, changes in forest canopy and land use patterns over a period of 1981–2010, while in Mt Elgon, we compare data from 1959–1999 on changes in forest cover, vegetation type and land use patterns. These indicators are used to capture the magnitude of changes that these forest landscapes have experienced largely as a result of human interference. The sections below present brief introductions to the study areas; the land and forest policies; trends in forest conditions; and the mechanisms used by the dominant groups to gain control over forest resources that traditionally belonged to indigenous ethnic groups.

3. Case Study: Mt Elgon, Kenya

Mt Elgon is the second highest mountain in Kenya located in the Western region bordering eastern Uganda. It is located in the slopes of an extinct volcano of tertiary origin with an altitudinal range between 2030 and 4320 m above sea level. The areas we cover in this paper includes Mt. Elgon in Western region and Trans Nzoia in Rift Valley region. The area is approximately 78,025 hectare, and is divided into a National Park, high closed canopy Forest Reserve, a National Game Reserve, and open areas of bush, grassland, and plantations. Mt Elgon is largely covered by forests. The local topography is dominated by alternating hills and valley bottoms. Soils are developed on tertiary basic igneous rocks and volcanic ashes, and are fertile [56]. Mt Elgon is an important water catchment area for the Nzoia River which flows into Lake Victoria and for the Turkwel River which flows into Lake Turkana. Mt. Elgon vegetation can be zoned into closed natural forests (47%), bush and grass lands (28%), bamboo forests (15%) and plantations (10%) as recorded by Hitimana in 2004 [57]. Hitimana further noted that tree felling, charcoal making and grass harvesting were the most common form of human induced disturbances in Mt. Elgon forest. Tree species affected most by selective logging were *Olea capensis, Croton macrostachyus* and *Diospyros abyssinica*. Mt. Elgon appeared largely an open forest with sparse foliage and thick undergrowth; and was under-stocked with sufficient room for regeneration improvement [57] (p. 290). The Mount Elgon Regional Ecosystem Conservation Programme (MERECP) undertook a three pronged programme to address this issue in both the Kenyan and the Ugandan side of Mt. Elgon. The programme in its final report of 2011 summed up Kenyan achievements as follows: plantations for livelihoods done in 200 ha; and forest restoration for carbon sequestration in 157 acres. The other objective of deforestation avoidance was not concluded in Kenya as the zoning of the forest for this purpose was still going on [58].

3.1. Land and Forest Policies in Mt. Elgon

Formal state policies influencing human-environment relationships in Mt Elgon region goes back to the early decades of the 20th century during the colonial period in Kenya. British colonial state initiated a process of disinheriting people from their ancestral lands that continued through to post-independence policies. An important landmark in this regard is 1932 when the colonial state in its effort to create "white highlands" for European settlers effectively removed the entire existing population from Trans-Nzoia to Mt Elgon [59]. These evicted people, who later came to be known as Sabaot, moved to the lower slopes of Mt. Elgon in the south. At the same time, the government also created the Mt. Elgon Forest Reserve. This reduced the amount of land available for the community living in the moorland in Chepkitale variously known as Ogiek, Mosop or Ndorobo. The colonial government also suggested entirely removing them from the highlands for protecting the forests, as the communities living there were practicing herding and foraging within the forest lands. However, this did not happen till 1968, when a part of the forest reserve was declared National Park and the inhabitants were forced to leave. To rehabilitate them, in 1971–1972 the government excised the lower part of the forest reserve and created a settlement programme in Chebyuk [53]. However, land thus distributed was grabbed by politically powerful groups, and people for whom this was intended remained landless, and they thus became illegal squatters in their ancestral land. In 2000, Chepkitale

was declared a National Game Reserve which meant that people were not allowed to reside in the area any more. A part of Mt Elgon is, however, allowed for commercial extraction and plantation [56,60]. The above policies to conserve the forests created acute shortages of land for many local people, resulting in squatting, landlessness and land degradation. The situation was further compounded in the post-independence period when land held by Europeans became available for settlement under different schemes (e.g., the Million-Acre Settlement Scheme) and was grabbed by a small minority leaving a large number of families with very little or no land at all. Syagga noted that the schemes mostly benefitted the "politicians with power and money and loyalists who had made their fortunes by being close to the colonial government, as well as businessmen with liquid cash. … The process created new African elite, which left the penniless scrapping for tiny pieces of land" [59] (p.10). As a legacy to the above policies, Mt. Elgon region became a centre of "a long standing dispute" between the ethnic groups mainly on the issues of "politics of belonging" [53,61,62] that impacted on people's right and access to land. The dispute turned into violent clashes that were observed in several instances, as in 1963 at the moment of independence; in 1990s during the return of the multi-party election; and more recently in 2006–2008 just before and after the election of 2007. The first two conflicts flared up mainly between Sabaots against the Luhya and other ethnic groups who were considered "outsiders" [54]. These "ethnic clashes" were caused, as noted in a Kenyan government study by a number of factors including "hunger for land by the Sabaot who felt neglected by the Government in that they had not, as a tribe, been considered for settlement schemes like other communities" [63] (p. 164). Thus, they were politically instigated to drive away the non-Sabaot from the region. The violence is viewed as a result of a sense of injustice, fear and economic opportunism among "locals" who sought to forcibly reclaim their lost lands that were allocated to "outsiders" at their expense [64]. The more recent violence in Mt Elgon involved Sabaot against Ogiek where both claim themselves as "sons of the mountain" in their struggle to gain access to land and forest resources. These ethnic tensions have had far reaching consequences for land and forest degradation in the region as we discuss below.

3.2. Trends in Forest Conditions in Mt. Elgon

Mt Elgon forests are managed as protective and productive zones. The rules applied are, however, widely variant. A report of the Mount Elgon Regional Ecosystem Conservation Programme (MERECP) noted that in the Forest Reserve although people were expected to get permits to use the forest or obtain its resources, no records were kept on what resources were extracted and no information was available on what level of use were sustainable; similarly, despite the total ban on resource extraction from the National Park, illegal extraction of forest products such as firewood, poles, water, medicines and honey, and even hunting happened "all the time" [60] (p. 32). Further, though a 1986 Presidential Decree banned all logging in Kenya's natural forests, it seemed to have excluded Mt. Elgon, where the removal of timber continued to be allowed by the authorities, resulting in large scale extraction of Elgon teak. Forest management in the region thus varied depending on local histories, legal and administrative status of land and forestry, and the relative power among resource users.

We have attempted to capture trends in forest conditions from land cover maps done by Mt Elgon Integrated Conservation and Development Project (MEICDP) in 1999 [65] and a remote sensing study

by Ndiwa in 2003 [66], cited in Soini [60]. The MEICDP commissioned aerial photography of the 215,570 hectare project area in March 1999. From these photographs, digital maps of land cover of Mt Elgon were produced in collaboration with Kenya Wildlife Service, the Forest Department, and Photomap (Kenya) Ltd. To gain insight into the trends of vegetation cover on Mt Elgon, MEICDP also digitised 1:50,000 scale topographic sheets based on earlier aerial photography available from 1959 and 1967 (henceforth referred to as 1960s). Though this is an excellent source of information on trends in land use in Mt Elgon forests, the methodology also has some limitations. Due to the differences in dates of the earlier aerial photographs for the topographic maps, it is not possible to depict vegetation at the same date for the entire mountain. Further, the vegetation categories depicted in the earlier maps do not correspond exactly to the categories mapped from the 1999 photography. Nevertheless, general trends in vegetation cover on Mt. Elgon can be reliably deduced from this analysis.

A comparison of vegetation cover on the mountain in the 1960s and 1999 shows that one third of the indigenous forest cover disappeared in this period. Indigenous forest cover declined from 53,281 ha (49% of the protected area) to 35,140 ha (33% of the protected area). While indigenous forests remained more important than any other type of vegetation on the mountain, only one-third of the protected land was covered by indigenous forests in 1999. The other important vegetation type, the moorland, was reduced by 25%—a decline from 24,765 ha (23%) to 18,627 ha (17%). The MEICDP report noted that from the conservation point, this was probably the most significant and disturbing change as this moorland represented a particular biotype of global significance, and continuation of its decline could have grave consequences for the survival of species endemic to this biotype. Several other vegetation types such as bamboo, bush, grass and plantations have expanded. The expansion of these vegetation types probably accounted for some of the decline in the area of indigenous forest as noted in the MEICDP report. The report also recorded a striking gain in the expansion of shamba lands (where farmers are temporarily allowed to cultivate small plots of forest land as long as they plant tree seedlings among their crops) within the forest reserve (9583 ha) in 1999 which was non-existent in 1960s. This area included land excised for Chebuyk settlement, but also showed that much more land was being cultivated than was permitted by the forest authorities under the non-residential cultivation system.

The 2003 survey of Mt. Elgon by Ndiwa [66] used remote sensing technique. He looked at changes during 12 years starting from 1986 and ending in 1998. He also found that in this period Mt. Elgon forest reserve has decreased by 21.1%. More than 80% of deforestation was attributed to clearing and agricultural expansion to forest land.

Problems of environmental degradation in the Western region, according to Nyawalo *et al* [67] include water scarcity due to the deforestation of Mt Elgon, Kakamega and Maragoli Hills forests; and forest encroachment and land grabbing by the influential members of society. These losses of habitat have resulted in the decline of certain bird and insect species of much importance to the local communities. The impact is also felt on local ecotourism especially in areas adjoining Kakamega, Teso and Maragoli forests, as well as in the diminishing Mt Elgon forests [67] (pp. 145–146).

3.3. Processes of Domination and Alienation in Mt Elgon

Perceptions of rights and entitlements along "ethnic" lines can create negative feelings and violent conflicts among competing communities [68]. In Mt. Elgon, as described below, this has certainly been the case. These negative feelings have also resulted in mistrust between local communities and forest managers. Forest rules imposed from above, and their biased implementation favouring extensive clear felling of valuable indigenous trees by commercial interests, have added to this mistrust. Thus, a situation of multi-layered grievances with a clear ethnic undertone has emerged that profoundly affected land and forest sustainability. Below, we discuss the important pathways through which this ethnic bias has unfolded in Mt. Elgon.

3.3.1. Identity Politics and Created Mistrust

The creation of reserve forests and the national park resulted in acute shortages of land and landlessness among the disinherited local people. As cited above, to settle people dispelled from the forests, the government excised lower part of Mt. Elgon and created Chebuyk settlement scheme in early 1970s. This programme soon generated land claims from not only the Ogiek who were living in the moorland, but also from Sabaots or Soy who were living in Chebyuk area, Bukusu and Teso neighbours, Gusii forest clearers and Kikuyu traders and farmers. The process of land allocation was also mired by "poor administration and political interference" [62] (p. 27). Some people got land in all three phases of the scheme through the influence of government or political leaders, while some did not get any. Through backing the land claims of specific communities the political leaders were only serving their own narrow political interests [69]. The entire process created an acute sense of competition, mistrust and tension among people who were promised land but did not get it; sometimes previous allocations were cancelled and people were reshuffled without taking into account the labour investment they had put in to the land; or, new people were added to the list who were accused of land grabbing [62] (pp. 30–31). The uncertainty and distrust of the government and other ethnic groups are manifested in the way people started viewing their relationship to land. Due to insecurity of tenure, people often prefer to grow eucalyptus, a fast growing species. The uncertainty and confusion regarding rights and access to land and forest have led to the inadvertent situation where people accelerated the cutting of trees to maximise benefit for fear of being moved at short notice. Thus, a report observed that in Mt. Elgon, Chebyuk area is "an exception with practically no tree growing at all."[70] (p. 118). Another report noted that people "do not plant trees for conservation" [60] (p. 42). As there is no stability, people have no time to think about preserving trees or planting them [70] (p. 79). The other consequence of ethnic tensions that culminated in violent clashes is destruction of forests as part of warfare. Nyukuri [71] mentioned that large areas of forest land were set on fire during ethnic clashes as part of a defensive strategy taken by the victims to deny their attackers hiding grounds. This happened in Molo, Nandi and Mt. Elgon. Nyukuri wrote, "This development in the long run may lead to catastrophic effects on the environment of these areas. In fact, these areas are some of the densely forested zones in Kenya and some are important rain catchment areas. The consequence of massive destruction of forests as was witnessed during the clashes in the mentioned areas would therefore affect the pattern and intensity of rainfall and subsequently affect the viability of rain-fed agriculture

and water supply in these zones. For instance, Mt. Elgon is the major source of perennial rivers such as Kuywa and Kibisi, which flows into Nzoia River that draws into Lake Victoria. Any effect, therefore, on the Mt. Elgon water catchment area will have negative consequences on Lake Victoria and its surrounding" [71] (p.29).

3.3.2. Alienation from Traditional Rights

Minority ethnic groups like the Sabaot (as perceived in relation to Luhya) and Ogiek (as perceived in relation to Sabaot) of Mt. Elgon feel that they have been ignored and bypassed by successive governments and that their resources have only benefitted those from the outside. This has happened not because "we don't have assets … but we don't have people to represent us in the government. There is a vacuum: the government is there, the people are here."[72] (p. 25). This feeling of alienation is also a result of the government narrative of forest conservation with a top-down command-and-control approach that is not shared by the people. There is evidently a sense of deep rooted distrust also: "people are not a threat to the existence of the forest, and therefore the government's claim that people had to be kicked out to preserve the forest was not genuine. We have always thought that the government had a different motive in chasing out our people from the forest."[72] (p. 3). Another Ogiek community leader found it strange that while they planted indigenous trees, the Kenya forest department was actually cutting them down and planting the exotic trees. "This really tells you the government has been more destructive than the Ogiek" [73] who are often blamed for destroying the forests.

In a review of Kenya's implementation of the UN Convention of Biological Diversity (CBD) Programme of Work on Protected Areas, concerns are expressed on the lack of any meaningful participation by the indigenous Ogiek on the pretext of low education and literacy levels as barriers to their participation in decision-making and as managers and co-managers. There was also lack of any revenue sharing with the indigenous and local communities who incur a lot of opportunity cost through loss of wildlife resources due to the protected areas [74]. The review further noted that the Community Wildlife Service that started in 1990 with the purpose of involving the local community in wildlife conservation outside the park, and financially supporting community social programmes for improvements in health, education and water supply "has failed in that the funding of projects is determined by the park authorities and the funding is not guaranteed. Many proposals have not been honoured and this has increased negative attitudes with the result that the indigenous peoples remain isolated without a chance to be part of the park management."[74] (p. 4). Similarly, in the Community Conservation Programme intended to support social and economic projects, the Ogiek were not involved in the selection and implementation of the programme. This created a sense of alienation among local communities in relation to the managers of protected areas. There is a strong feeling that the process of alienation of minority rights that started since the colonial period still continues despite changes of successive governments. Ogiek people believe that the entire process of transforming the Ogiek ancestral land to a game reserve at the expense of the minority community's livelihood is a gross violation of human and land rights [75].

3.3.3. Bureaucratic Favour for Profit

Ongugo *et al.* [56] in their community based study of Mt. Elgon forests observe that institutions responsible for the management of the protected areas often do not consider the traditional and long-term de facto rights of the local communities to exploit goods and services. Alongside this denial of local rights, large scale commercial logging is allowed which has "dramatically opened the canopy." [60] (p. 21). The logging companies came from outside the area, and therefore from ethnic groups that do not belong to the land. This added to local grievances. Available documents show there have been serious concerns among local groups in Mt. Elgon on the ways harvesting right of forest timber was allocated. Examples are cited of logging companies that have been harvesting indigenous species, particularly, Elgon teak. As there was a ban on harvesting indigenous species since 1986, questions were raised regarding the unhindered logging operations in the area circumventing the ban. Local people were concerned that the harvesting method applied by logging companies was not selective felling of the species but done in clusters, and the regeneration potential of the species was essentially wiped out as the seed sources were all removed. Cluster harvesting also opened up the forest more than desirable for the shade-favouring teak. The discontent of the local community was thus caused by concerns that these companies were causing environmental damage while logging, and acting in total disregard of local considerations; they also wondered why the logging companies should be able to harvest what they had conserved but were not allowed the use [76]. Similar concerns were echoed in another study where respondents reported that big companies are able to manipulate the regulations; have the power to control the amount collected; and can encroach upon non-harvesting plantations. Extraction of larger quantities by the companies is believed to have led to stricter collection regulations for the individuals who have less power [77] (pp. 69–70).

The discussion above shows that the major processes of the destruction of forests in Ogiek-inhabited areas have been large scale commercial logging; excisions for human settlement most of which went to politically influential individuals; and land taken by private individuals under the existing land laws for cultivation of export crops. Thus, over the decades a situation is created where "outsiders now have official ownership of Ogiek land" [73]. In a recent statement to the United Nations Permanent Forum on Indigenous Issues (UNPFII), Cheruiyot succinctly summed but theyup the situation, "ever since colonial times there have been attempts to evict the Ogiek from their ancestral land, usually on the pretext that they are degrading the forest. In 1977 to date, frequent threats, evictions, and displacement have been witnessed in Ogiek ancestral territories. This has resulted in increased poverty, illiteracy leading to loss of hope. But when the Ogiek are removed, their forest is not protected but rather exploited by logging and tea plantations – some owned by government officials."[78]. The Ogiek believe that the evictions, disinheritance and alienation from their land and forests are all due to who they are, what they believe or where they live [79]. This is indeed a case of ethnic inequality and discrimination in related social, political, economic areas that manifests in environmental degradation.

4. Case Study: Chittagong Hill Tracts, Bangladesh

The hilly regions of the Chittagong Hill Tracts (henceforth, the Hill Tracts) are located in the south-east end of Bangladesh bordering Myanmar and India. It consists of Rangamati, Bandarban and

Khagrachari Hill districts. The area contains steep-fold mountains aligned from north, north-west to south, south-east. Elevations reach up to 1000 m, with sharp-edges and steep slopes. About two-thirds of the soil is silt, clay loam, acidic with low nutrient retention capacity and low fertility [80]. Swidden cultivation, locally known as Jum, which is a slash-and-burn technique of cultivation is practiced on the slopes, and plough cultivation producing cotton, rice, tea, and oilseeds is done in the valley bottoms. Fruit orchards and horticulture is also practiced where land is suitable.

The Hill Tracts is traditionally inhabited by the indigenous Hill peoples whose lives and livelihoods, languages and cultural traditions are distinctly different from those of the Bengalis, the largest ethnic group in Bangladesh who traditionally live in the plains. The Hill Tracts has been the ancestral home of a number of ethnic groups, the most numerous being the Chakma, Marma and Tripura. This ethnic composition is however changing rapidly due to the government led transmigration policies of settling the Bengalis in the Hill Tracts. Thus, while in 1947 the Hill peoples constituted more than 98% of the total population, the 1991 population census showed their proportion dwindling to only 50%, the other half were the Bengalis. The later census of 2001 does not show any ethnic breakdown, but an estimation based on Bangladesh Bureau of Statistics data shows that in 2001 the indigenous Hill peoples consisted of 44% while that of non-indigenous people had gone up to 56% [81] (pp. 8–9). In this paper, we shall use the term "Hill peoples" to collectively describe all ethnic groups who are indigenous to this area.

4.1. Land and Forest Policies in the Hill Tracts

Traditionally, management of land and forests in the hills of Chittagong were vested in the community as a whole based on customary rules. Individuals had the right to cultivate, build home, extract resources, hunt and fish, and graze cattle. The predominant form of land use was swidden cultivation, characterised by a rotation of crop agriculture and fallow periods. Once land was fallow it reverted back to the community [82]. In 1868, the British colonial administration "took the ownership of land away from the community and vested it with and for the benefit of the state, an institution in which the Hill people had no representation or participation."[83] (p. 29). As a way to consolidate its ownership of all forestland, the government declared one-fourth of the land as reserve forest (where rights of the people were denied) and the rest as district (protected) and un-classed state forests. The reserve forests prohibit access or use of the forest or forest produce, without the government's express consent, thereby criminalizing and outlawing the Hill peoples whose lives and livelihoods were closely interconnected with the forests. In the "un-classed state forests" also known as "village common forests", the customary rights of the people were allowed as mere rights of usage rather than as rights of ownership [84]. Interestingly, while indigenous people's rights to forest land were denied or severely restricted, attempts were made to increase revenue through extraction of forest products, and forests were opened for commercial exploitation. Bengali traders were invited from the plain to extract timber and elephants were used for transportation in the remote areas. In this way, revenue from forest products increased substantially [85] while the forests were being degraded. For example, while a government document in 1869 by Capt. T.H Lewin, the then Deputy Commissioner of the Hill Tracts, reported "large tracts of valuable forest trees" throughout the whole district [86] (p. 8), another report of 1875 by William Schilich, the then Conservator of Forests noted that forest resources were

degraded substantially and many important trees such as *Jarul (Lagerstroemia spp.)* and *Toon* (*Cendrcla toona*) disappeared from accessible areas [87]. In response, the government pronounced a number of laws regulating the use of forests and forest resources. The Forest Act of 1927 formalized strict state control on the reserve forests and as a result marginalised the Hill peoples in various ways, *i.e.*, through displacement, loss of rights, criminalization, disempowerment of women, and environmental degradation [83] (p. 26).

However, commercial extraction of hill forests continued under successive governments. In addition, industrial use of forest products was intensified in the 1950s when the Karnafuli paper mill and other pulp, plywood and match industries were established that started extensively using bamboo and soft wood trees. In the early 1960s, Kaptai hydroelectric project was constructed that submerged 40% of the best arable valley land and displaced 100,000 people. Many of them were never compensated and remained landless. Some went to reserve forests and started swidden cultivation, risking "trumped-up criminal cases and harassment for 'theft' of forest produce" in lands which used to be theirs by century old customary rights [84] (p. 11).

Further pressure on the environment came since new laws were passed in the 1970s allowing non-resident Bengalis to acquire land rights within the Hill Tracts for homesteads, commercial plantations and industrial plants which was hitherto nearly impossible. [88] (p. 65). Massive transmigration of the Bengalis into the Hill Tracts took place in the pretext that the plains of Bangladesh are densely populated whereas there are vast tracts of the Hill Tracts lying empty. This notion of emptiness is contested as only 6% of land is cultivable in the Hill Tracts due to the steep slopes and forest cover [89]. The transmigration policy thus not only increased the pressure on land and further aggravated land alienation but also had far reaching consequences in the relations between the Bengalis and the Hill peoples. Disinherited from their traditional land rights, the Hill peoples started a movement for explicit constitutional recognition and protection of their rights that led to an armed struggle for autonomy. The government responded by undertaking a full-scale militarization of the Hill Tracts, accompanied by massacres of the Hill peoples, rape, abduction, torture and eviction from homes. Forests were cleared in the name of counter-insurgency, *i.e.*, for the purpose of easy patrolling of the military, compounding the degradation of an already fragile environment [84] (p. 9). After more than two decades, the Parbattyo Chattagram Jana Sanghati Samiti, the largest party of the Hill peoples, and the government signed the Peace Accord in 1997. The Peace Accord, however, changed little in the dispossession and displacement of the Hill people that continued in the post-Accord period through in-migration of Bengalis and compulsory acquisition of lands by the government and its various agencies with continuing degradation of forest lands [90] (p. 29).

4.2. Trends in Forest Conditions in the Hill Tracts

A few studies are available that show changes and trends in the forest conditions of the Hill Tracts. ISRIC-World Soil Information, has carried out a study using remote sensing of bio-mass trend and rain-use efficiency indicators [80]. In this study, biomass or net primary production was used as an integrated measure of land productivity, and its deviation from the local norm was taken as an indicator of land degradation or improvement. Changes in biomass were measured by remote sensing of the normalised difference vegetation index (NDVI). The study assessed the biomass state and trends

over a period of nearly 23 years from 1981–2003 in the Hill Tracts. Trends in spatially integrated monthly NDVI for the Hill Tracts as a whole over 270 months indicated that the biomass showed an overall decrease; monthly rainfall for the entire Hill Tracts showed an overall decline; and the overall trends in annual rainfall and biomass were downwards. The study also found that the rain-use efficiency, the ratio of net primary production to precipitation, has decreased over 22% of the land area. The other indicator, net primary productivity, *i.e.*, the rate at which vegetation in an ecosystem fixes CO_2 minus the rate at which the vegetation returns CO_2 to the atmosphere through plant respiration, decreased over 62% of land area with an annual mean rate of 162 kg per hectare and increased over 38% of land area with an annual mean rate of 160 kg per hectare, showing an overall decrease for the Hill Tracts as a whole by an annual mean rate of 44 kg per hectare. In summary, the study concluded that although there were significant variations among the regions, overall trends show that green bio-mass and net primary productivity decreased over 62% of the land area; 20% of the land area suffered a decrease in both net primary productivity and rain-use efficiency, and total rainfall decreased over the period.

A study by CEGIS and BCAS investigated the underlying causes of the deterioration of flows of the natural springs in the Hill Tracts [91]. A variety of methods for data collection were used, namely, geological and climatic data, satellite imagery and community interviews. The report noted that degradation of forest quality and substantial loss in canopy coverage was likely to be the most significant cause behind the deteriorating water flows observed within the study. Dense forest is drastically reduced in the recent years, between 1989 and 2003, an estimated 170,000 hectares of dense forest (approximately 53%) was lost over the Hill Tracts area. The most severe condition was observed in Khagrachari district, *i.e.*, approximately a loss of 95%; the same for Rangamati and Bandarban was estimated at 40% and 35%, respectively. There has been a 23% increase in the fallow/agriculture/homestead land use, while the herb/shrubs/grass category decreased by 33%. The study noted that this type of change facilitated fast surface runoff thereby reducing the soil's water retention capacity and percolation into water table. It was also observed that there was an overall decreasing rainfall pattern, and increasing trend of evaporation and sunshine hours within the Hill Tracts. The report conducted community interviews to verify the satellite images. Degradation of natural forest (cutting of trees, bamboos and bushes) was found the most frequently mentioned cause of drying up of the springs accounting for about 42% of the responses. Other causes included, change in climatic condition, extraction of stone, changes in land use and improper physical intervention such as plantation of rubber trees, excessive swidden cultivation, hill cutting, building of roads/infrastructure, *etc.*

Another study by CEGIS prepared digital elevation maps and land cover maps for the whole of Hill Tracts by analysing ASTER (Advanced Spaceborne Thermal Emission and Emission and Reflection Radiometer) satellite images of 15m resolution [89]. The report compared its findings with a previous study that CEGIS carried out in 2003 using Landsat data [92]. The comparison showed that during 2003–2010 dense forest was reduced by 61% and medium dense forest by 58%. In the same period, land under low dense forest increased by 46% and herb-shrub/grass increased by more than 500%, respectively. Fallow/agriculture was increased by 52%. This report thus confirmed earlier studies that quality forests and indigenous tree canopy is disappearing fast in the Hill Tracts.

4.3. Processes of Domination and Alienation in the Hill Tracts

The history of dominance and alienation, as noted above, started with consolidation of colonial rule and vesting of all hill land to the state, ushering a major landmark in denying the customary rights of the Hill peoples. The bureaucratic favour rendered to the Bengalis in the colonial administration and in granting them commercial rights to the Hill Tracts initiated a process of ethnicity based domination and alienation. Since then successive governments have attempted to increase the size of government controlled forests that were opened up for use of those with greater social and political powers to influence the bureaucracy and the law enforcing agencies. These powerful individuals and groups mostly came from the plain land Bengalis, while the Hill peoples faced disparities in economic, social and political power that was compounded by their ethnic and cultural status. Below we highlight the main mechanisms that played important roles in environmentally degrading the Hill Tracts over the years.

4.3.1. Policies of Dispossession, Insecurity and Mistrust

Apart from being disinherited from the forests in the pretext of forest conservation, the Hill peoples have been subjected to a "development project" that submerged most of their best agricultural land; and have faced dispossession by the government-sponsored settlers who are allotted their customarily-held lands for rubber and other commercial plantations [84]. The continuous process of land acquisition by the state and state-sponsored Bengali interest groups and the corresponding land alienation among the Hill peoples have created a situation where the latter have become squatters on their own land with hardly any rights on their uses. This situation has resulted in environmental degradation in a number of ways. First, the Hill peoples have only "uncertain" usufruct rights to the land they use. The inherent uncertainty works against any initiatives that are required for improving land and forests. Unsurprisingly, a study notes that among the forest communities the tendency to grow trees or re-vegetate is low [88]. Furthermore, the fact that the Hill peoples live in constant fear of eviction and prosecution is likely to prevent them from taking any long-term measures for improvement of soil and forest conditions. Second, evidence suggests that mechanisms of violence and intimidation including clear felling and burning of existing orchard and timber plantation on Hill peoples' lands that are indiscriminately leased by the government to the Bengalis or illegally grabbed by them can only result in sharpening insecurity and strong disincentive to further investment in land and forest.

Additionally, certain government policies have a discouraging effect on a wide scale adoption of agroforestry and plantation in the Hill Tracts. For example, the Forest Transit Rules 1973 require the farmers to get written permission from the forest department officials for cutting farm-trees and for transporting timber to the market centres. The bureaucratic meandering and bribe-seeking attitude of officials make it difficult for small farmers to get permission [93,94], thereby compelling them to sell timber in the black market at a very low price. This cumbersome and corrupt permit process has been one of the biggest problems for private tree plantations whereby about 50 per cent of the harvest sales value may be spent in obtaining permission to bring this same harvest to market [88] (p. 55). As a result, marketing of fruits and timber came to be controlled by a small number of Bengali traders from outside the Hill Tracts who are able to lubricate the bureaucratic machinery by virtue of their economic

and political power. These policies exacerbate existing poverty and act against any innovation in sustainable forestry development.

4.3.2. Land Grabs and Forest Destruction

Over the years, a number of different agencies have been involved in land grabbing in the Hill Tracts that invented a whole range of mechanisms including the use of violent force and fraud. These agencies include the forest department, civil administration, security forces, business corporations, commercial NGOs, plantation leaseholders, political leaders, land dealers, settlers, *etc.* Adnan and Dastidar [90] provide examples that show land grabbing by agencies in total disregard of their impact on the forest sustainability. One of the main agencies to acquire land is the forest department in the name of afforestation projects that typically involve monoculture plantations. Land is acquired from forest commons where most of the Hill peoples are settled often in violation of existing rules and procedure. Adnan and Dastidar refer to a number of cases of forcible acquisition by the forest department for establishing reserve forests. In one case, the forest department, even before the formal land acquisition process was completed, sent in its personnel and contractors who "proceeded to cut down trees raised in the private lands" of the Hill peoples [90] (p. 52). Another important agent in land grabbing has been the plantation lease holders. In an incident in Bandarban Hill district, land was leased out to outsiders for plantations where 228 Mro households were living and had established fruit and timber plants. In order to grab this land, the leaseholders brought in hundreds of workers from outside and cut down the fruit and timber plantations that had been raised by the Hill peoples, intending to replace these with new horticulture and rubber plantations [90] (p. 84). In another case, in Doluchhari area of Bandarban district, nearly 100 acres of hill lands were seized by powerful interest groups during 2009 that brought in hired workers backed by armed gangs and burnt down the existing forests and vegetation using kerosene to whip up the flames. After destroying the fruit and timber plantations of the Hill peoples, the grabbers proceeded to make the ground suitable for new rubber and other commercial plantations [90] (p. 89). Typical mechanisms to grab land in the name of afforestation and plantations seem to be the use of force and violence, and deploying large armed gangs to clear the grabbed lands by cutting pre-existing trees for new plantation. The commercial interest groups were able to use their social and political connections to influence the police, administration and political leaders. The Hill peoples could not match this strength, wealth and connections to cope with these multifarious mechanisms. The ethnic bias against the Hill peoples among the Bengali-dominated civil and military administration further compounded the powerlessness of the Hill peoples who as their last resort often turned to legal complaints and petitions to higher authorities that often resulted in long-delays, inactions and frustrations. The process of land grabbing has had profound impact on land and forest degradation in the Hill Tracts since establishing control was basically achieved through felling of trees or burning the vegetation.

4.3.3. Land Speculation and Profiteering

The growing bureaucratic and military hegemony and commercial interests also led to the growth of a class of professional land grabbers and dealers who were involved in selling possession of the occupied lands to wealthy individuals and companies interested in acquiring land in the Hill Tracts for

commercial purposes. Adnan and Dastidar [90] observe that interestingly, they could "sell" land without having any form of formal titles to the land, leaving formalization of rights to be done by the buyers. They also report cases where formal leaseholders kept their lands fallow for speculation purposes without raising plantations or making any other kind of development only to sell it later at higher prices to private companies or commercial interests [90] (pp. 90–91). These influential land grabbers and dealers were typically affiliated to major political parties and used their connections to prevent the local police and administration from taking any action against their often unlawful activities [90] (p. 108). Although data is scarce on the extent of such land speculation for profit, it is apparent that these uses were not conducive to the growth of forestry.

5. Discussion

This paper contributes to the sustainability literature by focusing on the importance of group or categorical inequalities for environmental outcomes. As we show above, ethnic identity can be used as a basis upon which access to valuable resources is granted or denied. Ethnic identities and values are sometimes endorsed by the state power and organisations, sometimes contested. State organisations often yield substantial political power and their support or lack of it can be important in creating and exploiting inequalities among groups. In both our cases, the colonial and successive democratic states played a crucial role in alienating particular ethnic groups from their traditional rights over the forestry lands, while granting access of the same to other groups. As we have shown, ethnicity based politics and resultant tension and violence contributed to exploitation of forestry resources to such extents that were clearly detrimental to sustainability.

Disinheritance of indigenous peoples from their lands in many Asian and African countries began with imposition of a new environmental narrative that has been variously termed as fortress conservation, environmental colonialism or conservation with "techno-bureaucratic codes" [95–97]. This conservation narrative assumes that communal management is detrimental to sustainability, harmful for physical environment, and leads to over-exploitation and destruction of wildlife. It valorises scientific management and control through a bureaucratic structure, and relies on "professional" expertise that has often resulted in homogenisation of forests into stands of trees as opposed to diverse ecosystems [97] (pp. 37–38). This was a big shift from erstwhile common property values and norms manifested in local informal regulation for use, access and extractions that sustained the environment in historical contexts. The conservation approach rested on state appropriation of land and forests, eviction of indigenous people and criminalisation of their traditional rights. Simultaneously, it entrusted "others" with its management and opened the reserves for private gains, commercial exploitation and counterproductive development interventions. The "others" often came from outside the area and as in the cases of both the Hill Tracts and Mt Elgon they belonged to ethnic groups different from the indigenous population, with more political clout and influence. In the Hill Tracts the government vested the management of acquired lands and forests to the Bengalis who also got licenses for commercial logging. On the one hand, more and more land was acquired for conservation, and on the other hand, Bengalis from the plain land were settled on areas that were cleared by felling trees and plantations raised by the Hill peoples. A similar trend is evident in Mt Elgon. Lands and forests were brought under conservation leading to evictions of the Sabaot and

Ogiek from their ancestral lands which became controlled by officials, and the "outsiders" were given commercial rights to logging that has been a major cause of destruction of the forests. These processes created mistrust and conflict among the groups, and land and forest use became contested. The "outsiders" naturally had little long term interest in the conservation of the forests, as they held only temporary permit to extract resources, and thus they often were motivated to maximise their extraction, and were least concerned with the long term impact of forest degradation. These long term impacts are borne by the indigenous people whose livelihoods depended on the forests thus degraded [2].

For smaller ethnic groups, alienation from their lands and eviction also led to their political alienation. In Kenya, few indigenous people hold positions in the government. The Ogiek and the Sabaot never held political power and their exclusion from it on an ethnic basis has been a source of much tension and violence. Most minority groups in Kenya, due to their smaller numbers, cannot succeed in having a member of their own group win an elective office in Kenya's majoritarian system of democracy. This difficulty is further compounded by allegedly "deliberate" attempts by the state to divide minorities between different administrative or electoral units, rendering them numerically inferior in whichever unit they are present. The Ogiek, for example, are spread over five constituencies, that has drastically reduced their chances of winning in an electoral contest in any of these areas [98]. In the Hill Tracts, there has been drastic erosion of political power of the Hill peoples in recent years. This combined with the programme of transmigration of Bengali settlers into the hill areas have led to a reversal of the indigenous–settler proportions in the electorate. Thus, the Hill peoples have become minorities in their own constituencies. Their numerically small population works to their disadvantage as it restricts their bargaining power. Continued in-migration of Bengali settlers and grabbing of the Hill peoples' land have resulted in serious deterioration of their social and political status vis-à-vis the Bengali interest groups. In both Kenya and Bangladesh cases, marginalisation in the country wide political structure and power relations has undermined the capacity of the ethnic minority groups to benefit from democracy, to protect their rights, or to save their forests from ruthless exploitation by the powerful groups.

Our findings have resonance with the theoretical argument discussed in the Introduction section that inequalities of power may be instrumental in environmental degradation as proposed by Boyce[1–3]. It also shows that institutions and political power are also important explanatory factors as emphasised by Scruggs [4]. While distributional aspects, in terms of income and wealth, are beyond our scope, we have provided evidence that distribution of incentives, in terms of benefits from resource conservation, as proposed by Baland and Platteau [22] may speed up the process of environmental degradation when it favours the dominant groups. Finally, our analysis complements the study by Andersson and Agrawal [25] that group inequalities have negative effects on resource sustainability.

Our findings show that ethnicity matters, not intrinsically, but instrumentally when ethnic markers are used as a means of restricting political power or economic benefits to a subgroup of the population [99]. This widens existing inequalities among groups and creates new inequalities. Inequality in political power leads to social, economic and cultural relegation of the minority groups, and, as we saw above, it impacts on the use of lands and forest resources that traditionally belonged to the disinherited groups. In a situation of intense group inequalities, democratic institutions tend to be influenced by ethnicity based politics, lending favour to more powerful groups in their pursuit of resource grab and exploitation. It is clear that attaining environmental sustainability requires greater

understanding of the complex web of power and legitimacy among rival ethnic groups within political processes and democratic institutions.

6. Conclusions

The paper explores interactions of social and environmental dimensions of sustainability and the role of mediating institutions in situations of acute socio-economic inequalities. Insights from the case studies show the importance of ethnic inequalities in defining sustainability outcomes. In particular, it highlights the dynamics of ethnic inequalities, and their implications for uses of forest commons in the contexts of domination of one or more ethnic groups over others that are facilitated by connivance of "democratic" institutions. As we have shown above, in situations of acute inequality, powerful groups are able to use their socio-economic positions to influence political processes as well as bureaucratic apparatus to benefit from exploiting natural resources even to the extent that generate substantial environmental harm. Although this paper is based on two case studies, ethnicity based tensions and resource conflicts are wide spread in many parts of the world, and the problem, unfortunately, has a global significance [100].

A couple of general conclusions can be made from the analysis. First, the nature of democratic institutions and their efficacy in achieving positive environmental outcomes depend on the contexts of power relations among individuals and groups. Majoritarian democracy as practiced in many African and Asian countries has often failed the minority ethnic groups in their quest for equal citizenship. Multiparty democracy has no doubt created opportunities for mobilization on ethnic lines, but within the wider political scenario, the minority groups with smaller numerical strength and socio-political resources, cannot compete with more powerful groups. Though procedural and constitutional models of democracy presupposes an equality in terms of the autonomous agency of individuals, there is indeed a concern that substantive principles of equality associated with distributive justice and fairness can in particular circumstances be in tension with democracy [101]. Further research in this area should critically explore the inherent conflicts, contestations and antagonisms [102] in the contexts of "divided" societies [103,104] for a more rigorous understanding of potentials of democratic institutions to address questions of equality and sustainability.

Second, social and environmental dimensions of sustainability cannot be treated separately and the issue of equity among groups, ethnic or otherwise, needs to be recognised in policies for sustainable development. The implications of ethnic identity are far greater in its environmental impact than it has been assumed so far, particularly in areas with stark inequalities, tensions and conflicts where democratic institutions are fragile and vulnerable to manipulations. Thinking in terms of collective action potentials, there is a clear need for further conceptual advances with regards to the key building blocks for sustainable outcomes that were identified by Ostrom [105] as reciprocity, reputation and trust. The discussion above has demonstrated that in multi-ethnic societies designing policies and institutions for sustainable development demand much deeper engagement with political processes and power relations among social groups.

There is a need for further research on integrated methodology for sustainability studies. Going beyond finding simple statistical associations, deeper probe is required to unpack causal links to driving factors and processes to specific outcomes. Integration of locally specific qualitative

socio-political information on political regimes and policy changes with remote sensed datasets on changes in land and biophysical features would help generate more reliable pictures of distribution of benefits emanating from various policies on people and landscapes. This can aid policy monitoring by taking into account early trends of any undesirable impact on livelihoods and environment.

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Author Contributions

All authors contributed to designing, performing and analyzing the research. The corresponding author wrote the paper with contributions from the co-authors. All authors read and approved the final manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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