Drivers of deforestation and forest degradation in Bangladesh:

Draft Report

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Drivers of deforestation and forest degradation in Bangladesh: *Final Report*

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1 Executive Summary

1. This report is a comprehensive assessment of the indirect and direct drivers of deforestation and forest degradation in Bangladesh as an early preparedness step for a REDD+ programme. Bangladesh is a low forest cover country that has suffered a massive forest loss over a period of several hundred years such that, what was once a largely forested country, now has only about 10% of the forest remaining. Recent studies have shown a decline of in forests exceeding 9000 km^2 since the 1930s alone, with an annualised deforestation rate in excess of 1%. The remaining forests are primarily composed of four broad types in distinct and disconnected areas: Sundarbans mangroves, sal forests north of Dhaka, hill forests in the southeast, and coastal forests. Most of these remaining forests are degraded, as a result of heavy use for industry, fuelwood harvesting, and subsistence living, including shifting cultivation in the hill forests, and shrimp farming is coastal mangroves.

2. The study was conducted through a literature review, a preliminary GIS study, and a series of nine workshops in Forest Department Districts. At these workshops, data were collected based on a questionnaire administered to all people who attended, a series of interviews with key people knowledgeable about forests, and through focal group discussions with local forest user groups in each area. The questionnaire and open discussions allowed people to express individual and group opinions on the main drivers of forest change and also asked for solutions. Data were compiled and analysed, and the drivers were then ranked for importance based on their relative importance from the literature, opinions of people from the workshops, an expert assessment by the study team, and their individual weighted importance with respect to increasing (or decreasing) carbon and biodiversity in the forests, and mitigation potential under REDD. The results, which

represent a combination of published information, public and expert opinion, and initial GIS mapping, are presented by forest type and nationally for the country.

3. The literature-based assessment reviewed 35 published studies on the drivers of forest change in Bangladesh, most that were specific to one the four forest types and seven that considered all forests together as national studies. Most authors distinguished between indirect and direct drivers, as well as between the drivers of degradation and those for deforestation. The indirect drivers were generally the same for deforestation and degradation and included poverty, over-population, and a group of drivers related to ineffective governance including lack of land-use planning, corruption, insufficient capacity to manage and enforce, and unclear land tenure. These led to some direct drivers of deforestation common to all forests including over-harvesting (excessive and illegal), agriculture (including shifting cultivation) and encroachment (industrial, military, and settlement). For forest degradation, the nationally common direct drivers were: fuelwood harvesting, and excessive and illegal logging. Driver pathways diagrams were developed for each forest type (see Figure 18).

4. While there were many drivers discussed among the 35 studies reviewed, some drivers had only minor effects wihile others, in addition to the key drivers described in 3. above, were key drivers drivers were specific to forest types, included the following (see Tables 2 and 3):

Factor	**Indirect driver**	**Leading to direct driver**
Coastal forest mangroves - deforestation:		
Economic	Global demand for seafood	Shrimp farming (e.g., Chakaria Sundarbans), Forests cleared for agriculture, coastal erosion
Sundarbans mangroves - degradation:		
Governance	Poor interdepartmental cooperation	Increasing salinity and reduced water flow, Tree diseases, coastal erosion
Sal forest – deforestation:		
Governance	Poor interdepartmental cooperation, policy failure	Loss of forest to military and other govt. agencies, land tenure disputes, litigations

Economic	Demand for food, living space and industrial other products	Forests cleared for crops, settlement and industries
Sal forest – degradation:		
Governance	Demand for wood products	Plantations
Hill forests – deforestation:		
Economic	Demand for electricity, demand for wood products and food	Flooding from dams, authorized/unauthorized flooding, shifting cultivation

5. The many published studies pointed out repeatedly that poor governance has been, and remains, a key driver of forest change. Governance issues are related to insufficient priorty assigned within government to protecting and managing the ecosystem services that the country receives from forests. This issue is manifested in many ways within government as: insufficient staff in the Forest Department (FD), inadequate funding to the FD, low overall capacity of FD staff, a certain level of corruption that is reportedly widespread (in the FD, the judiciary, and political interference), lack of ability or capacity to assign land tenure, insufficient land use planning, inability to apply the existing good policies or to practice proper sustainable forest management (despite planning), and a lack of inter-departmental consultation on resources development that have all resulted in deforestation and forest degradation through the multiple direct dirvers.

6. The GIS based analysis of change of Normalized Difference Vegetation Index (NDVI) and two band Enhanced Vegetation Index (EVI2) showed that vegetated area has decreased over last 4 decades, especially in the Sal forest area. The Sundarbans do not show deforestation but there has been some negative change in vegetation structure indicating degradation. Analysis of recent changes of net primary productivity also show positive change over last 15 years in the Sundarbans, but percent tree cover has gone down. This confirms that older and taller trees have decreased in abundance in this area. A decrease in net primary productivity was noted in central sal and hill forest areas. The Sal forest area did not show much decrease in percent tree cover, therefore suggesting degradation has occurred there. The hill forest area had a negative percent tree cover change, indicating both forest degradation and deforestation.The proximity analysis of roads, waterways and townships to forested areas showed that areas with better tree cover area are mostly well away from

roads and townships, except for the Sal forest area. High population density is also correlated with lower vegetation cover in forests, that indicated widespread degradation.

7. The results from the nine workshops were compiled to provide a ranked list of indirect and direct drivers. The main indirect drivers were common among forest types and also common to deforestation and forest degradation. These common indirect drivers were: poverty (and unemployment), overpopulation, and a suite of governance issues, some of which varied among forest types. The main governance drivers included: unclear land tenure, lack of landuse planning (zonation), inadequate application of policy, laws, and management, inadequate enforcement, insufficient Forest Department staff, poor interdepartmental coordination, and corruption (political interference and payments). Lack of education of forest users and local communities about forest management and ecosystem services was indicated as anindirect driver in Coastal forests, Sundarbans forests, and Sal forests. For the mangrove forests the global demand for seafood, resulting in forest clearing for shrimp farming, was also a driver set. Rarely, however, was there a one to one relationship between an indirect driver and a direct driver of forest change. Instead, multiple drivers combined to be responsible for deforestation and forest degradation.
8. The most important common direct drivers of deforestation are fuelwood harvesting, illegal and excessive wood harvesting, agricultural expansion (including shifting cultivation), industrial and settlement encroachment, and shrimp farming in mangroves. For forest degradation, again fuelwood and illegal wood harvesting were most important, along with plantations replacing natural forests, encroachment, and infrastrucure developments (roads, corridors, etc.). In Hill forests, cattle grazing was a direct driver of degradation; in the Sundarbans increased salinity owing to reduced waterflows is the first ranked driver of degradation for the mangroves as well aspollution from industry, agriculture, and shrimp farms werekey degradation drivers that also applied in Coastal forests. Natural disasters are also driving degradation of mangrove forests.

9. In summary, at the national level for Bangladesh, the key direct drivers of forest degradation are fuelwood and illegal and excessive harvesting, followed in rank importance by plantation forestry, and encroachment, with pollution and natural disasters Sundarbans and the Coastal forests. The main direct driversof deforestation areillegal and excessive

harvesting, infrastructure development, fuelwood harvesting,agricultural land clearance, and anthropogenic fires, across Bangladesh.

10. People living in or near forests (vs. those in urban areas) and those with more education had different perceptions of forest drivers than those living in towns or cities, or those with lesser education. Forest-dwellers were unwilling to admit that the negative effects of illegal logging are affecting the quality of forests, while at the same time thinking that fires and infrastructure are damaging influences. There was also a generational difference in opinion about the decline in forest quality. These differences suggest that a REDD program must be aware of how different constituencies will respond to a program or project during the consultation and development periods.

11. As was noted in the literature review, this field study also found a large number of governance issues were responsible for forest change. These are related to the inadequate capacity of the Forest Department to adequately fulfil its mandate and the low government priority assigned to forest ecosystem services. These issues represent some of the key challenges for a REDD program in Bangladesh.

12. Indirect drivers of forest change are generally related to national and global demands for forest products including wood for fuel, buildings, and furniture, non-timber forest products for crafts and foods, and to national and international demands for agricultural products and seafood (i.e., shrimp) for national consumption or export. While high population levels in Bangladesh are beyond the capacity of any REDD program, requiring instead a more directed and fundamental social program approach, other drivers, both indirect and direct, can be addressed to a large extent. An effective REDD programme strategy will be to deal with indirect drivers as well as some of the direct drivers that result from them, at the same time. Dealing only with direct drivers will not produce a long-term solution to forest cover loss because the problems that underpin those drivers still remain. The indirect drivers that can be mitigated include: poverty/unemployment, education of people about forests and their management, and many if not all of the governance issues. For governance of REDD programs to be successful, such programs and their governance must be accountable, transparent, inclusive, gender-responsive, motivational, and coordinated across sectors,

including coordination of private market and UN-REDD/government-driven initiatives. In the absence of transparency, REDD programs may fail as a result of widespread corruption.

13. Workshop participants of both sexes suggested a large number of ideas for dealing with drivers of forest change and for forest management issues more generally, in Bangladesh. Further, it is important for a REDD strategy to pay close attention to the new Forest Policy (2016) and the revised Forest Master Plan (2016) as it moves forward, to ensure consistency with government direction.

14. In the future, an increasing trend towards an urban population may result in reduced impacts to forests. This trend to urbanisation can further ameliorate impacts on forests through the use of fuels other than wood for cooking. For example, the production of natural gas from the Sylhet region and the potential reserves in the Bay of Bengal, may substantially reduce the use of wood fuels in the relative near future. Also on the positive side, an increasingly educated Bangladeshi public will require and demand better protection of forest ecosystem services, in part for recreation away from urban centres. On the other hand, an increasingly global trade market and the desire for foreign capital will continue to provide pressure on the Bangladesh coastal areas to convert mangroves to shrimp farms and to provide wood furniture to a growing middle class. Climate change may result in more chaotic weather, especially for the intensity of cyclones, as well a sea-level rise threatening key forest areas.

15. Recommendations from this study include: 1.) an effective strategy for a REDD+ programme will be to deal with the main indirect drivers and the direct drivers that flow from them simultaneously. 2.) The key underlying drivers to be addressed by a future REDD+ programme include: improved education (awareness), poverty, and the multiple drivers that comprise governance. 3.) The main underlying drivers to address are: fuelwood collection, illegal and excessive logging, agricultural conversion, encroachment, and infrastructure development. It will be important, however, to determine relative contributions of each driver first. 4.) Develop a forestry extension services program in association with the Forest Department to deal with the educational awareness driver. 5.) Reducing poverty of forest-dependent people through alternative livelihood support accomplishes the dual objectives

of local poverty alleviation and increasing carbon in the forest. However, any alternative livelihoods program needs to be realistic, relevant to local people, and approached with a well-articulated business plan, including a market survey. 6.) Avoiding corruption under a REDD program will requires checks in the system, transparency, and accountability at all levels. 7.) A REDD programme can only proceed where there is clear land tenure for the forest or area under consideration.

16. The way forward: results from this study show a combined scientific and social expression of the most important drivers, weighted by their potential for effects on carbon, biodiversity, and capacity to be mitigated. These ranks should be viewed as a set of hypotheses about the relative importance of these drivers to forest change in Bangladesh. Testing these hypotheses requires an assessment of the relative importance of drivers, in terms of how much forest loss or change (% of total) can be attributed to each. This study will enable an improved priority ranking of drivers for development of a strategic plan, with policies and measures, to mitigate forest change. Second, as assessment is needed on where REDD can be done in Bangladesh, with a view to the best potential for success and the greatest effectiveness for carbon additionality. Third, the REDD programme will have to work with appropriate agencies and individuals to develop a suite of plans and documents, including an MRV strategy and plan based on a national forest monitoring strategy and program, a system of safeguards and a safeguards information system (SIS), a forest carbon reference level report, an assessment of protected areas relative to REDD, and an forest emissions level report. All of these strategies, plans, and reports are essential towards finalising a national REDD strategy (NRS).

1. Introduction and purpose of the report

Under the United Nations Framework Convention on Climate Change (UNFCCC), there has been recognition that greenhouse gases of anthropogenic origin are responsible for global warming. About 15-20% of these gases come from forest loss and degradation, with the largest contribution from tropical forests (IPCC 2007).In response, a a climate change mitigation approach designed to incentivize developing countries to reduce carbon emissions from deforestation and forest degradation was developed. Known as REDD+, this approach is defined as "reducing emissions from deforestation and forest degradation" in developing countries, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks. .To help support such efforts, the UN-REDD Programme, a United Nations collaborative Initiative, was launched in 2008. It builds on the convening role and technical expertise of the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Programme (UNDP), and the United Nations Environment Programme (UNEP). It supports nationally led REDD+ processes and promote the informed and meaningful involvement of all stakeholders, including indigenous peoples and other forest-dependent communities, in national and international REDD+ implementation.

As a tropical country that could support an increased forest area, Bangladesh has strong potential for reforestation and forest restoration under REDD+ activities because of the available formerly forested lands, as well as other presently degraded forests that could be managed sustainably. As a result, there is a strong possibility under REDD+ for additionality of carbon in the country. Bangladesh is embarking on its REDD-readiness preparations and a key initial step is an assessment of the drivers of deforestation and forest degradation. This is a necessity in order to plan future effective REDD+ strategies for the country.

Forest area of Bangladesh has been declining since the 1870s (see section 1.3.3) and the current forest land is less than 16%, or 2.33 million ha (Government of Bangladesh (GoB) 2014). However, the 'official forest area' and what is actually covered by forest is very different. Potapov, et al. (2017) estimated the total national tree canopy cover area as 3,165,500 ± 186,600 ha in the year 2000, with trees outside forests making up 54% of total canopy cover. Total tree canopy cover increased by 135,700 (± 116,600) ha (4.3%) during

the 2000–2014 time interval. Bangladesh exhibits a national tree cover dynamic where net change is rather small, but gross dynamics significant and variable by forest type. Despite the overall gain in tree cover, results revealed the ongoing clearing of natural forests, especially within the Chittagong hill tracts. While forests decreased their tree cover area by 83,600 ha, the trees outside forests (including tree plantations, village woodlots, and agroforestry) increased their canopy area by 219,300 ha (*ibid*). FAO (2008) and others (e.g., Reddy et al. 2016) indicate that only between 1.41 and 1.44 million ha are actually forested (<10%). Of this area, just 411,000 ha remain as primary forests and mangroves make up another 531,000 ha (GoB 2014). Various factors have led to a high rate of deforestation varying between 0.3 and 2%/yr over the past 30 years and has also resulted in a large area of degraded forests in the country (Iftekar 2006, Alam et al. 2008, Islam and Sato 2012, Reddy et al. 2016). For example, the sal (*Shorea robusta*) or plains forest type has declined by more than 70% since 1985, making it the most threatened forest ecosystem in the country (Alam et al. 2008). Reddy et al. (2016) reported a net loss of 9,054 km^2 of forest between 1935 and 2014, or about 39% of the forest area. As a result, a REDD+ programme that is implemented in an informed manner, has a strong opportunity for success in Bangladesh.

There is a clear distinction between deforestation, which is a land use (and land cover) change resulting in no (or very sparse) tree cover, and forest degradation, which is a gradual and sustained loss in forest ecosystem services as a result of poor and unsustainable forest management (Simula 2009, Sasaki and Putz 2009). In terms of carbon, the UNFCCC considers degradation as a "direct human induced long-term loss (persisting for X years or more) of at least Y% of forest carbon stocks (and forest values) since time (T) and not qualifying as deforestation". In other words, a long-lasting loss of carbon from the forest. Carbon is but one measure of degradation but is perhaps the easiest to measure directly or remotely (see section 3.0 on 'Forest cover and land use change'). Degradation represents a continuum of changes in a forest that often eventually culminates in deforestation over time, but that always reduces biodiversity and amount of carbon stored (Thompson et al. 2013). Degradation may take many forms and can be viewed in terms of types or perspectives, for example: the loss of species, reduced tree cover and lost forest productivity, a change in the ecosystem state from one species association to another, the conversion of natural forest to plantation, or excessive human-caused fires are all forms of

degradation and can all result in biodiversity and carbon loss from the ecosystem. The causes of these changes are invariably human interventions that are generally unplanned, or made with no consideration for maintaining the original ecosystem, including its biodiversity. In many cases, degradation is the result of illegal activities, such as illegal logging.

Governance and land tenure issues are important in the REDD+ context, as they cover all dimensions of how public officials and institutions deal with stakeholders and the rights of land-owners. UNDP and the Asian Development Bank (ADB) expanded the definition of governance to include the private sector, non-government organisations (NGOs), international partners, and all other actors that influence how resources are used and decisions are made. This definition is particularly important in forestry, where public policies (e.g., those dealing with forests, land management, climate change, private sector development, and rural development) are closely linked to private sector activities and partially to private ownership of the resource (Castern and Pillai 2011). Good forest governance is characterized by predictable, open and informed policy-making based on transparent processes and respect for land ownership and indigenous cultures, a bureaucracy imbued with a professional ethos, an executive arm of government accountable for its actions, and a strong civil society participating in decisions related to the sector (ITTO and FAO, 2009).

Understanding the causes of deforestation and degradation is an important early step in planning a REDD+ programme, and is the purpose of this study. REDD+ will require interventions to mitigate forest (and carbon) loss and reforestation in an attempt to increase carbon stored in forests. To accomplish this broad objective it is crucial to understand what is and has been causing deforestation and forest degradation, in order to implement actions that can mitigate effectively these losses and increase carbon stored. In the past few years, there have been several studies that have examined causes of forest loss and degradation in Bangladesh, for example: Rasul et al. 2004, Iftekar 2006, Ahmed et al. 2008, Alam et al. 2008, Islam and Sato 2012, Hossain et al. 2013, Miah et al. 2014, and several others. This study will take advantage of this past research but also conduct an extensive review process across the country to assess and identify the main drivers of forest change.

This study on drivers of forest loss distinguishes between indirect (ultimate) drivers and direct (proximate) drivers. Indirect or underlying drivers are complex interactions of social, economic, political, cultural, demographic, and technological processes that result in the direct drivers causing deforestation or forest degradation. Indirect drivers act at multiple scales: international (markets, commodity prices), national (population growth, domestic markets, policies, governance), and local (poverty, livelihoods). Direct drivers of deforestation and forest degradation are the human activities and actions that directly affect forest cover and result in loss of carbon stocks. Global population growth and the consequent demand for increased forest and agricultural commodities are resulting in major land-use changes for the entire planet. For example, FAO (2009) predicts a 70% increase in the demand for food by 2050. Agriculture is estimated to be the main direct driver for approximately 80% of global deforestation and timber harvesting (often illegal) is a major driver of degradation, along with fuelwood collection, grazing by animals, and charcoal production (Kissinger et al. 2012). Pathways from indirect drivers to direct drivers are often unclear and usually differ between degradation and deforestation. Therefore, the aim of this study was to assess the indirect and direct drivers of both deforestation and degradation, specifically for Bangladesh. Further, because these often vary both by forest type and sub-nationally, the study design was extensive, covering the key forest areas and types across Bangladesh, during October to December 2016. Drivers have undoubtedly changed over time, for example owing to past military conflicts, however, to implement a REDD+ program, we cannot change the past and later historical drivers, we need to focus on current issues and perhaps future possibilities.

1.1 UNFCCC and the international REDD+ Program context

Reducing emissions from deforestation and forest degradation (REDD+) is a mechanism developed by the Parties to the UNFCCC. It creates a financial value for the carbon stored in forests by offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon pathways to sustainable development. Developing countries would receive results-based payments for results-based actions. REDD+ goes beyond simply deforestation and forest degradation, and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.

The overall development goal of the UN-REDD Programme is to reduce forest emissions and enhance carbon stocks in forests, while contributing to national sustainable development, as guided by its strategic framework.

Under this strategic framework, there are three expected outcomes from a REDD+ programme:

1. Contributions of REDD+ to the mitigation of climate change as well as to the provision of additional benefits have been designed.
2. Country contributions to the mitigation of climate change though REDD+ are measured, reported and verified, and the necessary institutional arrangements are in place.
3. REDD+ contributions to the mitigation of climate change are implemented and safeguarded with policies and measures that constitute results-based actions, including the development of appropriate and effective institutional arrangements.

To accomplish these objectives, there are four cross-cutting themes including governance, land tenure, gender equality, and stakeholder engagement that must be considered in a national programme. *Governance* for REDD+ relates to governance enablers and/or challenges that influence how emission reduction from deforestation and forest degradation will take place. These issues often go beyond the forestry sector and cover policies linked to changes in land-use change. Governance for REDD+ will be vital in order to better understand and deal with different drivers of deforestation. Putting REDD+ strategies or programmes into practice is made easier where governing institutions are strong, *tenure rights* clearly defined and the protection of minority rights respected. The challenges faced in many developing countries with regard to land tenure and REDD+ often stem from the difficulty of reconciling customary rights and statutory law, combined with increasing pressure on forest resources as a result of many local demands for ecosystem services or forest conversion to other land uses. Some common issues that relate to REDD+ include: lack of legal provisions to recognize customary forest tenure, lack of transparency in transactions related to forestland, cumbersome forestland registration procedures that tend to exclude the poor, lack of enforcement of existing forest tenure claims, and lack of institutional capacity to address forest tenure issues. The Cancun Agreements request that developing country parties address land tenure issues (1/CP.16, paragraph 72) when developing and implementing their national REDD+ strategies. For consideration of equality and given various social, economic and cultural inequalities and legal impediments,

particularly within the forest sector, women (and often other marginalised groups, such as indigenous people, the poor, youth, and handicapped, etc.) within many societies continue to experience ongoing exclusion that limit their ability to fully participate in, contribute to, and benefit from REDD+. It is therefore crucial that deliberate and meaningful efforts are taken to ensure REDD+ action is inclusive, fair and gender responsive both in policy and in practice. Finally, in order to uphold basic human rights and increase the success of REDD+, it is imperative to enable *stakeholder* groups to participate in REDD+ decision-making at local and national levels. The UN-REDD Programme has a specific focus on indigenous peoples and other forest-dependent communities, while also encouraging broader multi-stakeholder processes.

REDD+ requires that countries develop a national framework and plan, guided by set of guidelines on how to prepare for implementation, called 'readiness'. REDD+ readiness relates to the efforts a country is undertaking, with the support of multilateral or bilateral support, to build its capacity to be ready for a REDD+ mechanism. An important component of readiness is understanding the drivers that are resulting in deforestation and forest degradation at a national and sub-national level. For REDD+ to succeed, these drivers must be addressed.

1.2 Bangladesh context

In August of 2010, Government of the People's Republic of Bangladesh became a partner country of the UN-REDD Programme. As part of its long term strategies to reduce GHG emissions, the Government of Bangladesh has taken steps to prepare for the implementation of REDD+ activities. It has developed the REDD+ Readiness Roadmap that was endorsed by the National REDD+ Steering Committee in December 2012. Subsequently, in June 2013, the UN-REDD Programme invited Bangladesh to submit a REDD+ Readiness Preparation Proposal (R-PP). The National Project Document was approved in May 2015. The National Program has the objective to support the Government of Bangladesh in initiating the implementation of its REDD+ Readiness Roadmap by establishing necessary REDD+ management processes, identifying strategic readiness options for completing its National REDD+ strategy, and developing the capacities required to begin implementation of REDD+. However, the REDD+ strategy appears separate from the 'Bangladesh Climate

Change Strategy and Action Plan' (2009), which does not consider forests. There is a need to re-visit the adaptation strategy because of the importance of forests to both climate change mitigation as well as adaptation. In this context, the need for adaptation to climate change in Bangladesh forests has been well-discussed in Chaturvedi (2016), who noted that changes in forests will occur in part owing to the highly fragmented and degraded state of most forests, and sea-level rise

The Forest Department (FD) of the Ministry of Environment and Forests (MoEF) is the lead Implementing Partner for the UN-REDD National Programme, led by a National Project Director and supported by the Program Management Unit. UNDP and the FAO are the two implementing partners at the country level. The duration of the NP is from May 2015 to April 2018, with the objective to support the Government of Bangladesh in the implementation of its REDD+ Readiness Roadmap. In this context, there are three expected outcomes:

1. Improved stakeholder awareness.
2. A national REDD+ strategy is formulated.
3. A national forest reference emissions level is established.

Under outcome 2, there is an expectation that the drivers of forest loss and change will be identified.

1.3 Biophysical context

The total area of Bangladesh is 147,570 km^2, with a predominantly deltaic geomorphology as a result of the long-term effects of three large rivers: Ganges, Meghna, and Brahmaputra. Bangladesh has the highest population density (>1084 persons per km^2) of any country in the world, with an estimated population in 2015 of more than 160 million. Population is predicted to be at least 200 million in 2050, with an increasing urban population (FAOSTAT 2016, Figure 1). Most of the population is rural, but increasingly urbanized (Figures 1 and 2), with migration to major centres including Dhaka, Chittagong, and Khulna. Almost half of the population lives below the poverty line (World Bank value) and most of these people are in rural areas, while ADB (2016) puts this number at 31.5% of the population living below the national poverty line. Although the current annual population growth rate has declined to about 1%, this growth is still a major concern

because of increasing pressures on natural resources and declining overall environmental conditions. Although the poverty rate has declined from about 87% in 1990 to 55% in 2014, according to the World Bank, about 77% of rural households are still poor. The very poor, defined by World Bank as those making under $US1.99/day, make up >40% of the population and inequality is continuing to grow.

The contribution of natural resources to livelihoods and the economy is enormous, based mostly on fisheries, agriculture, and forestry. More than 80% of the rural population is directly or indirectly dependent on free access natural resources for subsistence. For example, over 60 million people are dependent on aquatic resources on a daily basis for food and about 90% of rural people cook with fuelwood, which amounts to 80% of the wood used in the country. Nevertheless, a 2014 survey suggested that there has been a decline from 44% to 35% of people cooking with fuelwood, overall, between 1991 and 2011. This would mean a decline in fuelwood use to about 11 million m^3 by 2050 (FMP 2016). Fifty to 65% of the country's protein requirement is met from local fisheries. The fishery sector contributes about 5% of the GDP, earns 11% of total export revenue, and employs about 20% of the country's total work force, while agriculture and forestry together provide approximately two-thirds of the country's employment, contributing about 20% of GDP (Faisal and Parveen 2004, FAO 2010, Hossain et al. 2013). Employment levels in the forestry sector have been declining, following a ban on logging on public lands and the fuelwood supply is in decline owing to extensive over-harvesting (Choudry and Hossain 2011; Figure 3), but charcoal production is increasing (Figure 4). FAO (2014) reported that 4400 people were directly employed in the forestry sector in 2011, although the IUCN and BFD (2016) suggest that 1.5 million "full-time equivalents" are employed in the forest sector, with 40% women. Data compiled for the new 'Forestry Master Plan, 2017-2036' showed that 1.8 million are employed in the furniture industry and 5.83 million people (with 2.4 million full-time) are employed in homestead-based plantations, and that there may be more than 15,000 sawmills. These figures exclude employment generated by tourism in protected areas, such as the Sundarbans. The forestry sector accounts for about 3% of the country's gross domestic product (GDP) and at least 2% of the labor force. These figures do not reflect the actual contribution from the forest sector in terms of monetary value because it does not consider the fuelwood, wood products, thatching, medicinal herbs, and foods that are

taken, largely illegally, by the >19 million of people who are dependent on forests for their livelihoods (Rahman and Ahmed 2016, IUCN and BFD 2016).

Figure 1: Past current and predicted population of Bangladesh (FAOSTAT 2016).

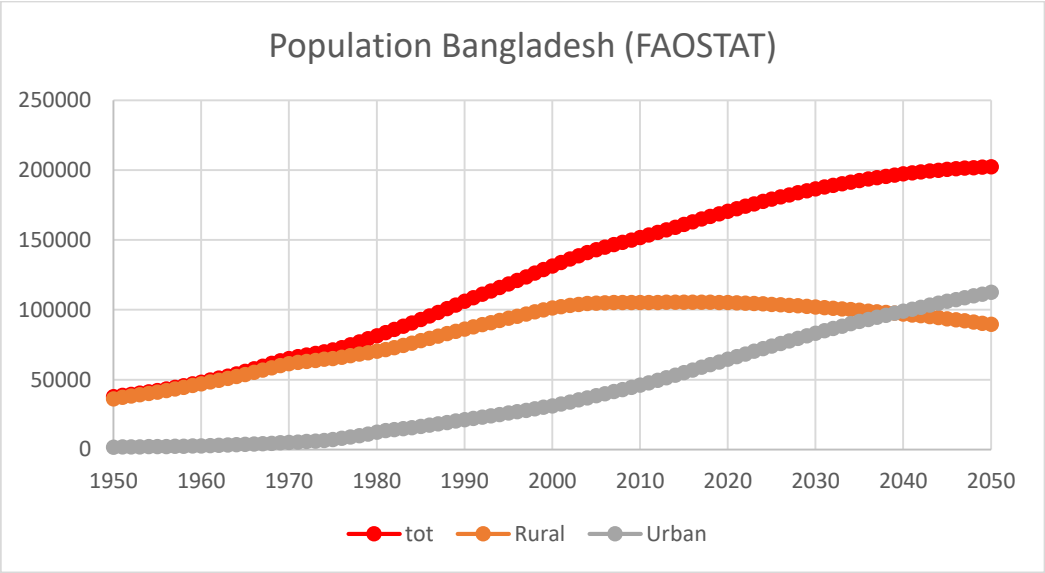


Figure 2: Population distribution in Bangladesh.

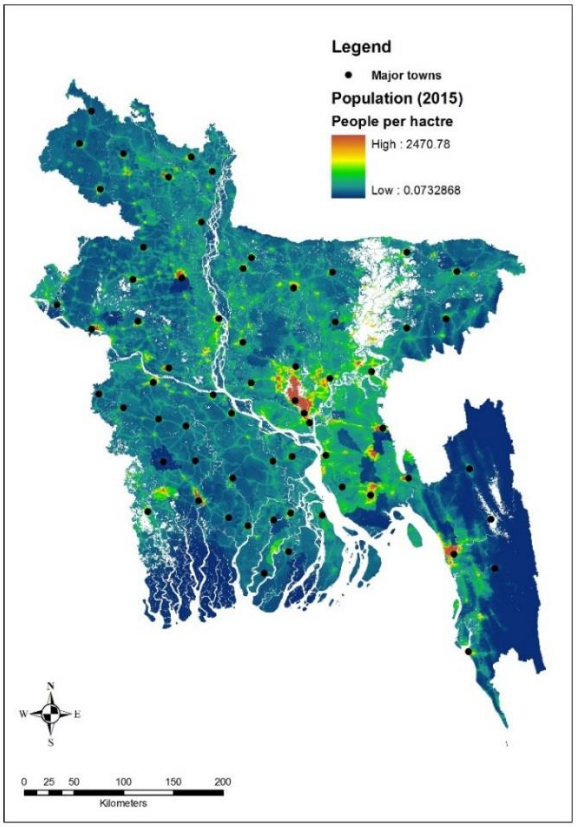


Figure 3 : Fuelwood harvest in Bangladesh (FAOSTAT 2016)

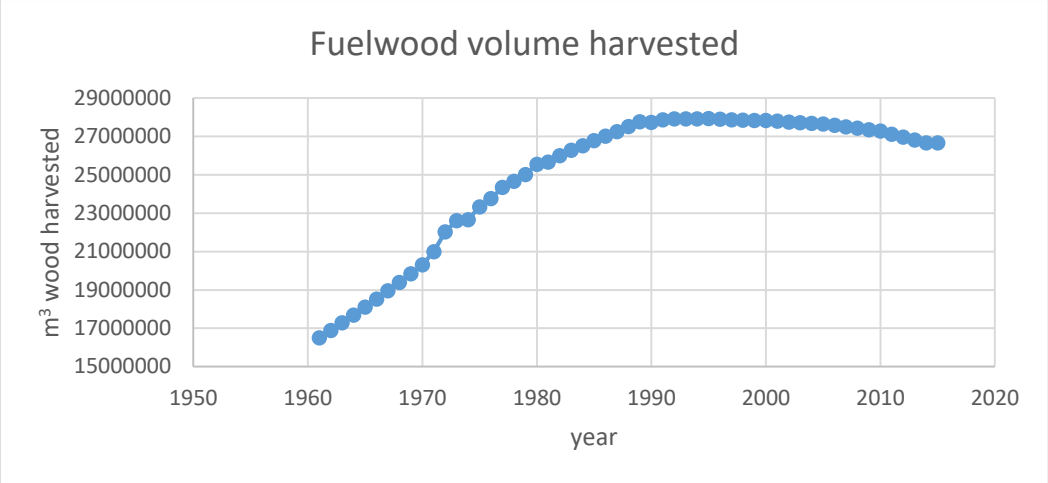
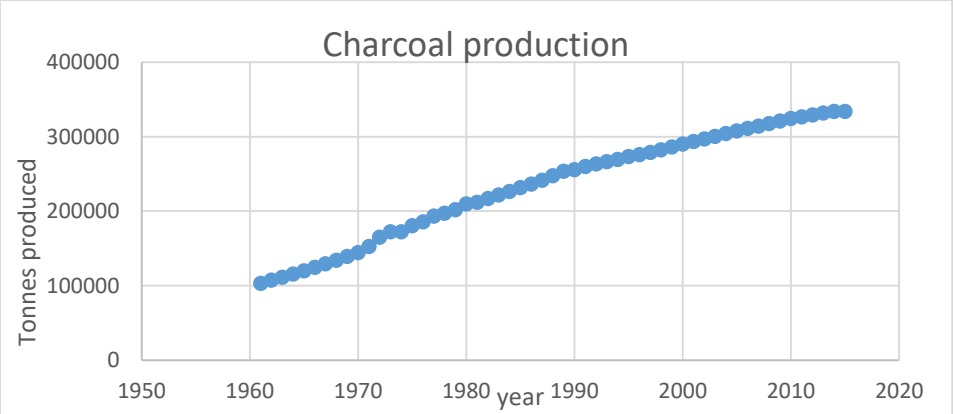


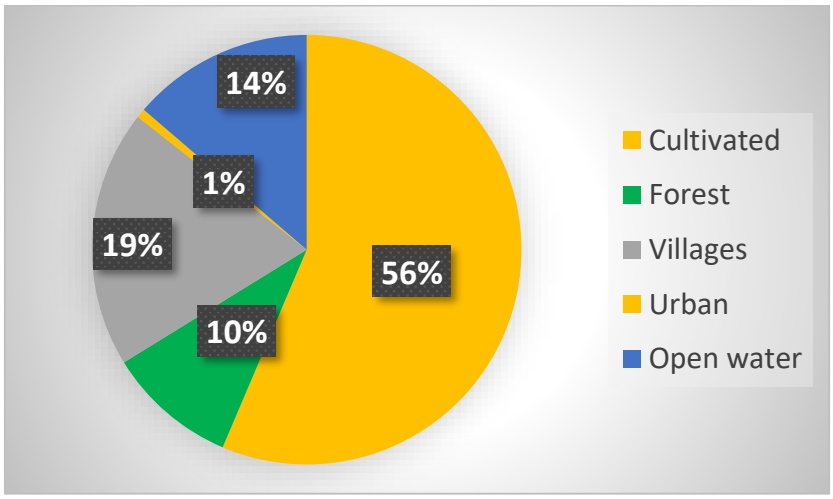
Figure 4 : Tonnes of wood charcoal produced (FAOSTAT 2016)



1.4 Land cover types

FAO (2008) reported that the major land covers in Bangladesh were cultivated area, followed by area occupied by villages, and open water (Figure 5).Bangladesh is a low-forest cover country, with less than 10% of the area classed as forests (FAO 2008), and this is a significant decline from 16-18% forested earlier in the 20thcentury (Hossain et al. 2013, Reddy et al. 2016). The area portrayed as forest in Figure 5 includes natural forests, plantations, and bamboo forests.

Figure 5 : Major land uses in Bangladesh (FAO, 2008)



1.4.1 Main ecosystem types of Bangladesh

The country was divided into 12 major ecosystems in a report by Ali Reza et al. (2002) (Figure 6), based on climatic, floral, edaphic, and hydrological differences. Floodplains occur on about 80% of the area. Major soil types are: floodplain (66% of all soils), hill, terrace, made-land (<1%), and miscellaneous soils. The soils range from sandy to clayey soils and vary considerably within each group in terms of their richness. Rainfall varies from 1440 to 4330 mm/yr, depending on location and most comes during the monsoon season from July to October, although climate change has altered timing of this season in recent years. Among these bio-ecological zones are the major forest areas including the Sundarbans, Chittagong Hills and Hill Tracts, sal forests, and the coastal forests (Figure 6).

There is some uncertainty about the amount of protected area in Bangladesh, although only a small percentage of the land base is protected. FAO (2008) reported 390,000 ha is protected, which is about 2.7% of the country and 27% of forests, while the GoB in their FRA report (2016) reported 271,000 ha are protected (18% of the forest). This latter figure was similar to that from Choudhury and Koike (2011) who reported 255,741 ha (17%) of forest is protected. Ahmed stated that only 1.1% of forest is protected, while Sunderland et al. (2011) reported an area of forest protected of 1.4%. The discrepancies among these figures are as a result of what is counted as 'forest' and what is counted as 'protected'. For example, 'game reserves' and 'wildlife sanctuaries' may be available for

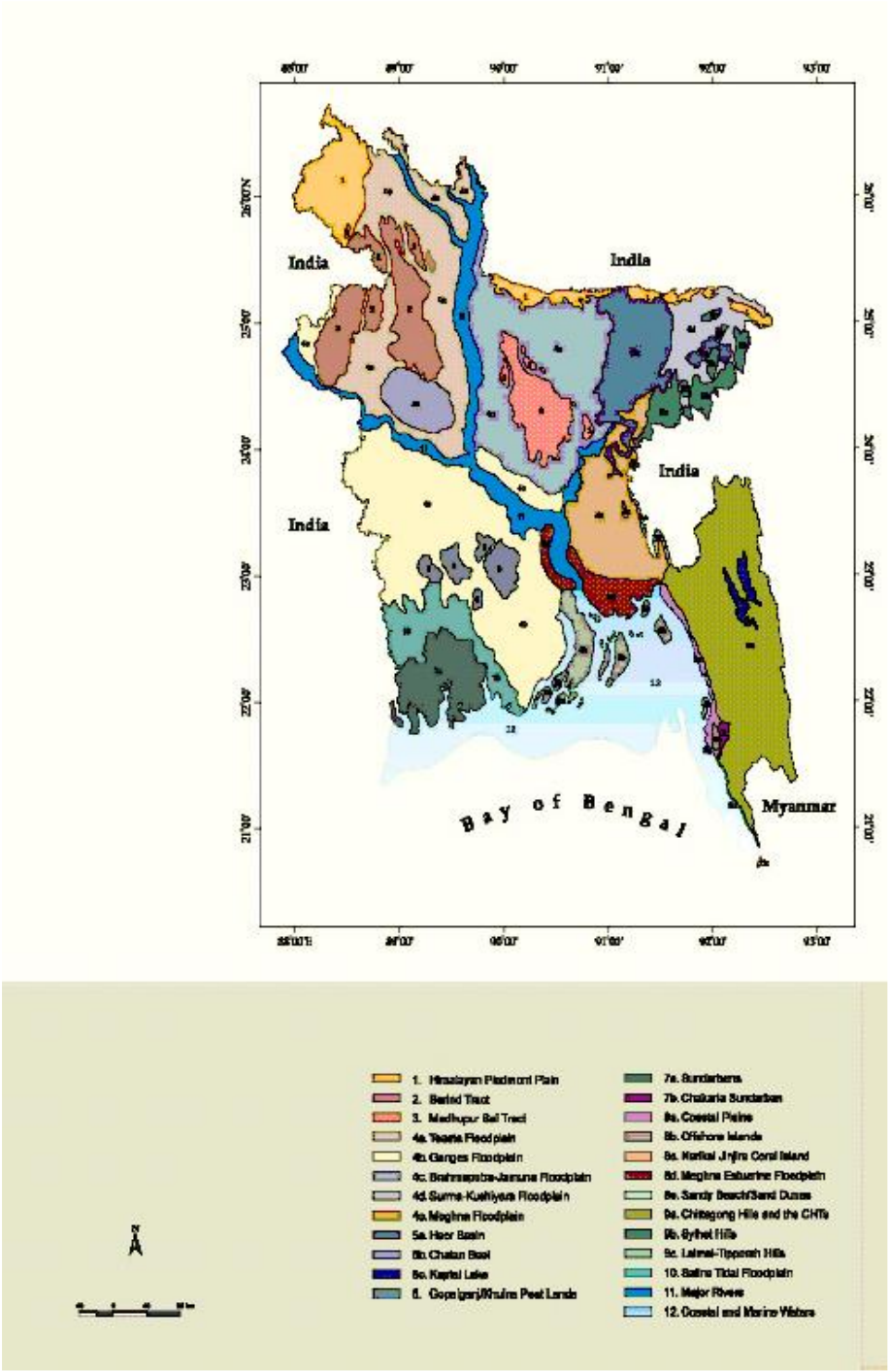
timber harvesting, and population pressure is such that fuelwood collection, animal grazing, and other degradation influences occur in all protected areas (Choudhury and Koike 2011).

Most protected areas are under a form of co-management. In the Co-management system, sharing of responsibilities is established through the formation of a Co-management Committee (CMC). According to the guidelines framed by the Government in 2006 CMC is responsible for management of PAs on the basis of local stakeholders' participation. They perform activities in PAs under the guidance of the Co-management Council, as approved by the Forest Department. Between 30 and100 residents of villages self-organize to form Village Conservation Forum (VCF), requiring that a third of the members be women. The VCF elects the Peoples Forum (PF) for each village (one male and one female) of VCF members. Community Patrol Groups (CPG) and Eco-Tour guides are selected from the villagers and represented in CMCs (GoB order issued 2009). As incentives, the CMC receives a portion of the income from the protected area for community development. Although PAs have been established for all forest types of Bangladesh, in reality these areas are not actually protected, mainly due to poor focus on public involvement in PA management and conservation process. Moreover, distribution, area, allocation by ecosystem, and number of PAs is inadequate for conservation of biodiversity, and is distant from the CBD Global Aichi Target calling for 17% of the land area protected. Effective co-management that ensures clearly defined rights and responsibilities of various stakeholders on PAs and in active participation in decision-making process is necessary to secure the future of Bangladesh's protected area system (IUCN and BFD 2016).

1.5 Main forest types

This report considers four of the five main forest regions of Bangladesh, including the mangroves (mostly located in the Sundarbans), sal forests on the central plains north from Dhaka, coastal forests (much of which is planted mangrove along the coastline and newly accreted char lands), and the Hill forests at Chittagong, Sylhet, Cox's Bazaar and the Chittagong Hill Tracts (CHT). A small area of fresh-water swamp forest in the northeast is not considered here. Forests may be divided into the following types based on tree ecology: tropical wet evergreen forests, tropical semi-evergreen forests, tropical moist deciduous forests, freshwater wetland forests, and mangroves. About 84% of forests are natural, while 16% are planted. Shin et al. (2008) reported that large closed-crown forests in Bangladesh

Figure 6 : Bio-ecological regions of Bangladesh (Ali Reza et al. 2002).

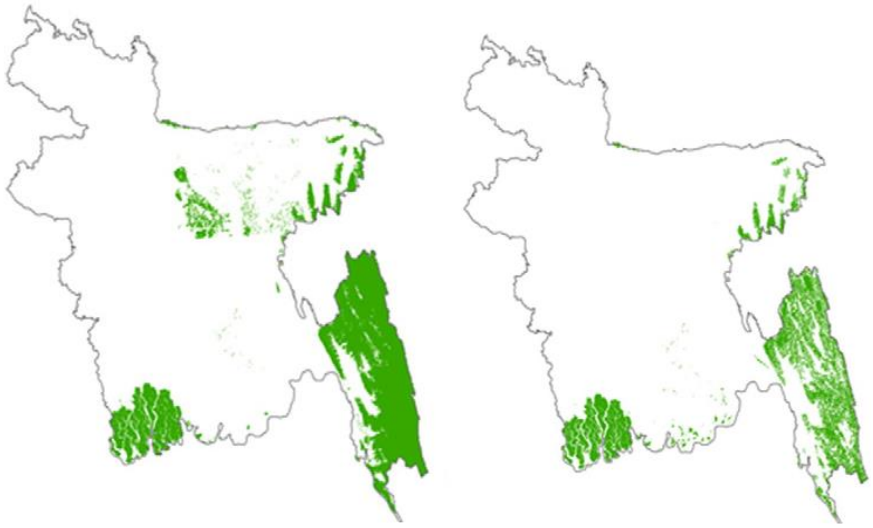


support about 121 tons of carbon/ha, disturbed closed forests have 110 t/ha, and disturbed open forests are reduced to 49 t/ha. Hill forests have more total carbon in their fully natural state at 283.80 t ha^{-1} (Ullah and Amin 2012).Bangladesh forests stocked a total 127.28 million tonnes carbon in above and below ground biomass, including dead wood, litter, and forest soil (FAO 2015).

Less than 1.44 million ha of forests remain in Bangladesh, and most of the remaining forests are degraded in some way (Thapa and Rasul 2006, Ahmed, 2008, Choudhury and Hossain 2011, Islam and Sato 2012). Deforestation has resulted in a loss of 9054 km^2 of forest since 1930 (Figure 7), based on a remote sensing survey by Reddy et al. (2016). In that latter study, all Sal forest was reported as 'plantation forest' because it had a regular pattern and as a result was reported as entirely deforested. That result from Reddy et al. is not entirely correct with 22.5 km^2remaining at Modhupur alone (Abdullah et al. 2015, see Figure 8) and FAO (2008) reported at least 340 km^2 of sal forest remains (Figure 9). According to the 'National Action Plan for Combating Desertification' (2005), deforestation overall in Bangladesh has generally been caused by: logging, mines and other developments, increased salinity and erosion, and jhum cultivation. Much of this forest reduction has been in the sal forest area (Figure 8), which has been about 75% depleted (Ahmed 2008, Abdullah et al. 2015). Rahman (2012) calculated that the growth in demand for forest products was increasing at about 5% per year, while the forest area is still declining. The long-term annual deforestation rate has been 1.1%, from regressing the data in Reddy et al. (2016; Figure 10), but various authors have suggested that, during some periods, it has been as high as >3%, especially during the 1970s (Ahmed 2008, Sarker et al. 2011). Rahman et al. (2012) indicated that the current rate of deforestation has slowed to 0.3%, or about 2000 ha/yr and Hosonuma et al. (2012) suggested that Bangladesh is a 'late transition' country, where forest cover is low and the rate of change has now approached zero, meaning that the potential for reforestation is good. Support for this hypothesis comes from an analysis by Miah et al. (2011) who proposed that Bangladesh is on the downside of a U-shaped curve relating loss of forest cover to income. That is, as incomes start to rise, impacts on forests begin to decline, presenting an opportunity for improved forest management and reforestation. For this to occur, however, improved governance is essential, as was noted by virtually all authors.

The National Conservation Strategy notes that most of the forest areas of Bangladesh face immense demographic pressure and have crossed resiliency limits. The rigidity in the public management systems and lack of financial resources continue to limit the ability of the forest organization to develop and sustain existing forest resources. Exponentially increasing use and dependence on forest goods and services by the fast growing population, and poor enforceability of forest regulations are the main problems faced by the forest resources of Bangladesh. The crux of the problem, therefore, lies outside the forestry sector. All other problems, including those within the forestry sector such as declining productivity and sustainability of forest resources, are manifestations of the main problem. Many of the problems within the forestry sector are ubiquitous. Inability of the forest resource to satisfy demands both at local and national levels is increasing all over Bangladesh. Forests are fragmenting, shrinking, and getting deforested. Most of the forest areas are drifting towards lower limits of resiliency (FAO 2008).

Figure 7 : Forest cover loss from 1930 (left panel) to 2014 (right panel) based on topographic maps from 1930 and remote sensing in 2014 (Reddy et al. 2016).



1930 2014

Figure 8: Historical decline in the Modhupur area sal forests.

Colours represent extent of forest in that year (From: Abdullah et al. 2015).

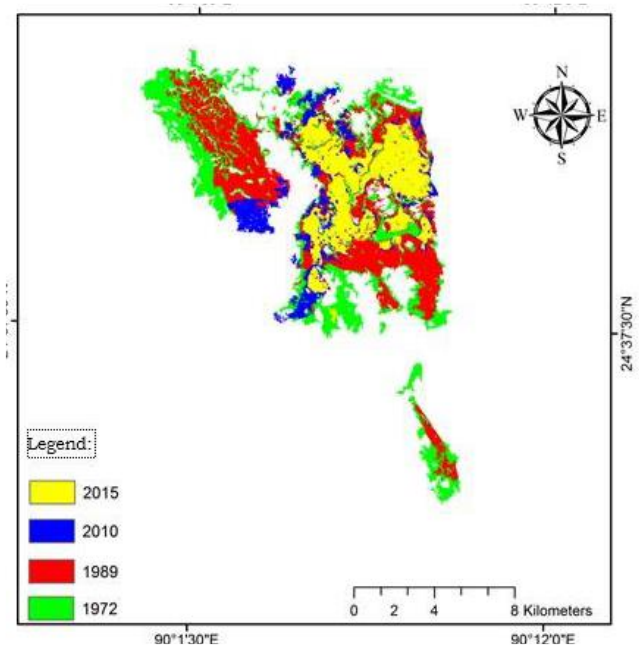


Figure 9: Area of forest types in Bangladesh (FAO, 2008).

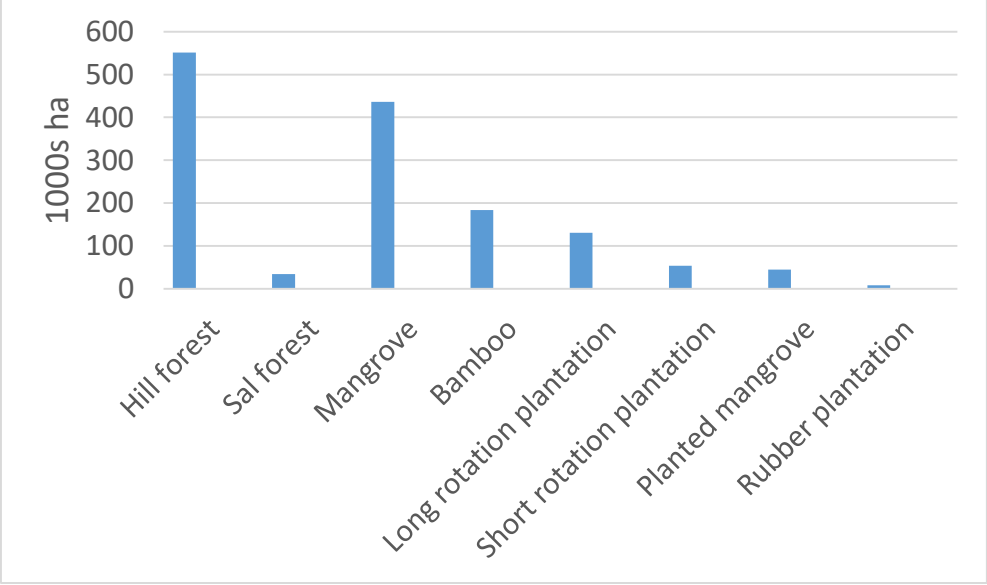
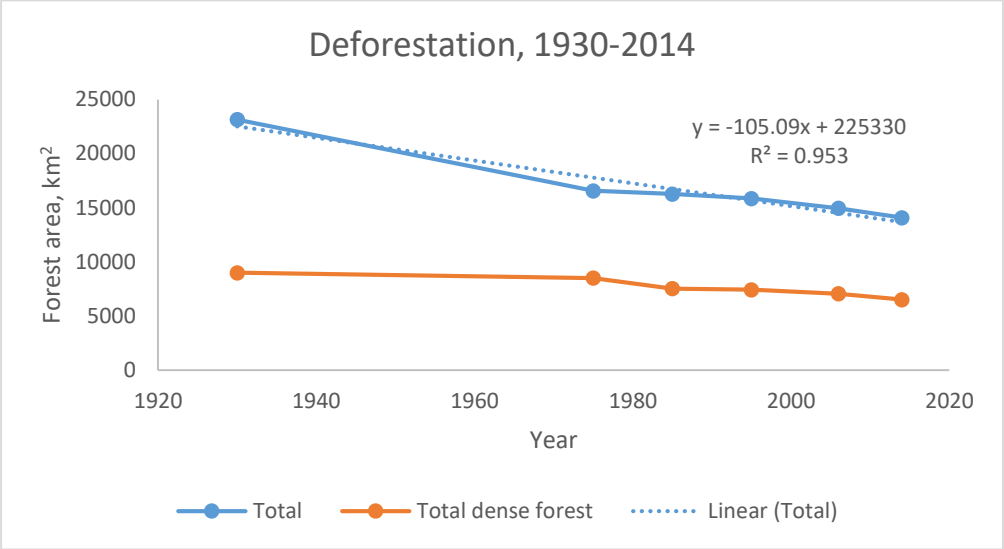


Figure 10: Rate of deforestation based on data from Reddy et al. (2016). The slope of the regression line is about 1.1%/year.



Mangroves (Sundarbans): The vast majority of mangrove forests occur in the southwest in the Sundarbans region, forming the largest mangrove forest in the world, with other natural mangroves along the rest of the coastline and at Chittagong. The Sundarbuns area is a deltaic swamp formed by silt transported over time by the Ganges River system. The total national area of mangroves has increased largely through planting to a national total of 531,000 ha in 2014 from 460,000 in 1990 (GoB 2015). Coastal erosion has eliminated some of these plantations, however. The Sundarbans mangroves have decreased slightly in area from 4015 km^2 in 1990 to 3963 km^2 in 2005, but have been mostly constant in size since the 1970s, on a total area of 6017 km^2. Rahman (2013) showed that Sundarbans forest had been lost due to coastal erosion since 1980s with a rate of 394 ha/year in the 1980s, 1131 ha/year in the 1990s and 698 ha/year in the 2000s. The mangroves are dominated by *Heritiera fomes,* with another 24 species of mangrove, and there is a highly diverse fauna (840 species) and flora (334 species) on the area (Rahman et al. 2010), many of which are endangered. About 4 million people depend directly on mangroves for their livelihoods (Spalding et al. 2010), with 3.5 million of these relying on the Sundarbans area (Uddin et al. 2013). Major causes of the deforestation of the mangrove in the vicinity of settlements are related to the growing need for food, fuel, and shelter (Rahman et al., 2013). Mangrove

forests in Bangladesh are also being generally degraded from over-exploitation, deforestation, land reclamation, increased salination from reduced upstream water flow, and pollution. Large areas of the headwaters have been cleared for fish and shrimp farming resulting in pollution by chemical into the mangroves. Top-dying disease has also become a concern, with many trees affected each year (Iftekhar and Islam 2004). There has been a decline in stem density of mangrove species in the natural stands, mostly as a result of this disease. Mangroves provide an important ecological service by protecting the land from tidal storm surges as a result of typhoons, which, in large part, is why so much coastal planting has been done. Although there is planting of mangroves in the area, the vast majority of regeneration is natural. Assisted natural regeneration (5,000 hectares) and enrichment planting (10,000 hectares) under the Sundarbans Biodiversity Conservation Project were implemented, with financial assistance from the Asian Development Bank. The mangroves are harvested to supply paper and hardwood mills as well as other industries such as boat-building, and used for local fuelwood.

Sal forests: The sal forests are tropical moist deciduous forests located in central Bangladesh, north from Dhaka. The total area of sal forests is 34,000 ha (FAO 2008), with about 86% of the forest situated in the districts of Gazipur, Mymensingh, Tangail and Comilla (central region), with the remaining 14% in the districts of Rangpur, Dinajpur and Rajshahi. These forests are dominated by *Shorea robusta* and have been severely reduced in area, largely by agriculture and military and industrial encroachment, with the remaining forests mostly degraded (Islam and Sato 2012, Hossain et al. 2013, Abdullah et al. 2015, Islam, 2006). Abdullah et al. (2015) reported that the forest area has been reduced by 75% since 1972 but Alam et al. (2008) suggested that only about 10% remains. Most animal species associated with these forests have disappeared. The forests are heavily used by local people for firewood and the landscape is interspersed with low-lying areas where crops and livestock-raising are common.

Hill forests: Chittagong, Sylhet Hills, Cox's Bazaar, and Chittagong Hill Tracts forests: The hills area forms about 12-15% of the country. The forests in this area are tropical evergreen and semi-evergreen and these each have several subtypes based on altitude, soil, and rainfall. The evergreen forest is composed of tropical wet evergreen and tropical mixed evergreen.

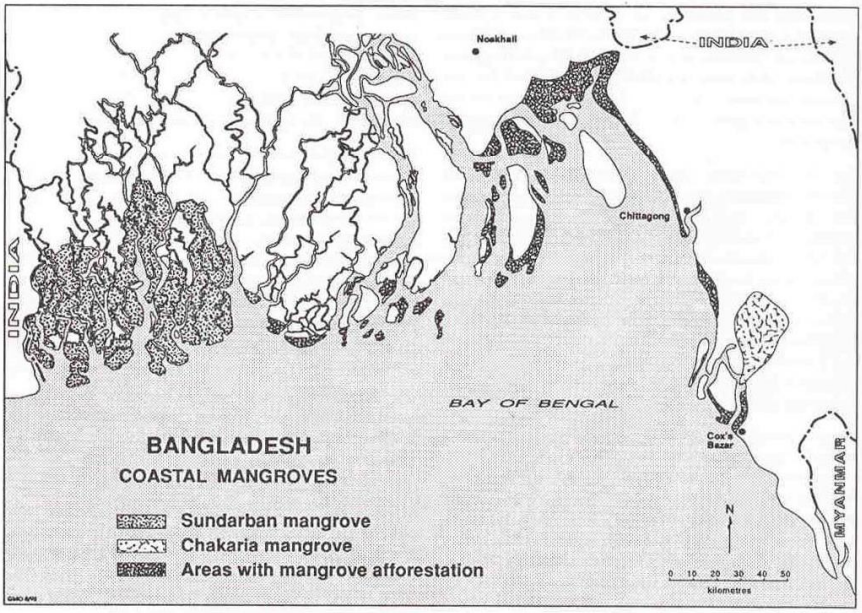
The deciduous forest consists of tropical moist deciduous and tropical open deciduous. Tropical mixed evergreen forest is the most important type, with the dominant tree species, the Dipterocarps, being highly valued due to their high-priced timber. Common evergreen species include *Dipterocarpus* spp., *Swintonia floribunda*, *Artocarpus chaplash*a, *Hopea odorata*, and *Tetrameles nudiflora*. Forest cover has been reduced from about 120,000 ha in 1990 to 85,000 ha in 2005 (FAO 2008). Miah et al. (2014) suggested that about 73% of the hill areas are only suitable for forestry. The CHT is populated by at least 12 ethnic communities: Chakma, Marma, Tripura, Tanchangya, Khayang, Chak, Murong, Pankhu, Lushai, Bawm, Khumi, and Uchai, each possessing distinct cultures and lifestyles. These people largely practice shifting cultivation, but the total population in the area has risen substantially owing to migration to the region from of refugees from Myanmar, as well as from other areas within Bangladesh, resulting in forest loss to increased agriculture (including shifting cultivation or jhum) and settlements. About 85,000 ha are now under shifting cultivation for about 60,000 people in these areas (Hossain 2011). The FMP (2016) indicated that less than 100,000 ha of forest remain from what was once >700,000 ha.

Coastal forests: Coastal forests comprise about 99,000 ha of planted mangrove and shoreline forests (GoB 2015) (Figure 11). This successful afforestation program began in 1966 and has continued since then, growing from 24,000 ha in 1990 to the current figure above. In keeping with the inconsistency of figures on forests in Bangladesh reported in the literature, other values for coastal mangrove forest include: 148,000 ha in 2006 (Islam 2007); Aziz (2006) reported 170,000 ha; and Islam and Rahman (2015) report 190,000 ha. The adjacent upland coastal shoreline was also generally deforested by the 1960s, and considerable effort has also been made to reforest these uplands as well, although there is a densely populated coast line (36.8 million people). These reforestation programs are intended to provide ecosystem services to coastal areas people from wood products, erosion protection, and increased fishery potential (Siddiqi 2001), as well as to stabilize newly accreted land (Islam and Rahman 2015). Thirty-seven non-mangrove species have been planted on the slopes of embankments and roadsides under the Green Belt Project in 1995 and Coastal Embankment Rehabilitation Project in 1997 (Islam and Rahman 2015). These species included timber, fuelwood, and fruit tree species. Islam (2017) in a time series

analysis using Landsat images of 1976 (Landsat MSS), 1989 (Landsat TM), 2000 (Landsat ETM+) and 2015 (Landsat L8 OLI) found that a gradual increase of coastal mangrove forest areas has occurred.

There has also been destruction of coastal forests. The destruction and encroachment of plantations have become a serious problem in Coastal forests (Hossain et al. 2016). The indirect cause is land tenure conflicts but the sites were allocated to the Forest Department to stabilize the land by planting trees for 20 years, after which the land could become available for agriculture or other uses (Choudhury 2000). However, Rahman and Pramanik (2015) have concluded that mangroves have been lost primarily because of agricultural expansion.

Figure 9: Mapped coastal afforestation in Bangladesh to 2013 (Papry 2014).



1.6 Forest governance and past history of forest change

Forest sector governance refers to the ways in which officials and institutions (both formal and informal) acquire and exercise authority in the management of the resources of the sector to sustain and improve the welfare and quality of life for those whose livelihoods depend on the sector. Good governance is fundamental to achieving positive and sustained development outcomes in the sector, including efficiency of resource management, increased contribution to economic growth and to environmental services, and equitable

distribution of benefits[1].Good forest governance has a central role in achieving sustainable forest management (SFM). It is also critical to ensuring the effectiveness of schemes to reduce greenhouse gas emissions from deforestation and forest degradation in developing countries (REDD) as well as of efforts to reduce illegal activities in the forest sector[2]. Governance is generally considered "good" if it is characterized by stakeholder participation, transparency of decision-making, accountability of actors and decision-makers, rule of law and predictability. "Good governance" is also associated with efficient and effective management of natural, human and financial resources, and fair and equitable allocation of resources and benefits (FAO, 2011).

The word "governance" covers all dimensions of how public officials and institutions deal with stakeholders about forest issues. UNDP and the Asian Development Bank expand the definition to include the private sector, NGOs, international partners, and all other actors that influence how resources are used and decisions are made. This definition is particularly important in forestry, where public policies (e.g., those dealing with forests, land management, climate change, private sector development, and rural development) are closely linked to private sector activities and partially to private ownership of the resource (Castern and Pillai 2011). Good forest governance is characterized by predictable, open and informed policy-making based on transparent processes; a bureaucracy imbued with a professional ethos; an executive arm of government accountable for its actions; and a strong civil society participating in decisions related to the sector (FAO and ITTO 2009). Thus, key principles of good governance include adherence to the rule of law; transparency and access to information; respect for rights; anti- corruption; participation and inclusiveness of all stakeholders, including equitably women, men and youth in decision making; performance and effectiveness; accountability of all officials, consensus seeking; capacity; gender equality; and political stability[3] (see also World Bank 2000).

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[1]http://siteresources.worldbank.org/EXTFORSOUBOOK/Resources/05-FSB-Ch05.pdf[Accessed 05 October 2016]

[2]http://www.fao.org/forestry/governance/monitoring/en/ [Accessed 05 October 2016]

[3] UN-REDD Programme (2015). REDD+ Academy Learning Journal, Module 12: Good Governance. Available at: https://www.unredd.net/documents/global-programme-191/redd-academy-3509/redd-academy-learning-journals/english.html

Poor governance, corruption and illegality[4] in the forest sector put at risk forest-dependent populations who rely on timber and non-timber forest products for their livelihoods and survival, and undermine responsible forest enterprises by distorting timber markets[5]. These failures result in a loss of revenue that could be invested in sustainable forest management or economic development. Often they are part of wider networks of corruption and environmental crime. The World Bank estimates the (global) annual market value of losses from illegal cutting of forests at over US$10 billion – more than eight times the total official developmental assistance (ODA) that flows to the sustainable management of forests. Illegal and unsustainable logging also undermines ongoing efforts to curb deforestation and enhance carbon stocks to mitigate climate change. Weak governance, including unclear or nonexistent policies or legislation and their enforcement on the use of forest resources is a key issue. Weak institutional structures and inability to monitor and enforce regulations hamper progress in many countries. These weaknesses are difficult to address politically, since well-connected interest groups tend to benefit from the status quo and resist change.

Forests have a number of characteristics, which make them problematic from a governance perspective including the nature of the resource (slow growing; multiple benefits; long term repository), the nature of the rights (*de facto* and *de jure* claims of ownership; unclear, gender inequitable and insecure rights of access to forest resources) and the value of forest resources (market and non-market benefits; benefits are enjoyed by users at local, national, international and global levels; forests are managed as sovereign territories; public goods values from forests are uncompensated creating a disequilibrium between the costs and benefits of their management; forest resources may have very high market values, and engage the interests of powerful stakeholders; strong pressures for governments to centralize their control, and to manage them non-transparently, in alliance with industrial interests; forests are open to abuse and may be a focus for illegality)[6].

[4]*Forest illegality* occurs when wood and other forest products are harvested, transported, processed, bought or sold in violation of national laws. The illegal conversion of forest to other uses – deforestation – may also be categorized as forest illegality.

[5]http://www.worldbank.org/en/topic/forests/brief/forest-law-enforcement-governance [Accessed 06 January 2017]

[6]https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/3763.pdf[Accessed 06 January 2017]

The forests of Bangladesh are managed and administered by several laws, policies and regulations including but not limited to Forest Act 1927 (amended in 1989 and 2000), Forest Policy 1994,Brick Burning (Control) (Amendment) Act 2001, Social Forestry Rules 2004 (amended in 2010 and 2011), Bangladesh Environmental Conservation (Amendment) Act 2010, Bangladesh Climate Change Trust Fund Act 2010, Bangladesh Environment Court Act 2010, Forest Produce Transit (Control) Rules 2011**,** Compensation for Wildlife Victim 2012, Bangladesh Bio-safety Rules 2012, Bangladesh Wildlife (Conservation and Security) Act 2012, Tree Conservation Act 2012 (Draft), Bangladesh REDD+ Readiness Roadmap 2012, Bangladesh Biological Diversity Act 2012, Disaster Management Act 2012, Sawmill (License) Rule 2012, Bangladesh Biological Diversity Act 2012, The Brick Manufacture and Brick Kiln Installation (Control) Act 2013, Ecologically Critical Area Management Rules 2013, Ecologically Critical Areas Act (Draft) 2016, National Conservation Strategy (Draft) 2016, Protected Area rules (Draft) 2016, National Forestry Policy 2016 (Draft), Updated Forestry Master Plan for Bangladesh 2016 (Draft).

Bangladesh signed the International convention for the protection of Birds in 1950, International Convention for the protection of plant in 1951 (ratified), Plant Protection Agreement for the South East Asia and Pacific Region in 1956 (ratified), Convention for the protection of the World Culture and National Heritage in 1972 (ratified), Convention on International Trade in endangered species of Wild Fauna and Flora in 1973 (ratified), Convention on the Conservation of Migratory Species of Wild animals in 1979, Protocol to Amend the Convention on Wetlands of International Importance Especially as Waterfowl Habitat in 1982, United Nations Framework Convention on Climate Change in 1992 (ratified), Convention on Biological Diversity in 1992, the Kyoto Protocol to the UNFCCC in 1997 (ratified), The Beijing Adjustments and Amendments to the 1987 Montreal Protocol on substances that Deplete the Ozone Layer in 1999, and Cartagena Protocol on Biosafety to the Convention on Biological Diversity in 2000 (ratified). It is also a signatory to the Ramsar Convention and the World Heritage Convention.

Bangladesh Forest Department is continuously challenged by different sectors in managing their lands especially by the Ministry of Land with the support from different policies like National Land Use Policy 2001; Khas Land Settlement Policy 1997; Non-agricultural Khas Land Settlement Policy 1995; Khas Land Settlement Policy for Hotel-Motel 1998; Balu Mohal and Sand Management Rules 2011; Chringri Mohal Management Policy

1998; 'Jal Mohal Management Policy 2009 ; Salt Mohal Management Policy 1992; Vested Property (Amendment) Law 2011; and The Acquisition and Requisition of Immovable Properties Ordinance 1982[7]. Major conflicting issues arise when forest lands are leased out to government or non-government institutions or enterprises for the purpose of development of roads and railways, rubber and tea garden, establishment of military base (e.g., very recently 1788 acres of reserved forest lands in Ramu of Cox's Bazar has been transferred after de-reserving for the purpose of national security), orchard, settlement programs, etc. without consulting Forest Department. Similarly, some policies result in perverse incentives such as the Forest Department raising revenue from logging, which creates an incentive for deforestation. The replacement of natural forests with plantations is often encouraged by government but is a perverse incentive resulting in forest degradation. Plantations have an important place in a forest management strategy, but not to such an extent that they damage overall ecosystem services

The history of forestry in Bangladesh can be characterized as a classic example of continued deforestation and degradation (Jashimuddin and Inoue, 2012; Islam and Sato, 2012). The forests were exploited to earn revenue and supply raw materials for the ship and rail industries during the British colonial era (1757–1947), and generate revenue and supply raw materials for forest industries during the period of Pakistan's rule (1947–1971), which also continued into the current period of independent Bangladesh sovereignty. Furthermore, ineffective and bureaucratic forest management approaches have an immense impact to the deforestation of most state forests in Bangladesh. Extensive research on land use changes in tropical Asia shows that forest/woodland and wetlands declined over the period of 1880 to 1980 by 131 million ha (47%). At the same time cultivated area increased by 106 million ha, nearly double that of 1880. Thus, 81% of the forest and wetland vegetation appears to have been converted during the expansion of agricultural land (Lambin and Geist 2006). Intensive timber extraction for domestic and export markets and the exploitation of firewood, fodder and forest products all contributed to deforestation in this part of the world.

Over the past few decades deforestation has become an issue of global concern for its rapid reduction of biodiversity and carbon emissions. The tropical moist deciduous Sal

[7] http://www.mof.gov.bd/en/budget/13_14/gender_budget/en/16 Chapter 17_46_Land_English.pdf

forest ecosystem of central Bangladesh is currently in a critical situation. Destructive anthropogenic and natural impacts coupled with overexploitation of forest resources have caused severe damage to the forest ecosystem. Due to rubber monoculture, expanding commercial fuel wood plantations and expanding agriculture, illegal cutting, encroachment of forest areas, and illegal poaching of wildlife, the Sal forest is losing biodiversity alarmingly (Hossain et al. 2013).

Unplanned and uncontrolled growth of shrimp enclosures have led to the destruction of mangrove forest areas since 1970s. Shrimp farming is highly profitable because of its export earning potentials. Therefore, this farming is often encouraged by the government agencies. From the late 1970s, the government of Bangladesh encouraged the conversion of reserved mangrove forest of the Chakaria Sundarbans by leasing out entire 8510 ha (which was nearly 18,200 ha in the past before declaring it as reserve mangrove forest in 1903) of the mangroves for shrimp farming, salt bed and human settlement (Hossain et al. 2001, Rahman and Hossain 2015).

2 Methods

This study of the drivers of deforestation and degradation in Bangladesh was conducted by the following means:

1. conducting an extensive literature review on drivers of forest change, including published and unpublished information;
2. developing a GIS-based basic model of the relationship between population density and transportation corridors and forest change; and
3. collecting information directly about drivers from all forest stakeholder groups, which included men, women and youth, across Bangladesh.

The study assessed drivers independently for four main forest types: sal, hill, Sundarban mangrove, and coastal forests for deforestation and separately for forest degradation. We did not deal with swamp forest or village forests. The work was conducted across Bangladesh among the 8 forest division areas, and every effort was made to be inclusive of all stakeholder groups at every district.

2.1 Literature review

The literature review made use of as many data sources as possible including published papers, unpublished reports (government, OD agencies, university, NGOs), website information, the Government FRA report (2015), and other information as available. The literature study assessed the following: governance, laws, and international treaties affecting the forest, socio-economic impacts of forest loss and change, drivers as identified in case studies, general drivers from other relevant studies and assessments (e.g., other REDD reports from Asia and developing countries).

2.2 GIS mapping and study

The GIS component study worked directly with FAO to examine the factors responsible for forest change. Datasets used included government mapping, the Global Forest Cover dataset, the Global Intact Forest Landscapes dataset, transportation, and population data layers. A basic model of impact was developed based on distance of forest from access to assess effects of these latter two variables on forest change. The maps produced for the study document included: forest cover at t-35 years based on satellite data 1978-2016, freely available from the NASA website, present (t) forest cover from updated RIMS data/ current satellite data, forest cover change over last four decades from the difference of the two above-mentioned maps, a map of forest degradation over last 15 years based on net primary productivity, Normalized Difference Vegetation Index (NDVI), and Enhanced Vegetation Index (EVI2 from near Infrared and Red bands) change over time from available satellite data (MODIS) and earlier.

2.3 Stakeholder information

The stakeholder engagement component study used three mechanisms to develop an information database on the drivers of forest change: 1. workshops with as many stakeholders as possible from government, beneficiaries, NGOs, and others at 9 locations; 2. key person interviews (KII) were used to obtain information on drivers from as many 'key' and knowledgeable people as possible on an *ad hoc* basis during the entire study period, and 3. focal group discussions with at least 2 groups of forest users per division. Sample sizes are provided later in the document.

2.3.1 Workshops:

These were arranged by UNDP, who invited as many stakeholders as possible (usually 30-60 people) per forest division, specifically inviting including women (10-20%), for a total sample of >400 people. Workshops were held at a time so that both men and women would attend and women were specifically encouraged to speak. A questionnaire on drivers was administered at each workshop to understand the local forest drivers and conditions leading to forest change (Appendix 1). This questionnaire provided a list of possible drivers that is not necessarily complete and provides space for other drivers that people may suggest based on local knowledge. We did not distinguish between direct and indirect drivers on the questionnaire itself, but expected that these will be separated as a result of discussions after the questionnaire is completed.

2.3.2 Key person interviews:

A suite of interviews was conducted during the workshops and at other times on an *ad hoc* basis to bolster the sample from knowledgeable individuals, including interested members of the public (e.g., teachers, community leaders). These data were added to the total but were meant to increase the sample of people who have an in-depth understanding of forest issues.

2.3.3 Focal group discussions:

To determine what the local communities and forest beneficiaries consider are the important drivers, focal group discussions were arranged by UNDP in each forest division. At these meetings, a team member administered the questionnaire orally in a group discussion. These meetings were designed to obtain a sample from groups of local forest users, as well as to gain some idea of how a payment for ecosystem service approach might be received. These data were added to the overall sample.

2.3.4 Data analysis:

Data from the workshops, interviews, and focal group discussions were compiled in an Excel spreadsheet and the results assessed using logistic probability models (proportional odds

cumulative logit modelling) to determine the most important drivers. Methods for ranking the drivers are described in section 4.5 below. The global models were blocked by forest type to look for differences and to assess interactions. A sample size of >1000 provided adequate df. The β coefficients of variables in the global models provided a means to assess the relative importance of factors affecting the drivers.

3 Forest cover and land use change[8]

3.1. Vegetation indices

Vegetation indices are used for global monitoring of vegetation conditions and are used in products displaying land cover and land cover changes (Table 1). These data may be used as input for modeling global biogeochemical and hydrologic processes and global and regional climate. These data also may be used for characterizing land surface biophysical properties and processes, including primary production and land cover conversion.

3.1.1 Normalized Difference Vegetation Index (NDVI)

The normalized difference vegetation index (NDVI) is a simple graphical indicator that can be used to assess whether the target being observed contains live green vegetation or not.

$$NDVI = (NIR-Red)/(NIR+Red)$$

3.1.2 Two band Enhanced Vegetation Index (EVI2)

Two band EVI is calculated from near infrared and visual red band of the satellite data. There are few reasons why a two-band EVI is useful. One is that it allows to calculate EVIs from earlier Landsat missions where a blue band is missing and thus allows us a window of comparing the vegetation condition across the time span for which satellite images are available. The EVIs can be used as complementary to NDVIs and provide us better insight into structural change of vegetation over time. The blue band has always

[8] The GIS-RS analysis used in this report with an intention to facilitate discussion during stakeholder discussion. Not to provide accurate estimation of forest cover loss or gain. Such statistics is being carried out by Forest Department with support from FAO.

been poor in quality due to the nature of reflected energy of the blue spectrum. The formula used for calculating a two band EVI is as follows

$$EVI2 = 2.5 * ((NIR-Red)/(NIR+2.4*Red+1))$$

Calculated EVI2 from Landsat 8 images for Bangladesh was compared with MODIS EVI and was found to be highly correlated (r = 0.87). This provides confidence in using EVI2 as an indicator for vegetation presence and structure. However, further field validation would be required to consider this as monitoring tool under REDD initiatives.

Global MODIS vegetation indices (Vegetation Indices 16-Day L3 Global 250m, MOD13Q1) are designed to provide consistent spatial and temporal comparisons of vegetation conditions. Blue, red, and near-infrared reflectances, centered at 469-nanometers, 645-nanometers, and 858-nanometers, respectively, are used to determine the MODIS daily vegetation indices.

The MODIS Normalized Difference Vegetation Index (NDVI) complements NOAA's Advanced Very High Resolution Radiometer (AVHRR) NDVI products and provides continuity for time series historical applications. MODIS also includes a new Enhanced Vegetation Index (EVI) that minimizes canopy background variations and maintains sensitivity over dense vegetation conditions. The EVI also uses the blue band to remove residual atmosphere contamination caused by smoke and sub-pixel thin clouds. The MODIS NDVI and EVI products are computed from atmospherically corrected bi-directional surface reflectances that have been masked for water, clouds, heavy aerosols, and cloud shadows.

Global MOD13Q1 data are provided every 16 days at 250 m spatial resolution as a gridded level-3 product in the Sinusoidal projection. Lacking a 250m blue band, the EVI algorithm uses the 500m blue band to correct for residual atmospheric effects, with negligible spatial artifacts.

Net Primary Productivity (NPP, in Kg C/m2) defines the rate at which all plants in an ecosystem produce net useful chemical energy. In other words, NPP (Net Primary Production Yearly L4 Global 1km, MOD17A3) is equal to the difference between the rate at which plants in an ecosystem produce useful chemical energy (or GPP), and the rate at which they expend some of that energy for respiration.

The Terra/MODIS Gross Primary Productivity (GPP) product (Gross Primary Productivity 8-Day L4 Global 1km, MOD17A2) is a cumulative composite of GPP values based on the radiation-use efficiency concept that is potentially used as inputs to data models to calculate terrestrial energy, carbon, water cycle processes, and biogeochemistry of vegetation. MOD17A2 is an 8-day composite at 1-km spatial resolution delivered as a gridded level-4 product in Sinusoidal projection.

The Terra MODIS Vegetation Continuous Fields (VCF, Vegetation Continuous Fields Yearly L3 Global 250m) product is a sub-pixel-level representation of surface vegetation cover estimates globally. Designed to continuously represent Earth's terrestrial surface as a proportion of basic vegetation traits, it provides a gradation of three surface cover components: percent tree cover, percent non-tree cover, and percent bare. VCF products provide a continuous, quantitative portrayal of land surface cover with improved spatial detail, and hence, are widely used in environmental modeling and monitoring applications. Generated yearly, the VCF product is produced using monthly composites of Terra MODIS 250 and 500 meters Land Surface Reflectance data, including all seven bands, and Land Surface Temperature.

Several reasons can explain the inter-annual fluctuations in the percentage of tree cover from year to year, and therefore, careful consideration should be exercised while performing inter-annual comparisons of MODIS based percent tree cover.

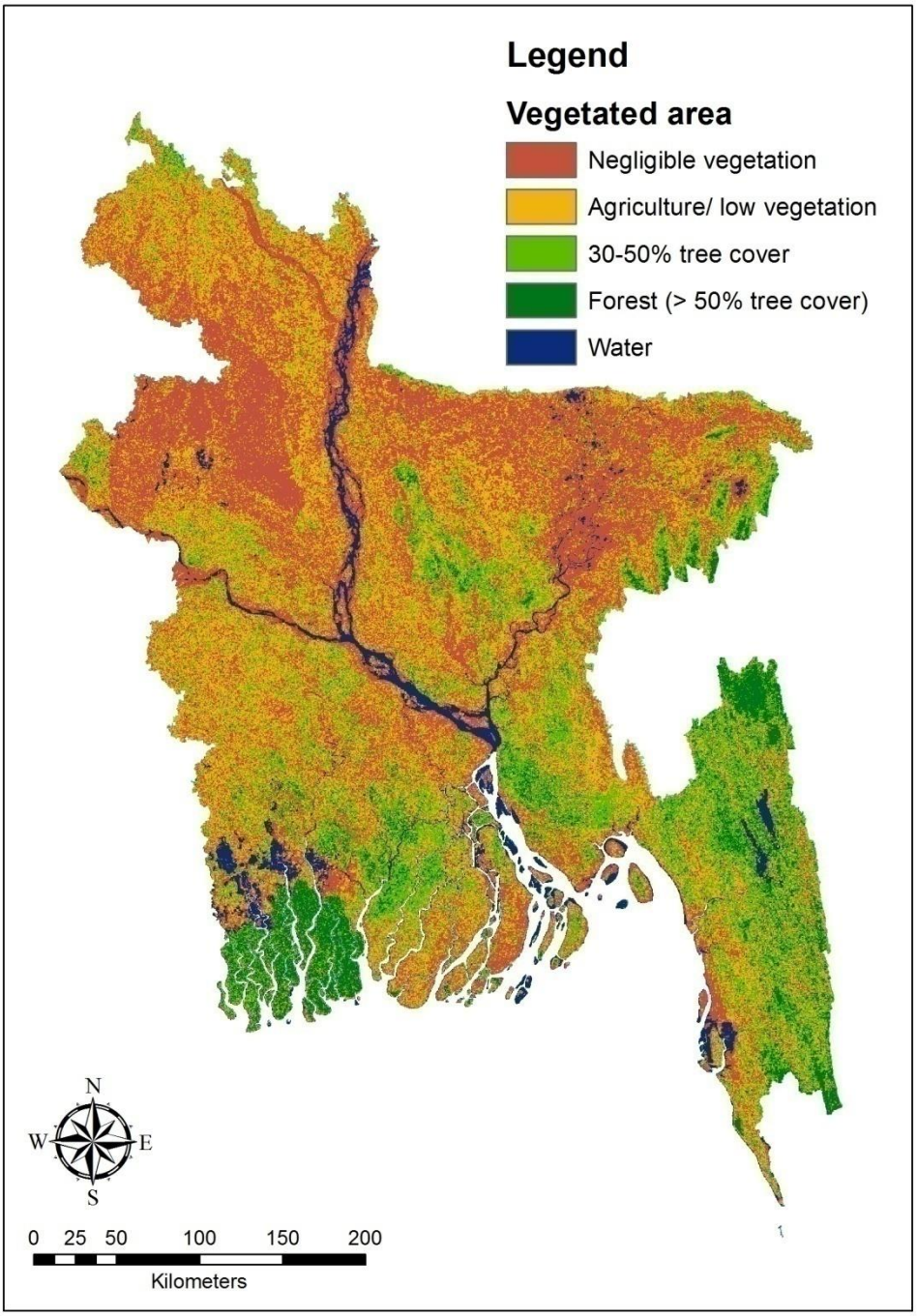
Table 1 : Data sources for GIS analysis

Satellite data	Product used	Time span	Resolution	Source
MODIS	Vegetation indices (NDVI, EVI), Primary productivity, Vegetation continuous fields (Percent tree cover)	2000-2016	250 m/ 1 km	NASA/USGS
Landsat 1-3	Green, Red and Infra Red Bands	1972-1979	60 m	NASA/USGS
Landsat 4-5	Blue, Green, Red and Infra Red Bands	1988-89, 1999	30 m	NASA/USGS

Landsat 8	Blue, Green, Red, Infra Red and Panchromatic bands	2016	30 m / 15 m	NASA/USGS

3.2 Vegetated area of Bangladesh

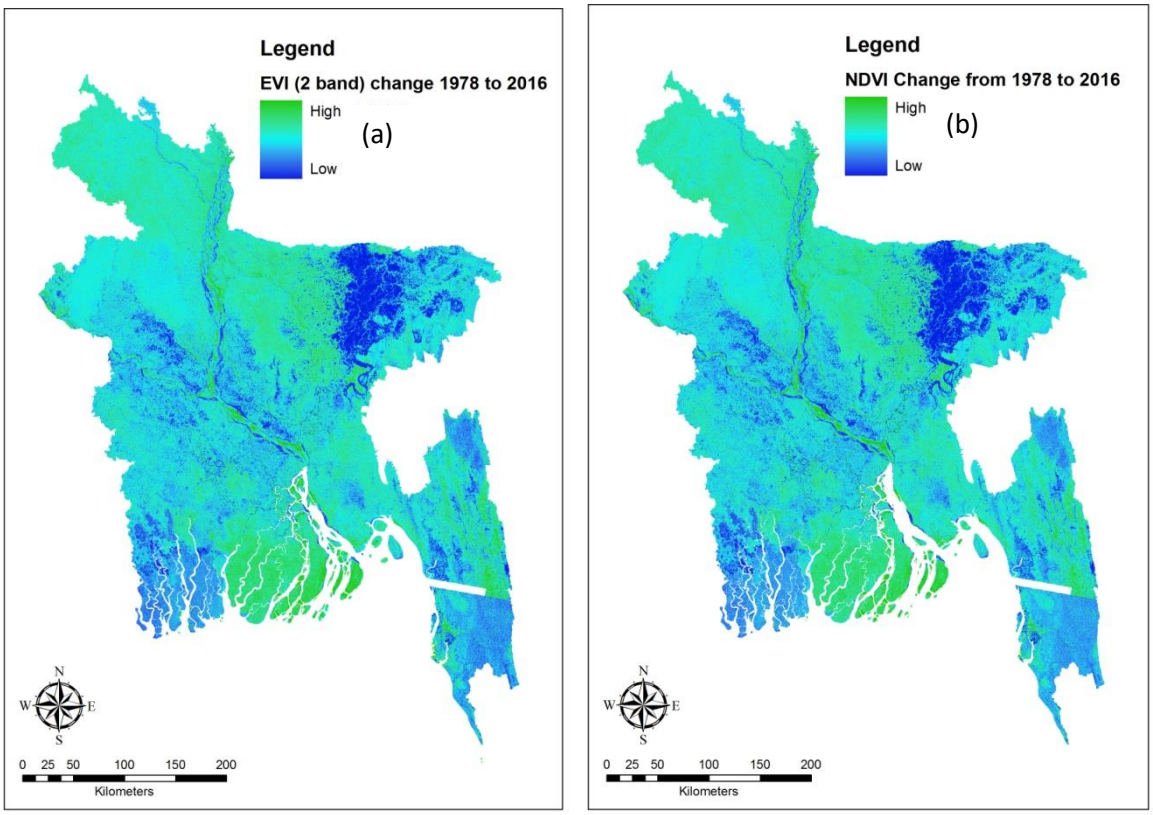
Figure 10: Map of vegetated area of Bangladesh (2016) derived from MODIS satellite data. The value depicts percent tree cover.



The vegetation map of 2016 (Figure 12) shows that apart from well-known forested areas (central Sal forests, the Sundarbans, Hill forests of Sylhet, Chittagong and Chittagong Hill Tracts, and coastal plantations), there is significant tree cover in homesteads of the Barisal and Comilla region.

3.3 Vegetation indices changes over last four decades

Figure 11 : Change in EVI2 (a) and NDVI (b) over last four decades (1978-2016).



Two band EVI and NDVI changes over last four decades show that vegetation pattern has gone through some interesting changes (Figure 13). Even though the Sundarbans forest area does not show significant deforestation, structural patterns of the area have changed, with possibly lower height of the vegetation.

However, net primary productivity either has not changed or has increased much over the last 15 years around the Sundarbans area but percent tree cover has declined significantly. This phenomenon can be attributed to the loss of older and larger trees and replaced by younger, relatively quickly growing trees in the next canopy layer. This also shows that even though, deforestation is not common in the Sundarbans, the area is going through some form of degradation.

Figure 12 : Percent tree cover change from 2000 to 2015 in Bangladesh. Redder colour shows greater loss and greener colour indicates gain.

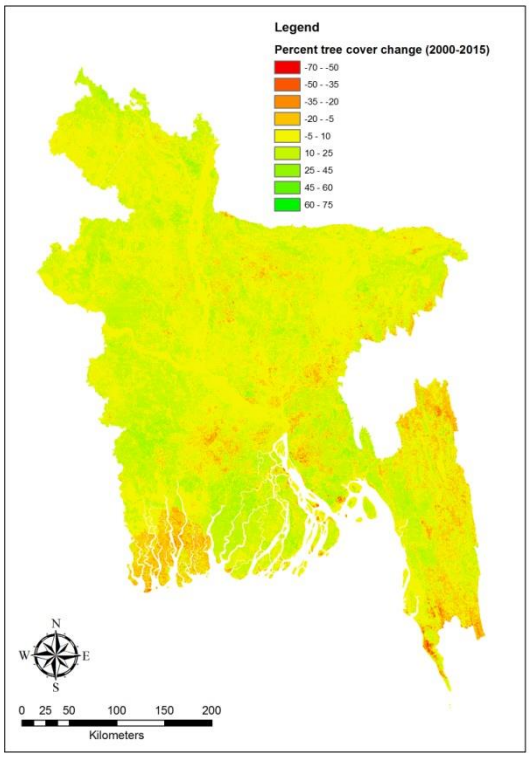
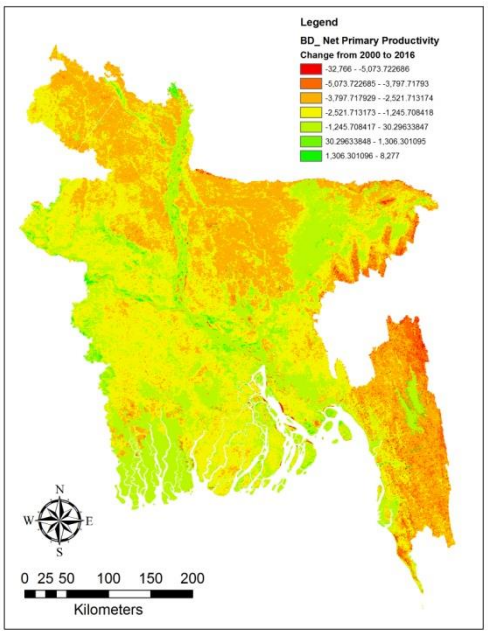


Figure 13 : Change in net primary productivity from 2000 to 2015 in Bangladesh. Redder colour indicates greater loss while greener indicates a positive change.



Both percent tree cover and net primary productivity have gone down in hill forest area (Figures 14 and 15), indicating both deforestation and degradation has taken place in this

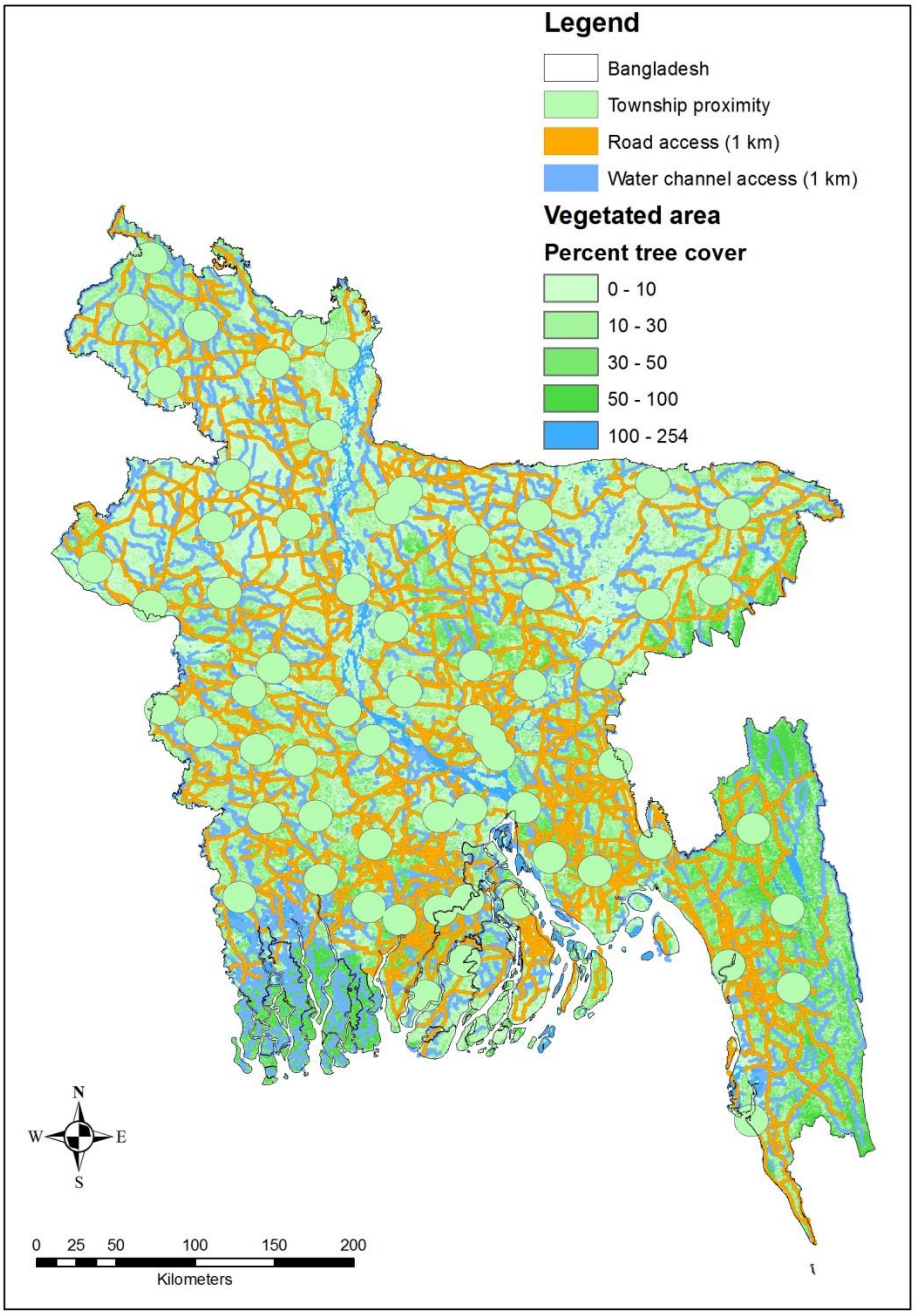
area. In the central Sal forest area, percent tree cover has gone down marginally, except for some patches that may have been affected by the social forestry practices in those areas. However the net primary productivity shows significant decrease across the area, indicative of degradation (Figure 15).

3.4 Population density and access to forested areas around roads and waterways

One km area on either side of the major roads and navigable waterways is considered very accessible for illegal loggers due to ease of movement and transportation of acquired logs. Although this access should also provide ease of patrolling and monitoring by FD officials, the lack of enforcement capacity provides considerable opportunity for illegal loggers.

Ten km around major townships is considered to be too far and so little occupied by the population residing in a given township. The analysis found that 72.65% of the area with more than 30 percent tree cover is away from major townships and 1km buffer of the roads. Further, population density (in 2015) was negatively correlated ($r = -0.38$) with percent tree cover, meaning that more populated areas have lower tree cover. For areas with 30% tree cover, the population density within 20 km of the forested area is less than 80 people/ha overall, except Sal forests of the central region (Figure 16).

Figure 14: Access through road and water channel network and proximity of vegetated area



4 The drivers of forest change

This section is divided into three parts; a literature review of past work on drivers of forest change in Bangladesh; the results of the workshops and interviews done by the project team; and a final section on an analysis of drivers that resulted from the data collected and the ranking of drivers.

4.1 Literature review

It is important to note that the impact of the individual drivers acting at a global to local scale can change over time. For example, forests in a country with internal political unrest are unlikely to be under the influence of the same drivers as the forests in a more stable country. Similarly, as technology changes, the impact of drivers will also change in time and over space. So, what we see now on the landscape is the sum total of effects of past and present drivers, which have acted at various times and at multiple scales.

The basic model of drivers that is discussed in published works assesses factors that result in the indirect drivers. These key factors are economic, demographic, technological, cultural, and socio-political (Geist and Lambin 2002), some of which are global, while others only act regionally or nationally. These factors each produce a suite of indirect drivers, and for Asia these are generally as follows, for both deforestation and degradation (Zurek et al., n.d., unpubl.):

1. Economic drivers
    - Demand for agricultural products (national and international deforestation driver)
    - Demand for timber products
    - Poverty
    - Land speculation
2. Demographic drivers
    - Population growth (all countries)
    - Population migration
3. Socio-political drivers (i.e., governance)
    - Weak governance systems

- ◦ Weak and uncertain land tenure
- ◦ Competing policies (cross-sectoral)
- ◦ No incentives for sustainable forest management for protection of forest areas
- ◦ Corruption
- ◦ Poor or no land-use planning
- ◦ Uncertain land tenure

4. Science and technology drivers
    - ◦ Poor logging practices
5. Cultural and religious drivers
    - ◦ No value given to forests

Direct drivers are those that act at a local scale, as people react to the influences of the indirect, or higher level drivers. Common direct drivers of forest change in Asia include the following (for both degradation and deforestation, unless specified): agriculture both commercial and subsistence (deforestation), logging (large scale commercial and illegal), fuelwood consumption, infrastructure development including road building, mining (deforestation), hydro power development (impoundments - deforestation), forest fires, urbanization and settlements (deforestation), collection of non-timber forest products, and land for military camps (deforestation) (Zurek et al. n.d., unpub).

Kissinger et al. (2012) distinguished the drivers of degradation and those of deforestation. They listed the following common direct deforestation drivers: commercial agriculture - cropland, pasture and tree plantations; subsistence agriculture including shifting cultivation; mining; infrastructure including roads, railroads, pipelines, hydroelectric dams, and urban expansion. They estimated that agriculture is the main driver for about 80% of deforestation at a global scale. For drivers of degradation these authors included: logging for both commercial and subsistence use and including legal and illegal logging, uncontrolled fires, livestock grazing in forest, and fuelwood/charcoal for both domestic and local markets. Timber extraction and logging activities account for more than 70% of total degradation in Latin America and tropical and subtropical Asia. The main indirect drivers, they felt, influence both deforestation and degradation, and include: international (markets, commodity prices), national (population growth, domestic markets, national policies, and governance), local circumstances (subsistence, poverty), weak forest sector governance and

institutions, lack of cross-sectoral coordination, and illegal activity (related to weak enforcement). They found that, most commonly, countries have largely defined strategies and interventions to deal with national and local scale drivers, but faced problems trying to address international drivers, and they acknowledged that international pressures will continue to increase.

4.1.1 Drivers of forest change in Bangladesh from published sources

In Bangladesh, there have been several studies of local and national causes of deforestation and degradation (Appendix 1). Many of these studies used a local interview technique and robust analysis to determine drivers, other studies were based on local observation, while a relative few were review papers. We have tabulated these to look for commonalities and present these results as a ranked set of drivers for each forest type, and generally for Bangladesh (Appendix 2). Most authors indicated that the indirect drivers of deforestation and degradation were the same for each of the forest types. On the other hand, there were distinct differences within forest types of the direct drivers between deforestation and degradation. Some published studies only reported direct drivers but none, however, looked beyond the borders of Bangladesh to consider the broader economic factors or other global drivers that have an impact at the national level from outside the country. For example, although shrimp farming is a major driver of deforestation in Coastal mangrove forests, no one made the link to global demand for seafood products and the resulting huge amount of exports to Europe and the USA from Bangladesh, in an industry that employs more than a million people in the country. Similarly, the global demand for particular tropical tree species of high-valued wood has led to forest degradation almost universally across the tropics, including the endangerment or outright extirpation of valuable tree species. In the latter case, one exception was from Rahman et al. (2012) who discussed species impoverishment in the Hill tracts forests.

Table 2: Ranked summary of main drivers from published studies

(see Appendix 2 for each study results) by forest types in Bangladesh. The rank is the total number of times, from most (1) to least (in >2 studies), that a driver was mentioned among the studies. Bracketed number is the rank and tied drivers were assigned the same rank.

Forest type	N	Effect	Indirect drivers	Direct drivers
Sundarbans	8	Deforestation	Poor management/policy (1)	Illegal logging (1)
			Overpopulation (2)	
			Poverty (2)	
			Lack of land use plan (2)	
			Corruption (2)	
	7	Degradation	Poor management/policy (1)	Increasing salinity (1)
			Overpopulation (1)	Legal and illegal logging (2)
			Poverty (1)	Pollution (2)
			Lack of land use plan (1)	Diseases (3)
			Agriculture (2)	
			Shrimp farms (2)	
Sal Forest	8	Deforestation	Poor management/policy (1)	Industrial encroachment (1)
			Overpopulation (2)	Agriculture (2)
			Poverty (2)	Militarisation (3)
			Unemployment (2)	Industrial fuelwood harvesting (3)
			Lack of available land (2)	
	8	Degradation	Poor management/policy (1)	Plantations (1)
			Overpopulation (2)	Fuelwood harvest (2)
			Poverty (2)	Illegal logging (2)
			Unemployment (3)	Encroachment (2)
			Lack of land (3)	
Hill forests	10	Deforestation	Overpopulation (1)	Agriculture/shifting cultivation (1)
			Unclear land tenure (2)	Legal and illegal logging (2)
			Poor management/policy (3)	Fire (3)
			Lack of land (4)	Impoundments (3)
			Poor technology (5)	
			Poverty (5)	
			Migration to area (5)	
	10	Degradation	Overpopulation (1)	Legal and illegal logging
			Migration to area (1)	
			Poverty (1)	
			Uncertain land tenure (1)	

Coastal forest*	4	Deforestation	Climate change	Failed plantation
			Cyclones	Erosion
			Increased salinity	Sea level rise
			Technical knowledge	Shrimp farming
			Overpopulation	Polders for rice
			Demand for seafood	Illegal harvest
			Demand for food	
			Unclear land tenure	
	2	Degradation	Overpopulation	Pollution,
			Unclear land tenure	Illegal harvest
General studies in Bangladesh	7	Deforestation	Ineffective governance/policy (1)	Industrialisation (1)
			Overpopulation (2)	Agriculture/shifting cultivation (2)
			Poverty (2)	Legal and Illegal logging (3)
			Corruption (2)	Militarisation (4)
			Lack of land (3)	Fire (4)
			Lack of land use planning (3)	Encroachment (4)
		Degradation	Poverty (1)	Legal and illegal harvesting (1)
			Ineffective governance/policy (2)	Plantation (2)
			Lack of land use plan (2)	Fuelwood harvesting (3)
			Overpopulation (2)	
			Lack of land (2)	

* Few published studies are available for coastal forests.

Sundarbans: The main indirect driver of both deforestation and degradation, as identified among studies, was poor governance (management) and policies, leading to deforestation from both excessive and illegal logging, and encroachment (or land-grabbing), and to forest degradation from increased salination (reduced freshwater flow)and pollution from shrimp farms and farms outside the Sundarbans, and illegal logging (Table 2).

Sal Forest: As was the case for the Sundarbans, weak governance (management) was identified as the main indirect driver leading to deforestation from industrial encroachment and agriculture, and degradation from plantations, illegal logging, and fuelwood harvesting in Sal forests (Table 2).

Hill forests: The key indirect driver of deforestation was identified as overpopulation followed by unclear land tenure, resulting in excessive agricultural clearing, including shifting cultivation (or jhum). For forest degradation, the main indirect drivers were

overpopulation, migration to the area (contributing to overpopulation), poverty, and unclear land tenure, which led to degradation from both legal and illegal logging (Table 2). Overpopulation of the area was in part the result of government policy that encouraged people to settle area, resulting in a population increase from 26,000 to 119,000 (Thapa and Rasul 2006).

Coastal forests: These forests were insufficiently studied for a clear result, but several drivers including illegal harvesting, climate change, shrimp farming, and increasing salinity have resulted in deforestation often followed by erosion from sea level rise (Table 2). The main indirect drivers appear to be overpopulation and unclear land tenure. Little discussion of forest degradation was found in the published materials for this forest type, although Miah et al. (2010) noted pollution of coastal waters from run-off in shrimp and crop farms and illegal harvesting of trees. Islam (2006) was one of the few authors who noted that cattle grazing on reforested lands is a cause of low natural regeneration and degradation.

4.1.2 Pathways of action of drivers from literature

Coastal forests are treated similarly to the Sundarbans, unless noted, owing to limited studies of drivers available. The literature review (Tables 2, Appendix 2) revealed the following common main indirect drivers of deforestation and forest degradation across all forest types:

- Ineffective governance and poor policy decisions
- Overpopulation
- Poverty

A second set of indirect drivers were common but absent in at least one forest type:

- Corruption
- Lack of land-use planning
- Uncertain land tenure

Corruption, lack of land-use planning, and uncertain land tenure are strongly tied to governance issues and can be pooled with the suite of issues related to governance failures, which also include insufficient funding to the Forest Department to be an effective organisation, poor policy decisions, lack of cross-sectoral (inter-agency) communication and planning, and top-down management (vs. a more inclusive management policy).

Nevertheless, each of these governance issues can result in different direct drivers that require different policies, actions, or measures (PAMs) to deal with and so they need to be considered separately.

The pathways identified in published studies suggested some common indirect drivers leading to a suite of direct drivers affecting all forest types (Table3, Figure 17). In particular, the key factor resulting in various indirect drivers is the multi-facetted effects of poor governance. This leads to three main common indirect drivers including corruption, lack of land-use planning, and unclear land tenure. Other important indirect drivers included poverty and overpopulation. These five indirect drivers, in turn, result together in four main direct drivers that are common to all forest types including fuelwood harvesting, illegal logging, subsistence land clearing/shifting cultivation, and industrial or non-industrial encroachment (Figure 17). These common direct drivers affected deforestation (via fuelwood harvesting, illegal logging, and subsistence land clearing/shifting cultivation), and degradation (via fuelwood harvesting and illegal logging).

4.2 Discussion of results from the literature survey

The literature review suggested that the main indirect drivers were the same for deforestation and degradation, as were also some of the major direct drivers, and that these indirect and direct drivers were common to all forest types. There were, however, distinct indirect and direct drivers that differed among the forest types. The pathways of causation of forest decline in Bangladesh are closely related to poverty, overpopulation, and an inability to govern natural resources in a properly planned manner. In fact, all of these indirect drivers are related, to a certain extent, with overpopulation resulting in extreme poverty, leading to a low tax base for government revenues and government inattention to natural resource management, with priority instead given to trying to develop industries to create jobs. Some authors pointed out the fallacy of this approach to governance because it assigns a low value to natural resources and assigns no value most ecosystem services from forests (e.g., Shin et al. 2008). Overpopulation and poverty result in pressures on the forests as people seek the very ecosystem services that are so undervalued by government, including clean water, fuelwood, shelter, and food and wood products for subsistence and cash sales. Lack of alternatives to forest dependency for livelihoods has further aggravated

deforestation and degradation. With a lack of clear land tenure in much of the forested areas, people are ungoverned and occupy the land, and this a main reason for the failure of logging bans and the protected areas program in protecting forests and biodiversity (FAO 2008, Sarker et al. 2011). Hence, forest governance needs to recognize the importance of inter-departmental cooperation, land-use planning, the value of ecosystem services, and clear land tenure systems in order to avoid forest change, while at the same time developing a proper sustainable forest management system and not tolerating corruption within (Ahmed 2008, Shin et al. 2008, Choudhury and Hossain 2011, Miah et al. 2011a, Sarker et al. 2011). Additionally, in terms of land tenure, women do not generally have ownership over land (International Labour Organization 2014)and they are often not given enough formal control over land even though they access and use many products (firewood, non-timber forest products). In essence, they take on the same roles as men, but are not formally accepted and do not receive formal recognition. This in turn, can act as a barrier to conservation or reforestation (UN-REDD Programme 2015).

Local communities and indigenous groups, especially women and youth within them, can be an informative source of knowledge in identifying drivers of deforestation and forest degradation around their communities, as well as a resource in identifying corresponding possible solutions. For example, women's practices, such as traditional agroforestry systems and tree planting can help identify barriers to sustainable management of forests or reforestation. Understanding the varying roles played by men and women can enable a more accurate analysis of the problem — who is driving deforestation, why, where and how — and also help identify potential solutions. This can help formulate governance interventions that are applicable and relevant at both national and local levels (UN-REDD Programme 2015).

Although the Forest Department is supposed to work with a long-term vision, such a vision cannot be maintained, mostly due to a severe lack of funds and sufficient personnel. However, where external funding has been made available for projects, such as plantations, the Department has functioned well (Choudhury and Hossain 2011; but see Shin et al. 2008 for an opposite opinion).

The role of the Forest Department has been well-established to:

1. Conduct multi-dimensional resource management viz., forest resource development and management, conservation and management of biodiversity and watersheds;

2. Protection and management of forests and wildlife wealth of the country couples with enforcement of various acts, ordinances, rules and regulations pertaining to forest management;
3. Sustainable management of forests to facilitate meeting basic needs of present and future generations (e.g., the new FMP (GoB 2016) suggests that demand for roundwood will grow from 8.6 million m^3/yr to 10.6 million m^3/yr in 2050);
4. Poverty alleviation through creation of forest-based employment and ecological role of the country;
5. Maintenance of natural habitat for biodiversity conservation; enrichment and rehabilitation of degraded forest land;
6. Participatory forest management, horizontal expansion of tree cover with fast growing and high yielding variety of species through people-oriented forestry programme in state-owned fringe, marginal, sub-marginal and newly accreted land and khas land including Un-classed State Forest (USF) land;
7. Realization of revenue, preparation of budget, auditing, accounting, etc.;
8. Encouragement and assistance in afforestation activities in public and private sector;
9. Provide technical advice and support to plant trees and practice agroforestry;
10. Fulfillment of national obligations towards the international efforts to control warming and desertification, prevent loss of biodiversity, and for other forestry related international treaties, protocols, and conventions endorsed by the government;
11. Rehabilitation of degraded forest land and watersheds through people's participation.

Maintaining this role, however, requires funding and staff, and as noted in the literature, both of which are currently inadequate. Since only 2010, total Forest Department staff has fallen by more than 5000 (29%), such that now each ranger patrols a very large area of forest. A much more appropriate staffing level and with increased capacity-building is required for the Department to function properly.

4.2.1 Indirect drivers

The literature distinguished six common indirect drivers (Figure 17, Table 3) and several other drivers that acted more locally, with respect to the forest types. The literature

for Bangladesh, however, does not think globally with respect to economic, social, or technological factors (see Table 3), including shifts in global demand for products or technologies that alter needs and wants for different products.

Governance: The most commonly mentioned indirect driver was ineffective governance, which captures many related variables including poor policies, lack of cross-sectoral cooperation in decision-making, poor land use planning, inability to manage forest resources, corruption, ineffective enforcement, over-whelmed judiciary, and unclear land tenure. Among these aspects of governance, corruption due to low salaries, the inability to manage forests in part owing to insufficient budget and capacity, lack of land-use planning, and unclear land tenure were the most common governance issues reported to be affecting all forests and acting through various direct drivers for deforestation and forest degradation.

Corruption is a pervasive problem throughout most developing countries. Corruption can take two forms, either direct monetary payments, or political influence over decisions or actions that are contrary to law or policy. It is a particularly negative aspect to governance because it results in a lack of respect for all governing officials and civil servants, regardless of whether they are corrupt or not. It indicates a lack of professionalism by those who practice it, makes land-planning essentially futile, and is actually beneficial to only a relatively small number wealthy individuals. Numerous authors have suggested that corruption is rampant in Bangladesh, including within the Forest Department, and has resulted in substantial deforestation (Sajjaduzzaman et al. 2005, Ahmed 2008, Islam and Sato 2011).The Forest Department is FD is maintained by rather poorly paid staff, insufficient budgets, is short-staffed, and lacks staff training facilities and budgets (Islam and Sato 2011), as a result supplementing low incomes by being corrupt is a matter of improving one's own lot and extremely tempting for those in a position to take advantage of it. A recent survey in Southeast Asia indicated an attitude that is culturally ingrained, even in young people, towards corruption: "…if I don't then someone else will" (ASEAN Focus magazine, 2016).

Forest and other land management policies and the lack of cross-sectoral coordination in policy development have had large negative effects on forest change (Ahmed 2008, Islam and Sato 2011, Hossain 2011). The Poverty Reduction Strategy Papers for Bangladesh (e.g., Gov. of Bangladesh 2011) have primarily focussed on economic

development and income generation activities, but the issue of the empowering rural community efforts for forest resources management has received little active attention as a poverty alleviation strategy (Nandy and Islam 2010), despite the clear policy direction given in these poverty strategies (Gov. Bangladesh 2011). The poverty reduction strategy from 2011 noted that the widespread destruction of forests, clearing of forest land for agriculture and homesteads, etc., would seriously impede achieving the target for 20 percent forest cover by the end of 2015 (Gov. Bangladesh 2011), which was clearly the result based on data from 2014 that showed a further decline in forest cover (see Figure 6). The government has apparently been unable to institute sustainable forest management, according to many of the published studies, including the lack of an implemented criteria and indicators framework. Further, the lack of specialised staff, such as marine and freshwater ecologists for mangrove forests, severely limits the technical capacity required to effectively manage the forests (Miah et al. 2010). Insufficient application of forest management policy and technical knowledge is coupled with an inadequate budget allocated to the Forest Department, resulting in not enough staff and an inability to implement sustainable forest management, despite the good policies in place. Nevertheless, top-down rather than inclusive forest management planning has led to forest plan implementation problems and local resentment (Sarker et al. 2011). For example, while a Tree Farming Fund (TFF) was established to provide a sustainable revenue stream for community forestry projects, program implementation faced roadblocks that stemmed from a top-down bureaucratic approach and poor governance system (Jashimudden and Inoue 2012). Sarker et al. (2011) pointed out that logging bans have been implemented into a policy vacuum that, with forethought, might have enabled response to the resultant social effects. While there have been some very successful policies instituted in recent years (Hossain et al. 2008), with improvements to certain forests, such as in coastal forests, where highly successful plantations have been established (Siddiqui and Khan 2004), overall forest decline continues owing to many governance issues, including ineffective policies and laws and inadequate enforcement (Muzaffar et al. 2011). For example, the now >20 year old Forest Policy to bring 20% of Bangladesh under forest cover has not been achieved, and is still mentioned as a target in poverty alleviation strategy papers and is still included in the new Master Plan and revised Forest Policy. Lack of achievement over this long period, however, suggests that the policy is ineffectual in the absence of specific investment.

The lack of cross-department sectoral consultation is a long-standing and serious problem affecting forest conservation in Bangladesh. Many government policies, such as past population relocations, establishment of military bases, and road placement, implemented without consultation with forestry officials, have had a tremendous impact on forest area. In the case of the Hill Districts, for example, the influx of people under government relocation policy has resulted in increased jhum cultivation, which has substantially reduced forest area and led to reduced ecosystem services (Rahman et al. 2012). Numerous development projects have proceeded with little or no discussion of the impacts on forests between departments (Ahmed 2008), including dams in the Hill forest area, roads in Sal forests, military installations, and projects that have reduced downstream water flows or resulted in pollution into the Sundarbans, with the consequent increased salinity and impacts on those forests (Choudhury and Hossain 2011). As a result, in the latter case, UNESCO is poised to place the World Heritage Sundarbans Protected Area on its 'most endangered sites' list.

The lack of proper land-use planning was cited by numerous authors as a major indirect governance driver leading to poor land management, with resultant forest loss and degradation (Hossain et al. 2008, Rahman et al. 2010, Sarker et al. 2011, Gov. Bangladesh 2011).This driver is closely related to,and exacerbated by unclear land tenure. Inadequate and improper land records increase difficulties in securing land tenure and land transfer. Thus, an inappropriate land administration and management system is the root cause for unplanned growth, and this eventually generates problems in development of the country (Hossain 2015). At present, the responsible ministries (Lands, and Law, Justice and Parliamentary Affairs) and agencies involved for land management and administration work independently with little coordination among them, and even less cooperation or consultation with the Forest Department. As a result, unplanned agricultural conversion, shrimp-farming, and industrial encroachment on forest areas result in deforestation (Rahman et al. 2010, Hossain 2015). Some development projects, such as "Capacity Building and Resource Mobilization for Sustainable Land Management" and a "survey of land rights", are helping but there is a need for national digital, GPS located and mapped property records base for a proper land information system. Land-use planning systems with zoning need to be implemented effectively to alleviate the inevitable continuing pressure on forests as the population continues to grow. Zonation ensures that the best use is made of

any given tract of land, assuming proper enforcement. Even with high population, clear land tenure and zonation can reduce impacts on forests (Shin et al. 2008), for example by zoning productive forests for commercial forestry, other ecosystem services and conservation, and limiting roads, agriculture and industrial expansion to appropriate lands.

Overpopulation: The very high population and low ratio of land to people remains a critical indirect driver of unsustainable forest resources use in Bangladesh, and has been recognized by the Government and numerous authors (Government of Bangladesh 2012). Overpopulation is manifested in extreme poverty, unsustainable resource use, subsistence living, lack of education, and illegal activities, among a host of other social problems related to government services. Past migration policies to alleviate overpopulation in some places, by encouraging people to move to less-populated regions, have resulted in severe damage to the forest ecosystems in the Chittagong and Hill Tracts region (Biswas et al. 2012). However, as noted above, clear land tenure would likely have prevented some of the damage to forests and deforestation that has occurred as a result (Shin et al. 2008).

Poverty: Poverty is manifested in the same ways that is overpopulation. Illiteracy limits the options for poor people because they lack the fundamental tools required to pursue other economic alternatives to subsistence living. And because of their socially prescribed roles and norms, women in Bangladesh are particularly vulnerable to living in poverty. They face large inequalities in the labour market, decision making processes, education and health as well as have limited access to control over resources, such as land and finances (Asian Development Bank 2004). Very poor people, in the absence of any possibility for education and alternate livelihoods, move to forested areas to live a subsistence lifestyle, all the while continuing to degrade the very resources they moved there to obtain. Millions of Bangladeshis are dependent directly on forests for their survival, for foods, fuelwood, and as a source for cash for trees illegally cut (e.g., Hossain et al. 2013). Regardless, numerous people living in forests still cannot meet their nutritional requirements (Islam and Sato 2012).

Global demand for timber, seafood, and agricultural products: These drivers were not specifically mentioned in any of the literature, but clearly underpin much of the demand for forest products, excessive or unwise use of forests leading to forest change, and forest land clearance. Therefore, they are discussed here.

The export value of agricultural goods from Bangladesh exceeds $3.5 billion annually (MIT/OEC 2016) and for shrimp alone is>$340 million. Demand for commercial food production globally, especially for seafood (shrimp) and specific agricultural products (jute, tobacco), has resulted in deforestation and degradation, especially in Sal forests, Coastal forests, and Sundarbans. Shrimp culture in the Sundarbans and Coastal forests has increased 8-foldin the past 20 years (Portley 2016), with a large area in total cleared for the farms. As the global and local population rises and with non-tariff exporting to many countries, especially the EU and the USA, the demand for shrimp will continue to grow.

There is also global demand for tropical wood products and the Bangladesh furniture industry exports about $50 million/year (Quamruzzaman 2014). Other wood products amount to another $35 million/year (World Bank 2016). These numbers may pale in comparison to other exports such as clothing, but nevertheless, the international demand for wood products is an indirect driver for excessive forest harvesting and for replacement of natural forests with plantations. Although oil palm is not considered a tree (e.g., by FAO), palm oil is a major Bangladesh export worth $1.01 billion in 2014 (MIT/OEC 2016) and is often planted on formerly forested areas.

4.2.2 Direct drivers:

The main direct drivers in Bangladesh, common among all forest, areas were over-harvesting of the forests (legal and illegal), fuelwood harvesting, subsistence and commercial agriculture (including shifting cultivation in Hill forests), and encroachment by industry and/or settlements. Up to 2006, an estimated 89,000 ha of forest lands have been encroached upon in different forest areas (Rahman 2011). Insufficient demarcation of the boundaries of national forests has made the situation worse. In addition, between 1971 and 2015 more than 20,000 ha of forestlands have been transferred to other agencies for non-forest purposes (Rahman 2011, MoEF, 2015). Other important direct drivers were more specific to forest types.

In Sal forests, the common indirect drivers of overpopulation, poverty, and poor governance discussed above are exacerbated by proximity to the largest city in the country, Dhaka. From Dhaka, moving to the forest for subsistence living is a readily available option for poor people and encroachment by both displaced people and industry are major direct

drivers in the decline of these forests in terms of direct loss, but also as a result of accidental wildfires (Islam and Sato 2012, Hossain et al. 2013). This is also an area of rich soils, where the increasing demand for agricultural and wood products have produced a large plantation sector, where forest conversion to *Eucalyptus, Acacia*, rubber tree, and other species is a common practice, and a large commercial agricultural sector where pineapple, banana, papaya, and other crops have replaced forests (e.g., Hossain et al. 2013). Large areas of sal forest have also been taken over by the military for bases, target ranges, and airfields (Iftekhar 2006, Ahmed 2008). All of these losses are expedited by corruption, lack of a land-use plan, and the inability of government to enforce existing laws, maintain protected areas, or to prosecute offenders (Ahmed 2008, Hossain et al. 2013, Rashid et al. 2013).

In Sundarbans and coastal forests, in addition to the main indirect drivers, a global demand for seafood products (local indirect driver) has resulted in deforestation for shrimp farming (direct driver in coastal), and outside the Sundarbans making it an indirect driver (Rahman et al. 2010). Although the area of mangroves has stabilised in the Sundarbans, past deforestation was significant and there continues to be degradation and loss of mangrove cover in other Coastal forests. The production of shrimp in Bangladesh has increased by a factor of eight from 1982 to 2014 (Portley 2016), resulting in forest damage to the Sundarbans and losses of coastal forests for shrimp-farms (Ahmed 2010). A main cause of mangrove decline in the Sundarbans and other coastal mangroves is salinity increase (Swapan and Gavin 2011) promoted by polder development and flood control projects in 1960s for shrimp and rice cultivation to the north (Hossain et al. 2015). This, in turn, led to the destruction of about 9,500 ha of mangrove forests (Azad et al. 2009) mostly in coastal forests, which has reduced production of forest products (Iftekhar and Islam 2004). Most polders were originally developed for rice farming, but many of these were converted to shrimp farms. Diseases have also affected the mangrove species of the Sundarbans, including 'top-dying' disease related to the increase in salinity from reduced freshwater flows (Choudhury and Hossain 2011), resulting in degradation through reduced canopy and stem density (e.g., Rahman et al. 2010).

Hill forests, like the Sal forests, have been greatly reduced in extent and quality by a large variety of anthropogenic drivers. As above, the common indirect drivers of overpopulation, poverty, and weak governance have acted in Hill forests through legal and illegal logging, fuelwood harvesting, encroachment for subsistence, and agriculture in the

form of shifting cultivation, that have both degraded and deforested the area (Figure 17) Specific to the Hill forests has been the impact of shifting cultivation that was practiced sustainably by local indigenous peoples for centuries, but since the 1980s, has become excessive relative to the available land base and soil conditions (Rahman et al. 2012). Aside from the direct deforestation losses to carbon in above ground biomass (trees, shrubs) and extensive soil erosion, excessive short-rotation shifting cultivation reduces carbon stocks in coarse and fine woody debris and increases carbon fluxes from soil and litter, limiting future recovery of ecosystem carbon through soil impoverishment (Eaton and Lawrence 2009). The change in shifting cultivation occurred as a result of an influx of people to the area under a government relocation policy, as well as migration of refugees from adjacent Myanmar (Iftekhar and Hoque 2005). In the absence of clear land tenure, the result of these migrations has been a competition for land and an increased area under cultivation, with the consequent loss of forest cover and a rotation period that has been reduced from >15 years to <4 years (Salam et al. 1999, Hossain 2011, Rahman et al. 2012). This is another area of the country where a forest disaster could have been averted if clear land tenure had been assigned, as pointed out by Thapa and Rasul (2006), who noted that the absence of tenure has been a major governance driver of deforestation and degradation. Past efforts to contain shifting cultivation have yielded encouraging results through rehabilitation of shifting cultivators in settled villages by awarding land for permanent cultivation, planting of trees as cash crop, and by providing community services in the settled villages. To date, these efforts do not solve the problem as a whole because they have occurred at a small scale. Another main direct driver of deforestation in the Hill forests has been flooding from dam construction (Thapa and Rasul 2006), for example the Kaptai dam that flooded 75 km^2 of forest at Rangamati (Ahmed 2008).

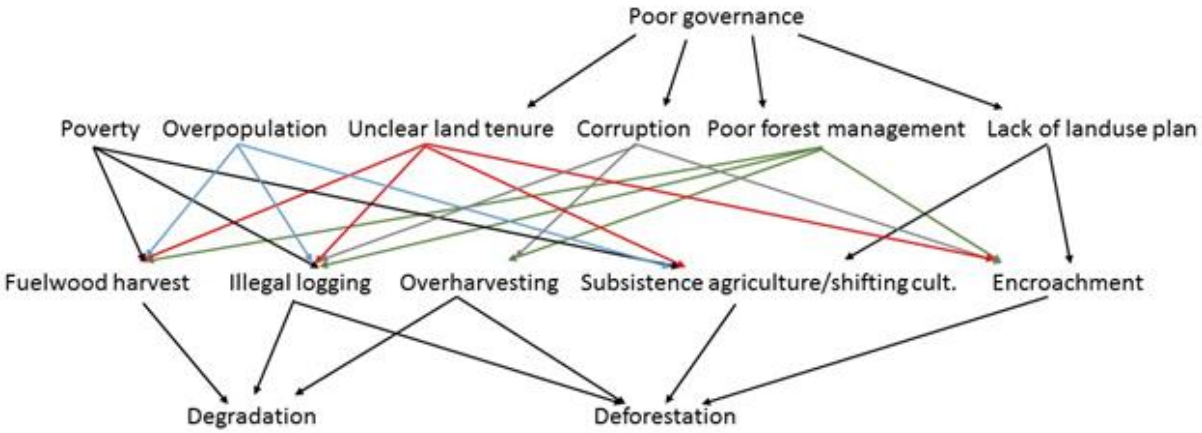
Table 3 : Summary of pathways from indirect to direct drivers related to forest types for drivers based on the literature reviewand with the addition of unrecognized economic and technological factors. The highest ranked indirect drivers from the published literature are shown in ***bold italics*****.**

Factors	Indirect drivers →	Direct drivers→	Deforestation or Degradation	Forest type affected

Economic	Demand for agricultural products	Agriculture	Deforestation	Sal, Hill
		Shifting cultivation	Deforestation	Hill
	Demand for seafood products	Legal and illegal shrimp farming (Sundarbans – indirect pollution effect)	Deforestation Degradation	Coastal. Sundarbans
	Demand for timber products	Legal and illegal timber harvest	Both	All
	Demand for cheap labour	Industrialisation	Both	Sal, Sundarbans
	Poverty	Fuelwood harvesting, illegal logging Subsistence land clearing	Both Deforestation	All
		Shifting cultivation, illegal logging	Deforestation	Hill
Demographic	***Population growth***	Subsistence land clearing, fuelwood collection, illegal logging	Both	All
	Migration	Shifting cultivation, illegal logging	Deforestation	Hill
	Lack of land	Encroachment	Deforestation	All
Governance	***Poor forest management***	Excessive harvesting, illegal harvesting, loss of high quality trees, plantations, lack of inclusive management, fire	Degradation	All
	Uncertain land tenure	Illegal harvesting, fuelwood collecting Encroachment, fire	Both Deforestation	All
		Shifting cultivation	Deforestation	Hill
	Lack of cross-sectoral cooperation	forest clearance, encroachment, militarisation, industrialisation	Deforestation	Sal
		Increasing salinity, pollution	Degradation	Sundarbans, Coastal
		Flooding impoundments, shifting cultivation	Deforestation	Hill
	Corruption	Illegal harvesting, encroachment	Both	All (especially Sal)
	Lack of land use planning	Encroachment, subsistence agriculture	Deforestation	All Hill

		Shifting cultivation, Militarisation, industrialisation	Deforestation	Sal
	Lack of enforcement	Illegal harvesting, encroachment	Both	All
Science and technology	Poor logging practices	Wastage of wood	Degradation	All
	Limited plantation options (species and locations)	Ineffectiveness of plantations (abandonment)	Degradation	All

Figure 15: Pathways of the key drivers common to all forest types from the literature survey. Weak governance was manifested in at least four ways: inability to assign land tenure, corruption (political interference or monetary), inability to properly manage forest resources, and inability to conclude and implement land use planning



4.3 Sample sizes for derivation of drivers of deforestation and degradation from workshops, interviews, focal groups – field study

Workshops were conducted in the forest districts and compiled by forest types. We administered a questionnaire (Appendix 1) to individual workshop participants and then held open discussion to develop an improved understanding of why they had indicated that certain drivers are important. These data were enhanced by interviews with key individuals who are knowledgeable about forests and through focal group discussions with local forest users. Reports from the individual workshops are in the Annex. Total sample exceeded 1000 people (Table 4)

Table 4: Sample sizes by forest types from workshops conducted for the field study.

Forest type	***Study Type***	***No. of study***	***Total Participants***
Hill forest	Questionnaire		194
	Key individual interview (KII)		53
	Open Discussion	4 Workshops	86
	Focal group (FGD)	6 FGDs	161
Sal Forest	Questionnaire		107
	KII		36
	Open Discussion	3 Workshops	43
	FGD	6 FGDs	152
Coastal Forest	Questionnaire		43
	KII		11
	Open Discussion	1 Workshop	45
	FGD	2 FGDs	60
Sundarbans mangrove Forest	Questionnaire		52
	KII		8
	Open Discussion	1 Workshop	16
	FGD	2 FGDs	50

4.4 Criteria and ranking of drivers

A key indirect driver is the 'demand for wood' but because this is universal, it is not included here as a driver *per se*, but rather it is reflected in all of the drivers related to forest change and especially for governance. Data on drivers (see Appendix 3 for a glossary of drivers used in this study) was compiled by forest type. A ranking of these drivers was achieved by combining the ranked data from the literature survey, the field study, and expert opinion from the project team, for each forest type. For the final ranking of drivers, a weight was assigned based on the perceived capacity of any kind of REDD+ program (as listed under the Cancun Accords) to mitigate the driver, its potential for a negative carbon effect, and its potential for a negative biodiversity effect, each weighted from 1 to 3. We tested the correlation among the data sources (literature, questionnaire, key person interviews, and focal group discussions) and found that, while many of the drivers were the same, there was no correlation among these data sets by rank importance ($r_s > 0.25$). Therefore, the data sets were all from different sample populations and a simple addition across the columns to obtain a standardized-to-1 ranking was done. The final ranks (Table 5 A-D) are transparent (i.e., derived ranks are shown) so that readers can clearly understand how the final results were achieved. There was a strong correlation between the drivers found in this study and the final rankings for all forest types ($Ps < 0.07$).

We used binary logistic regressions to look for relationships between the drivers and socio-economic variables that may have influenced the responses of participants, blocked by forest type. These data are used separately to assist a future REDD program as a constituency analysis.

Table 5. A to D. Final ranks of importance assigned to indirect and direct drivers of forest degradation and deforestation by four main forest types in Bangladesh, from workshops conducted as a part of the field study. Drivers with the same rank are tied. Effect on carbon and biodiversity were ranked as 1 (high) to 3 (low). Mitigation possibility through a REDD+ Programme was ranked as 1 (high) to 3 (low). 'Study' refers to this field study, where Q = results from the workshop questionnaire, KII = key person interviews, and FGD = focal group discussions. Data are presented for: (A) Sundarbans (B) Coastal (C) Hill and (D) Sal forest. See Appendix 3 for a glossary of drivers.

Table 5A. Direct and Indirect drivers of deforestation and forest degradation in the Sundarbans, Bangladesh

Driver	Literature rank	Study rank 1 (Q)	Study rank 2 (KII)	Study rank 3 (FGD)	Expert ranking	Effect on carbon	Effect on biodiversity	Ability to mitigate	Normalised ranks	Final rank
Indirect Deforestation										
Poverty	2	2	2	1	3	2	2	3	0.088	1
Poor forest management/policy[1]	1	5	5	5	3	1	1	1	0.114	2
Insufficient staff FD	5	5	1	5	1	2	2	1	0.114	2
Overpopulation	2	3	5	5	3	2	1	3	0.124	3
Corruption[2]	2	4	4	5	3	3	3	2	0.135	4
Land use planning	2	5	5	5	4	2	2	1	0.135	4
Climate change	5	5	3	5	4	2	1	3	0.145	5
Lack of education	5	5	5	2	5	3	2	1	0.145	5
Direct deforestation										
Illegaland excessive harvesting[3]	1	1	3	1	1	1	1	1	0.088	1
Fuelwood harvesting	2	5	1	5	3	1	1	2	0.147	2
Fire	5	2	2	5	4	1	2	2	0.169	3
Pollution	3	5	5	5	2	2	2	2	0.191	4
Increased salinity	4	5	5	5	3	2	2	3	0.191	4
Encroachment[4]	4	5	5	5	5	2	2	1	0.213	5

Indirect Degradation										
Reduced flows	2	1	1	5	1	2	2	2	0.103	1
Poor management/policy	1	3	2	5	4	1	1	1	0.116	2
Poverty	1	2	5	5	3	2	2	3	0.148	3
Agriculture	2	5	4	5	4	1	1	2	0.155	4
Landuse planning	1	5	5	5	3	2	2	1	0.155	4
Overpopulation	1	5	5	5	3	2	1	3	0.161	5
Corruption	1	5	3	5	3	3	3	2	0.161	5
Direct degradation										
Increased salinity	1	1	2	5	2	2	2	3	0.108	1
Illegal and excessive harvesting[5]	2	5	4	5	2	1	1	1	0.126	2
Natural disasters	5	4	4	1	3	2	2	3	0.144	3
Chemicals from shrimp farm and agriculture	5	5	1	5	4	2	1	2	0.15	4
Diseases	3	2	5	5	2	3	3	3	0.156	5
Fuelwood harvest	5	3	5	5	3	2	2	1	0.156	5
Pollution/siltation	5	4	3	5	3	2	2	3	0.162	6

Table 5B. Direct and Indirect drivers of deforestation and forest degradation in the Coastal Forest areas, Bangladesh

Driver	Literature rank	Study rank 1 (Q)	Study rank 2 (KII)	Study rank 3 (FGD)	Expert ranking	Effect on carbon	Effect on biodiversity	Ability to mitigate	Normalised ranks	Final rank
Indirect deforestation										
Overpopulation	5	1	1	1	1	1	1	3	0.074	1
Lack of education	5	5	2	3	2	3	2	1	0.122	2
Demand for seafood	1	5	5	5	3	1	1	3	0.127	3
Land tenure	2	4	3	5	3	3	3	1	0.127	3
Corruption	5	2	5	5	3	2	2	2	0.138	4
Poor enforcement	5	3	5	5	3	2	2	1	0.138	4
Poor forest policy	5	5	5	5	3	1	1	1	0.138	4
Poverty	5	5	4	2	3	2	2	3	0.138	4
Direct deforestation										
Illegaland excessive harvesting	2	1	1	1	4	1	1	1	0.081	1
Shrimp farming	1	5	2	5	2	1	1	2	0.128	2
Agriculture	3	3	2	5	3	1	1	2	0.134	3
Infrastructure (roads)	5	2	5	2	3	2	1	2	0.148	4
Fuelwood	5	5	3	5	2	1	1	1	0.154	5
Fire	4	4	5	5	4	1	1	2	0.174	6
Natural disasters	5	5	5	3	2	2	2	3	0.181	7
Indirect degradation										
Overpopulation	1	2	5	1	2	1	1	3	0.155	1
Poor management, laws policy	2	5	1	5	2	1	1	1	0.175	2
Lack of awareness/education	3	5	2	3	3	2	2	1	0.204	3
Poverty	5	3	3	2	3	2	2	3	0.223	4
Corruption	5	1	5	5	3	2	2	2	0.243	5
Direct degradation										

Illegaland excessive harvesting	1	1	1	1	4	1	1	1	0.1	1
Fuelwood harvesting	2	2	5	5	2	1	1	1	0.173	2
Natural disasters	5	5	5	2	1	2	2	3	0.227	3
Plantation	5	5	5	3	5	2	1	1	0.245	4
Pollution	3	5	5	5	3	2	2	3	0.255	5

Table 5C. Direct and Indirect drivers of deforestation and forest degradation in the Hill forest, Bangladesh

Drivers	Literature rank	Study rank 1 (Q)	Study rank 2 (KII)	Study rank 3 (FGD)	Expert ranking	Effect on carbon	Effect on biodiversity	Ability to mitigate	Normalised ranks	Final rank
Indirect deforestation										
Overpopulation	1	1	1	1	2	2	1	3	0.056	1
Poor forest management/policy	3	3	2	5	2	1	1	1	0.089	2
Corruption	5	2	3	2	3	2	2	2	0.098	3
Poverty	5	5	4	1	3	2	2	2	0.112	4
Unclear tenure	2	5	5	5	2	3	3	2	0.126	5
Poor enforcement	5	4	5	5	3	2	2	1	0.126	5
Insufficient manpower FD	5	5	5	4	3	2	2	1	0.126	5
Lack of land	4	5	5	5	4	1	1	3	0.131	6
Lack of education	5	5	5	3	5	3	2	1	0.136	7
Direct deforestation										
Agriculture/shifting cultivation	1	2	3	1	2	1	1	2	0.08	1
Illegal and excessive harvesting	2	1	2	2	2	2	2	1	0.086	2
Encroachment	5	5	1	5	2	2	2	1	0.141	3
Fuelwood harvest	5	3	5	4	4	2	2	1	0.16	4
Fires	3	5	5	3	3	3	3	2	0.166	5
Infrastructure (roads etc.)	5	4	4	5	4	2	1	2	0.166	5
Impoundments	4	5	5	5	3	1	2	3	0.202	6
Indirect Degradation										
Overpopulation	1	1	1	1	3	2	1	3	0.084	1
Unclear land tenure	1	4	5	2	2	2	2	1	0.123	2
Corruption	5	2	2	5	3	2	2	2	0.149	3
Poor management /policy and law	5	5	3	5	2	1	1	1	0.149	3
Migration	1	5	5	5	2	2	2	3	0.162	4

Poor enforcement	5	3	5	5	2	2	2	1	0.162	4
Poverty	1	6	4	5	3	2	2	3	0.169	5
Direct degradation										
Illegaland excessive harvesting	1	2	1	2	2	1	1	1	0.107	1
Fuelwood harvesting	5	1	2	5	2	1	1	1	0.175	2
Plantations	5	5	5	1	2	2	1	1	0.214	3
Fire	5	3	5	5	3	1	1	2	0.243	4
Cattle grazing	5	5	3	5	3	3	2	1	0.262	5

Table 5D. Direct and Indirect drivers of deforestation and forest degradation in the Sal forest, Bangladesh.

Driver	Literature rank	Study rank 1 (Q)	Study rank 2 (KII)	Study rank 3 (FGD)	Expert ranking	Effect on carbon	Effect on biodiversity	Ability to mitigate	Normalised ranks	Final rank
Indirect deforestation										
Poor forest management /policy	1	5	1	3	2	1	1	1	0.071	1
Overpopulation	2	1	5	4	2	2	1	3	0.095	2
Poverty/unemployment	2	5	2	2	2	2	2	3	0.095	2
Corruption	5	2	4	1	3	2	2	2	0.1	3
Lack of available land	2	5	5	5	3	1	1	3	0.118	4
Education on forest	5	5	3	5	3	2	2	1	0.123	5
Poor enforcement	5	3	5	5	2	3	3	1	0.128	6
Land tenure	5	4	5	5	2	3	3	1	0.133	7
Insufficient FD staff	5	5	3	5	4	3	2	2	0.137	8
Direct deforestation										
Industry /settlement encroachment	1	5	1	2	2	2	2	1	0.08	1
Agriculture	2	5	2	1	2	1	1	2	0.091	2
Illegal and excessive harvesting	5	1	3	4	3	1	1	1	0.109	3
Industrial fuelwood	3	5	5	3	2	1	1	1	0.12	4
Infrastructure (roads, etc.)	5	2	5	5	3	2	1	2	0.143	5
Fuelwood collection	5	3	4	5	4	2	2	1	0.149	6
Fire	5	4	5	5	3	1	1	2	0.149	6
Military bases	3	5	5	5	4	2	2	2	0.16	7
Indirect Degradation										
Overpopulation	2	1	1	2	2	2	1	3	0.093	1
Poor management /policy and law	1	5	2	3	2	1	1	1	0.107	2
Poverty/unemployment	2	3	5	5	2	2	2	3	0.160	3
Lack of land	2	5	5	5	2	1	1	3	0.160	3

Corruption	5	2	4	5	2	2	2	2	0.160	3
Direct Degradation										
Illegal and excessive harvesting	2	2	1	2	2	1	1	1	0.130	1
Encroachment	2	5	3	3	1	1	1	1	0.185	2
Fuelwood harvesting	2	1	2	4	2	2	3	1	0.185	3
Plantations	1	5	4	1	2	3	2	2	0.217	4
Infrastructure (roads)	5	3	5	5	3	2	1	2	0.283	5

[1] Poor policy, laws etc. refer to issues or rules that are perceived either as biased or having a negative effect on forests, including certain policies, insufficient budgets, and a generally low priority assigned to forest ecosystem services within government. In some cases, insufficient staff was singled out as a driver and is recorded separately. Most often this driver refers to the need for more cooperative and inclusive management of forests that involves local stakeholders.

[2] Corruption may be either actual payments made to conduct an otherwise illegal action, or political interference in an otherwise legal decision or action.

[3] Illegal and legal excessive (or over-harvesting) always occurred together as a driver, although the solution for each differs. From FD lands there is no legal harvesting permitted from natural forest.

[4] Encroachment is no longer a major driver in Sundarbans, but was historically reported as past important in the literature study.

[5] Specifically includes wood for brick mills in Sundarbans (and probably elsewhere as well, but was specifically mentioned in Sundarbans).

Table 6: Global ranks for Bangladesh of all drivers from the field study for: A. deforestation and B. forest degradation.

Drivers with the same rank are tied. Effect on carbon and biodiversity were ranked as 1 (high) to 3 (low). Mitigation possibility through a REDD+ Programme was ranked as 1 (high) to 3 (low). Study refers to this study, where Q = results from the workshop questionnaire, KII = key person interviews, and FGD = focal group discussions. Vacant cells from the individual forest types for a given driver were scored as 6.

A. Indirect and direct drivers of deforestation in Bangladesh

Drivers	Literature rank	Study rank 1 (Q)	Study rank 2 (KII)	Study rank 3 (FGD)	Expert ranking	Effect on carbon	Effect on biodiversity	Ability to mitigate	Normalized total rank	Rank
Indirect drivers of deforestation										
Overpopulation	10	6	12	11	8	7	4	12	0.047	1
Poor management, laws, and policy	10	18	13	18	10	4	4	4	0.055	2
Poverty and unemployment	14	17	12	6	11	8	8	11	0.059	3
Corruption	17	10	16	13	12	9	9	8	0.064	4
Lack of education (awareness)	20	20	15	13	15	11	8	4	0.072	5
Insufficient FD staff	21	21	15	20	14	13	12	10	0.085	6
Unclear land tenure	15	19	19	21	13	15	15	10	0.086	7
Poor enforcement	21	16	21	21	14	13	13	9	0.087	8
Lack of land	19	22	22	20	20	16	15	16	0.101	9
Demand for food/seafood	19	23	23	23	21	19	19	21	0.114	10
Lack of landuse planning	20	23	23	23	22	20	20	19	0.115	11
Climate change	23	23	21	23	22	20	19	21	0.116	12
Drivers of direct deforestation										

Illegal and excessive harvesting	10	4	9	8	10	5	5	4	0.034	1
Infrastructure (roads, etc.)	16	13	15	14	12	8	5	7	0.056	2
Fuelwood collection	17	16	13	19	13	6	6	5	0.059	3
Agriculture	12	16	13	13	13	9	9	12	0.060	4
Fires (human-caused)	17	15	17	18	14	6	7	8	0.063	5
Encroachment (industry or settlement)	21	22	18	22	19	16	16	14	0.092	6
Shrimp farming	19	23	20	23	20	19	19	20	0.101	7
Pollution	21	23	23	23	20	20	20	20	0.106	8
Natural disasters	23	23	23	21	20	20	20	21	0.106	9
Impoundments	22	23	23	23	21	19	20	21	0.107	10
Military bases	21	23	23	23	22	20	20	20	0.107	11
Increased salinity	22	23	23	23	21	20	20	21	0.108	12

B: Indirect and direct drivers of forest degradation in Bangladesh

Driver	**Literature rank**	**Study rank 1 (Q)**	**Study rank 2 (KII)**	**Study rank 3 (FGD)**	**Expert ranking**	**Effect on carbon**	**Effect on biodiversity**	**Ability to mitigate**	**Normalized total rank**	**Rank**
Indirect driver of degradation										
Overpopulation	5	9	12	9	10	7	4	12	0.041	1
Poor management, laws, policy	9	18	8	18	10	4	4	4	0.045	2
Poverty and unemployment	9	14	17	17	11	8	8	12	0.058	3
Corruption	16	10	14	20	11	9	9	8	0.058	4
Reduced water flows	20	19	19	23	19	20	20	20	0.096	5
Unclear land tenure	19	22	23	20	20	20	20	19	0.098	6

Lack of education	21	23	20	21	21	20	20	19	0.099	7
Agriculture	20	23	22	23	22	19	19	20	0.101	8
Lack of land	20	23	23	23	20	19	19	21	0.101	9
Lack of landuse planning	19	23	23	23	21	20	20	19	0.101	10
Migration	19	23	23	23	20	20	20	21	0.101	11
Poor law enforcement	23	21	23	23	20	20	20	19	0.101	12
Direct drivers of degradation										
Fuelwood collection	14	7	14	19	9	6	7	4	0.051	1
Illegal and excessive harvesting	10	14	12	14	14	9	9	9	0.058	2
Plantation	17	21	20	11	15	13	10	10	0.075	3
Pollution and siltation	19	20	15	21	16	12	11	14	0.082	4
Natural disasters	22	21	21	15	16	16	16	18	0.093	5
Encroachment (industry or settlement)	20	23	21	21	19	19	19	19	0.103	6
Increased salinity	19	19	20	23	20	20	20	21	0.104	7
Fires (human-caused)	23	21	23	23	21	19	19	20	0.108	8
Diseases	21	20	23	23	20	21	21	21	0.109	9
Infrastructure (roads, etc.)	23	21	23	23	21	20	19	20	0.109	9
Cattle grazing	23	23	21	23	21	21	20	19	0.109	11

4.5 Drivers of forest change – field study

While some drivers ranked more highly than others (Tables 5A-D), it is important also to view the drivers as a suite of variables that are often inter-linked and acting together, even synergistically in many cases, to result in deforestation and forest degradation. As was the case from the literature study, most of the main indirect drivers of deforestation and forest degradation were the same, and were found in all forest types, and so represent the main national level drivers (Table 6 A and B, Table 2). These common key indirect drivers included poverty, overpopulation, and several issues related to governance including: insufficient forest staff, inadequate enforcement, inadequate policies or policies not followed, insufficient co-management of forests, and corruption (political interference and direct payments to people in authority). While most drivers were common to all forest types, there were some direct drivers that were specific to each of the forest types, as was also found from the literature review. Further, the relative importance of some drivers varied among the forest types (Tables 5A-D) and as compared to ranks from the literature review (Table 2). The GIS component study also found that there is a direct relationship between population density and deforestation in Hill Forests, and population density was related to degradation in all areas, reinforcing the importance of overpopulation as a key driver of forest change. A common driver that we encountered, which was only reported once in the literature review by Sunderland et al. (2011), was the lack of, and need for, better education of local people about forest values and ecosystem services. This indirect driver was noted for the Sundarbans, Sal, and Coastal forest types. This was a particularly interesting finding because it clearly suggests that the local people are interested in improving the management of their local forests and presumably understand that they are currently degrading the forests through their actions. Among the factors listed in section 4.1, no technology or cultural drivers were identified during the workshops. Nevertheless, it is important to recognize that the technologies for small and large scale harvesting, sawmilling, paper making, and forest management techniques have change markedly during the past decade. Importing such technologies to modernise forest management would reduce increase wood yields and by wasting less wood.

Among the three common main drivers was “Poor management, laws and policy”, also reported by all 35 published studies. This driver encompasses an assemblage of governance

issues, some directly related to the Forest Department and others more broadly reflective of government priorities towards forests. From the workshops and literature review, there is an apparent and long-standing *lack of priority* given by government to sustaining the many valuable (but non-valued) ecosystem services, which a huge number of people derive from forests in Bangladesh. This issue is visibly demonstrated by the lack of sufficient training available for staff on current management techniques and equipment, the small departmental budget making it difficult to enforce laws and implement policies, the inability of staff to travel within their forest districts, and the poor living conditions of many forest staff. Further, the current policy and laws (although under revision) do not well reflect contemporary thinking about forest management and monitoring, and these policies have been unable to address key issues such as land use planning and land tenure, both of which are essential to enable proper forest management.

Unclear land tenure was an especially important indirect governance driver in three of the forest types. Unclear tenure and land rights represents a tragedy of the commons where, if no one has clear title, then common access results in excessive harvesting, fuelwood collection, land-grabbing, and encroachment. Coupled with this issue, is that fact that women, in particular, face barriers in obtaining tenure and land rights in Bangladesh. Existing laws of inheritance, patriarchal values and social practices in Bangladesh are discriminate against women, and severely hinder women's right and access to resources, particularly to land and other fixed assets (Jinnah 2013; FAO 2017). In 2011, Bangladesh ranked 81 out of 83 non-OECD countries based on women's access to land, credit, non-land property, and inheritance practices (FAO 2017).This is turn not only makes women more disadvantaged and more vulnerable to poverty, it can also lessen their willingness and incentives for engaging in forest conservation and preservation efforts.

Another common governance driver was the lack of interdepartmental cooperation, which results in deforestation from poorly placed roads, military bases, railways, and other infrastructure as a result of no consultation with the forest managers. This driver also has downstream effects as a result of run-off from industry and agriculture, as well as reduced freshwater flows owing to international and national taking of water, all resulting in degradation of mangrove forests, particularly in the Sundarbans, despite having a restriction to allow industries within 10 km of its buffer area. Corruption is another commonly reported governance issue that was mentioned specifically at all workshops as a driver that affects the

ability of the Forest Department to function. Corruption was mentioned in some literature studies (Ahmed 2008, Miah et al. 2011, Sarker et al. 2011), but was emphasized far less compared to what was found in this study. Clearly not everyone is corrupt, but it only takes a few dishonest individuals to reflect poorly on politicians and the Forest Department as a whole. Finally, the need for better and more co-management of forests was stressed by many workshop participants and was also repeatedly mentioned in published studies of forest change in Bangladesh. Co-management was also stressed in several published studies, especially related to the Hill forests (e.g., Sarker et al. 2011). Among the governance drivers, the capacity of the Forest Department to function and improved co-management are areas that could be positively influenced by a REDD programme.

Overpopulation, poverty, lack of education, and widespread unemployment are closely related and were common indirect drivers. While a REDD programme can do little with respect to the problem of a high population, certain changes might be affected with respect to education and alternative lifestyles that could influence poverty to some extent. This is discussed further below in section 5.8. While basic education is a major issue influencing the capacity of poor people to advance, many workshop participants also suggested that the Forest Department could improve the forest extension services to help them understand forests and ecosystem services. In this was and as a part of co-management, local people would be better able to manage their local forest areas.

Drivers in Sundarbans: The Sundarbans area includes both the protected area and surrounding forested areas, although most of the discussion refers to the mangrove forests. The highest ranked indirect drivers were: poor forest management and policy application, insufficient Forest Department staff, and overpopulation (Table 5A).In addition to the common indirect drivers, reduced water flows as a result of upstream changes was indicated as an important driver of degradation of mangrove forests. The key drivers of deforestation were fuelwood harvesting, illegal and excessive tree felling, and anthropogenic fire. While encroachment was mentioned in the literature (Rahman et al. 2010), this driver appears to be no longer an issue for the Sundarbans and so it was deleted as a current diver. For degradation, key direct drivers were fuelwood harvesting, illegal and excessive harvesting, pollution (from upstream industry, ship traffic, as well as from shrimp farms and agriculture in the stream headwaters), increasing salinity (which is related to canopy thinning through

disease), reduced freshwater flows as result of water diversions, and natural disturbances (cyclone damage).

Drivers in Coastal forests: The main common indirect drivers also affected Coastal forests, along with demand for seafood and lack of education about forests (Table 5B). People attending the workshops expressed the need for better forest education to assist in better managing local forests. 'Unclear land tenure' was also found to be a key indirect governance-related driver for coastal forests. The direct drivers of deforestation include: shrimp farming, agriculture, fuelwood collection, illegal and excessive harvesting, infrastructure development, and natural disturbances (cyclones), with shrimp farming and illegal harvesting ranked highest. For degradation, the universally common indirect drivers were important, while the direct drivers included fuelwood harvest, illegal and excessive harvesting, pollution (mostly from shrimp farms), plantations, and natural disturbances, with wood removals ranked the highest.

Drivers in Hill forests: While the indirect drivers were mostly common to other areas, the direct drivers in Hill forests exhibited the least similarity to the drivers in the rest of the country (Table 5C). In particular, aside from the common direct drivers of illegal and excessive wood and fuelwood harvest, other drivers here included jhum agriculture (with some commercial agriculture such as tobacco and root crops), anthropogenic fire to clear land, and encroachment that drive deforestation directly. Tobacco farming is spreading in Hill forests with an increased demand for fuelwood for leaf curing. Fire and cattle-grazing are other important degradation drivers specific to the Hill forests. While jhum agriculture was not a major issue in the past when the population was relatively low and the rotation age was 25-25 years, the population is now so large that large areas have been cleared and the rotation age is now only a few years (Hossain et al. 2011). With respect to the suite of governance drivers for deforestation, in Hill forests these included the most variables recorded for any of the forest types, comprising: poor management and policies, corruption, enforcement, insufficient FD manpower, and unclear land tenure. Among those, unclear land tenure ranked highest, after overpopulation. The literature also mentioned impoundments as causing deforestation (e.g., Thaspa and Rasul 2006, Ahmed 2008), but this driver was not recorded in our study.

Drivers in Sal forests: Drivers in the sal forests (Table 5D) were the most complex of all the forest types, involving a large suite of variables. Again, the common indirect drivers, poverty, overpopulation and poor forest management, laws and policies, also affected sal forests. In addition to these, corruption and lack of available land ranked highly as indirect drivers of deforestation, while unclear land tenure, corruption and lack of education were indicated as other key indirect drivers of forest degradation. Loss of forest was importantly directly caused through encroachment by industry and settlements, agricultural conversion (both commercial and subsistence), and illegal and excessive harvesting. Industrial use of fuelwood was a driver of deforestation. Degradation is largely and directly driven by illegal and excessive harvesting, fuelwood collection, and encroachment. The GIS component study found that roads, in particular, were related to increasingly sparse forest closer to roads, with much denser forests several km away from the roads. In all, there were 14 direct drivers of forest change that ranked highly enough to be included in Table 5D, suggesting an extraordinary complexity among factors for Sal forests. Another driver in Sal forests, from literature but not in this study, was deforestation for military bases (Ahmed 2008), although this was a driver recorded in this study but for the Hill forests.

In summary, the main national drivers of forest change are poverty, overpopulation, lack of education and awareness of forest values and management, and many aspects of poor governance. National direct drivers of deforestation are: illegal and excessive harvesting, fuelwood harvesting, agriculture, and anthropogenic fires. National direct drivers of degradation are illegal and excessive harvesting, fuelwood harvesting, plantation forestry, and encroachment (but not in Sundarbans), while pollution and natural disasters specifically affect mangrove forest areas (i.e., Sundarbans and Coastal forests).

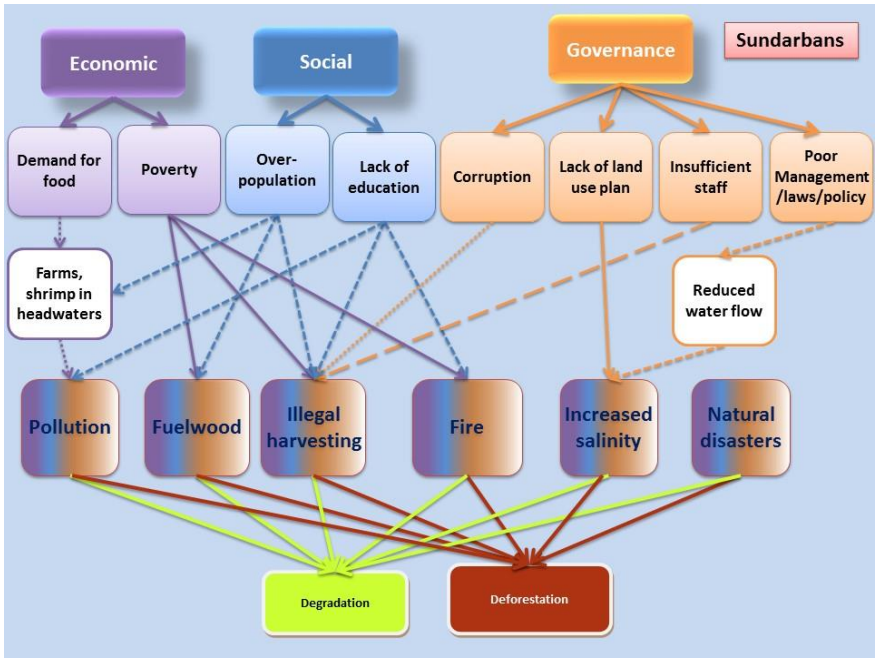
4.6 Driver pathways – field study

For REDD+ to proceed, it is important to understand linkages among indirect and direct drivers, in order to begin to assess the most effective areas at which to apply the programme. For this reason, driver pathway charts were developed for each set of drivers by forest type (Figure18 A-D). The key indirect factors are economic, related to demand for forest and food products and the need for employment and resources by poor people, the

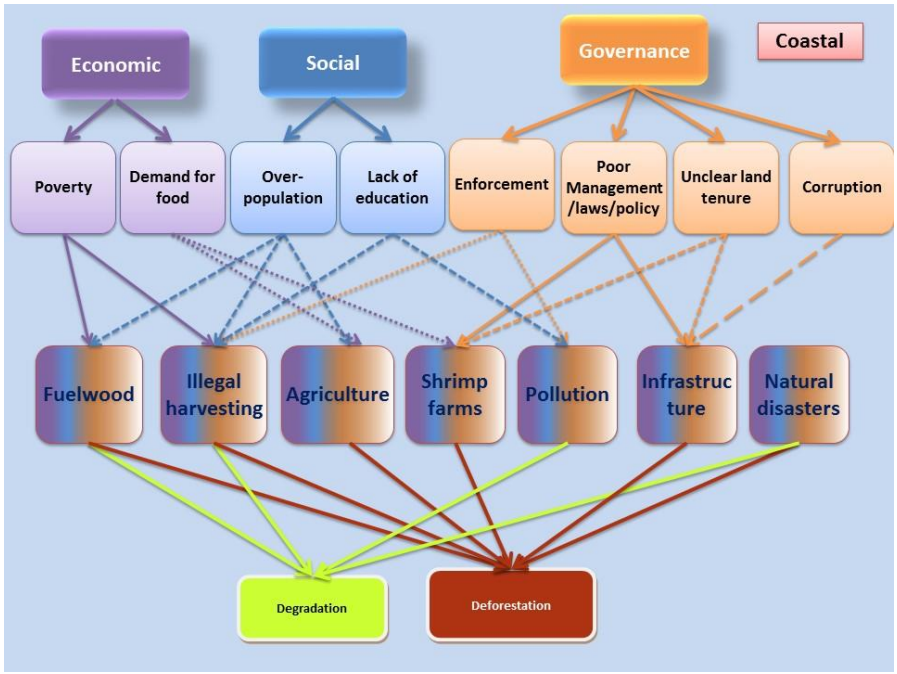
social issues of overpopulation and lack of education, and governance issues that have been discussed at length throughout this report. There was rarely a direct one-to-one linkage between indirect and direct drivers, and in most cases, several indirect drivers affect the magnitude of each direct driver. The common indirect drivers of overpopulation and poverty/unemployment are directly linked to the direct drivers of fuelwood harvesting, illegal and excessive timber harvesting, agricultural clearing, and forest encroachment through settlements. These drivers are as a result of the large number of poor people living in forests where they make a subsistence living, but also as a result of encroachment by industry and settlers, with the resultant land-grabbing in the absence of a land tenure system in many cases. These drivers are responsible, in part, for both forest degradation and deforestation.

Figure 16 A to D. Driver pathways for forest change by forest types for deforestation and forest degradation (A) Sundarbans (B) Coastal (C) Hill (D) Sal forest

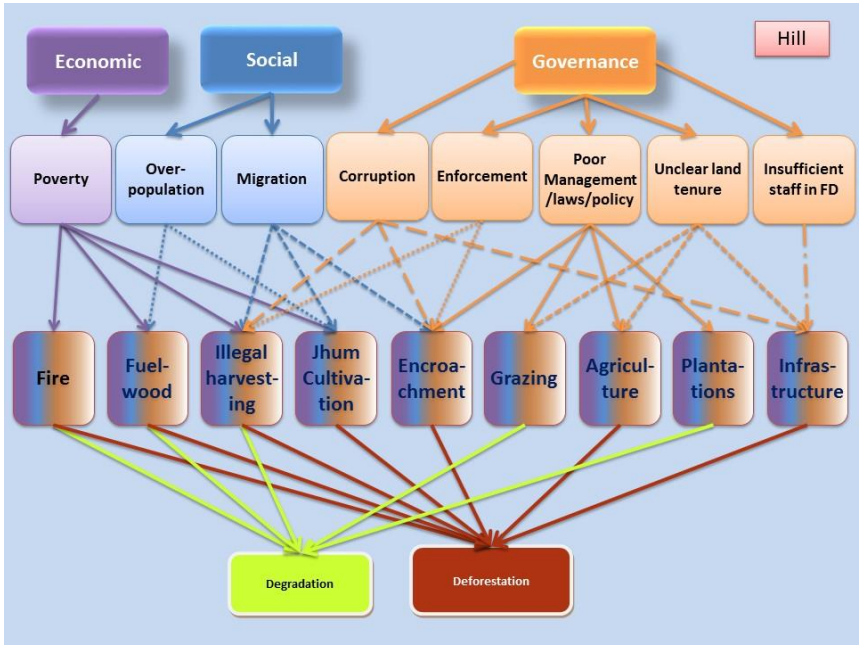
Figure 18 A. Sundarbans forests



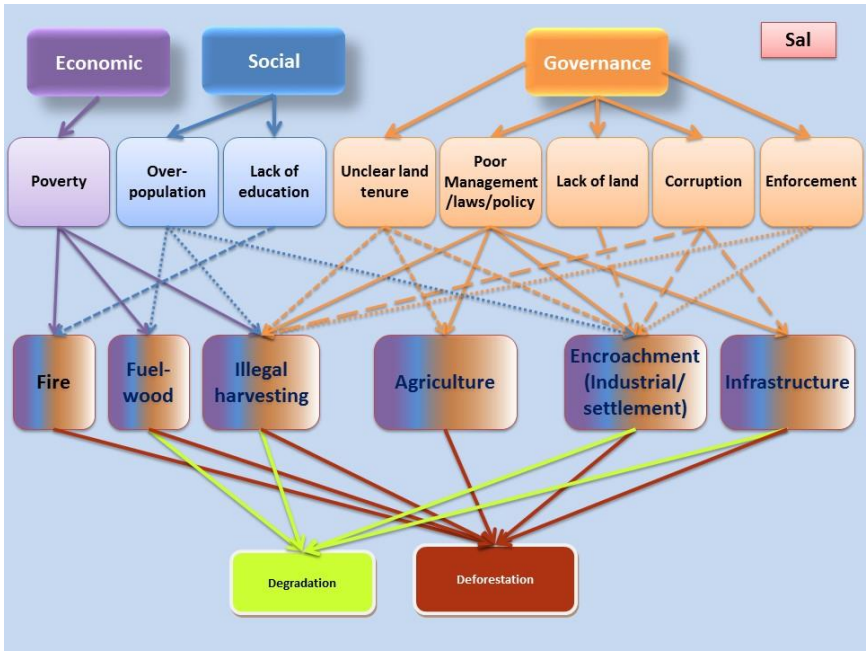
B. Coastal forests



C. Hill forests



D. Sal Forest


Economic
Social
Governance
Sal
Poverty
Over-population
Lack of education
Unclear land tenure
Poor Management /laws/policy
Lack of land
Corruption
Enforcement
Fire
Fuel-wood
Illegal harvesting
Agriculture
Encroachment (Industrial/ settlement)
Infrastructure
Degradation
Deforestation

4.7 Factors influencing respondents choices of drivers – field study

The binary logistic regressions based on the global datasets identified certain socio-economic factors that influenced the choice of driver importance by respondents to the questionnaire (Tables 7-10).

Table 7: Factors affecting people's perception about illegal and excessive harvesting as a deforestation driver.

Variables	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	0.0247	2.9550	0.0080	0.9933
RESIDENCE (Village=1, Town=2)	1.3290	0.5916	2.2470**	0.0247
AGE (in year)	-0.0099	0.0286	-0.3450	0.7299
EDUCATION2 (HSC)	1.3870	1.5880	0.8730	0.3827
EDUCATION3 (HSC)	1.4030	1.5610	0.8990	0.3687
EDUCATION4 (Bachelor)	1.0530	1.5560	0.6760	0.4988
EDUCATION5 (Masters and above)	2.1480	1.6190	1.3270	0.1844
OCCUPATION2 (Business)	-3.1820	0.9070	-3.5080****	0.0005
OCCUPATION3 (Journalist)	-2.6460	1.5110	-1.7510*	0.0800
OCCUPATION4 (Farmer)	-1.5670	0.9873	-1.5870*	0.1024
OCCUPATION5 (Social work)	-2.0680	0.8744	-2.3650**	0.0180
RESIDENCE (Near forest, Yes=1, else =0)	-1.2970	1.9650	-0.6600	0.5094
YEAR OF LIVING NEAR FOREST	0.0338	0.0185	1.8310*	0.0671
FOREST INCOME (Yes=1, Else =0)	0.0801	0.5553	0.1440	0.8854
SETTLER (Yes=1, Else =0)	0.1766	0.2968	0.5950	0.5518

Base Cases: EDU1= Primary, OCCUPATION1=Service; N=335;
Dependent Variable = Illegal and excessive harvesting

Summary:

(1) Urban dwellers are more inclined to consider illegal and excessive harvesting a major driver of deforestation compared to the rural people.
(2) People from business, journalism, agricultural farming, and social work are less likely to identify illegal and excessive harvesting as a major deforestation driver compared to those who have services as their profession.
(3) People with a longer living period around a forest area are more interested to diagnose illicit and excessive harvesting as a major driver of deforestation.

Table 8: Factors affecting people's perception about infrastructure development as a deforestation driver

Variables	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	-23.2300	3536.0000	-0.0070	0.9948
RESIDENCE (Village=1, Town=2)	-1.2990	0.8339	-1.5580*	0.1093
AGE (in year)	0.1317	0.0539	2.4450***	0.0145
EDUCATION	15.4100	3536.0000	0.0040	0.9965
OCCUPATION	-2.1760	1.8890	-1.1520	0.2493
RESIDENCE (Near forest, Yes=1, else=0)	-0.5662	4.0430	-0.1400	0.8886
YEAR OF LIVING NEAR FOREST	-0.0019	0.0245	-0.0770	0.9388
FOREST INCOME (Yes=1, Else=0)	-1.4730	0.9942	-1.4820*	0.1034
SETTLER (Yes=1, Else =0)	0.4490	0.4677	0.9600	0.3370

Dependent Variable: Infrastructure development

Summary:

(1) Compared to the rural people, urban people are less likely to see infrastructure development being a deforestation driver. That is, rural people are more likely to identify this as a major driver compared to their urban counterparts.
(2) The parameter of AGE is positive (0.1317). That is, older people are more concerned than then the younger that infrastructure development is a major cause of deforestation.
(3) People having forest income are less likely to identify infrastructure development as a major driver of forest destruction in Bangladesh.

Table 9: Factors affecting people's perception about anthropogenic forest fire as a deforestation driver

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	-9.45	5070.00	0.00	1.00
RESIDENCE (Village=1, Town=2)	2.07	1.50	1.37	0.17
AGE (in year)	-0.19	0.08	-2.32**	0.02
RESIDENCE (Near forest, Yes=1, else=0)	-0.03	0.89	-0.04	0.97
YEAR OF LIVING NEAR FOREST	0.08	0.04	1.94**	0.05
FOREST INCOME (Yes=1, Else=0)	2.38	1.18	2.02**	0.04
SETTLER (Yes=1, Else=0)	-0.77	1.01	-0.76	0.45

Dependent Variable: Anthropogenic forest fire

Summary:

(1) Compared to the younger generations, older people are less likely to view fire as a potential driver for forest destruction
(2) People living for longer period of times in the forest areas are more inclined to identify fire as a major agent of deforestation
(3) People with a forest income are most likely to see fire as a major deforestation driver.

Table 10 : Factors affecting people's perception about illegal and excessive harvesting as a degradation driver

Variables	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	-2.2037	1.5052	-1.4640	0.1432
RESIDENCE (Village=1, Town=2)	0.6365	0.4900	1.2990	0.1940
AGE (in year)	0.0021	0.0236	0.0870	0.9307
EDU2	0.2485	1.3635	0.1820	0.8554
EDU3	0.5260	1.2304	0.4280	0.6690
EDU4	1.8692	1.1661	1.6030**	0.1009
EDU5	1.4583	1.2120	1.2030	0.2289
RESIDENCE (Near forest, Yes=1, else=0)	-0.1291	0.3711	-0.3480	0.7279
YEAR OF LIVING NEAR FOREST	-0.0061	0.0131	-0.4670	0.6404
FOREST INCOME (Yes=1, Else=0)	0.8556	0.5102	1.6770*	0.0936
SETTLER	0.0907	0.2460	0.3690	0.7123

Dependent Variable: Illegal and excessive harvesting

Summary:

(1) People with a bachelor's degree are more aware compared to those with primary education that illegal and excessive harvesting is a major driver for forest degradation.
(2) People with forest income are more likely to identify illegal and excessive harvesting as a major degradation driver.

It was clear from these analyses that people living in villages near forests and with education had different perceptions of forest drivers than those living in towns or cities or those with lesser education. Forest-dwellers were unwilling to admit the negative effect that illegal logging is having on the quality of forests, while at the same time thinking that fires and infrastructure are damaging drivers. There was also a generational difference in opinion about the decline in forest quality and its causes, with younger people less likely than older people to think that the forest is being degraded.

Taken together, these data suggested that a REDD communications programme may have to take into account the different audiences and their manner of thinking about forests. In other words, communications to urban and rural residents should differ in their emphasis, and it will be necessary to consider different approaches for communicating to men and women, owing to their different roles in the forest, perceptions of issues and knowledge of differing aspects of forests

5 Challenges and opportunities

Through REDD+ funding and the numerous issues that face forest management and conservation in Bangladesh, many opportunities exist both within and outside of government to improve approaches to forest management, with a resultant increased carbon storage and associated co-benefits for biodiversity and ecosystem services. These opportunities exist in the areas of enhancing biodiversity conservation, improving forest management, improving livelihoods, and in improving governance. For positive changes to occur, a REDD+ program needs to pay close attention to the drivers of forest change, by addressing these at the outset as a focal area of the program. Clarifying these drivers is the focus of this report, as a key component of REDD readiness.

5.1 Legal and governance

Important indirect drivers that REDD+ can address in Bangladesh generally relate to the many governance issues that plague good forest management in the country. People in the workshops noted that the existing Forest Law needs to be updated to incorporate current thinking. Recently, however, some steps have been taken to bring direction for the Forest Department up-to-date, with a new Forest Master Plan and a revised Forest Policy (the previous policy from 1994, although good, was in need of updating). It will be important to educate equitably women, men and youth in local forest communities about the implications of these new documents. The changes and the recommendations that the new documents provide are one step in modernising the Departmental mandate. Nevertheless, in the absence of funding, these documents may remain as nothing more than unfulfilled guidance.

Corruption was an issue noted in all workshops and, as noted, it takes very few corrupt individuals to alter public perception entirely about governance. Eliminating corruption requires a major effort to construct a capable State through an understanding and rectifying of the causes of the issue and instilling a sense of professional pride within government. In a non-corrupt state, the public will not tolerate the practice, the probability of being caught is high, and the penalties are severe enough to dissuade most from the practice. In developing countries, a change in attitude is difficult, and requires a huge

coordinated effort starting within the highest levels of government, boycotting of corrupt individuals and companies, exposing corrupt individuals, the implementation of an effective unbiased anti-corruption unit, and a judiciary that cannot be bribed. A key aspect to reducing corruption within the forest management domain is to eliminate top-down management and to implement a fully inclusive forest management system, including for policy development. These sorts of fundamental governance changes are far beyond a REDD program, but within such a program, at least, care can be taken to ensure that all actions taken and funds spent are transparent, and that project staff are fairly compensated, while enforcing a no-tolerance policy towards corruption.

5.2 Policy

Problematic past forest policies were noted in the literature and at all workshops during this study. In particular, policy-making is widely described as top-down, instead of consultative. However, the very recently revised Forest Policy (GoB 2016) provides a new firm direction for the Department and, as a result, no issues and challenges with respect to policy, other than its implementation, are foreseen except to specifically deal with gender issues. For example, this revised Policy discusses at length the need for co-management of forests, an issue that was raised in all workshops but does not mention women. A strong opportunity exists now for a REDD program to begin to implement direction provided in the new Policy document. For example, the Policy sets a 20% forest cover target, talks about adapting to climate change and valuing ecosystem services, all of which can be built into a REDD program.

5.3 Institutional

Capacity development of the FD to manage forests sustainably continues to be an issue that requires a much greater commitment from government. The FD requires strong support from both the government and the people to control illegal cutting, 'legal' overharvesting, and encroachment, which are major direct drivers of forest change. Litigation of forest cases, dual administration on lands (especially for USF, newly accreted char lands, plain land sal forests and Khas lands), population migration and resultant

displacement, dissatisfaction and conservative behaviour of the indigenous/ethnic people (in CHT and plain land sal forests), difficult working situation in the CHT due to the prevailing situation and the unsettled land tenure issue, general distrust and fear of people about foresters and FD, insufficient staffing, and lack of incentives for foresters to work in a remote place are some of the challenges faced by the FD as an institution. Lack of interdepartmental collaboration and discussion of issues and policies with respect to developments remains as a substantial constraint on the ability of the FD to manage forests and conserve carbon and biodiversity effectively. However, an opportunity exists under UN-REDD to develop a broad cooperation among donor agencies, UN agencies, NGOs, the FD, and other government departments to make a strong commitment towards the Forest Policy statements and together move forest management forward towards the 20% cover target.

5.4 Stakeholders

Coordination among different stakeholders sometimes appears as a difficult issue to resolve. In the past, the FD has sometimes failed to effectively coordinate with multiple government agencies, NGOs, CSOs, or local communities to engage them in forest conservation. Institutional or individual capacities and policy supports are important for effective coordination. As for example, different donor-funded development projects have had a provision to provide cash incentives to the project participants, especially in the CHT. This has resulted in an expectation of money from any new project activity, which the FD cannot provide in all the cases. Irregularities in participant selection, corruption and inefficiency of some forest officers has, at times, made this issue even more complex. One of the key drivers leading to forest change observed in this study is the desire for, and lack of, forest extension services to improve local knowledge about forest ecology, forest management, and ecosystem services. Hence, an opportunity exists to move forward in this area, by providing knowledge and information materials to interested citizens and groups to improve the co-management of forest areas. Critical in this process is to ensure such knowledge and information is shared in a gender-responsive format, wherein it takes into account barriers which could be faced by marginalized groups (e.g. literacy issues, location,

access to technology, etc.) and in response is provided in a format that is available and accessible equitably to women, men and youth.

The logistic models clearly indicated that there are different perceptions among the public with respect to which drivers are causing forest change. This presents a challenge for policy makers and for a REDD program to understand how best to develop projects and present the projects during consultations. In particular, urban and rural dwellers have differing opinions about the drivers.

5.5 Forest management and conservation

Article 18A of the Bangladesh Constitution states that "The state shall endeavor to protect and improve the environment and to preserve and safeguard the natural resources, biodiversity, wetlands, forests and wildlife for the present and future citizens." Nevertheless, the demand for wood products is predicted to rise substantially into the future by various studies and the FAO, despite a national forest area that has declined continuously over the past 100 years or more. As a result, the need for a strong science-based and contemporary sustainable forest management program, with a focus on ecosystem services, including a capable monitoring system, with criteria and indicators against which to measure success, will be even more essential into the future. However, until the Forest Department can overcome a vast array of deficiencies, forest management will not be improved. These issues have been well-described above bot also include an under-funded forest research program, far too little of the land area in protected areas (2% compared to a global target of 17%). The result is a general lack of capacity in the Forest Department to adequately fulfil its mandate. REDD+ can address some of these issues through training and implementation of good management practices, working to expand protected areas, and improving sustainable forest management through projects undertaken.

5.6 Climate change and REDD+

Bangladesh is very vulnerable to climate change due to its geographical location, dense population, extensive coastline, and poor socio-economic condition. REDD+ can be

used for a dual purpose of mitigating climate change through coastal protection, as well as for climate mitigation. The Bangladesh Forest Department has already established large scale mangrove plantations of*S. apetala* along the coast and thus has started to create a better environment for fisheries and biodiversity (Islam et al. 2013), while sequestering additional carbon and improving erosion resistance (Islam and Rahman 2015). The remaining concern, however, is the capacity to control the illegal clearing of these mangrove resources as fuelwood or for shrimp farming. Further, a REDD+ program should take advantage of climate change modelling to select appropriate tree species and locations to take aclimate-adaptive approach to planning. Merging REDD+ mitigation actions with climate change adaptation plans is a necessity to ensure the long-term success of the project.

5.7 Improving livelihoods

The goals of REDD+ and reducing forest loss can take several forms through policy options to combat the drivers of degradation and deforestation. A key indirect driver of forest decline in Bangladesh is poverty, resulting in numerous local actions that deforest and degrade the forest, including encroachment, fuelwood harvesting and illegal logging. Reducing poverty of forest-dependent people, including equitably women, men and youth, through alternative livelihood support accomplishes the dual objectives of local poverty alleviation and increasing carbon in the forest. However, any alternative livelihoods program needs to be realistic, gender-responsive, relevant to local people, and approached with a well-articulated business plan including a market survey. A large list of possible alternate livelihoods can be compiled, for example mushroom culture, apiculture (honey), agroforestry, improved woodstoves, seaweed farming, duck farming, small-scale furniture making, vegetable farming, cattle fattening and milking, backyard poultry, handloom weaving, raising seedlings, fishnet making, pisciculture, fishing, goat farming, horticulture (e.g., papaya, banana, mango, litchi, lemon), tailoring and embroidery, agro-food processing, muri (puffed-rice), candy, spice powder, banana chips, cap making, mat making (e.g., Sital pati of Sylhet region), silk products, coir production, handicrafts (bag, sital pati), pottery, baskets, wall hanging, carpet, embroidered quilt, bracelet, wood works, dresses, cushion, pillow-cover, bedspreads, woven cloth, traditional jewelry, candles, terracotta,

hand-made paper items, etc., but it will be important to consult with women, men and youth in local communities in project areas which ones may be most feasible and relevant to local conditions. Below are some possibilities that could potentially be useful in the Bangladesh context in hill or Sal forests, especially.

For instance, bamboo is a rapidly self-renewing resource with very high carbon storage potential that can be used for a wide array of products. Nath et al. (2009) found that just three species of village bamboos in India together store 120.8 t ha^{-1} of carbon, which is equivalent to, or better than many forest types. At the same time, bamboo can be used for a huge range of non-perishable goods from handicrafts to commercial flooring and, so, offers a strong potential for alternative livelihoods as well. Bamboo product production has been used very successfully in multiple areas in Southeast Asia, for example in Thailand where the ITTO has deployed several bamboo projects in association with the transboundary Emerald Triangle Protected Area, resulting in as much as $70,000/yr to individual local villages (ITTO 2016). Early, continuous yields from selective harvesting on even small parcels of land, low capital and high labor intensity, virtually 100% conversion efficiency to about 1,500 products, and, typically, 75% of economic returns benefiting rural people are advantageous attributes of promoting bamboo in appropriate areas (Lobovikov et al. 2012). The only shortcoming to bamboo cultivation, as with any such development project, is that it initially takes time for the resource to grow, in this case 3 to 4 years to mature, but this is considerably faster than planted *Acacia*, for example. Promoting bamboo cultivation in marginal areas and around homesteads and increasing capacity of the local people in producing diversified products could be a good initiative to reduce dependency on forests and improve local livelihoods.

Another livelihood alternative that, when done properly, using a science-based approach, is agroforestry for a variety of crops that can be under-planted in an existing forest or maintained in restored forests. Through agricultural intensification, agroforestry helps to increase food and fodder while protecting the existing forest where unemployed and poor people can improve their livelihoods through market driven, locally led tree cultivation systems that generate income and build assets (Elevitch and Wilkinson 2000, Rahman et al. 2012). Successful models for projects are presented, for example in Rahman et al. (2012), where excellent results were achieved. These latter authors concluded that effective measures should be taken to reduce shifting cultivation, but to do so farmers will need

knowledge and information to become aware of possibilities, along with other support to enable them to adopt agroforestry techniques successfully, for example, as a sustainable land-use system.

There are some high value timber and non-timber products that could also be considered in Bangladesh. For example, agar wood production techniques have been well-established and advanced in Malaysia and Indonesia (Saikia and Khan 2014, Lok and Zuhaidi 2016) and could be imported to Bangladesh. Past efforts in Bangladesh (especially in Moulavibazar district) using indigenous technology had some success but scientific techniques are lacking to culture the species and to inoculate with the fungus necessary to produce the resins (Abdin 2014, Choudhury et al. 2016)). Research on the improvement and promotion of current practices in the Sylhet region could be a good livelihood options for forest dwelling communities in all over the hill forests. Other successful forest-based livelihoods exist as well, such as orchid culture, fruit tree orchard (conventional like mango, litchi, malta, orange, lemon, etc., or unconventional like, cao, latkon, amloki, uriam, etc.) and all of these examples require capacity-building, funding, and dedication to a well-designed and managed project, but may be well-suited to a REDD+ programme. Apart from these several other specific livelihood options like fish farming, cattle, fattening, poultry, handicrafts making, etc. could be considered and promoted with improved technology and linking them with identified value chains.

6 Summary of drivers of change and key messages, including policy options/implications

Forest ecosystems are important ecological and socioeconomic assets to be conserved for the well-being of present and future generations because of the ecosystem services that they can provide, including as reservoirs of carbon. The country's expanding population and conflicting land use pressures necessitate a balanced forest sector strategy that responds to international commitments, national development paradigms, and environmental imperatives, as well as to local socioeconomic requirements (GoB revised Forest Policy 2016). Indirect drivers are related to national and global demands for forest products, including wood for fuel, buildings, and furniture, non-timber forest products for crafts and foods, and agricultural products and shrimp for national consumption or export.

The main indirect drivers of forest change in Bangladesh are common to all forest types and include overpopulation, poverty and unemployment, and the suite of governance problems that stem largely from the low priority that government has given to the ecosystem goods and services that forests provide to the country. Direct drivers are often directly related to poverty and unemployment, as people move to forest to try and support themselves and their families in a subsistence manner that includes illegal logging and fuelwood harvesting, which are common drivers to both deforestation and degradation in all forest types. The new Forest Master Plan (GoB 2016) suggests that 300,000 ha could be reforested, mostly in CHT, but it will be necessary to deal with tenure issues and to strengthen the FD for this to occur. The latter statement from the Master Plan supports the findings of this study with respect to the importance of resolving an array of governance drivers, including land tenure and rights, which are resulting in forest change through a number of direct drivers.

6.1 Key indirect drivers to resolve for REDD to be successful

While high population levels in Bangladesh are beyond the capacity of any REDD+ program, requiring instead a more fundamental social approach, other drivers, both indirect and direct can be addressed to some extent. Regardless, with strong governance, overpopulation becomes less of an issue in forests, especially when the land is zoned and ownership is clarified. The indirect drivers to address include: poverty/unemployment, education, and many if not all of the governance issues. For governance of REDD+ programs to be successful, such programs and their governance must be accountable, transparent, inclusive, motivational, and coordinated across sectors. REDD+ affords to possibility to conserve carbon while providing co-benefits equitably to women and men in local communities but this can only be accomplished through good governance. Coordination with other programs inside and outside of government is essential to a strong REDD+ Program (Figure 19). In this way, governance can assure that important drivers of forest change are being addressed in a coordinated fashion.

Figure 17: A schematic model of a possible coordinated approach to REDD governance within Bangladesh.

Poverty: This main indirect driver, common to all forest types, can be approached as a problem to be resolved locally with efforts at developing alternative livelihoods as discussed above. Clearly this will not be a saviour for poverty in Bangladesh and it is not possible to eliminate poverty on a sectoral basis, but by targeting program areas, such as communities adjacent to protected areas, and equitably women and men within them, some success can be achieved. The FAO (2003) suggested that there are three main ways of achieving forest-based poverty alleviation: preventing forest resources from shrinking if they are necessary for maintaining well-being; making forests accessible and redistributing resources and rents; and increasing the value of forest production.

Education: This was an unexpected but interesting indirect driver that should be heeded by a REDD+ program, possibly through an extension program developed in association with the FD. Education on forest issues suggests a strong interest in local people in improving their capacity for forest management and conservation, of which advantage should be taken.

Governance – land tenure: No forest management or REDD+ program can succeed in the absence of certainty over land rights and tenure (Sunderlin et al. 2009). Even with a high population providing pressure on forest lands, the presence of a land tenure system is a powerful disincentive to illegal activities. In Bangladesh, there is a clear need to address the issue of forest tenure and land rights before moving forward with a REDD+ program. Given the gender inequalities present in existing land tenure arrangements in Bangladesh, embedded in this issue is also the need to ensure that forest tenure and land rights are

equitably addressed and given to both women and men. This involves considerable consultation and a willing government, but is a pre-condition for REDD+ or any other payment for ecosystem services program to be effective, fair and equitable. Policies need to be in place that pay attention to the principle of Free Prior and Informed Consent (FPIC) and to the 2007United Nations Declaration on the Rights of Indigenous People (UNDRIP). These are vital to assuring protection of local rights in the course of implementing REDD+ (Sunderlin et al. 2009). Carbon can only be stored in forests where people understand who has rights to the land. For major forest areas such as Sundarbans, Roy et al. (2012) have suggested changes in the property regime systems, more specifically co-management with the forest communities having specific roles, responsibilities and benefits along with the State.

Governance - corruption: This report has addressed corruption issues above, however, the corruption driver must be considered in developing REDD+ policiesand measures. Corruption can be expected to pose a significant risk to REDD+ projects. Reducing corruption under REDD+ requires careful financial oversight. Further, conceptually REDD+ should offset the opportunity costs of alternative land uses by designing a national REDD+ architecture to ensure that those who lose from not practising alternative land uses receive sufficient compensation for their potential losses, to avoid corrupt practices (Tacconi et al. 2009). Again, a nationwide movement against corruption from all corners of the society including the government, civil society, political leaders, and general public could bring some positive changes in this regard.

Government - management and policies: The primary challenge for sustainable forest management is finding ways to benefit from ecological services without compromising the forest's ability to provide those services. Essential for REDD+ to succeed are good forest policies, laws and management that can be built upon but lack of these was presented at all workshops for each of the forest types. In fact, there is no lack of good policy in the Forest Department, rather the issues relate to staffing, capacity, and funding to implement good policy. REDD+ can therefore build on the new Forest Master Plan and the Revised Forest Policy in program implementation.

Governance - forest law enforcement: This particular indirect driver remains a nation-wide problem as a result of corruption, illegal harvesting, slow resolution of charges brought, and insufficient enforcement staff. This is an important governance issue that must be

addressed within government to reach solutions, such as enabling rapid prosecution of offenders, or creating a forest offence tribunal under the judiciary system for quick litigation, in order for REDD+ to be effective.

Governance – interdepartmental cooperation/consultation: There has been an ongoing long list of development projects in Bangladesh that have not considered the loss of ecosystem services from forests to local communities and to the country as a whole. This stems in large part from the under-valuation of forest ecosystem services within government. The case needs to be made at the highest levels of government, with direct linkage to international obligations that forests provide valuable ecosystem services to people that ought not to be ignored in planning developments.

6.2 Recommendations for actions

For REDD+ programme to be effective, a strategic approach will be needed to improve indirect drivers that can be remedied, while at the same time implementing programs to deal with the direct drivers that are most influential. If the indirect drivers cannot be improved, working on direct drivers will result in only a temporary solution. It was clear from the literature and the workshops that the main indirect drivers that can be affected under REDD relate directly to governance. During the workshop, the project team heard numerous suggestions to improve forest management and conservation from interested participants (Appendix 4). Those recommendations and others from the project team, are presented below:

1. Improve the implementation of existing laws and policies

- Improved law enforcement is essential to good forest management
- Restrict the removals of forest products to sustainable levels with a system of passes or permits needs to be enforced
- Existing laws and policies should be implemented to the best possible level.
- ECA rules specifying not to allow any industrial or other infrastructure within 10 km boundary of a forest should be strictly followed.
- Bangladesh should formulate a biodiversity policy to conserve forest

- Control sawmills and brickfields and remove those that are currently operating illegally
- Resolve land tenure and land rights issues, at the very least in REDD+ project areas
- Establishing the boundary demarcation of forest lands should be given priority
- Develop and promote an improved system for the timely litigation of forests cases, such as by establishing District Forest Offence Tribunal (where necessary) could be a good option for quick litigation
- Make people aware at the local level about new policies or laws

2. Capacity development (both institutional and individual) in the following areas:
    - Improve efforts toward sustainable forest management (e.g., implement a monitoring program with criteria and indicators, land-use planning, etc.)
    - Develop an adaptation program for forest resilience to climate change
    - Develop and implement a forest monitoring, reporting and verification program
    - Properly assess and value forest ecosystem services
    - Co-management becomes a cornerstone of the forest management program

3. Coordination (interdepartmental, IGO, NGO, etc.)
    - Coordination between FD and government agencies including administration, law enforcing agencies, land ministry, transportation, fisheries, tourism, etc. must be improved to ensure that forests are considered a priority in development projects
    - Coordination between FD and other stakeholders such as forest dependent communities, local government representatives, NGOs, CSOs, is needed to improve co-management of forests
    - Take more advantage of the assistance in capacity building that is available through the many international agencies such as ITTO, FAO and the World Bank, in terms of advisory documents that are available with respect to a wide range of forest management issues and technical support.
    - Concerned forest officials of certain forest area where any land survey project is going on should cooperate and ensure proper documentation of all the records to the survey team and will maintain a diary of the works or communications in this

behalf to protect forest lands. Concerned forest officials will be made responsible personally if any forest land is dispossessed or lost due to their ignorance or negligence.

4. Improvements to forest policies and laws

- Policy making, like co-management of forests, needs to be inclusive, participatory and gender responsive.
- Designated forest officials (at least DFO level) should have the authority to legally resolve forest cases
- There is a need for strong regulation to stop transfer of privately owned Baid land inside the Sal forests to avoid further wood extraction
- No Jote to be permit should be issued within certain buffer area around reserve forests in CHT to avoid illegal harvest in the reserve areas
- Conservation of ecosystem services need to be properly valued as economic benefits, as a means to assess fairly the impacts of any development projects
- Validity and effects of the current imposed moratorium on timber harvest should be reviewed
- Reclaim encroached lands to forest through rehabilitation of encroachers by adopting new laws and/or policies.
- A fast−track forest offence resolution process could be a better option .
- A national tree planting movement should be encouraged and will require legal and policy support
- Co-management Committees (CMCs) should be given a formal legal basis
- Select a certain percentage (e.g., 5%) of social forestry participants from local leaders/elites
- Incorporate ecotourism as a part of forest management to support both the forests and the communities
- Develop land leasing guidelines

5. Alternative livelihoods

- Equitably support women and men within forest dependent communities with alternative livelihood strategies and programs that match local traditions and cultures
- Initiate education and livelihood development projects within 10 km buffer zones of the forests especially near protected areas, such as the Sundarbans

6. Forest management

- It is essential to equitably involve local people in forest co-management and co-management should be the cornerstone of the national forest management program
- Natural regeneration should be given priority in the hill and sal forests. Assisted natural regeneration and enrichment planting may be considered where applicable.
- Natural forests should be kept free from any human interference or intervention for at least 5 to 10 years to rejuvenate.
- Land planning through zoning for conservation, protection and production purposes is an essential step in landuse planning (core/buffer/ecotourism)
- Participatory or social forestry activities to be expanded in all available spaces including road sides, railway tracks, river banks, flood/cyclone protection dams, etc.
- Avoid monoculture plantations as far as possible
- Native species should be given priority in any plantation program
- Seed trees should be identified and protected to act as source of high quality seeds or planting materials, where natural regeneration is an important component of forest renewal
- Promote indigenous multilayer tree planting around homesteads with raintree, fruit trees (coconut, malta, etc.), bamboos, etc.
- Massive awareness campaign is necessary throughout the country to halt deforestation and forest degradation.
- Headwater inhabitants should be compensated as a mechanism to conserve forests
- Proper forest land zoning is essential
- Accommodate religious and cultural values of forests in any management program
- The rights of the indigenous/local people should be protected
- Monitoring of forest collections is essential to control sustainable production

- Redefine khas land to exclude Acquired Forests, Protected Forests, newly accreted and forested coastal land and common property resources like haor, baor, beel, rivers and other wetlands to avoid lease for the sake of conservation of these fragile ecosystems (From: National Conservation Strategy)
- Restore and sustainably manage degraded and other marginal areas, including coastal areas and wetlands, under climate resilient, participatory afforestation, reforestation, rehabilitation and ecological restoration processes to increase carbon sequestration consistent with the production and distribution of co-benefits that contribute to meeting local community requirements (from: revised National Forest Policy).

7. Good governance

- Forest legal cases should be resolved as quickly as possible and false cases to be withdrawn
- Compile and assess successful cases of community-based forest management programs under REDD from a variety of case studies as a learning tool in implementing a REDD program (e.g., Tanzania, Kenya, Brazil).
- Recognize the importance of a certain level of rule-making autonomy by local forest users is important for forest conservation as an important aspect of a co-management program.
- Support people, especially women, youth and indigenous people, in climate resilient private tree growing efforts and develop innovative conservation partnerships with the private sector, civil society, and conservation and natural resources management NGOs to forestall forest encroachment and to impede deforestation and forest degradation by addressing the key drivers of forest change (from: new Forest Policy).

8. Commitment to conserve forests

- A strong political and social commitment to forest ecosystem services is required at the political level in both government and opposition parties

- Improve and expand the protected areas network with a view towards protecting primary forests and working towards the CBD Aichi global target of 17% of the land area
- Avoid or limit infrastructure developments in existing forests (roads, railways, etc.) as far as possible and protect the few remaining primary forests
- Provide incentives to conserve forests and consider imposing progressive taxes on forest resource extraction
- Resolve land conflicts among different agencies/sectors through a formal land use plan
- Resolve land tenure issues

9. Research and Development

- Improve coordination with universities and research organizations to conduct research issues related to forest, environment, livelihoods, and climate change mitigation and adaptation
- Strengthen the Forest Research Institute and link it closely to the FD so that research priorities are aligned with departmental needs.
- Shifting cultivation in the CHT should be considered as a priority research issue to determine the amount of impact on deforestation and forest degradation

6.2.1 Recommendations from this study

Recommendations based on this study include the following:

1.) An effective strategy for a REDD+ programme will be to deal with the main indirect drivers and the direct drivers that flow from them simultaneously.

2.) The key underlying drivers to address under a future REDD+ programme include: improving education (awareness) and addressing poverty, and the multiple drivers that comprise governance.

3.) The main underlying drivers to address are: fuelwood collection, illegal and excessive logging, agricultural conversion, encroachment, and infrastructure development. It will be important, however, to determine the relative percentage contributions of each driver, as a next step.

4.) Develop a forestry extension services program in association with the forest department to deal with the educational awareness driver.

5.) Reducing poverty of forest-dependent people through alternative livelihood support accomplishes the dual objectives of local poverty alleviation and increasing carbon in the forest. However, any alternative livelihoods program needs to be realistic, relevant and desired by local people, and approached with a well-articulated business plan including a market survey.

6.) Avoiding corruption under a REDD+ program will require checks in the system, transparency, and accountability at all levels.

7.) A REDD+ programme can only proceed if there is clear land tenure for the forest or area under consideration for project. Land tenure was determined to be a main underlying driver of forest change and, in the absence of clear tenure, a project will fail.

6.3 Future drivers

The key driver of forest change in Bangladesh is the high population with its consequent high demand for wood products, particularly wood fuel. While the population is likely to continue to grow, the increasing trend towards an urban population may result in reduced impacts to forests. Similar trends are also being observed elsewhere in Asia. This trend to urbanisation can further ameliorate impacts on forests through the use of fuels other than wood for cooking. For example, the production of natural gas from the Sylhet region and the potential reserves in the Bay of Bengal, may substantially reduce the use of wood fuels in the relative near future. Also on the positive side, an increasingly educated Bangladeshi public will require and demand better protection of forest ecosystem services, in part for recreation away from urban centres. On the other hand, an increasingly global trade market and the desire for foreign capital will continue to provide pressure on the Bangladesh coastal areas to convert mangroves to shrimp farms and to provide wood furniture to a growing middle class. Climate change may result in more chaotic weather, especially for the intensity of cyclones. Such disastrous cyclones may result in increased damage to forests, especially along the coastal areas. Hence it will be important to continue to stabilise accreted lands with a mangrove plantation program.

6.4 The way forward

The results from this study show a combined scientific and social expression of the most important drivers, weighted by their potential for effects on carbon, biodiversity, and capacity to be mitigated. This ranking should be viewed as a set of hypotheses about the relative importance of these factors to forest change in Bangladesh. Testing these hypotheses requires an assessment of the relative importance of drivers, in terms of how much forest loss or change (% of total deforestation or degradation) can be attributed to each. Degradation can be specifically measured remotely as NDVI or EVI change over time, or by determining the carbon depletion from a given forest area. This kind of study will enable an improved priority setting for development of a strategic plan with policies and measures to mitigate the drivers. Second, as assessment is needed on where REDD can be done in Bangladesh with a view to the best potential for success and the greatest effectiveness for carbon additionality. Third, the REDD programme will have to work with appropriate agencies and individuals to develop a suite of plans and documents, including an MRV strategy and plan based on a national forest monitoring strategy and program, a system of safeguards with a safeguards information system (SIS), a forest carbon reference level report, and an forest emissions level report. All of these strategies, plans, and reports are essential steps towards finalising a national REDD strategy (NRS).

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8 References[9]

Abdin, M. 2014. The Bangladeshi agarwood Industry: development barriers and a potential way forward. Bangladesh Development Research Center, Bangladesh Deve. Res. Working Paper Series 22. Falls Church, VA, USA.

Abdullah, H.M., Mahboob, M.G., Rahman, M.M. and Ahmed, T. 2015. Monitoring natural Sal forest cover in Modhupur, Bangladesh using temporal Landsat imagery, during 1972–2015.International Journal of Environment 5(1): 1–7.

Asian Development Bank (ADB) 2004.Bangladesh Resident Mission and
Regional and Sustainable Development Department.
https://www.adb.org/sites/default/files/institutional-document/32545/country-gender-strategy-bangladesh.pdf

ADB. 2016. Basic Statistics 2016. April 2016 http://www.adb.org/publications/basic-statistics-2016

Ahmed, A. 2011. Some of the major environmental problems relating to land use changes in the coastal areas of Bangladesh: A review. Journal of Geography and Regional Planning 4(1): 1-8.

Ahmed, A.I.M.U. 2008. Indirect causes of deforestation and forest degradation in Bangladesh. Global Forest Coalition (GFC), Amsterdam.

Alam, M., Furukawa, Y., Sarker, S.K., and Ahmed, R. 2008. Sustainability of Sal (Shorea robusta) forest in Bangladesh: past, present and future actions. International Forestry Review 10(1): 29-37.

[9]Some references may be from Appendix 2 and not found in the main text.

Ali Reza, A.H.M., Barua, Shuvashish P., Huq, S. M. Imamul, Khan, A. S. Moniruzzaman, and Nishat, A. (eds.). 2002. Bio-ecological zones of Bangladesh. IUCN Bangladesh Country Office, Dhaka, Bangladesh. 141pp.

Azad, A., K. Jensen, and C. Lin. 2009. Coastal aquaculture development in Bangladesh: unsustainable and sustainable experiences. Environ. Management 44:800–809.

Aziz, A. 2010. Coastal and marine plant resources of Bangladesh: management and exploitation. Annual Bot. Conf., Univ. Chittagong, Chittagong. P. 14.

Biswas, S., Swanson, M.E. and Vacik, H. 2012. Natural resources depletion in hill areas of Bangladesh: A review. Journal of Mountain Science 9(2): 147-156.

Castren, T. and Pillai, M. 2011. Forest Governance 2.0: A primer on ICTs and governance. Washington DC: Program on Forests (PROFOR).

Chaturvedi, R.K. 2016. Impact of climate change on the forest of Bangladesh. Paper delivered at the workshop on Climate change impacts: Enhancing resilience of forest ecosystems and forest dependent communities to enable adaptation to climate impacts, Climate Resilient Participatory Afforestation and Reforestation Project (CRPARP), Forest Department, Dhaka, Bangladesh. 26 July.

Choudhury, M., Hussain, M.D., Chung, S.O., Kabir, E., and Rahman, A. 2016. Agarwood manufacturing: a multidisciplinary opportunity for economy of Bangladesh: a review. Agricultural Engineering International: CIGR Journal 18(3): 171-178.

Choudhury, M.S.H., and M. Koike. 2011. An overview on the protected area system for forest conservation in Bangladesh. Jour. For. Res. 21:111-118.

Choudhury, J.K. and M.A.A. Hossain. 2011. Bangladesh forestry outlook study. FAO, Regional Office Asia and Pacific, Bangkok.

Choudhury, A.M. 2000. Flood 1998: Oceanic perspective. In: Q. K. Ahmad, A. K. A. Chowdhury, S. H. Imam and M. Sarker (eds.), Perspectives on Flood 1998, University Press Ltd., Dhaka, Bangladesh.

Eaton J.M., and D. Lawrence. 2009. Loss of carbon sequestration potential after several decades of shifting cultivation in the Southern Yucata. For. Ecol. Manage. 258: 949–958.

Elevitch, C.R., and Wilkinson, K.M. 2000. Economics of farm forestry: financial evaluation for landowners. In: Elevitch, C.R., and Wilkinson, K.M. (eds.):Agroforestry guides for Pacific Islands #7. Permanent Agricultural Resources (PAR), Hawaii.

Faisal, I.M., and Parveen, S. 2004. Food security in the face of climate change, population growth, and resource constraints: implications for Bangladesh. Environmental Management 34(4): 487-498.

FAO. 2017. Gender and Land Rights Database. http://www.fao.org/gender-landrights-database/country-profiles/countries-list/national-legal-framework/en/?country_iso3=BGD

FAO. 2014. Contribution of the forestry sector to national economies. Finance Working Paper FSFM/ACC/09. Rome. Online at: http://www.fao.org/3/a-i4248e.pdf

FAO. 2015. Global Forest Resources Assessment 2015. Desk reference. Food and Agriculture Organization of the United Nations, Rome. Online at: http://www.fao.org/3/a-i4808e.pdf

FAO. 2011. Framework for assessing and monitoring forest governance. The Program on Forests (PROFOR), Food and Agriculture Organization of the United Nations.

FAO. 2010. Fishery and Aquaculture Country Profiles The People's Republic of Bangladesh. http://www.fao.org/fishery/facp/BGD/en

FAO. 2009. How to feed the world in 2050. Rome, Italy. http://www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How_to_Feed_the_World_in_2050.pdf

FAO. 2008. National forest and tree resources assessment 2005-2007, Bangladesh. Rome. Online at: http://www.fao.org/forestry/17847/en/bgd

FAO. 2003. State of the World's Forests 2003, FAO, Rome.

Geist, H.J., and Lambin, E.F. 2002. Proximate causes and underlying driving forces of tropical deforestation. BioScience 52(2): 143-150.

Government of Bangladesh. 2016. National forest policy, final draft. Dhaka.

Government of Bangladesh. 2016. FMP (Forestry Master Plan 2017-2036). Draft summary for policy makers. Dhaka.

Government of Bangladesh. 2014. Forest Resources Assessment: country report 2015. Rome, Italy.

Government of Bangladesh. 2012. Population Policy of 2012. Dhaka. http://arparaup.magura.gov.bd/node/1141620/%09%E0%A6%AC%E0%A6%BE%E0%A6%82%E0%A6%B2%E0%A6%BE%E0%A6%A6%E0%A7%87%E0%A6%B6-%E0%A6%9C%E0%A6%A8%E0%A6%B8%E0%A6%82%E0%A6%96%E0%A7%8D%E0%A6%AF%E0%A6%BE-%E0%A6%A8%E0%A7%80%E0%A6%A4%E0%A6%BF-%E0%A7%A8%E0%A7%A6%E0%A7%A7%E0%A7%A8-%28Bangladesh-Population-Policy-2012%29

Government of Bangladesh, Ministry of Planning. 2011. Sixth five year plan: accelerating growth and reducing poverty. Dhaka. http://www.enhancedif.org/en/document/bangladeshs-poverty-reduction-strategy-paper-2011-2015

Haque, A., Alam, J.B., Shaha, N.K., and Raihan, F. 2008. Study on Land use Pattern Change and Its Causes.Inter. Jour. Environ. Res. 2(2): 199-204.

Hosonuma, N., Herold, M., De Sy, V., De Fries, R.S., Brockhaus, M., Verchot, L., Angelsen, A. and Romijn, E. 2012. An assessment of deforestation and forest degradation drivers in developing countries. Environmental Research Letters 7(4): 044009.

Hossain, M.S., Dearing, J.A., Rahman, M.M. and Salehin, M. 2016. Recent changes in ecosystem services and human well-being in the Bangladesh coastal zone. Regional Environmental Change, 16(2): 429-443.

Hossain, M. 2015. Improving land administration and management in Bangladesh. Bangladesh Institute of Development studies (BIDS). Dhaka.

Hossain, M.N., Rokanuzzaman, M., Rahman, M.A., Bodiuzzaman, M. and Miah, M.A. 2015. Causes of Deforestation and Conservation of Madhupur Sal Forest in Tangail Region. Journal of Environmental Science and Natural Resources 6(2): 109-114.

Hossain, M.A. 2011. An overview on shifting cultivation with reference to Bangladesh. Scientific Research and Essays 6(31): 6509-6514.

Hossain, M.K., Alam, M.K., and Miah, M.D. 2008. Forest restoration and rehabilitation in Bangladesh. IUFRO World Series Vol.20 No.3: 21-66.

Hossain, M.S., Lin, C.K. and Hussain, M.Z. 2001. Goodbye Chakaria Sundarban: the oldest mangrove forest. The Society of Wetland Scientists Bulletin. DOI: 10.1672/0732-9393(2001)018[0019:GCSTOM]2.0.CO;2

Hossain, M.N., Rokanuzzaman, M., Rahman, M.A., Bodiuzzaman, M. and Miah, M.A. 2013. Causes of Deforestation and Conservation of Madhupur Sal Forest in Tangail Region. Journal of Environmental Science and Natural Resources, 6(2): 109-114.

Iftekhar, M.S. 2006. Forestry in Bangladesh: an overview. Journal of Forestry 104(3): 148-153.

Iftekhar, M.S., and M.R. Islam. 2004. Degeneration of Bangladesh's Sundarbans mangroves: a management issue. Int. For. Rev. 6(2):123–135.

Iftekhar, M.S., and Hoque, A.K.F. 2005. Causes of forest encroachment: An analysis of Bangladesh. GeoJournal 62(1-2): 95-106.

International Labour Organization. 2014. A quiet revolution: Women in Bangladesh. http://www.ilo.org/global/about-the-ilo/newsroom/comment-analysis/WCMS_234670/lang--en/index.htm

IPCC. 2007. Fourth assessment report: chapter 9 Forestry. https://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch9.html

Islam, M.M. 2007. Proceedings of the workshop on coastal forest rehabilitation and management in Asian tsunami-affected countries. FAO, Bangkok Office.

Islam, M.M. 2017. Tracing mangrove forest dynamics of Bangladesh using historical Landsat data. Student thesis series INES nr 415. Department of Physical Geography and Ecosystem Science, Lund University, Sweden.

Islam, S.A. and Rahman, M.M. 2015. Coastal afforestation in Bangladesh to combat climate change induced hazards. Journal of Science, Technology & Environment Informatics 02(1): 13–25.

Islam, K.K., and Sato, M. 2012. Deforestation, land conversion and illegallogging in Bangladesh: the case of the Sal (Shorea robusta) forests. iForest 5: 171-178 [online 2012-06-25] URL: http://www.sisef.it/iforest/contents?id=ifor0578-005

Islam, M.M. 2007. Proceedings of the workshop on coastal forest rehabilitation and management in Asian tsunami-affected countries. FAO, Bangkok Office.Islam, K.K. and Sato, N. 2012. Deforestation, land conversion and illegal logging in Bangladesh: the case of the Sal (Shorea robusta) forests. iForest 5: 171-178 [online 2012-06-25] URL: http://www.sisef.it/iforest/contents?id=ifor0578-005

Islam, M.R. 2006. Managing Diverse Land Uses in Coastal Bangladesh: Institutional Approaches. Pages 237- in C.T. Hoanh, T.P. Tuong, J.W. Gowing, and B. Hardy (eds.), Environment and livelihoods in tropical coastal zones. Cabi, UK.

Islam, S.T. 2006. Resource assessment of deciduous forests in Bangladesh, Durham theses, Durham University. Available at Durham E-Theses Online: http://etheses.dur.ac.uk/3889/1/3889_1450.pdf

Islam, S.A., Miah, M.A.Q., Habib, M.A., Moula, M.G., and Rasul, M.G. 2013. Growth performance of underplanted mangrove species in *Sonneratia apetala* plantations along the western coastal belt of Bangladesh. Bangladesh Journal of Forest Science 32(2): 26-35.

ITTO (International Tropical Timber Organisation). 2016. Emerald Triangle Transboundary protected Area project. ITTO Technical Series. Yokohama, Japan.

ITTO and FAO. 2009. Forest governance and climate-change mitigation. A policy brief prepared by ITTO and FAO.

IUCN and BFD. 2016. Bangladesh National Conservation Strategy, Part II: Sectoral Profile. BFD, Ministry of Environment and Forests, Government of the People's Republic of Bangladesh, and IUCN, Bangladesh Country Office, Dhaka, Bangladesh.

Jashimuddin, M. and Inoue, M., 2012. Community forestry for sustainable forest management: Experiences from Bangladesh and policy recommendations. Formath 11: 133-166.

Jinnah, S., 2013. Land and Property Rights of Rural Women in Bangladesh. Drafted for the Community Development Association (CDA). January. http://www.ohchr.org/Documents/HRBodies/CEDAW/RuralWomen/CDABangladesh.pdf

Kibria, M.G., Rahman, S.A., Imtiaj, A. and Sunderland, T.C.H. 2011. Extent and consequences of tropical forest degradation: successive policy options for Bangladesh. Journal of Agricultural Science and Technology B 1(1): 29-37.

Kissinger, G., M. Herold, and V. De Sy. 2012. Drivers of deforestation and forest degradation: a synthesis report for REDD+ policymakers. Lexeme Consulting, Vancouver, Canada.

Lambin, E.F., and Geist, H. (eds.). 2006. Land-use and Land-cover Change: Local Processes and Global Impacts. Springer, Germany.

Lok, E.H. and Zuhaidi, Y.A.. 2016. Growth and management of *Aquilaria malaccensis* for agarwood – a new domestication perspective. International Journal of Agriculture, Forestry and Plantation 3: 55-60.

Lobovikov, M., Schoene, D. and Yping, L. 2012. Bamboo in climate change and rural livelihoods. Mitigation and Adaptation Strategies for Global Change 17(3): 261-276.

Miah, M.D., Akther, S., Shin, M.Y., and Koike, M. 2014. Scaling up REDD+ strategies in Bangladesh: a forest dependence study in the Chittagong Hill Tracts. Forest Science and Technology 10(3): 148-156.

Miah, M.D., Masum, M.F.H., Koike, M., and Akther, S. 2011a. A review of the environmental Kuznets curve hypothesis for deforestation policy in Bangladesh. iForest 4: 16-24. online: 2011-01-27] URL: http://www.sisef.it/iforest/show.php?id=558

Miah, M.G., Bari, M.N. and Rahman, M.A. 2011b. Agricultural activities and their impacts on the ecology and biodiversity of the Sundarbans area of Bangladesh. Jour. National Science Foundation of Sri Lanka 31(1-2): 175-199.

Miah, G., Bari, N. and Rahman, A. 2010. Resource degradation and livelihood in the coastal region of Bangladesh. Frontiers of Earth Science in China 4(4): 427-437.

MIT/OEC. 2016.http://atlas.media.mit.edu/en/profile/country/bgd/

MoEF. (GoB, Ministry of Environment and Forests). 2015. Ministry of Environment and Forests. Gazette Notification No. PaBaMa/(Ba:Sha-1)/21/2012/295 dated 09 August 2015:Bangladesh Gazette, Extraordinary, August 11, 2015 p. 6417]

Muzaffar, S.B., Islam, M.A., Kabir, D.S., Khan, M.H., Ahmed, F.U., Chowdhury, G.W., Aziz, M.A., Chakma, S., and Jahan, I., 2011. The endangered forests of Bangladesh: why the process of implementation of the convention on biological diversity is not working. Biodiversity and Conservation 20: 1587-1601.

Nandy, P., and Islam, M.A. 2010. Climate resilient coastal zone development in Bangladesh: participatory governance for common resources management. Pp. 58-72, in Management and Sustainable Development of Coastal Zone Environments. Springer, Netherlands.

Nath, A.J., Das, G., and Das, A.K.2009. Above ground standing biomass and carbon storage in village bamboos in North East India. Biomass and Bioenergy 33(9): 1188-1196.

Papry, R.I. 2014. Status of coastal plantation in Chittagong Coastal Forest Division. IOSR Journal of Environmental Science, Toxicology and Food Technology8: 79-83.

Portley, E. 2016. Report on the Shrimp Sector: Asian Shrimp Trade and Sustainability. Sustainable Fisheries Partnership. http://cmsdevelopment.sustainablefish.org.s3.amazonaws.com/2016/04/07/Asian%20shrimp_long%20form-05098e04.pdf

Potapov, P., Siddqui, B.N., Iqbal, Z., Aziz, T., Zzaman, B., Islam, A., Pickens, A., Talero, Y., Tyukavina, A., Turubanova, S. and Hansen, c. 2017. Comprehensive monitoring of Bangladesh tree cover inside and outside of forests, 2000–2014. *Environmental Research Letters*, 12: 1-16, 104015. https://doi.org/10.1088/1748-9326/aa84bb

Quamruzzaman, M. 2014. An overview of Bangladesh furniture industry. The Daily Star, Dhaka. http://www.thedailystar.net/an-overview-of-bangladesh-furniture-industry-6612

Rahman, M.R. and Hossain, M.B. 2015. Changes in land use pattern at Chakaria Sundarbans mangrove forest in Bangladesh. Bangladesh Res. Pub. J. 11(1): 13-20.

Rahman, M.M. 2013. Analysis of Coastal Erosion and Forest Loss in the Sundarbans Mangrove Using Time-Series Satellite Data (Chapter No. 6, pp 123-140). In G. Gleason and T.R. Victor (eds.). *Mangrove Ecosystems: Biography, Genetic Diversity and Conservation Strategies*, Nova Science Publishers, New York, USA.

Rahman, M.M. 2012. Analyzing the contributing factors of timber demand in Bangladesh. Forest Policy and Economics 25: 42-46.

Rahman, L.M. 2011. Forest policy, legislation and institution in Bangladesh. Pages 333-350 in: Ahmad et al. (ed.) 2011. First Bangladesh Forestry Congress 2011: Congress Proceedings. Forest Department, Ministry of Environment and Forest, Government of the People's Republic of Bangladesh.

Rahman, L.M. and Ahmed, F.U. (2016). Forest Dependent People in Bangladesh. Pages 57-60 in: Bhuiyan, Z.H., Thakur, A.B. and Uddin, M.S. and Hossain, A.A. (eds.). Souvenir: National Tree Planting Campaign and Tree Fair 2016. Forest Department, Ministry of Environment and Forests, Government of the People's Republic of Bangladesh.

Rahman, M.M., and Pramanik, M.A.T. 2015. Monitoring Mangrove Plantation along the Coastal Belts of Bangladesh (1989-2010). *Journal of Forest and Environmental Science*, 31(3): 225-234.

Rahman, S.A., Rahman, M.F. and Sunderland, T. 2012. Causes and consequences of shifting cultivation and its alternative in the hill tracts of eastern Bangladesh. Agroforestry Systems 84(2): 141-155.

Rahman, M.M., Rahman, M.M., and Islam, K.S. 2010. The causes of deterioration of Sundarbans mangrove forest ecosystem of Bangladesh: conservation and sustainable management issues. AACL Bioflux 3(2): 77-90.

Rahman, M.M., Ullah, M.R., Lan, M., Sumantyo, J.T.S., Kuze, H. And Tateishi, R. 2013. Comparison of Landsat image classification methods for detecting mangrove forests in Sundarbans. *International Journal of Remote Sensing,* 34(4): 1041–1056.

Rashid, A.M., Craig, D., Mukul, S.A., and Khan, N.A.2013. A journey towards shared governance: status and prospects for collaborative management in the protected areas of Bangladesh. Journal of forestry Research 24: 599-605.

Rasul, G.,Thapa, G.B., and Zoebisch, M.A. 2004. Determinants ofland-use changes in theChittagong Hill Tracts ofBangladesh. Applied Geography 24: 217–240.

Reddy, C.S., Pasha, S.V., Jha, C.S., Diwakar, P.G., and Dadhwal, V.K. 2016. Development of national database on long-term deforestation (1930–2014) in Bangladesh. Global and Planetary Change 139: 173-182.

Roy, S., Islam, M.S., and Islam, M.M. 2014. Indirect causes of deforestation and its effects on the environment of Madhupur Sal forest, Bangladesh. Bangladesh J. Environ. Sci. 27: 162-169.

Roy, A.K.D., Alam, K., and Gow, J. 2012. A review of the role of property rights and forest policies in the management of the Sundarbans Mangrove Forest in Bangladesh. Forest Policy and Economics 15: 46-53.

Roy, A.K.D., and Alam, K. 2012. Participatory forest management for the sustainable management of the Sundarbans mangrove forest. American Journal of Environmental Sciences 8(5): 549-555.

Saikia, P., andKhan, M.L. 2014. Ecological features of cultivated stands of *Aquilaria malaccensis* Lam. (Thymelaeaceae), a vulnerable tropical tree species in Assamese homegardens. International Journal of Forestry Research 2014, Article ID 140926, http://dx.doi.org/10.1155/2014/140926

Sajjaduzzaman, M., Muhammed, N., and Koike, M.A.S.A.O. 2005. Mangrove plantation destruction in Noakhali coastal forests of Bangladesh: a case study on causes, consequences and model prescription to halt deforestation. Int. Jour. Agric. Biol. 7: 732-734

Salam, M.A., Noguchi, T., and Koike, M., 1999. The causes of forest cover loss in the hill forests in Bangladesh. GeoJournal 47(4): 539-549.

Sarker, S.K., Deb, J.C., and Halim, M.A. 2011. A diagnosis of existing logging bans in Bangladesh. Int. Forest. Rev. 13: 461-475.

Sasaki, N., and Putz, F.E. 2009. Critical need for new definitions of “forest” and “forest degradation” in global climate change agreements. Conservation Letters 2 (5):226-232.

Shin, M.Y., Miah, M.D., and Lee, K.H. 2008. Mitigation options for the Bangladesh forestry sector: implications of the CDM. Climate Policy 8(3):243-260.

Shin, M.Y., Miah, M.D., and Lee, K.H. 2004. Mitigation options for the Bangladesh forestry sector: implications of the CDM. Climate Policy 8: 243-260.

Siddiqi, N.A. 2001. Mangrove forestry in Bangladesh. Univ. of Chittagong, Nibedan Press.

Siddiqi, N.A., and Khan, M.A.S., 2004. Human-induced succession of vegetation on new accretions in the coastal areas of Bangladesh. Journal of Tropical Forest Science 16: 187-198.

Simula, M. 2009. Towards defining forest degradation: comparative analysis of existing definitions. Forest Resources Assessment Working Paper 154. Food and Agriculture Organization, Rome, Italy. [online]: ftp://ftp.fao.org/docrep/fao/012/k6217e/k6217e00.pdf.

Spalding, M., Kainuma, M., and Collins, L. 2010. World atlas of mangroves. Earthscan, London, UK.

Sunderland, T.C.H., Kibria, M.G., Rahman, S.A., and Imtiaj, A. 2011. Depleting tropical forest at a landscape scale: finding solutions for Bangladesh. Journal of Biodiversity and Ecological Sciences 1(1): 53-64.

Sunderlin, W.D., Larson, A.M. and Cronkleton, P. 2009. Forest tenure rights and REDD. Pages 139-150 in Angelsen, A. (ed.),Realising REDD: national strategy and policy options. CIFOR, Bogor Indonesia.

Swapan, M.S.H., and Gavin, M. 2011. A desert in the delta: participatory assessment of changing livelihoods induced by commercial shrimp farming in Southwest Bangladesh. Ocean Coast. Manage. 54:45–54.

Tacconi, L., Downs, F., and Larmour, P. 2009. Anti-corruption policies in the forest sector and REDD+. Pages 163-174 in Angelsen, A. (ed.),Realising REDD: national strategy and policy options. CIFOR, Bogor Indonesia.

Thapa, G.B., and Rasul, G. 2006. Implications of changing national policies on land use in the Chittagong Hill Tracts of Bangladesh. Journal of Environmental Management 81(4): 441-453.

Thompson, I. D., M. R. Guariguata, K. Okabe, C. Bahamondez, R. Nasi, V. Heymell, and C. Sabogal.2013. An operational framework for defining and monitoring forest degradation. Ecology and Society 18 (2): 20.

Uddin, M.S., van Steveninck, E.R., Stuip, M., and Shah, M.A.R. 2013. Economic evaluation of provisioning and cultural services of a protected mangrove ecosystem: a case study on Sundarbans Reserve Forest, Bangladesh. Ecosystem Services 5: 88-93.

Ullah, M.R., and Al-Amin, M. 2012. Above-and below-ground carbon stock estimation in a natural forest of Bangladesh. Jour. For. Sci. 58(8): 372-379.

UN-REDD Programme (2015). REDD+ Academy Learning Journal, Module 12: Good Governance. https://www.unredd.net/documents/global-programme-191/redd-academy-3509/redd-academy-learning-journals/english.html

World Bank. 2016. World Integrated Trade Solution. http://wits.worldbank.org/CountryProfile/en/Country/BGD/Year/2011/TradeFlow/Export/Partner/all/Product/44-49_Wood

Zurek, M., H. Galt, H., Pritchard, L., and Broadhead, J. n.d. Assessing drivers of deforestation and degradation: theory and practice with reference to ASEAN countries. Online at: Http://www.leafasia.org/sites/default/files/public/resources/LEAF-Assessing-drivers-of-deforestation-and-degradation-MZ.pdf

9 Appendices

9.1 Appendix 1. The questionnaire administered at 9 regional workshops to collect data on forest change drivers from attendees.

Questionnaire on factors (or drivers) responsible for forest loss and forest degradation in Bangladesh
- Please answer all questions.
Village or town where you live or work: **Your age: _____**
_____ **Education level:_____**
Your job or occupation:
_____
Number of years working or living in or near forest (do you live near forest?):
_____
Are you a settler in this forest region? (yes/no)

Has the forest cover in this area decreased in the past 10 years? (yes/no)
_____
Has the rate of forest loss gone up or down in the past 5 years?
_____
Has the local forest been degraded in the past 10 years? (yes/no)

Have forest laws or policies resulted in improved forest management? (yes/no) Please comment:_____

What changes could be made to improve forest cover and halt degradation?
1.
2._____
3._____4._____
_____
5._____

Please comment briefly about people's attitudes about forests:
_____
_____
_____
_____
_____
_____
_____
Any other comments about deforestation or degradation?

_____
_____
_____
_____
_____

Please rank from 1 (worst or most important) to 5 (less worse, least important) the most important of the following factors for forest loss *and* for forest degradation (Note: forest loss = conversion of forest to other land use, e.g., pasture. Degradation = treed but low canopy cover). ****You may add other factors if you wish.**

Factor (driver)	**Forest cover loss**	**Forest degradation**
Small scale agriculture		
Commercial agriculture		
Livestock grazing		
Legal forest harvesting		
Illegal logging		
Population growth or movement of people		
Roads, railroads		
Other infrastructure: mines, power lines, pipelines, etc.		
Fuelwood collecting and charcoal production		
Corruption		
Poor law enforcement		
Forest policies and laws		
Uncertain land ownership		
Fires		
Poverty		
Other?		
Other?		

9.2 Appendix 2. Summary of drivers as reported from 35 studies in the published literature for the main forest types in Bangladesh.

Forest type	Deforestation		Degradation		Source
	Indirect drivers	***Direct drivers***	***Indirect drivers***	***Direct drivers***	
Sundarbans	Corruption,	Land-grabbing	Corruption, illegal shrimp farms.	Pollution	Sajjaduzzaman et al. 2005
	Poverty, poor forest management, overpopulation		Poverty, poor governance, overpopulation	Illegal logging, increasing salinity, sedimentation, excessive logging	Ahmed 2008
			Inadequate government and lack of training,	Increased salinity from reduced flow, overexploitation	Kibria et al. 2011
	Poor land use planning, poor forest management,		Poor land use planning and governance, Shrimp farming and other aquaculture, agriculture	Encroachment (including reclamation), pollution, salination, grazing, diseases, natural disasters	Rahman et al. 2010

Forest type	Deforestation		Degradation		Source
	Indirect drivers	***Direct drivers***	***Indirect drivers***	***Direct drivers***	
				(cyclones, sea level rise)	
				Illegal logging, over-exploitation, increased salinity, top-dying disease	Siddiqi 2001
		Overexploitation, increased salinity, sea level rise			Choudhury and Hossain 2011
	Poor management, Unclear tenure	Fuelwood harvesting, illegal logging	shrimp farming,	Pollution	Roy and Alam 2012
	Poor management, overpopulation, poverty, Poor planning, Corruption	illegal logging,	Weak governance, overpopulation, poverty, Shrimp farming, agriculture	Fuelwood collection	Miah et al. 2011b
Sal forests	Population growth, unemployment, poverty, unclear land tenure, unfair forest policy, corruption and favouring elites	Illegal logging, agriculture - commercial and subsistence, industrial encroachment	Population growth, unemployment, poverty, unclear land tenure, unfair forest policy, corruption	Plantation forestry, fuelwood shortage, illegal logging, industrial encroachment	Islam and Sato 2012

Forest type	Deforestation		Degradation		Source
	Indirect drivers	***Direct drivers***	***Indirect drivers***	***Direct drivers***	
		Agriculture, fire, industrial fuelwood		Plantation, grazing, fuelwood (domestic and industrial)	Hossain et al. 2013
	Poor forest policy	Industrialisation, militarisation		Plantation	Ahmed 2008
	Limited land availability, unemployment	Settlement, agriculture, (encroachment), militarisation	Limited land availability, unemployment	Plantation, agroforestry	Abdullah et al. 2015
	Poor forest policy, top-down management, overpopulation, poverty, lack of available land	Encroachment, roads, militarisation	Poor forest policy, top-down management, overpopulation, poverty, lack of available land	Encroachment, roads	Iftekhar and Hoque 2005
		War in 1970s, encroachment		Illegal logging	Kibria et al. 2011
		Agriculture (commercial), fuelwood, settlement			Haque et al. 2008
	Poor forest policy Corruption Overpopulation	Excessive logging (legal and illegal) Agriculture Brickfield	Poor forest policy Corruption Overpopulation	Plantations	Roy et al. 2014

Forest type	Deforestation		Degradation		Source
	Indirect drivers	***Direct drivers***	***Indirect drivers***	***Direct drivers***	
Hill forests: **Chittagong, Chittagong Hill Tracts, Sylhet**	Overpopulation, migration to area, uncertain land tenure	Over-harvesting	Overpopulation, migration to area, uncertain land tenure	Over-harvesting	Miah et al. 2014
	Lack of alternative livelihoods, unclear tenure	Militarisation, industrialisation, shifting cultivation, illegal logging, encroachment	Lack of alternative livelihoods, unclear tenure	Militarisation, industrialisation, shifting cultivation, illegal logging, encroachment	Ahmed 2008
		Excessive shifting cultivation		Illegal logging	Hossain 2011
	Overpopulation, land scarcity, unclear land tenure, poor government policy (migration)	Excessive shifting cultivation, dam impoundments, illegal logging, overexploitation			Thapa and Rasul 2006
	Inefficient technology (wastage), overpopulation, poor government policy	Agriculture, excessive shifting cultivation, uncontrolled logging, fuelwood, grazing, fire		Fuelwood	Kibria et al. 2011

Forest type	Deforestation		Degradation		Source
	Indirect drivers	***Direct drivers***	***Indirect drivers***	***Direct drivers***	
	Poverty, lack of land use planning, uncertain tenure	Agriculture/shifting cultivation			Hossain et al. 2008
	Overpopulation and migration, poor government policy, poverty, lack of land, lack of full valuation of forest value	Encroachment, dams, militarisation	Overpopulation and migration, poor government policy, poverty, lack of land	Plantations	Iftekhar and Hoque 2005
	Poverty, over-population, lack of land, lack of technology, uncertain land tenure, top-down management by FD, under-capitalisation	Fires, soil erosion, excessive shifting cultivation	Poverty		Rahman et al. 2012
	Overpopulation, lack of proper policy and poor land management, land scarcity	Agriculture, industrialisation, settlement, sand mining			Biswas et al. 2012
	Overpopulation, Poor governance	Shifting cultivation, overharvesting	Overpopulation, Poor governance	Shifting cultivation, overharvesting	Salam et al. 1999
Coastal forest		Plantation failures, cyclones, erosion			Papry 2014

Forest type	Deforestation		Degradation		Source
	Indirect drivers	***Direct drivers***	***Indirect drivers***	***Direct drivers***	
	Climate change, increased salinity (reduced freshwater flows), cyclones, early lack of technical knowledge	Sea level rise, mortality of planted trees			Islam and Rahman 2015
	Demand for agriculture and seafood, overpopulation	Polder construction for rice and shrimp			Ahmed 2011
	Overpopulation,	Shrimp farming, overharvesting	Overpopulation	Pollution	Miah et al. 2010
General studies of Bangladesh:	Consumerism, ineffective governance, overpopulation, poverty	Agriculture, militarisation, Industrialisation	Consumerism, ineffective governance, overpopulation, poverty	Plantation, militarisation, industrialisation,	Ahmed 2008
	Over population, unemployment, migrants, low capacity in FD, corruption, intersectoral conflict		Over population, unemployment, migrants, low capacity in FD	Unsustainable commercial forestry	Miah et al. 2010
		Agriculture and shifting cultivation, encroachment, uncontrolled logging, fire,		Animal grazing, fuelwood collection,	Kibria et al. 2011

Forest type	Deforestation		Degradation		Source
	Indirect drivers	***Direct drivers***	***Indirect drivers***	***Direct drivers***	
		poor technology (wood use)			
	Poverty, lack of land use planning, uncertain tenure, lack of land, socio-political instability	Agriculture/shifting cultivation, encroachment, fire, industrialisation (including brickworks)	Poverty, lack of land use planning, uncertain tenure, lack of land, socio-political instability	Illegal logging, fuelwood, poor technology of logging	Hossain et al. 2008
	No strategic planning, no national C&I, lack of intersectoral coordinated decision-making for forest management, poor pay = corruption		No strategic planning, no national C&I, lack of intersectoral coordinated decision-making for forest management, poor pay = corruption		Sarker et al. 2011
	Limited land, high unemployment, overpopulation, poverty, poor policy, lack of valuation of forest	Industrial development, illegal logging, militarisation, roads, dams	Limited land, high unemployment, overpopulation, poverty	Illegal logging, plantations	Iftekhar and Hoque 2005

Forest type	Deforestation		Degradation		Source
	Indirect drivers	***Direct drivers***	***Indirect drivers***	***Direct drivers***	
	FD unwilling or unable to regulate tree harvest, benefits to elites (corruption), poverty	Overharvest, illegal logging			Shin et al. 2008

9.3 Appendix 3. Glossary of drivers.

Overpopulation
Over population is an undesirable condition where the human population exceeds the carrying capacity of an area in terms of the resources they need to survive, like water and essential nutrients. This condition results min excessive resource use, pollution, and conflicts over land.

Poor management, laws, and policy
Poor management, laws and policy are all linked to governance issues. This can be both induced by lack of enthusiasm from a designated official to lack of political commitment of the office bearers as government officials and elected representatives of the people. Some policy and law are quite old and have not gone through proper updating to reflect current needs.

Poverty and unemployment
Poverty is general scarcity of resources required by a person. It is often indicates the state of one who lacks a certain amount of material possessions or money to meet his or her needs. Unemployment is defined by the unavailability of income generating activities or jobs for a person who is willing to work. Unemployment is considered to be directly linked with the poverty of the person or associated dependent family members.

Poor communities consume available natural resources for their immediate survival. For example, in the absence of the provision of gas and electricity or the availability of renewable sources of energy at affordable rates, wood is the major source of energy for communities in hilly areas.

Corruption
Corruption can be defined as dishonest or fraudulent conduct by people in positions of authority. Corruption may be in return of direct personal benefits (monetary or other bribe), or through political influence over decisions of forest management that are contrary to the law or policy. This is relevant for all the forest areas of Bangladesh and involves many offices including elected people's representatives, Forest Department, land administration and other law enforcing agencies.

Lack of education (awareness)
Lack of education refers to both formal and informal education to increase awareness about benefits of forests and their associated ecosystem services. Many people are unaware or unable to appreciate forests' role in providing intangible benefits, especially environmental benefits. They only can think of wood as forest product and services. This leads to the attitude to overlook the need for forest protection and management. Being reluctant to put out a forest fire or considering forest offences lesser of a crime are few of the examples. The informal awareness is generally low in migrated settlers into the forest area and people who are not direct beneficiary of the forests.

Insufficient Forest Department staff

Forest Department have low number of field personnel in many areas of the country compared to the open resource they have to manage and protect. With limited logistics, these personnel are unable to carry out regular patrolling and visit all the managed areas within reasonable timeframe. This allows people with ill motives to access forested areas, go for illicit cutting or even encroaching of the forest land for other uses. For Sundarbans, the bandits living in the forest are able to overpower the sparsely staffed patrol stations within the forest.

Unclear land tenure

Land tenure is defined by how property rights to land and associated resources (such as water, trees etc.) are to be allocated. They include how access is granted to rights to use, control, and transfer land, as well as associated responsibilities and restraints. In simple terms, land tenure systems determine who can use what resources for how long, and under what conditions.

Land tenure is an important part of social, political and economic structures. It is multi-dimensional, bringing into play social, technical, economic, institutional, legal and political aspects that are often ignored but must be taken into account.

Lack of clarity on the identity of rights-holders and/or a lack of recognition of rights over land may lead to the exclusion of certain stakeholders from REDD+ planning and implementation. This carries the risk that REDD+ payments may not be allocated equitably. There is also a risk that unclear land tenure rights could incentivise corruption.

Land tenure issue in Sal forest area and hill forest areas in Bangladesh are quite different. In the Sal forest region, it is well-defined and enforceable in a formal court of law. However, many land tenure issues in the Chittagong Hill Tracts region is based on customary structures within the community.

Poor enforcement

Poor enforcement is a governance issue of non-implementation of policies and laws in place. The reasons for non-implementation are many but are usually related to lack of staff, or desire on the part of staff to enforce laws for some freason.

Lack of land

Land is an essential natural resource, both for the survival and prosperity of humanity, and for the maintenance of all terrestrial ecosystems. Over millennia, people have become progressively more expert in exploiting land resources for their own needs. The limits on these resources are finite while human demands on them are not. Increased demand or pressure on land resources shows up as declining crop production, degradation of land quality and quantity, and competition for land.

Demand for food/seafood

Demand for food and or seafood is directly linked with growing requirement from the local inhabitants to national and global markets. Demand for food is often derived by the subsistence requirement of the people living in and around forests. Demand for seafood is

mostly driven by global market demand for shrimps, especially for the Sundarbans and coastal forest areas.

Lack of land use planning
Lack of land use planning refers to absence of proper regulation of land use in an efficient way to prevent land use conflicts. Lack of land use planning is mentioned for both within and outside forested areas and usually involves zoning to enable or disallow various kinds of land uses.

Within forested areas, there is no clear distinction between production forestry areas and truly conservation areas. Even if there is some delineation of such use pattern, they may not be appropriate given the local demand or resource base. Sometimes within forest land use planning (functional zoning) has stopped with the moratorium on harvesting. Effectively, therefore there is no forest management plan in place for most of the forest areas.

Lack of landuse planning outside the forest affects forest resources indirectly. Indiscriminate industrial expansion in Sal forest areas is one such instance. Extensive shrimp farming, ineffective polder system on the upstream of the Sundarbans region is another example of lack of landuse planning. Lack of landuse planning is also very acute for newly accreted areas (Char lands) of the coastal belt of Bangladesh.

Climate change
Deforestation contributes to the climate change through enhancement of green house gas emissions and reduction of carbon sinks. However, climate change is also thought to be linked with increased frequency and intensity of natural disasters such as tropical cyclones. Sea level rise is another important issue, especially for coastal forest areas and Sundarbans. Sea level rise in the coastal belt with very high tidal fluctuation is thought to induce submersion and gradual erosion of low-lying new accretions and beach areas.

Excessive and Illegal harvesting
Over-harvesting and illegal harvesting were always discussed in the workshops at the same time. Areas that are closed to harvesting may be logged illegally to gain cash from selling wood. Over-harvesting can be defined as the extraction of the forest products at a higher rate than permitted by law or under a forest plan and is always there in all forest areas of Bangladesh. Nevertheless, whenever any legal permit is issued to collect or carry wood, usually more than the stipulated amount is removed from the forest and carried under the legal permit.

Infrastructure (roads etc.)
Infrastructure mostly refers to roads, railways, dams, towns, and other developments. Roads and other infrastructure also provide increased access into the forested area and leads to degradation of the adjacent forest areas.

Fuelwood collection or harvesting

Fuelwood collection is widespread in all forest areas of Bangladesh because the vast majority of people cook with wood heat. Further, there are some commercial enterprises that require large amount of fuelwood, such as brick or pottery kilns. Although officially not allowed, these industries consume large amounts fuelwood, especially in central Sal forests, Sundarbans, and hill forests.

Agriculture

Agriculture is globally one of the most well-known drivers of deforestation. Agriculture causes direct conversion of forests into agricultural landuse. However, agricultural waste of pesticides and chemical nutrients can also cause indirect degradation and gradual deforestation of forested land.

Local inhabitants of Sal forest area deforest areas by converting the raised (Chala) forested areas into low lying agricultural strips (baid land) crisscrossing the forests. For hilly areas of Chittagong Hill Tracts, large scale agriculture (pineapple, tobacco) and horticulture such as fruit orchard (banana), root crop (ginger, turmeric), etc., are a main reason for encroachment, while shifting cultivation is major driver of deforestation.

Fires (human-caused)

Forest fires from natural causes (lightening) are rarely reported in Bangladesh, especially in the recent past and almost all fires are human-caused. In hill forest areas, fire is often linked to uncontrolled burning from slash and burn for cultivation. In central Sal forest region, fire may be initiated by negligence of people and in Sundarbans, fire is often associated with clearing of bush within low-lying wetlands for ease of access for fishing.

Encroachment (industry or settlement)

Encroachment may be defined as intrusion on a person's territory and associated rights. In regard to forest areas of Bangladesh, encroachment varies in scale and type. In central Sal forest regions, the encroachment is largely from industrial or other large enterprises building factories and other establishments in the area. They sometime buy private lands near the forested areas and encroach the nearby forest patches. Sometimes political influence or corruption through bribery plays a major role in elite encroachement. Industrial scale agriculture and horticulture also induces encroachment of forest areas. Encroachment is also occurs through expansion of household areas and homestead gardens.

People who migrate usually move to forested areas to form new settlements. Displaced people due to river bank erosion had moved to Central Sal forest areas and people from plain land migrated to hilly areas. Many international refugees are trying settle in forested areas of the hill forests of Chittagong and Chittagong Hill Tracts region, increasing encroachment clearing.

Shrimp farming

Shrimp farming within forested areas in the coastal region has caused direct deforestation. A complete disappearance of Chakaria Sundarbans reserve forest is one of the prime examples of such deforestation. In the Sundarbans and adjacent coastal forests, shrimp farms have acted indirectly by generating pollution or by increasing demand of wood based products from the forests as no tree cover is available in the areas with shrimp cultivation.

In the Sundarbans area, the situation is so dire that people forced to collect even fodder from within Sundarbans.

Reduced water flows
Reduced water flows refer to decreased amount of freshwater availability for Sundarbans and coastal forest areas. This is linked to diversion of large amount of freshwater through creation of dams (such as Farakka Dam in India) and also numerous polders for regulating natural flow of the water channels. There are also structures created by people upstream to help them with shrimp farming and other fisheries. This is linked to increased salinity, less effective dilution of industrial pollutants dumped into the waterways, and siltation of the waterways.

Pollution
Pollution may adversely affect biodiversity in general, reduce species' fecundity and thus cause long term degradation in the process. Pollution from upstream industries, agriculture and shrimp farming is documented for the Sundarbans and coastal forest areas and is thought to cause degradation in the mangroves.

Increased salinity
Salinity increase is reported in the Sundarbans and Coastal region over last few decades and is linked with reduced freshwater flow from international and national catchment areas and sea level rise induced by climate change. Increased salinity is also linked with siltation as coagulation of silt occurs more heavily under influence of salinity.

For Sundarbans, increased salinity is thought to be linked with reduced regeneration of desired sundri tree (Heretiera fomes) and may also lead to gradual shift of species mix with increase of goran (Ceriops) and gewa (Excoecaria agallocha). This processes are considered to be a degradation of the ecosystem from the current state.

Natural disasters
Natural disasters that are directly affecting the Sundarbans and Coastal forests are mostly tropical cyclones and associated tidal surges. The hilly areas close to coastal belt such as Cox's Bazar region are also affected by them. Central Sal regions have seasonal tornados and flooding and Hilly forested areas have flash floods although the effects from these disasters on Sal and hill forests is relatively low.

Impoundments
Impoundment is defined as the body of water confined within an enclosure, as a reservoir. This is usually created due to erection of dams. The Kaptai hydropower dam created the Kaptai lake, the largest impoundment in Bangladesh, stretching across significant low lying valleys of Chittagong Hill Tracts region. This has triggered direct conversion of forested land to wetlands and has also been the underlying cause of deforestation and forest degradation by displaced people's settlement, agriculture and lifestyle change such as going back to Jhum cultivation in uphill slopes.

Military bases

Establishment of military bases within forest areas causes direct conversion of forest land to another land use. Often military maintain large cleared areas around the base for ease of monitoring subversive movements. Central Sal forests have cantonments in the forested areas. In hilly areas, years of insurgency have lead to establishment of many military camps and bases in the region.

Migration
Migration of people to forested areas leads to the conversion of forests by newcomers into their homesteads and agricultural lands. They also come with increased demand for forest products, causing degradation.

River bank erosion causes displacement of many people every year in Bangladesh, often forcing people to move to areas that do not belong to any private owner, usually a forested area. In coastal areas, people move into newly accreted lands mostly for fertility of the land for agricultural practices. In hilly areas, there was state sponsored migration and this is still going on through movement of friends and families who are now settled there. There is also influx of international refugees from neighbouring countries such as Myanmar into the hilly areas.

Plantation
Plantation is conversion of natural forests into monoculture or a mix of desired species. Plantation is often associated with reduction of ecosystem services, especially for associated biodiversity, both fauna and flora. Teak plantation in the Chittagong Hill Tracts natural forest areas and plantations of Acacia and Eucalyptus under social forestry across the country is referred to by 'plantation' and is a cause of forest degradation. Of course, plantations can play a considerable role in an overall forest management plan for a region by reducing pressures on natural forests, if done under controlled management regime.

Diseases
In terms of disease, the most widely known and reported forest tree species disease is the top-dying of the Sundarbans Sundri (Heretiera fomes) tree. The causal link of this disease is yet to be established with any environmental or pathogenic agents but is likely related to pollution and or reduced waterflows.

Cattle grazing
Cattle often cause damage to tree regeneration and to new plantations through grazing and trampling. In hilly areas of Sylhet, grazing takes place during and after monsoon when low-lying haor areas are flooded.

9.4 Appendix 4. Recommendations from Workshops

Hill Forest [Sreemongal, Rangamati, Chittagong, Cox's Bazar]

Overall comments/ recommendations
"No rights, No REDD+" may be considered in formulating REDD policy.
Alternatives to plant-based sticks (plastic stick to helpbetel leaf plants to creep up instead of tree sticks).
Avoid development works inside forests
Brick field/Sawmill to be controlled
CMC should have legal basis.
Coordination between FD and other agencies and stakeholders
Empower Forest Department with staffs and logistic
Everyone should play responsible role.
Eviction of all industries from forest land
Forest land demarcation
Forest offence should be non-bailable.
Good governance – transparency, accountability, efficiency.
Governance system, policies and laws need assessment and improved
Headwater inhabitants need to be benefitted to conserve forests. PES system may help.
Higher tax may be imposed on timber extraction.
Involving people in forest management
Land leasing plan/guideline necessary
Less valuable indigenous tree species should be selected for plantation programs
Livelihoods or AIGA opportunity like, veterinary training, cattle and poultry, doll making, fish farming, etc.
Mother trees to be identified for conservation
Motivation and awareness creation
Natural regeneration to be protected.
People should get cash benefit to conserve forests.
Politicians to be evaluated based on their role in forest conservation
Proper forest land zoning (betel leaf cultivation, fuelwood plantation, conservation, etc.)
Proper implementation of existing laws and policies.
Religious or cultural harmony is necessary.
Research is needed to find out whether it destroys forests.
Resettle the forest villagers
Social forestry may be extended to green the open and exposed hills.
Social forestry policies are not fully implemented. Poor people in some cases didn't become participant rather influential people became participant.
Sources of furniture to be identified and permitted by FD to stop illegal trafficking of furniture.
Strengthen monitoring and coordination
Strict government order is needed for forest conservation like, government's recent stand against terrorism.
Strong political and social commitment
There should be no *Jote* permit within certain distance from reserve forests in CHT.
There should have win-win partnership between government and forest dependent communities.
Tree planting movements may help.
Village common forests (VCF) or *para ban* can be good example for forest conservation. VCF could be awarded prize under REDD+. VCF should be legally recognized. So people will be encouraged.

Sal Forests [Gazipur, Mymensingh, Rangpur]

Overall comments
AIGAs
Brick field/Sawmill to be controlled
Capacity of FD officials to be improved for litigation and forest management
Crop pattern to be changed to resolve elephant problem through planting crops which elephants do not like such as, karola, chili, ladies finger, etc.
DoE should work along with BFD in issuing location and environment clearance certificates for new industries
FD staff to be increased
Forest cases should be resolved as quickly as possible and false cases to be withdrawn
Forest land demarcation
Good governance – transparency, accountability, efficiency.
Governance system, policies and laws need to be improved
Improving SF programs
Inter ministerial/sectoral coordination
Land ownership problems to be resolved
Land zoning (based on uses)
Motivation and awareness creation
National interests to be given priority
Need strong regulation to stop transfer of privately owned *Bait* land.
People should be involved in forest management.
PES for Sal restoration
Proper implementation of all policies and laws.
Proper land use policy/plan
Reclaim encroached land through rehabilitation of encroachers by adopting new laws and/or policies.
Rights of indigenous people should be considered
Scientific management of forests is necessary
Social and political elites to be involved in participatory forestry
Strong law enforcement
Update forest policy or law

Sundarbans Mangrove [Khulna]

Overall comments/ recommendations
Access should be strictly restricted without pass or permit
Alternative Income Generating Activities
Awareness creation and motivation
Capacity development of FD
Conservation of the Sundarbans should get highest priority.
Effluent treatment before discharging into the river or sea to be mandatory for all industrial setups.
Forest cases should be resolved instantly or quickly
Forest degradation is more important than deforestation in the Sundarbans
Governance system, policies and laws need assessment and improved
Initiate education, health, agricultural and livelihood development projects within 10 km buffer zone of the Sundarbans
Introduce Ecotourism
Alternatives to plant-based sticks (plastic stick to help fisherman to use as kocha in Sundarbans instead of tree pole).
Proper implementation of all policies and laws.
Religious and cultural values of forest like Ban bibi worship, Rash Purnima, etc. Indigenous people sacrifice hens for forest conservation
Research is needed to find out whether major species are reducing in numbers or associate species are increasing.
Restrict access of resource collectors at least for 10 years
Scientific management of forests is necessary
Social forestry may be introduced at the outskirts of the Sundarbans
Update forest policy or law

Coastal Forests [Barisal]

Overall comments/ recommendations
AIGAs Brick field/Sawmill to be controlled Everyone should play their respective role. Forest land demarcation Good governance – transparency, accountability, efficiency. Govt. initiatives needed to resolve land conflicts Improving Social Forestry programs Indigenous multilayer tree planting around homesteads with raintree, fruit trees (coconut, malta, etc.), bamboos, etc. Land leasing plan/guideline necessary Motivation and awareness creation Need village/house plan. Building high-rise apartments may save spaces for planting trees Proper implementation of existing laws and policies.

10 Annexes: Individual workshop reports:

1. **Mymensingh**
2. **Khulna**
3. **Rangamati**
4. **Cox's Bazaar**
5. **Chittagong**
6. **Sreemangal**
7. **Barisal**
8. **Rangpur**
9. **Gazipur**

10.1 Mymensing: Sal forest zone

Workshop Report On

Identification of Drivers of Deforestation and Forest Degradation in Bangladesh: Sal Forest Zone, Mymensingh

11-13 December 2016
Hotel Sylver Castle, Mymensingh, Bangladesh

Programme Management Unit (PMU)
UN-REDD Bangladesh National Programme
Bangladesh Forest Department

17December 2016

UN-REDD Bangladesh National Programme

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17 December 2016

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Executive Summary

The depletion of forest resources is a major environmental issue especially in the developing countries. Identification of drivers of deforestation and forest degradation is critical and mandatory to formulate effective and meaningful national strategies to save forest resources across the country. The UN-REDD Bangladesh National Programme of Bangladesh Forest Department (BFD) has amassed a team of international and national consultants to identify the direct and indirect drivers that are deemed responsible for deforestation and forest degradation (D&D) in the country. The team is composed of Dr. Ian Thompson - an international consultant with expertise in REDD+, Dr. Mohammed Jashimuddin as Governance Specialist, Dr. Mohammad Mahfuzur Rahman as a Natural Resource Economist, and Mr. Saiful Islam Khan as a GIS expert. Apart from the methodology validation workshop in Dhaka, the D&D study team has planned a total of nine workshops at eight different administrative divisions of the country plus one at the Rangamati District of Chittagong Hill Tracts (CHTs). This report is the summary of the ninth workshop held during 11-13December 2016 in Mymensingh, Bangladesh.The meeting started with a welcome speech from Mr. Rakibul Hasan Mukul, Asst. Chief Conservator of Forests, Development Planning Unit & National Project Director, UN REDD Bangladesh National Programme, followed by a presentation on REDD+ in Bangladesh byMr. Sayeed Mahmud Riadh, REDD+ Governance Activity Coordinator, UN-REDD Bangladesh National Programme. To set the context of the study, a Bangla power point presentation on the drivers of deforestation and forest degradation across the world as well as in Bangladesh was presented by Dr. Mohammed Jashimuddin on the team's behalf. The third presentation was conducted by Mr. Saiful Islam Khan on administering the socioeconomic survey on the D&D drivers and their underlying causes. After all these presentations a lively open discussion with constructive criticisms and suggestions on the drivers of deforestation and forest degradation continued with concluding remarks from Mr. Syed Nurul Islam, Superintendent of Police, Mymensingh, Mr. Md. Yusuf Ali, Director, Department of Environment, Mymensingh, Mr. Abdul Mabud, Conservator of Forests, Central Circle, Bangladesh Forest Department, Mr. Choudhury Abdullah Al Mamun, PPM, DIG of Police, Mymensingh Range, Mr. G M Saleh Uddin, Divisional Commissioner, Mymensingh and from the chair of the meeting Mr. Md. Yunus Ali, Chief Conservator of Forests, Bangladesh Forest Department, Bangladesh. Finally the meeting ended with the vote of thanks from Mr. Gobinda Roy, DFO, Mymensingh Forest Division. Each of the speakers tried to highlight on what the major threats to forest resources, especially the Mymensingh region, were and why and what we need to do to save the planet from the destruction of climate change.

Beside the formal workshop and open discussion among all participants present in the meeting, the D&D study team also conducted a number of key informant interviews (KIIs) and two focused group discussion (FGDs). The KIIs and FGDs were conducted by Mr. Saiful Islam Khan and Dr. Mohammed Jashimuddin. The team interviewed school teachers, college/university teachers, social workers, political leaders, local government leaders, Forest Department (FD) officials, and high officials from Mymensingh. The two FGDs were conducted at forest dependent communities of Hobirbari Beat, Valuka Range, Valuka, Mymensingh Forest Division and Bhutia, Dukhola Beat, Dukhola Range, Madhupur Upazila, Tangail Forest Division.

The workshop, FGDs, and KII participants identified a number of drivers. The major drivers for deforestation were forest land tenure conflicts inherited from British colonial legacy, long time for litigation and huge number of forests cases, poverty and high dependency on forests for livelihoods, lack of alternative livelihoods or employment opportunities, unclear forest boundary, industrialization, land encroachment, poor implementation of laws and policies,

political and social influence, corruption, negligence of forest officials about their duties, lack of good governance, conflicting laws and policies, high value of land, lack of awareness, attitude towards forests from both public and private, continued dissatisfaction of indigenous people as their rights are ignored by the Forest Settlement Officer (FSO), establishment of firing range by armed forces, rubber garden, social forestry activities by destroying natural forests, development activities, false cases, commercial agriculture like banana, pineapple, papaya, orange, malta, lemon, etc., high demand of cash crops, lack of logistics and limited staff of FD.

The drivers of forest degradation were more or less similar if not the same. The D&D team identified a number of drivers of forest degradation. Some of these drivers are long time for litigation and huge number of forests cases, industrialization, insufficient care and maintenance (silvicultural operation) by FD, social forestry activities through monoculture plantation like Acacia, poverty and high dependency on forests for livelihoods.

The participants in the MymensinghProgramme emphasized on a number of issues to be resolved as soon as possible to stop the ongoing D&D in the forest areas of Mymensingh region. Capacity development of FD,proper implementation of existing laws and policies, building awareness among general public, good governance, motivating local people to conserve forests, creation of alternative livelihood opportunities, scientific management of forests, updating policies or laws, resolving forest cases instantly or quickly, consider rights of indigenous people, DoE should work along with BFD in issuing location and environment clearance certificates for new industries, proper land use policy, capacity development of FD officials for litigation and forest management, giving more priority for national interests, increasing FD staff, environment education, training of participants, involving social and political elites in participatory forestry, and resolving land ownership problems could help conserve forests in the Mymensingh region.

1 UN-REDD Bangladesh National Programme

1.1. *Background*

In August of 2010, Government of the People's Republic of Bangladesh became a partner country of the UN-REDD Programme. The UN-REDD Programme is the United Nations collaborative Programme on reducing emission from deforestation and forest degradation. The Programme assists developing countries like Bangladesh to build capacity to reduce emissions and to participate in a future REDD+ mechanism.

In subsequent years, Bangladesh took several key steps i.e., established the National REDD+ Steering Committee; the REDD+ Preparation Proposal (R-PP) was approved in end of 2013 by UN-REDD Policy Board. The UN-REDD National Programme Document was approved by national counterparts & participating UN organization in 2015. Finally, the government approved the UN-REDD Bangladesh National Programme in 19 June 2016.
The Forest Department (FD) of the Ministry of Environment and Forests (MoEF) is the lead Implementing Partner for the UN-REDD National Programme, headed by a National Project Director (NPD), supported by Programme Management Unit (PMU). The United Nations Development Programme (UNDP) and Food and Agriculture Organization (FAO) are the two co-implementing partners helping the PMU. The duration of the NP is from July 2015 to June 2018.
The UN-REDD Bangladesh National Programme has the objective to support the Government of Bangladesh in initiating the implementation of its REDD+ Readiness Roadmap (i.e., R-PP) by establishing necessary REDD+ management processes, identifying strategic readiness options for completing its National REDD+ strategy, and developing the capacities required to begin implementation of REDD+.

1.2. *Scope of the Report*

The primary aim of this report is to document the preliminary outcomes of the consultation workshop, FGDs, and KIIs conducted in Mymensingh to capture the major drivers of deforestation and forest degradation in Mymensingh region held on 11-13December 2016 organized by the UN-REDD Bangladesh National Programme.

1.3. *Organization of the Report*

Section 1 introduces the Background of UN-REDD Programme; Section 2 elaborates on the details of the workshops. Relevant annexes – i.e., presentation on UN-REDD Bangladesh National Programme, presentation by consultant team and list of participants are appended at the end of report.

2 Workshop on Drivers of Deforestation &Forest Degradation (D&D)

2.1. *Background of the Drivers of Deforestation &Forest Degradation Study*

Bangladesh is a signatory to the UN Framework Convention on Climate Change (UNFCCC). The Conference of the Parties (COP) to the UNFCCC has taken a number of decisions in recent years to encourage developing country Parties to take climate change mitigation actions in

forestry sector. The role of forests and reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) have been fully recognised and enshrined in the Paris Agreements.

As part of the country's long-term strategy to reduce GHG emissions, largely described in its Intended Nationally Determined Contributions (INDC), the Government of Bangladesh has taken initial steps to contribute to this global effort to address climate change, and one of such steps is to develop its capacity to implement REDD+. The Government of Bangladesh prepared and endorsed its REDD+ Readiness Roadmap in 2012.

To support this effort, the UN-REDD Bangladesh National Programme was established to provide technical capacity development assistance to the Government of Bangladesh in designing and implementing its National REDD+ Strategy and in meeting the international requirements under the UNFCCC Warsaw Framework to receive REDD+ results-based finance.

One of the key components of the REDD+ readiness process is to identify public policy approaches and interventions, including incentive mechanisms to effectively address key drivers and causes of deforestation and forest degradation (D&D). In order to identify such approaches, a clear understanding of drivers and causes of D&D in Bangladesh must first be developed.

To develop such an understanding, UN-REDD Bangladesh National Programme amassed a team comprised of international and national consultants. The team accordingly developed a methodology and planned a total of 9 regional workshops distributed across the country. The Mymensingh workshop and aligned FGDs and KIIs were conducted aiming at the following objectives:

- To identify the most important drivers of deforestation and forest degradation in Mymensingh region and
- To focus on the historical background of the drivers and potential solution(s) to the problems of D&D.

2.2. *Organization of the Workshop*

List of Invitees: Participants list was developed by Divisional Forest Officer, Mymensingh Forest Division based on criteria put forward to the study team. In general, the criteria put forward by study team suggested inclusion from – local administration, departments, educational institutions, NGOs, indigenous communities, local leaders, business representatives and people living adjacent to the forested areas. A letter of invitation was prepared by Project Director, which was distributed by the departmental staff to help the project.

Workshop Presentations and Information Materials: The primary objective of the workshop was to identify Drivers of Deforestation and Forest Degradation for the Mymensingh region by the relevant stakeholders and to fine tune the methodology. Accordingly four presentations were made by Mr. Rakibul Hasan Mukul, Mr. Sayeed Mahmud Riadh, Dr.

Mohammed Jashimuddin and Mr. Saiful Islam Khan to set the context (Table 1). A number of awareness materials (Table 2) were shred among the participants of the workshop.

Table 1: List of Presentations

Sl	Presentation on	Basic Message	Presentation by
1.	UN REDD Bangladesh	Welcome address	Mr. Rakibul Hasan Mukul, National Project Director, UN REDD Bangladesh
2.	REDD+ in Bangladesh	Introduction on REDD+ in Bangladesh	Mr. Sayeed Mahmud Riadh, Governance Co-ordinator, UN-REDD Bangladesh
3.	Drives of Deforestation and Forest Degradation	Context of Drives of Deforestation and Forest Degradation Study and requirement	Dr. Mohammed Jashimuddin, National Consultant, D&D study team
4.	Socioeconomic study	Identification of major socioeconomic drivers responsible for D&D in Mymensingh	Mr. Saiful Islam Khan, National Consultant, D&D study team

Table 2: List of Awareness Materials shared during the Workshop

Sl	Item	Information shared
1.	REDD+ and National Programme Leaflet in Bangla	What is UN-REDD Programme; what is REDD+, what are the five activities of REDD+, Warsaw Frameworks, why REDD+ is important, its relevance, why REDD+ is important for Bangladesh; evolution the NP and the targeted outcomes.
2.	National Programme Leaflet in English	Relevance of REDD+ in Bangladesh, evolution of REDD+ Programme, phased approach and outputs, Warsaw framework, National Programme Objective, duration, budget, outcomes and outputs, project management.
3.	Document folder	What is REDD+, short brief on National Programme, phased approach of UN-REDD Programme and institutional framework proposed for REDD+ Programme in Bangladesh.
4.	Note book	What is REDD+, its five activities, UN-REDD Programme, Warsaw elements, Bangladesh National Programme, targeted outputs and delivery schedule.
5.	Branded Pen	With UN-REDD, Government and Forest Department's logo.
6.	Bangla Presentation on REDD+	What are drivers of deforestation and forest degradation, why study is required?

2.3. Programme Schedule

The entire Programme comprises of 3 days of activity (Table 3), where 1st day involves a FGD at Hobirbari, reaching the destination at Mymensingh, and coordination and communication with local Forest Department officials and internal team meeting. The second day of the Mymensingh activities consists of the consultation workshop itself with socioeconomic survey and KIIs before lunch at Hotel Sylver Castle, Mymensingh. The third day consists of a FGD at Bhutia, Dukhola Beat, Dukhula Range, Modhupur Upazila, Tangail with local forest dependent communities and elites and community leaders, and heading back to Dhaka in the afternoon (Tables 3&4).

Table 3. Detailed Programme Schedule for Mymensingh

Day 01:11Dec ,2016 .Sun day	**Activity**	**Remarks**
09.AM 00	Leave for Mymensingh	ByRoad
11-AM 00.1.00PM	Field Visit at Hobir Bari Beat, Valuka Range, Mymensingh for FGD	FGD at Hobirbari Beat with both poor forest dependent communities and local elites
01:00 PM-03.00 PM	TravelValuka to Mymensingh	By Road
03PM 00.-04PM 00.	Check in to the Guest House/ Hotel	Guest House/ Hotel ,Mymensingh
04PM-0 00.6.PM 00	Meeting with DFO	DFO Office ,Mymensingh
06PM-0 00.7PM 00.	Back to the Guest House / Hotel	Guest House/ Hotel, Mymensingh
07:00 PM –08:00 PM	Preparatory Meeting	Guest House/ Hotel, Mymensingh
08:30 PM	Dinner	Night stay at Guest House Hotel//
Day 2 :12 Dec .2016,Monday		
:0730 AM	Break fast	
08:30 AM –10:30 AM	Preparation for the workshop	
10:30 AM -03:00 PM	Workshop, Key Informant Interview, Questionnaire Survey and Lunch	Detailed programme is attached herewith.
07:30 PM	Dinner	Night stay at Guest House/ Hotel,Mymensingh
Day 3 :13 Dec.2016,Tuesday		
0AM 30 :7	Break fast	
08-AM 00.12PM 00.	Field Visit at Bhutia, Dukhola Beat, Dukhula Range, Modhupur Upazila, Tangail for FGD	FGD at Bhutia with poor forest dependent communities, community leaders and local elites
12.00-PM 04.00PM	Travel Mymensingh to Dhaka	By Road

The workshop meeting was started with the welcome speech delivered by Mr. Rakibul Hasan Mukul, Asst. Chief Conservator of Forests, Development Planning Unit & National Project Director UN REDD Bangladesh National Programme, followed by Mr. Sayeed Mahmud Riadh, REDD+ Governance Activity Coordinator, UN-REDD Bangladesh National Programme with his detailed presentation on the background, objectives, and roadmaps of REDD+ in Bangladesh. This was followed by presentation given by Dr. Mohammed Jashimuddin on the overview of D&D study and REDD+ in Bangladesh and beyond. The fourthpresentation was conducted by Mr. Saiful Islam Khan on administering the socioeconomic survey on the D&D drivers and their underlying causes. After all these presentations a lively open discussion with constructive criticisms and suggestions on the drivers of deforestation and forest degradation continued with concluding remarks from Mr. Syed Nurul Islam, Superintendent of Police, Mymensingh, Mr. Md. Yusuf Ali, Director, Department of Environment, Mymensingh, Mr. Abdul Mabud, Conservator of Forests, Central Circle, Bangladesh Forest Department, Mr. Choudhury Abdullah Al Mamun, PPM, DIG of Police, Mymensingh Range, Mr. G M Saleh Uddin, Divisional Commissioner, Mymensingh, and from the chair of the meeting Mr. Md. Yunus Ali, Chief Conservator of Forests, Bangladesh (Table 4). Finally the workshop was ended with Vote of Thanks from Mr. Gobinda Roy, DFO, Mymensingh Forest Division. The open discussion was facilitated by the chair of the meeting Mr. Md. Yunus Ali, Chief Conservator of Forests, Bangladesh. After the meeting a total of 19 KIIs were conducted

by Dr. M. Jashimuddin and Mr. Saiful Islam Khan. The summary of the activities can be given in Table 5.

Table 4. Detailed activities of the consultation workshop in Mymensingh

Time	Activity	Presenter / Facilitator
10.00 hrs.-10.30 hrs.	Registration	
10.30 hrs.-10.35 hrs.	Welcome address	Mr. Rakibul Hasan Mukul, Asst. Chief Conservator of Forests, Development Planning Unit & National Project Director UN REDD Bangladesh National Programme
10.35 hrs.-10.55 hrs.	Brief introduction and Presentation on REDD+ in Bangladesh	Sayeed Mahmud Riadh, Governance Coordinator, UN REDD Bangladesh National Programme
10.55 hrs.-11.15 hrs.	Presentation on the study of Drivers of Deforestation and Forest Degradation	Dr. Mohammed Jashimuddin, Professor, IFESCU & National Consultant, D & D study team
11.15 hrs.-11.45 hrs.	Questionnaire Survey	Mr. Md. Saiful Islam Khan National Consultant, D & D study team
11.45 hrs. -12.45 hrs.	Open Discussion	Facilitated by Mr. Md. Yunus Ali, Chief Conservator of Forests, Bangladesh
12.45 hrs.-12.50 hrs.	Remarks by the Guest of Honour-1	Mr. Syed Nurul Islam, Superintendent of Police, Mymensingh
12.50 hrs.-12.55 hrs.	Remarks by the Guest of Honour-2	Mr. Md. Yusuf Ali, Director, Department of Environment, Mymensingh
12.55 hrs.-01.00 hrs.	Remarks by the Guest of Honour-3	Mr. Abdul Mabud, Conservator of Forests, Central Circle, Bangladesh Forest Department
01.00 hrs.-01.05 hrs.	Remarks by the Guest of Honour-4	Mr. Choudhury Abdullah Al Mamun, PPM, DIG of Police, Mymensingh Range
01.05 hrs.-01.10 hrs.	Remarks by the Chief Guest	Mr. G M Saleh Uddin, Divisional Commissioner, Mymensingh
01.10 hrs.-01.15 hrs.	Remarks by the Chair	Mr. Md. Yunus Ali, Chief Conservator of Forests, Bangladesh
01.15 hrs-01.20 hrs.	Vote of Thanks	Mr. Gobinda Roy, DFO, Mymensingh Forest Division
01.20 hrs.-01.35 hrs.	Key Informant Interview	Dr. Jashimuddin and Mr. Saiful Islam Khan
01.35 hr.-02. 00 hrs.	Lunch and Prayer	

Table 5. The activities conducted in the Mymensingh Field Trip

Name of activities	No. of activities	Participants
Presentations	04	04 presenters and around 50 participants
Socioeconomic Survey	01	40 respondents
FGDs	02	50 (25 in each FGD) forest dependent people
KIIs	19	Government officials School, college and university teachers Forest officers Union council chairman and members

		Other important personnel

2.4. *Major Drivers of D&D (Sequentially from the most important driver)*

The Drivers of Deforestation	The Drivers of Forest Degradation	Overall comments/ recommendations
1.Forest land tenure conflicts inherited from British colonial legacy 2. Long time for litigation and huge number of forests cases. According to section 4, 5 & 6 of Forest Act 1927 notice is issued for reservation of a particular forest area but general people do not get copy of that. Sometimes FD files cases at the Civil Court although Forest Settlement Officer (FSO) appointed by FD may act as Civil Court. 3. Poverty and high dependency on forests for livelihoods 4. Lack of alternative livelihoods or employment opportunities 5. Unclear forest boundary 6. Industrialization 7. Land encroachment 8. Poor implementation of laws and policies 9. Political and social influence. 10. Corruption, negligence of forest officials about their duties 11. Lack of good governance 12. Conflicts in existing laws and policies. 13. High value of land 14. Lack of awareness 15. Attitude towards forests from both public and private 16. Continued dissatisfaction of indigenous people as their rights are ignored by the FSO 17. Establishment of firing range by armed forces since 1977-78 18. Rubber garden since 1987-88 19. Social forestry activities by destroying natural forests 20. development activities 21. False cases 22. Commercial agriculture like banana, pineapple, papaya, orange, malta, lemon, etc. High demand of cash crops. 23. Lack of logistics and limited staff of FD	1. Long time for litigation and huge number of forests cases. 2. Industrialization 3. Insufficient care and maintenance (silvicultural operation) by FD. 4. Social forestry activities through monoculture plantation like Acacia. 5. Poverty and high dependency on forests for livelihoods	Issues need to be accomplished right away: 1. Forest cases should be resolved as quicklyas possible and false cases to be withdrawn 2. Capacity development of FD 3. Awareness creation and motivation 4. Creation of AIGA 5. Governance system, policies and laws need to be improved 6. Scientific management of forests is necessary 7. Update forest policy or law 8. People should be involved in forest management. 9. Rights of indigenous people should be considered 10. DoE should work along with BFD in issuing location and environment clearance certificates for new industries 11. Proper land use policy 12. Capacity of FD officials to be improved for litigation and forest management 13. National interests to be given priority 14. FD staff to be increased 15. Crop pattern to be changed to resolve elephant problem through planting crops which elephants do not like such as, karola, chili, ladies finger, etc. 16. Environment education 17. Participants to be made accountable 18. Participants' training 19. Social and political elites to be involved in participatory forestry 20. Proper implementation of all policies and laws. 21. land ownership problems to be resolved

2.5. *Summary of the outputs*

The discussion was quite lively and open to clearly identify some salient drivers of deforestation and forest degradation of the forests in Mymensingh. It was not easy to single out a top driver since the drivers differed significantly from place to place. However, some common and important deforestation drivers the D&D team identified were forest land tenure conflicts inherited from British colonial legacy, long time for litigation and huge number of forests cases, poverty and high dependency on forests for livelihoods, lack of alternative livelihoods or employment opportunities, unclear forest boundary, industrialization, land encroachment, poor implementation of laws and policies, political and social influence, corruption, negligence of forest officials about their duties, lack of good governance, conflicting laws and policies, high value of land, lack of awareness, attitude towards forests from both public and private, continued dissatisfaction of indigenous people as their rights are ignored by the Forest Settlement Officer (FSO), establishment of firing range by armed forces, rubber garden, social forestry activities by destroying natural forests, development activities, false cases, commercial agriculture like banana, pineapple, papaya, orange, malta, lemon, etc., high demand of cash crops, lack of logistics and limited staff of FD.

The drivers of forest degradation were more or less similar if not the same. The D&D team identified a number of drivers of forest degradation. Some of these drivers are long time for litigation and huge number of forests cases, industrialization, insufficient care and maintenance (silvicultural operation) by FD, social forestry activities through monoculture plantation like Acacia, poverty and high dependency on forests for livelihoods.

The participants in the MymensinghProgramme emphasized on a number of issues to be resolved as soon as possible to stop the ongoing D&D in the forest areas of Mymensingh region. Capacity development of FD,proper implementation of existing laws and policies, building awareness among general public, good governance, motivating local people to conserve forests, creation of alternative livelihood opportunities, scientific management of forests, updating policies or laws, resolving forest cases instantly or quickly, consider rights of indigenous people, DoE should work along with BFD in issuing location and environment clearance certificates for new industries, proper land use policy, capacity development of FD officials for litigation and forest management, giving more priority for national interests, increasing FD staff, environment education, training of participants, involving social and political elites in participatory forestry, and resolving land ownership problems could help conserve forests in the Mymensingh region.

3 Conclusions

The Mymensingh meetings were quite successful in terms of identifying some important drivers of deforestation and forest degradation. The FGDs and KIIs came out with some important suggestions as to what steps are needed to address the identified drivers of D&D.

Annex – 1: FGD Process

A typical FGD process followed in UN-REDD D&D study consisted the following steps

(1) **Introducing everyone:** A typical FGD starts with the self-introduction of all people present in the discussion.

(2) **An Introductory lecture**: The speaker or facilitator delivers a preliminary lecture to the focus group (FG) detailing the differences between Deforestation and Forest Degradation (D&D). Relevant examples help the FG understand the differences between the two.

(3) **Guiding the discussion:** The FGD is requested to identify the drivers of Deforestation and Forest Degradation separately. We normally start with Deforestation and end up with Forest Degradation. It is important to clarify in advance that, ***notwo person should repeat the same driver(s)***, else the discussion continues for no conclusion. Female participants, non-beneficiary (of Social Forestry Programme), and the people in the back rows can be instigated repeatedly to speak out.

(4) **The method**: We normally follow the '**snowball'** method where the facilitator provokes the participants to speak out on the drivers of D&D. At certain point after repeated efforts, the FG's intension to describe the D&D drivers diminishes almost to zero.

(5) **Scoring the responses**: Once the drivers (of each Ds) are identified, we normally read the listed drivers to the FG and request them to choose the most important (destructive) drivers. This can be done by picking up a driver (say, X) and requesting the FG members to raise their hands if they consider that X is the most important (No.1) driver for Deforestation (or the other D). The number of raised hands can be counted and recorded to search out the top most drivers for the Ds.

(6) **Duration of discussion**: A fixed amount of time (roughly 1.5 hours) was allotted for each of the FGDs. This facilitated the spontaneity and ensured unbiased outcomes of the FGDs.

10.2 Khulna: Mangrove Forest Zone

Workshop Report On

Identification of Drivers of Deforestation and Forest Degradation in Bangladesh: Mangrove Forest Zone, Khulna

05-08December 2016
Hotel Royal Int., Khulna, Bangladesh

Programme Management Unit (PMU)
UN-REDD Bangladesh National Programme
Bangladesh Forest Department

10December 2016

UN-REDD Bangladesh National Programme

The UN-REDD Bangladesh National Programme is implemented by Bangladesh Forest Department under the leadership of Ministry of Environment and Forests. United Nations Development Programme (UNDP) and Food and Agriculture Organization (FAO) are the two implementing partners.

Citation

UN-REDD Bangladesh National Programme. 2016. Workshop Report on the Study of Drivers of Deforestation and Forest Degradation in Bangladesh: Mangrove Forest Zone, Khulna. UN-REDD Bangladesh National Programme, Bangladesh Forest Department. Khulna Workshop Proceedings held on 05-08December 2016.

Disclaimer

The materials/information presented on this meeting/event report/publication is the presenters'/participants'. UN-REDD Bangladesh National Programme makes no statements, representations, or warranties about the presented opinions and this do not necessarily represent those of the United Nations, UN-REDD Programme's implementing agencies including UNDP, FAO and UNEP or its Member States.

10 December 2016

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Executive Summary

The depletion of forest resources is a major environmental issue especially in the developing countries. Identification of drivers of deforestation and forest degradation is critical and mandatory to formulate effective and meaningful national strategies to save forest resources across the country. The UN-REDD Bangladesh National Programme of Bangladesh Forest Department (BFD) has amassed a team of international and national consultants to identify the direct and indirect drivers that are deemed responsible for deforestation and forest degradation (D&D) in the country. The team is composed of Dr. Ian Thompson - an international consultant with expertise in REDD+, Dr. Mohammed Jashimuddin as Governance Specialist, Dr. Mohammad Mahfuzur Rahman as a Natural Resource Economist, and Mr. Saiful Islam Khan as a GIS expert. Apart from the methodology validation workshop in Dhaka, the D&D study team has planned a total of nine workshops at eight different administrative divisions of the country plus one at the Rangamati District of Chittagong Hill Tracts (CHTs). This report is the summary of the eighth workshop held during 05-08December 2016 in Khulna, Bangladesh.The meeting started with a welcome speech from Mr. Sayeed Mahmud Riadh, REDD+ Governance Activity Coordinator, UN-REDD Bangladesh National Programme. To set the context of the study, a Bangla power point presentation on REDD+ and the drivers of forest degradation and deforestation across the world was presented by Dr. Mohammad Jashimuddin on the team's behalf. The third presentation was conducted by Mr. Saiful Islam Khan on administering the socioeconomic survey on the D&D drivers and their underlying causes. The forth presentation was conducted by Mr. Md. Sayed Ali, DFO, Sundarban (West) Forest Division on Management of Sundarbans Mangrove Forest and Challenges. After all these presentations a lively open discussion with constructive criticisms and suggestions on the drivers of deforestation and forest degradation continued with concluding remarks from Mr. Md. Faruk Hossain, Additional Divisional Commissioner, Khulna, Mr. Modinul Ahsan, Divisional Forest Officer, Wildlife Management and Nature Conservation Division, Khulna, and finally from the chair of the meeting Mr. Zahir Uddin Ahmed, Conservator of Forests, Khulna Circle, Bangladesh Forest Department.Each of the speakers tried to highlight on what the major threats to forest resources, especially the Sundarbans, were and why and what we need to do to save the planet from the destruction of climate change.

Beside the formal workshop and open discussion among all participants present in the meeting, the D&D study team also conducted a number of key informant interviews (KIIs) and two focused group discussion (FGDs). The KIIs and FGDs were conducted by Mr. Saiful Islam Khan and Dr. Mohammed Jashimuddin. The team interviewed school teachers, college/university teachers, social workers, political leaders, local government leaders, Forest Department (FD) officials, and high officials from Khulna. The two FGDs were conducted at forest dependent communities of Khuriakhali, Sharankhola, Bagerhat District, one with poor forest dependent group and the other with village elite group.

The workshop, FGDs, and KII participants identified a number of drivers. The major drivers for deforestation were high demand for forest resources, over exploitation through legal permits, illegal timber extraction and trafficking trough water vessels/boats inside permitted products like golpata, fish, honey, etc., poverty and high dependency for livelihoods, lack of alternative livelihoods or employment opportunities, bandits inside the forests, natural calamities like cyclone, etc., sawmills, dry fish preparation (uses firewood from forests illegally), political and social influence, corruption, lack of good governance, conflicts in existing laws and policies, low punishment for forest offences (6 months to 5 years), lack of security and logistics (food, transportation, fund/budget, etc.) and limited staff of FD, lack of awareness and conservation ethics

among general people, attitude towards forests from both public and private, and fire inside the forest (unintentional/intentional, sometimes *mowalis* use fire during honey collection).

The drivers of forest degradation were more or less similar if not the same. The D&D team identified a number of drivers of forest degradation. Some of these drivers are reduction of water flow at Padma, saline intrusion, firewood collection, use of poison for fishing, industrialization (200-300 industries situated nearby the Sundarbans, insufficient care and maintenance (silvicultural operation) by FD, poverty, natural calamities like cyclone, etc., diseases like, top dying of Sundri, siltation on forest floor due to less flow of water from upstream, discharge of industrial effluents directly to sea or river, and excessive use of fertilizers and chemicals due to agricultural expansion including shrimp culture.

The participants in the KhulnaProgramme emphasized on a number of issues to be resolved as soon as possible to stop the ongoing D&D in the Sundarbans mangrove forests. Capacity development of FD,proper implementation of existing laws and policies, building awareness among general public, good governance, motivating local people to conserve forests, creation of alternative livelihood opportunities, restricting access without pass or permit, scientific management of forests, introducing ecotourism, updating policies or laws, restricting access of resource collectors at least for 10 years, not allowing CMCs to be involved in local politics, resolving forest cases instantly or quickly, restricting sawmills around the Sundarbans, introducing social forestry at the outskirts of the Sundarbans, initiating education, health, agricultural and livelihood development projects within 10 km buffer zone of the Sundarbans, employing Ecological Critical Area (ECA) rules, and strictly banning discharge of effluent into the river or sea without treatment.

1 UN-REDD Bangladesh National Programme

1.1. *Background*

In August of 2010, Government of the People's Republic of Bangladesh became a partner country of the UN-REDD Programme. The UN-REDD Programme is the United Nations collaborative Programme on reducing emission from deforestation and forest degradation. The Programme assists developing countries like Bangladesh to build capacity to reduce emissions and to participate in a future REDD+ mechanism.

In subsequent years, Bangladesh took several key steps i.e., established the National REDD+ Steering Committee; the REDD+ Preparation Proposal (R-PP) was approved in end of 2013 by UN-REDD Policy Board. The UN-REDD National Programme Document was approved by national counterparts & participating UN organization in 2015. Finally, the government approved the UN-REDD Bangladesh National Programme in 19 June 2016.
The Forest Department (FD) of the Ministry of Environment and Forests (MoEF) is the lead Implementing Partner for the UN-REDD National Programme, headed by a National Project Director (NPD), supported by Programme Management Unit (PMU). The United Nations Development Programme (UNDP) and Food and Agriculture Organization (FAO) are the two co-implementing partners helping the PMU. The duration of the NP is from July 2015 to June 2018.
The UN-REDD Bangladesh National Programme has the objective to support the Government of Bangladesh in initiating the implementation of its REDD+ Readiness Roadmap (i.e., R-PP) by establishing necessary REDD+ management processes, identifying strategic readiness options for completing its National REDD+ strategy, and developing the capacities required to begin implementation of REDD+.

1.2. *Scope of the Report*

The primary aim of this report is to document the preliminary outcomes of the consultation workshop, FGDs, and KIIs conducted in Khulnato capture the major drivers of deforestation and forest degradation in the Sundarbans held on 05-08December 2016 organized by the UN-REDD Bangladesh National Programme.

1.3. *Organization of the Report*

Section 1 introduces the Background of UN-REDD Programme; Section 2 elaborates on the details of the workshops. Relevant annexes – i.e., presentation on UN-REDD Bangladesh National Programme, presentation by consultant team and list of participants are appended at the end of report.

2 Workshop on Drivers of Deforestation &Forest Degradation (D&D)

2.1. *Background of the Drivers of Deforestation &Forest Degradation Study*

Bangladesh is a signatory to the UN Framework Convention on Climate Change (UNFCCC). The Conference of the Parties (COP) to the UNFCCC has taken a number of decisions in recent years to encourage developing country Parties to take climate change mitigation actions in

forestry sector. The role of forests and reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) have been fully recognised and enshrined in the Paris Agreements.

As part of the country's long-term strategy to reduce GHG emissions, largely described in its Intended Nationally Determined Contributions (INDC), the Government of Bangladesh has taken initial steps to contribute to this global effort to address climate change, and one of such steps is to develop its capacity to implement REDD+. The Government of Bangladesh prepared and endorsed its REDD+ Readiness Roadmap in 2012.

To support this effort, the UN-REDD Bangladesh National Programme was established to provide technical capacity development assistance to the Government of Bangladesh in designing and implementing its National REDD+ Strategy and in meeting the international requirements under the UNFCCC Warsaw Framework to receive REDD+ results-based finance.

One of the key components of the REDD+ readiness process is to identify public policy approaches and interventions, including incentive mechanisms to effectively address key drivers and causes of deforestation and forest degradation (D&D). In order to identify such approaches, a clear understanding of drivers and causes of D&D in Bangladesh must first be developed.

To develop such an understanding, UN-REDD Bangladesh National Programme amassed a team comprised of international and national consultants. The team accordingly developed a methodology and planned a total of 9 regional workshops distributed across the country. The Khulna workshop and aligned FGDs and KIIs were conducted aiming at the following objectives:

- To identify the most important drivers of deforestation and forest degradation in the Sundarbans mangrove forests and
- To focus on the historical background of the drivers and potential solution(s) to the problems of D&D.

2.2. Organization of the Workshop

List of Invitees: Participants list was developed by Divisional Forest Officer, Sundarban (West) Forest Division based on criteria put forward to the study team. In general, the criteria put forward by study team suggested inclusion from – local administration, departments, educational institutions, NGOs, indigenous communities, local leaders, business representatives and people living adjacent to the forested areas. A letter of invitation was prepared by Project Director, which was distributed by the departmental staff to help the project.

Workshop Presentations and Information Materials: The primary objective of the workshop was to identify Drivers of Deforestation and Forest Degradation for the CHT region by the relevant stakeholders and to fine tune the methodology. Accordingly four presentations were made by Mr. Sayeed Mahmud Riadh, Dr. Mohammed Jashimuddin, Mr. Saiful Islam Khan and

Mr. Md. Sayed Ali to set the context (Table 1). A number of awareness materials (Table 2) were shred among the participants of the workshop.

Table 1: List of Presentations

Sl	Presentation on	Basic Message	Presentation by
5.	REDD+ in Bangladesh	Introduction on REDD+ in Bangladesh	Mr. Sayeed Mahmud Riadh, Govrnance Co-ordinator, UN-REDD Bangladesh
6.	Drives of Deforestation and Forest Degradation	Context of Drives of Deforestation and Forest Degradation Study and requirement	Dr. Mohammed Jashimuddin, National Consultant, D & D study team
7.	Socioeconomic study	Identification of major socioeconomic drivers responsible for D&D in Khulna	Mr. Saiful Islam Khan, National Consultant, D & D study team
8.	Status of the Sundarbans Mangrove Forest	Presentation on Management of Sundarbans Mangrove Forest and Challenges	Mr. Md. Sayed Ali, Divisional Forest Officer, Sundarban (West) Forest Division

Table 2: List of Awareness Materials shared during the Workshop

Sl	Item	Information shared
7.	REDD+ and National Programme Leaflet in Bangla	What is UN-REDD Programme; what is REDD+, what are the five activities of REDD+, Warsaw Frameworks, why REDD+ is important, its relevance, why REDD+ is important for Bangladesh; evolution the NP and the targeted outcomes.
8.	National Programme Leaflet in English	Relevance of REDD+ in Bangladesh, evolution of REDD+ Programme, phased approach and outputs, Warsaw framework, National Programme Objective, duration, budget, outcomes and outputs, project management.
9.	Document folder	What is REDD+, short brief on National Programme, phased approach of UN-REDD Programme and institutional framework proposed for REDD+ Programme in Bangladesh.
10.	Note book	What is REDD+, its five activities, UN-REDD Programme, Warsaw elements, Bangladesh National Programme, targeted outputs and delivery schedule.
11.	Branded Pen	With UN-REDD, Government and Forest Department's logo.
12.	Bangla Presentation on REDD+	What are drivers of deforestation and forest degradation, why study is required?

2.3. *Programme Schedule*

The entire Programme comprises of 4 days of activity (Table 3), where 1st day involves reaching the destination and coordination and communication with local Forest Department officials and internal team meeting. The second day of the Khulna activities consists of the consultation workshop itself with socioeconomic survey and KIIs before lunch at Hotel Royal Int., Khulna. The third day consists of a 2 FGDsat Khuriakhali, Sharankhola Upazila, Bagerhat with local forest dependent communities and elites and community leaders. The fourth day consists of heading back to Dhaka in the early morning (Tables 3&4).

Table 3. Detailed Programme Schedule for Khulna		
Day 01:05Dec ,2016 .Mon day	**Activity**	**Remarks**
09AM 00 :	Leave for Airport	ByRoad
10-AM 00.11.00AM	Travel Dhaka toJessore	By Air
11-AM 00.01:00 PM	TravelJessore to Khulna	By Road
1PM – 0 00.2PM 00.	Check in to the Guest House/ Hotel	Guest House/ Hotel ,Khulna
04PM-0 00.6PM 00.	Meeting with CF and DFO	CF Office ,Khulna
06PM-0 00.7PM 00.	Back to the Guest House / Hotel	Guest House/ Hotel, Khulna
07:00 PM –08:00 PM	Preparatory Meeting	Guest House/ Hotel, Khulna
08:30 PM	Dinner	Night stay at Guest House Hotel//
Day 2 :06Dec .2016,Tuesday		
:0730 AM	Break fast	
08:30 AM –10:30 AM	Preparation for the workshop	
10:30 AM -03:00 PM	Workshop, Key Informant Interview, Questionnaire Survey and Lunch	Detailed programme is attached herewith.
07:30 PM	Dinner	Night stay at Guest House/ Hotel,Khulna
Day 3 :07 Dec.2016,Wednesday		
0AM 30 :7	Break fast	
08-AM 00.06PM 00.	Field Visit at Khuriakhali, Sharankhola Upazila, Bagerhat for FGD	2 FGDs at Khuriakhali, one with poor forest dependent groups and the other with local elite groups
06.00-PM 07.00PM	Back to the Guest House / Hotel ,Chittagong	Guest House/ Hotel ,Khulna
08:00 PM	Dinner	Night stay at Guest HouseHotel /
Day 4: 08 Dec. 2016, Thursday		
06.30 AM-8:30 AM	Travel Khulna to Jessore	By Road
08.30 AM-09.00 AM	Breakfast	
09.30 AM-10.30 AM	Travel Jessore to Dhaka	By Air
10.30 AM-12.30 PM	Back to office	By Road

The workshop meeting was started with the welcome speech delivered by Mr. Sayeed Mahmud Riadh, REDD+ Governance Activity Coordinator, UN-REDD Bangladesh National Programme. Mr. Riadh continued with his detailed presentation on the background, objectives, and roadmaps of REDD+ in Bangladesh. This was followed by presentation given by Dr. Mohammed Jashimuddin on the overview of D&D study and REDD+ in Bangladesh and beyond. The third presentation was conducted by Mr. Saiful Islam Khan on administering the socioeconomic survey on the D&D drivers and their underlying causes. The forth presentation was conducted by Mr. Md. Sayed Ali, DFO, Sundarban (West) Forest Division on Management of the Sundarbans Mangrove Forest and Challenges. After all these presentations a lively open discussion with constructive criticisms and suggestions on the drivers of deforestation and forest degradation continued with concluding remarks from Mr. Md. Faruk Hossain, Additional Divisional Commissioner, Khulna, Mr. Modinul Ahsan, Divisional Forest Officer, Wildlife Management and Nature Conservation Division, Khulna, and finally from the chair of the meeting Mr. Zahir Uddin Ahmed, Conservator of Forests, Khulna Circle, Bangladesh Forest Department (Table 4). The open discussion was facilitated by the chair of the meeting Mr. Zahir Uddin Ahmed, Conservator of Forests, Khulna Circle. After the meeting a total of 10-12 KIIs were conducted by Dr.

Mohammed Jashimuddin and Mr. Saiful Islam Khan. The summary of the activities can be given in Table 5.

Table 4. Detailed activities of the consultation workshop in Khulna

Time	Activity	Presenter / Facilitator
10.00 hrs.- 10.30 hrs.	Registration	
10.30 hrs. - 10.50 hrs.	Brief introduction and Presentation on REDD+ in Bangladesh	Sayeed Mahmud Riadh, Governance Coordinator, UN REDD Bangladesh National Programme
10.50 hrs. - 11.10 hrs.	Presentation on the study of Drivers of Deforestation and Forest Degradation	Dr. Mohammed Jashimuddin, Professor, IFESCU & National Consultant, D & D study team
11.10 hrs. - 11.45 hrs.	Questionnaire Survey	Mr. Saiful Islam Khan, National Consultant, D & D study team
11.45 hrs. – 11.55 hrs.	Presentation on Management of Sundarbans Mangrove Forest and Challenges	Mr. Md. Sayed Ali, Divisional Forest Officer, Sundarban (West) Forest Division
11.55 hrs. - 12.55 hrs.	Open Discussion	Facilitated by Mr. Zahir Uddin Ahmed, Conservator of Forests, Khulna Circle
12.55 hrs. - 01.00 hrs.	Remarks by the Special Guest	Mr. Md. Faruk Hossain, Additional Divisional Commissioner, Khulna
01.00 hrs. – 01.05 hrs.	Remarks by the Special Guest	Mr. Modinul Ahsan, Divisional Forest Officer, Wildlife Management and Nature Conservation Division, Khulna
01.05 hrs. - 01.15 hrs.	Remarks by the Chair	Mr. Zahir Uddin Ahmed, Conservator of Forests, Khulna Circle
01.15 hrs. - 01.30 hrs.	Key Informant Interview	Dr. M. Jashimuddin and Mr. Saiful Islam Khan
01.30 hr. - 02. 00 hrs.	Lunch and Paryer	

Table 5. The activities conducted in the Khulna Field Trip

Name of activities	No. of activities	Participants
Presentations	04	04 presenters and around 50 participants
Socioeconomic Survey	01	40 respondents
FGDs	02	50 (25 in each FGD)forest dependent people
KIIs	12	Government officials School, college and university teachers Forest officers Union council chairman and members Other important personnel

2.4. *Major Drivers of D&D (Sequentially from the most important driver)*

The Drivers of Deforestation	The Drivers of Forest Degradation	Overall comments/ recommendations
1.High demand for forest resources	1. Saline intrusion 2. Firewood collection	Issues need to be accomplished right away:

The Drivers of Deforestation	The Drivers of Forest Degradation	Overall comments/ recommendations
2. Over exploitation through legal permits. 3. Illegal timber extraction and trafficking trough water vessels/ boats inside permitted products like golpata, fish, honey, etc. 4. Poverty and high dependency for livelihoods 5. Lack of alternative livelihoods or employment opportunities 6. Bandits inside the forests 7. Natural calamities like cyclone, etc. 7. Sawmills 8. Dry fish preparation (uses firewood from forests illegally) 12. Political and social influence. 13.Corruption 14. Lack of good governance 15. Conflicts in existing laws and policies. 16. Low punishment for forest offences (6 months to 5 years) 17. Lack of security and logistics (food, transportation, fund/budget, etc.) and limited staff of FD 18. Lack of awareness and conservation ethics among general people 19. Attitude towards forests from both public and private 20. Fire inside the forest (unintentional/intentional, sometimes *mowalis* use fire during honey collection) 21. Socio-economic effect	3. Use of poison for fishing 4. Industrialization (200-300 industries situated nearby the Sundarbans 5. Insufficient care and maintenance (silvicultural operation) by FD. 6. Poverty 7. Natural calamities like cyclone, etc. 8. Diseases like, top dying of Sundri 9. Siltation on forest floor due to less flow of water from upstream 10. Discharge of industrial effluents directly to sea or river 11. Excessive use of fertilizers and chemicals due to agricultural expansion including shrimp culture 12. Invasive species 13. Reduction of water flow at Padma	1. Capacity development of FD 2. Awareness creation and motivation 3. Creation of AIGA 4. Religious and cultural values of forest like Ban bibi worship, Rash Purnima, etc. Indigenous people sacrifice hens for forest conservation 5. Access should be strictly restricted without pass or permit 6. Scientific management of forests is necessary 7. Introduce Ecotourism 8. Update forest policy or law 9. Restrict access of resource collectors at least for 10 years 10. Conservation of the Sundarbans should get highest priority. 11. Forest degradation is more important than deforestation in the Sundarbans 12. CMCs are getting involved in local politics which might be dangerous in future. 13. Forest cases should be resolved instantly or quickly 14. Social forestry may be introduced at the outskirts of the Sundarbans 15. Initiate education, health, agricultural and livelihood development projects within 10 km buffer zone of the Sundarbans 16. Complexity in laws and policies like for example, Kuchia (Swamp eel) is wildlife according to forest law but exportable product in fisheries law. 17. Governance system, policies and laws need assessment and improved 18. Research is needed to find out whether major species are reducing in numbers or associate species are increasing. 19. Ecologically Critical Area (ECA) laws and policies should be implemented 20. Effluent treatment before discharging into the river or sea to be mandatory for all industrial setups.

2.5. Summary of the outputs

The discussion was quite lively and open to clearly identify some salient drivers of deforestation and forest degradation of the Sundarbans in Khulna. It was not easy to single out a top driver since the drivers differed significantly from place to place. However, some common and important deforestation drivers the D&D team identified were high demand for forest resources, over exploitation through legal permits, illegal timber extraction and trafficking trough water vessels/boats inside permitted products like golpata, fish, honey, etc., poverty and high dependency for livelihoods, lack of alternative livelihoods or employment opportunities, bandits inside the forests, natural calamities like cyclone, etc., sawmills, dry fish preparation (uses firewood from forests illegally), political and social influence, corruption, lack of good governance, conflicts in existing laws and policies, low punishment for forest offences (6 months to 5 years), lack of security and logistics (food, transportation, fund/budget, etc.) and limited staff of FD, lack of awareness and conservation ethics among general people, attitude towards forests from both public and private, and fire inside the forest (unintentional/intentional, sometimes *mowalis* use fire during honey collection).

The drivers of forest degradation were more or less similar if not the same. The D&D team identified a number of drivers of forest degradation. Some of these drivers are reduction of water flow at Padma, saline intrusion, firewood collection, use of poison for fishing, industrialization (200-300 industries situated nearby the Sundarbans, insufficient care and maintenance (silvicultural operation) by FD, poverty, natural calamities like cyclone, etc., diseases like, top dying of Sundri, siltation on forest floor due to less flow of water from upstream, discharge of industrial effluents directly to sea or river, and excessive use of fertilizers and chemicals due to agricultural expansion including shrimp culture.

The participants in the KhulnaProgramme emphasized on a number of issues to be resolved as soon as possible to stop the ongoing D&D in the Sundarbans mangrove forests. Capacity development of FD,proper implementation of existing laws and policies, building awareness among general public, good governance, motivating local people to conserve forests, creation of alternative livelihood opportunities, restricting access without pass or permit, scientific management of forests, introducing ecotourism, updating policies or laws, restricting access of resource collectors at least for 10 years, not allowing CMCs to be involved in local politics, resolving forest cases instantly or quickly, restricting sawmills around the Sundarbans, introducing social forestry at the outskirts of the Sundarbans, initiating education, health, agricultural and livelihood development projects within 10 km buffer zone of the Sundarbans, employing Ecological Critical Area (ECA) rules, and strictly banning discharge of effluent into the river or sea without treatment.

3 Conclusions

The Khulna meetings were quite successful in terms of identifying some important drivers of deforestation and forest degradation. The FGDs and KIIs came out with some important suggestions as to what steps are needed to address the identified drivers of D&D.

Annex – 1: FGD Process

A typical FGD process followed in UN-REDD D&D study consisted the following steps

(1) **Introducing everyone:** A typical FGD starts with the self-introduction of all people present in the discussion.

(2) **An Introductory lecture**: The speaker or facilitator delivers a preliminary lecture to the focus group (FG) detailing the differences between Deforestation and Forest Degradation (D&D). Relevant examples help the FG understand the differences between the two.

(3) **Guiding the discussion:** The FGD is requested to identify the drivers of Deforestation and Forest Degradation separately. We normally start with Deforestation and end up with Forest Degradation. It is important to clarify in advance that, ***notwo person should repeat the same driver(s)***, else the discussion continues for no conclusion. Female participants, non-beneficiary (of Social Forestry Programme), and the people in the back rows can be instigated repeatedly to speak out.

(4) **The method**: We normally follow the '**snowball'** method where the facilitator provokes the participants to speak out on the drivers of D&D. At certain point after repeated efforts, the FG's intension to describe the D&D drivers diminishes almost to zero.

(5) **Scoring the responses**: Once the drivers (of each Ds) are identified, we normally read the listed drivers to the FG and request them to choose the most important (destructive) drivers. This can be done by picking up a driver (say, X) and requesting the FG members to raise their hands if they consider that X is the most important (No.1) driver for Deforestation (or the other D). The number of raised hands can be counted and recorded to search out the top most drivers for the Ds.

(6) **Duration of discussion**: A fixed amount of time (roughly 1.5 hours) was allotted for each of the FGDs. This facilitated the spontaneity and ensured unbiased outcomes of the FGDs.

10.3 Cox's Bazar: Hill and Coastal forest zone

Workshop Report On

Identification of Drivers of Deforestation and Forest Degradation in Bangladesh: Cox's Bazar

02-04 December 2016
Long Beach Hotel, Cox's Bazar, Bangladesh

Programme Management Unit (PMU)
UN-REDD Bangladesh National Programme
Bangladesh Forest Department

8 December 2016

UN-REDD Bangladesh National Program

The UN-REDD Bangladesh National Program is implemented by Bangladesh Forest Department under the leadership of Ministry of Environment and Forests. United Nations Development Program (UNDP) and Food and Agriculture Organization (FAO) are the two implementing partners.

Citation

UN-REDD Bangladesh National Program. 2016. Workshop Report on the Study of Drivers of Deforestation and Forest Degradation in Bangladesh: Cox's Bazar. UN-REDD Bangladesh National Program, Bangladesh Forest Department. Cox's Bazar Workshop Proceedings held on 02-04 December 2016.

Disclaimer

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8 December 2016

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Executive Summary

The depletion of forest resources is a major environmental issue especially in the developing countries. Identification of drivers of deforestation and forest degradation is critical and mandatory to formulate effective and meaningful national strategies to save forest resources across the country. The UN-REDD Bangladesh National Programme of Bangladesh Forest Department (BFD) has amassed a team of international and national consultants to identify the direct and indirect drivers that are deemed responsible for deforestation and forest degradation (D&D) in the country. The team is composed of Dr. Ian Thompson - an international consultant with expertise in REDD+, Dr. Mohammed Jashimuddin as Governance Specialist, Dr. Mohammad Mahfuzur Rahman as a Natural Resource Economist, and Mr. Saiful Islam Khan as a GIS expert. Apart from the methodology validation workshop in Dhaka, the D&D study team has planned a total of nine workshops at eight different administrative divisions of the country plus one at the Rangamati District of Chittagong Hill Tracts (CHTs). This report is the summary of the workshop held during 02-04 December 2016 in Cox's Bazar, Bangladesh.

The meeting started with a welcome speech by Mr. Nasim Aziz, Project Manager, UN-REDD Bangladesh National Program. It was followed by an elaborated speech on REDD+ activities in Bangladesh by Mr. Sayeed Mahmud Riadh, REDD+ Governance Activity Coordinator, UN-REDD Bangladesh National Program. To set the context of the study, a Bangla power point presentation on REDD+ and the drivers of forest degradation and deforestation in Bangladesh and across the world was presented by Dr. Mohammed Jashimuddin on the team's behalf. It was immediately followed by the socioeconomic questionnaire survey conducted by Dr. Mohammad Mahfuzur Rahman. A lively open discussion took place immediately after the four consecutive presentations, which was participated by people from major agencies and profession in the Cox's Bazar District. Concurrent key informant interviews (KIIs) were conducted with the key personalities present in the meeting. However, the workshop was concluded with the formal speeches delivered respectively by Mr. A. K. M. Shahriar, Deputy Director, Department of Agriculture, Cox's Bazar, Mr. Karamat Ali Mollik, DFO, Cox's Bazar (North) Forest Division, Mr. Ali Kabir, DFO, Cox's Bazar (South) Forest Division, and Mr. Kazi Mohammad Abdur Rahman, ADC (general), Cox's Bazar. The consultation workshop was presided by Mr. Rakibul Hasan Mukul, The Project Director, UN-REDD National Program, Bangladesh. Each of the speakers tried to highlight on what the major threats to forest resources were and why and what we need to do to save the planet from the destruction of climate change.

Beside the formal workshop and open discussion among all parties present in the meeting, the D&D study team also conducted a focused group discussion (FGDs). The D&D research team interviewed local leaders, government officials, journalists, freedom fighters, college professor, social workers, political leaders, and local government leaders, from Cox's Bazar.

The workshop, FGDs, and KII participants identified a number of drivers for D&D in Cox's Bazar. The major drivers for deforestation were Rohingya refugee, weakness of FD (insufficient staffs and logistics), betel leaf cultivation, corruption of all agencies and leadership, want of accountability of FD and other government agencies and political leaders, poor law (since the criminals get bail easily) and its poor application, local muscle power and encroachment, forest villagers (expanding into forest land generations after generations), expansion of cantonment, hill cutting, and communication network by the Army, and population explosion. In the degradation end, some salient drivers were hill cutting, Rohingya problem, poverty and unemployment, betel leaf cultivation, and cattle grazing. The speakers also suggested a number of initiatives to fight the D&D drivers and important of them were political commitment to forest conservation, involvement of people in forest management, making good relationship with people (both the Govt and the FD), and alternative income generation activities (AIGAs).

1 UN-REDD Bangladesh National Programme

1.1. *Background*

In August of 2010, Government of the People's Republic of Bangladesh became a partner country of the UN-REDD Programme. The UN-REDD Programme is the United Nations collaborative programme on reducing emission from deforestation and forest degradation. The program assists developing countries like Bangladesh to build capacity to reduce emissions and to participate in a future REDD+ mechanism.

In subsequent years, Bangladesh took several key steps i.e., established the National REDD+ Steering Committee; the REDD+ Preparation Proposal (R-PP) was approved in end of 2013 by UN-REDD Policy Board. The UN-REDD National Programme Document was approved by national counterparts & participating UN organization in 2015. Finally, the government approved the UN-REDD Bangladesh National Programme in 19 June 2016.
The Forest Department (FD) of the Ministry of Environment and Forests (MoEF) is the lead Implementing Partner for the UN-REDD National Programme, headed by a National Project Director (NPD), supported by Programme Management Unit (PMU). The United Nations Development Programme (UNDP) and Food and Agriculture Organization (FAO) are the two co-implementing partners helping the PMU. The duration of the NP is from July 2015 to June 2018.
The UN-REDD Bangladesh National Programme has the objective to support the Government of Bangladesh in initiating the implementation of its REDD+ Readiness Roadmap (i.e., R-PP) by establishing necessary REDD+ management processes, identifying strategic readiness options for completing its National REDD+ strategy, and developing the capacities required to begin implementation of REDD+.

1.2. *Scope of the Report*

The primary aim of this report is to document the preliminary outcomes of the consultation workshop, FGDs, and KIIs conducted in Cox's Bazar to capture the major drivers of deforestation and forest degradation in Cox's Bazar forest division held on 03 December 2016 organized by the UN-REDD Bangladesh National Programme.

1.3. *Organization of the Report*

Section 1 introduces the Background of UN-REDD programme; Section 2 elaborates on the details of the workshops. Relevant annexes – i.e., presentation on UN-REDD Bangladesh National Programme, presentation by consultant team and list of participants are appended at the end of report.

2 Workshop on Drivers of Deforestation & Degradation

2.1. *Background of the Drivers of Deforestation & Degradation Study*

Bangladesh is a signatory to the UN Framework Convention on Climate Change (UNFCCC). The Conference of the Parties (COP) to the UNFCCC has taken a number of decisions in recent years to encourage developing country Parties to take climate change mitigation actions in forestry sector. The role of forests and reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) have been fully recognised and enshrined in the Paris Agreements.

As part of the country's long-term strategy to reduce GHG emissions, largely described in its Intended Nationally Determined Contributions (INDC), the Government of Bangladesh has taken initial steps to

contribute to this global effort to address climate change, and one of such steps is to develop its capacity to implement REDD+. The Government of Bangladesh prepared and endorsed its REDD+ Readiness Roadmap in 2012.

To support this effort, the UN-REDD Bangladesh National Programme was established to provide technical capacity development assistance to the Government of Bangladesh in designing and implementing its National REDD+ Strategy and in meeting the international requirements under the UNFCCC Warsaw Framework to receive REDD+ results-based finance.

One of the key components of the REDD+ readiness process is to identify public policy approaches and interventions, including incentive mechanisms to effectively address key drivers and causes of deforestation and forest degradation (D&D). In order to identify such approaches, a clear understanding of drivers and causes of D&D in Bangladesh must first be developed.

To develop such an understanding, UN-REDD Bangladesh National Programme amassed a team comprised of international and national consultants. The team accordingly developed a methodology and planned a total of 9 regional workshops distributed across the country. The Cox's Bazar workshop and aligned FGDs and KIIs were conducted aiming at the following objectives:

- To identify the most important drivers of deforestation and forest degradation in the Cox's Bazar area and
- To focus on the historical background of the drivers and potential solution(s) to the problems of D&D

2.2. Organization of the Workshop

List of Invitees: Participants list was developed by Divisional Forest Officer, Cox's Bazar Division based on criteria put forward to the study team. In general, the criteria put forward by study team suggested inclusion from – local administration, departments, educational institutions, NGOs, Indigenous communities, local leaders, business representatives and people living adjacent to the forested areas. A letter of invitation was prepared by Project Director, which was distributed by the departmental staff to help the project.

Workshop Presentations and Information Materials: The primary objective of the workshop was to identify Drivers of Deforestation and Degradation for Cox's Bazar area by the relevant stakeholders. Accordingly, three presentations were made. The first presentation was on REDD+ activities in Bangladesh given by Mr. Sayeed Mahmud Riadh, REDD+ Governance Activity Coordinator, UN-REDD Bangladesh National Program. To set the context of the study, a Bangla power point presentation on REDD+ and the drivers of forest degradation and deforestation in Bangladesh and across the world was presented by Dr. Mohammed Jashimuddin on the D&D team's behalf. It was immediately followed by the presentation on how to fill up the socioeconomic survey form by Dr. Mohammad Mahfuzur Rahman.

Table 1: List of Presentations

Sl	Presentation on	Basic Message	Presentation by
9.	The progress of REDD+ readiness activities in Bangladesh	Context of REDD+ in Bangladesh: the program structure, objectives, national committees and functions, and financial details of the program	Mr. Sayeed Mahmud Riadh, REDD+ Governance Activity Coordinator, UN-REDD Bangladesh National Program

Table 1: List of Presentations			
Sl	**Presentation on**	**Basic Message**	**Presentation by**
10.	Drives of Deforestation and Degradation	Context of Drives of Deforestation and Degradation Study and requirement	Dr. Mohammed Jashimuddin, National Consultant, D & D study team
11.	Socioeconomic study	Identification of major socioeconomic drivers responsible for D&D in Cox's Bazar	Dr. Mohammad Mahfuzur Rahman, National Consultant, D & D study team

Table 2: List of Awareness Materials shared during Inception Workshop		
Sl	**Item**	**Information shared**
13.	REDD+ and National Programme Leaflet in Bangla	What is UN-REDD programme; what is REDD+, what are the five activities of REDD+, Warsaw Frameworks, why REDD+ is important, its relevance, why REDD+ is important for Bangladesh; evolution the NP and the targeted outcomes.
14.	National Programme Leaflet in English	Relevance of REDD+ in Bangladesh, evolution of REDD+ programme, phased approach and outputs, Warsaw framework, National Programme Objective, duration, budget, outcomes and outputs, project management.
15.	Document folder	What is REDD+, short brief on National programme, phased approach of UN-REDD programme and institutional framework proposed for REDD+ programme in Bangladesh.
16.	Note book	What is REDD+, its five activities, UN-REDD programme, Warsaw elements, Bangladesh National Programme, targeted outputs and delivery schedule.
17.	Branded Pen	With UN-REDD, Government and Forest Department's logo.
18.	Bangla Presentation on REDD+	What is drivers of deforestation and forest degradation, why study is required.

2.3. *Programme Schedule*

The entire preogramme comprises of 3 days of activity (Table 3), where 1st day involved reaching the destination, coordination, and communication with local Forest Department officials and internal team meeting. The second day of the Cox's Bazar activities consists of the consultation workshop itself with KIIs, socioeconomic survey, and FGDs after the workshop in couple of places. On the third day, the team headed back to Dhaka.

The meeting started with a welcome speech by Mr. Nasim Aziz, Project Manager, UN-REDD Bangladesh National Program. It was followed by an elaborated speech on REDD+ activities in Bangladesh by Mr. Sayeed Mahmud Riadh, REDD+ Governance Activity Coordinator, UN-REDD Bangladesh National Program. To set the context of the study, a Bangla power point presentation on REDD+ and the drivers of forest degradation and deforestation in Bangladesh and across the world was presented by Dr. Mohammed Jashimuddin on the team's behalf. It was immediately followed by the socioeconomic questionnaire survey conducted by Dr. Mohammad Mahfuzur Rahman. A lively open discussion took place immediately after the four consecutive presentations, which was participated by people from major agencies and profession in the Cox's Bazar District. Concurrent key informant interviews (KIIs) were conducted with the key personalities present in the meeting. However, the workshop was concluded with the formal speeches delivered respectively by Mr. A. K.

M. Shahriar, Deputy Director, Department of Agriculture, Cox's Bazar, Mr. Karamat Ali Mollik, DFO, Cox's Bazar (North) Forest Division, Mr. Ali Kabir, DFO, Cox's Bazar (South) Forest Division, and Mr. Kazi Mohammad Abdur Rahman, ADC (general), Cox's Bazar. The consultation workshop was presided by Mr. Rakibul Hasan Mukul, The Project Director, UN-REDD National Program, Bangladesh. Each of the speakers tried to highlight on what the major threats to forest resources were and why and what we need to do to save the planet from the destruction of climate change. The summary of the activities can be given in Table 5.

Table 3. The activities conducted in the Cox's Bazar Field Trip

Name of activities	No. of activities	Major Participants
Presentations	03	03 presenters and around 50 participants in each
Socioeconomic Survey	01	40 (roughly) respondents
FGDs	01	35 local people
KIIs	01	1. Kazi Md. Abdur Rahman, ADC (general), Cox's Bazar 2. Fazlul Qader Chy, Editor, The Daily Cox's Bazar 3. Nur Mohammad, Chairman, Hoaikong, Cox's Bazar 4. Helena Tahera, Upazilla Vice Chairman, Cox's Bazar Shadar 5. Biswajit Sarkar, Journalist and Environment Worker 6. Md. Shahjahan, Commander, District Freedom Fighter Command Council, Cos'x Bazar 7. Dipok Shorma, Jounalist 8. A.K. M. Shahriar, DD, Department of Agriculture, Cox's Bazar

2.4. *Major Drivers of D&D in Cox's Bazar Forest Division, Bangladesh Forest Department*

The drivers of D&D greatly varied from division to division. Thus, the drivers identified in Cox's Bazar also were unique. Table 6 summarizes the total outcomes of the Cox's Bazar tour. The drivers of D&D identified by different groups had some similarities and dissimilarities. We believe the similar drivers were the common concern of every class of people while the differentiation in identifying the drivers did have some connections to the interest of the respondent group. For example, the poor people were not willing to identify fuel wood collection as a threat to deforestation. Similarly, a land grabber were not willing to highlight that encroachment could be a threat either. However, Table 6 clearly portrays the most important reasons behind deforestation and forest degradation in Cox's Bazar Forest Division.

Table 4. Major Drivers of D&D in Cox's Bazar Forest Division identified in consultation workshop, socioeconomic survey, KII and FGD

	Workshop	FGD	KII	Socioeconomic Survey
Venue	Long Beach Hotel, Cox's Bazar	Inani, Teknaf LGED Road Cox's Bazar	Long Beach Hotel, Cox's Bazar	Long Beach Hotel, Cox's Bazar
No. of Participants	50	35 (Male: 29, Female: 6)	15	40

Drivers of Deforestation	1. Rohingya refugee 2. Weakness of FD (staffs, logistics) 3. Betel leaf cultivation 4. Corruption of all agencies and leadership 5. Want of accountability of FD and other government agencies and political leaders 6. Poor law (since the criminals get bail easily) and its poor application 7. Local muscle power and encroachment 8. Forest villagers (expanding into forest land generations after generations) 9. Expansion of cantonment, hill cutting, and communication network by Army 10. Want of awareness and patriotism 11. Wrong selection of plantation (site-species matching is not correct) 12. Population explosion Degradation 13. Forest destroyers are listed in committees meant for forest protection (ghosts in the grains) 14. Brickfield business	1. Rohingya refugee 2. Chakma migrant (from Bandarbans) 3. Poverty and unemployment 4. Fuelwood collection 5. Natural calamity (of '91, '94 mainly) 6. Government lot system for salvation cutting after natural disasters (of '91, '94 mainly) 7. Forest villagers 8. Expansion of Army cantonment and their development activities 10. Population explosion 11. Local leaders: corruption, illegal felling, and encroachment	1. Population explosion 2. Illegal tree cutting 3. Political influence 4. Settlement 5. Poverty	1.population increase 2. Illegal tree cutting 3. Weak law enforcement 4. Grazing cattle 5. Small agriculture 6. Corruption 7.business agriculture 8. Fuel wood collection 9. Weak forest policy 10. Road, railways
Drivers of Degradation	1. Hill cutting 2. Rohingya	1. Betel leaf cultivation	Degradation	1. Illegal tree cutting

	3. Poverty and unemployment 4. Betel leaf cultivation 5. Grazing	2. Grazing 3. Natural disasters 4. Hill cutting 5. Short rotation commercial plantation	1. Illegal tree cutting 2. Population 3. Development project 4. Settlement 5. Grazing	2. Population increase 3. Business agri 4.Weak law enforcement 5. Land ownership
Overall Recommendation	1. Political commitment to forest conservation 2. Involving people in forest management 3. Making good relationship with people (both the Government and the FD) 4. Incorporating people in forest management with the FD 5. Looking for alternatives to plant-based sticks (plastic stick, for example) to help betel leaf plants to creep up. 6. FD should plan for a wing for fuelwood plantation management 7. Social forestry may be extended to green the open and exposed hills. 8. AIGAs			

2.5. *Summary of the outputs*

The Cox's Bazar tour helped the study team identify a series drivers of D&D in Cox's Bazar area. The major drivers identified in the open discussion were Rohingya refugee, weakness of FD (staffs, logistics), betel leaf cultivation, corruption of all agencies and leadership, want of accountability of FD and other government agencies and political leaders, poor law (since the criminals get bail easily) and its poor application, local muscle power and encroachment, forest villagers (expanding into forest land generations after generations), expansion of cantonment, hill cutting, and communication network by Army, want of awareness and patriotism, wrong selection of plantation (site-species matching is not correct), and population explosion. Similarly, the drivers identified for forest degradation were hill cutting, Rohingya, poverty and unemployment, betel leaf cultivation, and grazing. In FGD, the major reasons found for deforestation were Rohingya refugee, Chakma migrant (from Bandarbans), poverty and unemployment, fuelwood collection, natural calamity (of '91, '94 mainly), government lot system for salvation cutting after natural disasters (of '91, '94 mainly), forest villagers, expansion of Army cantonment and their development activities, population explosion, and local leaders: corruption, illegal felling, and encroachment. Similary, the degradation drivers were betel leaf cultivation, grazing, natural disasters, hill cutting, short rotation commercial plantation, listing of forest destroyers in committees meant for forest protection (ghosts in the grains), and brickfield business.

The social leadership in the KIIs identified five reasons for deforestation and five for forest degradation. The deforestation drivers were Population explosion illegal tree cutting, political influence, settlement, and poverty. And the forest degradation drivers were illegal tree cutting, population, development project, settlement, and grazing. Similar reasons were identified in the socioeconomic survey. However, the top five reasons found in the socioeconomic study were population explosion, illegal tree felling, weak law enforcement, grazing cattle, and small agriculture. Similarly, the top five forest degradation agents were illegal tree felling, population, developmentproject, settlement, and grazing.

The meeting also came up with a number of candid suggestions on how to combat the drivers to restore country's forest resources. Some of the salient recommendations to the solution of the D&D problem were political commitment to forest conservation, involving people in forest management, making good relationship with people (both the Government and the FD), incorporating people in forest management with the FD, looking for alternatives to plant-based sticks (plastic stick, for example) to help betel leaf plants to creep up, FD should plan for a wing for fuelwood plantation management, social forestry may be extended to green the open and exposed hills, and AIGAs.

3 Conclusions

The Cox's Bazar consultation workshop was quite successful in terms of identifying some important drivers of deforestation and forest degradation. The FGD and KII came out with some important suggestions as to what steps are needed to address the identified drivers of D&D.

Annex – 1: FGD Process

A typical FGD process followed in UN-REDD D&D study consisted the following steps

(1) **Introducing everyone:** A typical FGD starts with the self-introduction of all people present in the discussion.

(2) **An Introductory lecture**: The speaker or facilitator delivers a preliminary lecture to the focus group (FG) detailing the differences between Deforestation and forest Degradation (D&D). Relevant examples help the FG understand the differences between the two.

(3) **Guiding the discussion:** The FGD is requested to identify the drivers of Deforestation and forest Degradation separately. We normally start with Deforestation and end up with forest Degradation. It is important to clarify in advance that, ***notwo person should repeat the same driver(s)***, else the discussion continues for no conclusion. Female participants, non-beneficiary (of Social Forestry Program), and the people in the back rows can be instigated repeatedly to speak out.

(4) **The method**: We normally follow the '**snowball'** method where the facilitator provokes the participants to speak out on the drivers of D&D. At certain point after repeated efforts, the FG's intension to describe the D&D drivers diminishes almost to zero.

(5) **Scoring the responses**: Once the drivers (of each Ds) are identified, we normally read the listed drivers to the FG and request them to choose the most important (destructive) drivers. This can be done by picking up a driver (say, X) and requesting the FG members to raise their hands if they consider that X is the most important (No.1) driver for Deforestation (or the other D). The number of raised hands can be counted and recorded to search out the top most drivers for the Ds.

(6) **Duration of discussion**: A fixed amount of time (roughly 1.5 hours) was allotted for each of the FGDs. This facilitated the spontaneity and ensured unbiased outcomes of the FGDs.

10.4 Chittagong: Hill and Coastal Forest Zone

Workshop Report On

Identification of Drivers of Deforestation and Forest Degradation in Bangladesh: Chittagong

30 Nov-01December 2016
Peninsula Hotel, Chittagong, Bangladesh

Programme Management Unit (PMU)
UN-REDD Bangladesh National Programme
Bangladesh Forest Department

10 December 2016

UN-REDD Bangladesh National Program

The UN-REDD Bangladesh National Program is implemented by Bangladesh Forest Department under the leadership of Ministry of Environment and Forests. United Nations Development Program (UNDP) and Food and Agriculture Organization (FAO) are the two implementing partners.

Citation

UN-REDD Bangladesh National Program. 2016. Workshop Report on the Study of Drivers of Deforestation and Forest Degradation in Bangladesh: Chittagong. UN-REDD Bangladesh National Program, Bangladesh Forest Department. Chittagong Workshop Proceedings held on 30Nov-02 December 2016.

Disclaimer

The materials/information presented on this meeting/event report/publication is the presenters'/participants'. UN-REDD Bangladesh National Program makes no statements, representations, or warranties about the presented opinions and this do not necessarily represent those of the United Nations, UN-REDD program's implementing agencies including UNDP, FAO and UNEP or its Member States.

10 December 2016

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Executive Summary

The depletion of forest resources is a major environmental issue especially in the developing countries. Identification of drivers of deforestation and forest degradation is critical and mandatory to formulate effective and meaningful national strategies to save forest resources across the country. The UN-REDD Bangladesh National Programme of Bangladesh Forest Department (BFD) has amassed a team of international and national consultants to identify the direct and indirect drivers that are deemed responsible for deforestation and forest degradation (D&D) in the country. The team is composed of Dr. Ian Thompson - an international consultant with expertise in REDD+, Dr. Mohammed Jashimuddin as Governance Specialist, Dr. Mohammad Mahfuzur Rahman as a Natural Resource Economist, and Mr. Saiful Islam Khan as a GIS expert. Apart from the methodology validation workshop in Dhaka, the D&D study team has planned a total of nine workshops at eight different administrative divisions of the country plus one at the Rangamati District of Chittagong Hill Tracts (CHTs). This report is the summary of the workshop held during 30Nov-02 December 2016 in Chittagong, Bangladesh.

The meeting started with an elaborated speech on REDD+ activities in Bangladesh by Mr. Sayeed Mahmud Riadh, REDD+ Governance Activity Coordinator, UN-REDD Bangladesh National Program. To set the context of the study, a Bangla power point presentation on REDD+ and the drivers of forest degradation and deforestation in Bangladesh and across the world was presented by Dr. Mohammed Jashimuddin on the team's behalf. It was immediately followed by the socioeconomic questionnaire survey conducted by Dr. Mohammad Mahfuzur Rahman. A lively open discussion took place immediately after the four consecutive presentations, which was participated by people from major agencies and profession in the Chittagong District. Concurrent key informant interviews (KIIs) were conducted with the key personalities present in the meeting. However, the workshop was concluded with the formal speeches delivered respectively by Mr. Md Shamsul Arefin, Divisional Commissioner, Chittagong, Mr. Abdul Latif Miah, CF, Chittagong Forest Circle, Dr. M Jaglul Hossain, DFO, Chittagong (North) Forest Division. The consultation workshop was concluded by the vote of thanks by Mr. Rakibul Hasan Mukul, the Project Director, UN-REDD National Program, Bangladesh. Each of the speakers tried to highlight on what the major threats to forest resources were and why and what we need to do to save the planet from the destruction of climate change.

Beside the formal workshop and open discussion among all parties present in the meeting, the D&D study team also conducted a focused group discussion (FGDs). The D&D research team interviewed local leaders, government officials, journalists, freedom fighters, university professor, social workers, political leaders, and local government leaders from Chittagong.

The workshop, FGDs, and KII participants identified a number of drivers for D&D in Chittagong. The major drivers for deforestation were muscle power or political corruption, unclear land ownership of FD, poverty and unemployment, weak law implementation, non-forestry uses of forestland, development work, weakness of FD in terms of logistics and insufficient manpower, lack of coordination among different government agencies, brickfield business, and inactivity of all stakeholders having impacts on forest resources. In the degradation end, some salient drivers were the want of land use planning, tourism development (non-ecotourism), settlement, fuel wood collection, and monoculture. The speakers also suggested a number of initiatives to fight the D&D drivers and important of them were empowerment of FD, strict implementation of forest law, strengthening monitoring and coordination, increasing transparency and controlling corruption, political commitment to conservation, reduction of forest dependency, avoiding forest for development work, collaboration of all stakeholders, eviction of all industries from forest land, and resettlement of the forest villagers.

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1 UN-REDD Bangladesh National Programme

1.1. Background

In August of 2010, Government of the People's Republic of Bangladesh became a partner country of the UN-REDD Programme. The UN-REDD Programme is the United Nations collaborative programme on reducing emission from deforestation and forest degradation. The program assists developing countries like Bangladesh to build capacity to reduce emissions and to participate in a future REDD+ mechanism.

In subsequent years, Bangladesh took several key steps i.e., established the National REDD+ Steering Committee; the REDD+ Preparation Proposal (R-PP) was approved in end of 2013 by UN-REDD Policy Board. The UN-REDD National Programme Document was approved by national counterparts & participating UN organization in 2015. Finally, the government approved the UN-REDD Bangladesh National Programme in 19 June 2016.
The Forest Department (FD) of the Ministry of Environment and Forests (MoEF) is the lead Implementing Partner for the UN-REDD National Programme, headed by a National Project Director (NPD), supported by Programme Management Unit (PMU). The United Nations Development Programme (UNDP) and Food and Agriculture Organization (FAO) are the two co-implementing partners helping the PMU. The duration of the NP is from July 2015 to June 2018.
The UN-REDD Bangladesh National Programme has the objective to support the Government of Bangladesh in initiating the implementation of its REDD+ Readiness Roadmap (i.e., R-PP) by establishing necessary REDD+ management processes, identifying strategic readiness options for completing its National REDD+ strategy, and developing the capacities required to begin implementation of REDD+.

1.2. Scope of the Report

The primary aim of this report is to document the preliminary outcomes of the consultation workshop, FGDs, and KIIs conducted in Chittagong to capture the major drivers of deforestation and forest degradation in Chittagong forest division held on 01 December 2016 organized by the UN-REDD Bangladesh National Programme.

1.3. Organization of the Report

Section 1 introduces the Background of UN-REDD programme; Section 2 elaborates on the details of the workshops. Relevant annexes – i.e., presentation on UN-REDD Bangladesh National Programme, presentation by consultant team and list of participants are appended at the end of report.

2. Workshop on Drivers of Deforestation & Degradation

2.1 Background of the Drivers of Deforestation & Degradation Study

Bangladesh is a signatory to the UN Framework Convention on Climate Change (UNFCCC). The Conference of the Parties (COP) to the UNFCCC has taken a number of decisions in recent years to encourage developing country Parties to take climate change mitigation actions in forestry sector. The role of forests and reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) have been fully recognised and enshrined in the Paris Agreements.

As part of the country's long-term strategy to reduce GHG emissions, largely described in its Intended Nationally Determined Contributions (INDC), the Government of Bangladesh has taken initial steps to contribute to this global effort to address climate change, and one of such steps is to develop its

capacity to implement REDD+. The Government of Bangladesh prepared and endorsed its REDD+ Readiness Roadmap in 2012.

To support this effort, the UN-REDD Bangladesh National Programme was established to provide technical capacity development assistance to the Government of Bangladesh in designing and implementing its National REDD+ Strategy and in meeting the international requirements under the UNFCCC Warsaw Framework to receive REDD+ results-based finance.

One of the key components of the REDD+ readiness process is to identify public policy approaches and interventions, including incentive mechanisms to effectively address key drivers and causes of deforestation and forest degradation (D&D). In order to identify such approaches, a clear understanding of drivers and causes of D&D in Bangladesh must first be developed.

To develop such an understanding, UN-REDD Bangladesh National Programme amassed a team comprised of international and national consultants. The team accordingly developed a methodology and planned a total of 9 regional workshops distributed across the country. The Chittagong workshop and aligned FGDs and KIIs were conducted aiming at the following objectives:

- To identify the most important drivers of deforestation and forest degradation in the Chittagong area and
- To focus on the historical background of the drivers and potential solution(s) to the problems of D&D

2.2 Organization of the Workshop

List of Invitees: Participants list was developed by Divisional Forest Officer, Chittagong Division based on criteria put forward to the study team. In general, the criteria put forward by study team suggested inclusion from – local administration, departments, educational institutions, NGOs, Indigenous communities, local leaders, business representatives and people living adjacent to the forested areas. A letter of invitation was prepared by Project Director, which was distributed by the departmental staff to help the project.

Workshop Presentations and Information Materials: The primary objective of the workshop was to identify Drivers of Deforestation and Degradation for Chittagong area by the relevant stakeholders. Accordingly, three presentations were made. The first presentation was on REDD+ activities in Bangladesh given by Mr. Sayeed Mahmud Riadh, REDD+ Governance Activity Coordinator, UN-REDD Bangladesh National Program. To set the context of the study, a Bangla power point presentation on REDD+ and the drivers of forest degradation and deforestation in Bangladesh and across the world was presented by Dr. Mohammed Jashimuddin on the D&D team's behalf. It was immediately followed by the presentation on how to fill up the socioeconomic survey form by Dr. Mohammad Mahfuzur Rahman.

Table 1: List of Presentations

Sl	Presentation on	Basic Message	Presentation by
12.	The progress of REDD+ readiness activities in Bangladesh	Context of REDD+ in Bangladesh: the program structure, objectives, national committees and functions, and financial details of the program	Mr. Sayeed Mahmud Riadh, REDD+ Governance Activity Coordinator, UN-REDD Bangladesh National Program

Table 1: List of Presentations			
Sl	Presentation on	Basic Message	Presentation by
13.	Drives of Deforestation and Degradation	Context of Drives of Deforestation and Degradation Study and requirement	Dr. Mohammed Jashimuddin, National Consultant, D & D study team
14.	Socioeconomic study	Identification of major socioeconomic drivers responsible for D&D in Chittagong	Dr. Mohammad Mahfuzur Rahman, National Consultant, D & D study team

Table 2: List of Awareness Materials shared during Inception Workshop		
Sl	Item	Information shared
19.	REDD+ and National Programme Leaflet in Bangla	What is UN-REDD programme; what is REDD+, what are the five activities of REDD+, Warsaw Frameworks, why REDD+ is important, its relevance, why REDD+ is important for Bangladesh; evolution the NP and the targeted outcomes.
20.	National Programme Leaflet in English	Relevance of REDD+ in Bangladesh, evolution of REDD+ programme, phased approach and outputs, Warsaw framework, National Programme Objective, duration, budget, outcomes and outputs, project management.
21.	Document folder	What is REDD+, short brief on National programme, phased approach of UN-REDD programme and institutional framework proposed for REDD+ programme in Bangladesh.
22.	Note book	What is REDD+, its five activities, UN-REDD programme, Warsaw elements, Bangladesh National Programme, targeted outputs and delivery schedule.
23.	Branded Pen	With UN-REDD, Government and Forest Department's logo.
24.	Bangla Presentation on REDD+	What is drivers of deforestation and forest degradation, why study is required.

2.3 Programme Schedule

The entire preogramme comprises of 3 days of activity (Table 3), where 1st day involved reaching the destination, coordination, and communication with local Forest Department officials and internal team meeting. The second day of the Chittagong activities consists of the consultation workshop itself with KIIs, socioeconomic survey, and FGDs after the workshop in couple of places. On the third day, the team headed towards Cox's Bazar and on the way conducted a FGD at Chunati Wildlife Sanctuary.

The meeting started with a speech on REDD+ activities in Bangladesh by Mr. Sayeed Mahmud Riadh, REDD+ Governance Activity Coordinator, UN-REDD Bangladesh National Program. To set the context of the study, a Bangla power point presentation on REDD+ and the drivers of forest degradation and deforestation in Bangladesh and across the world was presented by Dr. Mohammed Jashimuddin on the team's behalf. It was immediately followed by the socioeconomic questionnaire survey conducted by Dr. Mohammad Mahfuzur Rahman. A lively open discussion took place immediately after the four consecutive presentations, which was participated by people from major agencies and profession in the Chittagong District. Concurrent key informant interviews (KIIs) were conducted with the key personalities present in the meeting. However, the workshop was concluded with the formal speeches delivered respectively by However, the workshop was concluded with the formal speeches delivered respectively by Mr. Md Shamsul Arefin, Divisional Commissioner, Chittagong, Mr. Abdul Latif Miah, CF, Chittagong Forest Circle, Dr. M Jaglul Hossain, DFO, Chittagong (North) Forest Division. The consultation workshop was concluded by the vote of thanks by Mr. Rakibul Hasan Mukul, the Project Director, UN-

REDD National Program, Bangladesh. Each of the speakers focused on what the major threats to forest resources were and why and what we need to do to save the planet from the destruction of climate change.The summary of the activities can be given in Table 5.

Table 3. The activities conducted in the Chittagong Field Trip

Name of activities	No. of activities	Major Participants
Presentations	03	03 presenters and around 50 participants in each
Socioeconomic Survey	01	35 (roughly) respondents
FGDs	01	19 local people
KIIs	01	1. Mr. Md Shamsul Arefin, Divisional Commissioner, Chittagong 2. Mr. Abdul Latif Miah, CF, Chittagong Forest Circle 3. Dr. Jaglul Hossain, DFO, Chittagong (North) Forest Division. 4. Dr. M. Kamal Hossain, Professor, IFESCU 5. Dr. M. Danesh Miah, Director, IFESCU 6. Mrs. Rahima Begum, Councilor, Chittagong City Corporation 7. Dr. M. Mosharraf Hossain, Professor, IFESCU 8. Mia Mohammad Keyamuddin, Senior Assistant Commissioner, Chittagong Collectorate 9. Md. Iftekher Hossain, Monitoring Officer, CODEC-CREL Project

2.4 Major Drivers of D&D in Chittagong Forest Division, Bangladesh Forest Department

The drivers of D&D greatly varied from division to division. Thus, the drivers identified in Chittagong also were unique. Table 6 summarizes the total outcomes of the Chittagong tour. The drivers of D&D identified by different groups had some similarities and dissimilarities. We believe the similar drivers were the common concern of every class of people while the differentiation in identifying the drivers did have some connections to the interest of the respondent group. For example, the poor people were not willing to identify fuel wood collection as a threat to deforestation. Similarly, a land grabber were not willing to highlight that encroachment could be a threat either. However, Table 6 clearly portrays the most important reasons behind deforestation and forest degradation in Chittagong Forest Division.

Table 4. Major Drivers of D&D in Chittagong Forest Division identified in consultation workshop, socioeconomic survey, KII and FGD

	Workshop	FGD	KII	Socioeconomic Survey
Venue	Peninsula Hotel, Chittagong	Chunati Wildlife Sanctuary, Chittagong	Peninsula Hotel, Chittagong	Peninsula Hotel, Chittagong
No. of Participants	82	19 (Male: 13, Female: 6)	15	35
Drivers of Deforestation	1. Muscle power or political corruption 2. Land ownership 3. Poverty/AIG 4. Weak law implementation 5. Non forestry use of forest land 6. Development work	1. Settlement 2. Brickfield 3. Poverty 4. Population increase 5. Encroachment 6. Corruption 7. Illegal felling 8. Lack of awareness 9. Development work 10. Animal grazing	1. Illegal felling 2. Population pressure 3. Lack of law implementation 4. Settlement 5. Agriculture use of forest land	Major Drivers Deforestation 1.Illegal tree cutting 2.Population increase 3. Corruption 4. Small agriculture

	7. Poor stuffing pattern in FD 8. Lack of coordination 9. Brickfield 10. Not active involvement of all stakeholders			5. Weak law enforcement 6. Weak forest policy 7. Fuelwood collection 8. Land ownership 9. Cattle grazing 10. Poverty
Drivers of Degradation	1. Land use planning 2. Tourism 3. Settlement 4. Fuel wood collection 5. Monoculture	1. Commercial afforestation for quick return 2. Local people are not involved in policy making 3. Population pressure	Degradation 1. Illegal felling 2. Population pressure 3. Agricultural use of forest land 4. Lack of law implementation 5. Unplanned Tourism	1.Illegal tree felling 2. Corruption 3. Population pressure 4. Small agriculture 5. Other infrastructures
Overall Recommendation	1. Empower Forest Department with staffs and logistic 2. Strict implementation of forest law 3. Strengthen monitoring and coordination 4. Transparency and stop corruption 5. Political commitment 6. Reduce forest dependency 7. Avoid forest for development work 8. Collaboration of all stakeholders 9. Eviction of all industries from forest land 10. Resettle the forest villagers			

2.5 Summary of the outputs

The Chittagong tour helped the study team identify a series of drivers of D&D in Chittagong area. The major drivers identified in the open discussion were muscle power or political corruption, unclear land ownership, poverty and unemployment, weak law implementation, non-forestry use of forestland, development work, poor stuffing pattern in FD, lack of coordination, brickfield, not active involvement of all stakeholders. Similarly, the drivers identified for forest degradation were poor land use planning, unplanned tourism development, settlement, fuel wood collection, and monoculture.

In FGD, the major reasons found for deforestation were settlement in forestland, brickfield, poverty and unemployment, population increase, encroachment, corruption, illegal felling, lack of awareness about the conservation of forest resources, development work, and animal grazing. On the other hand, the degradation drivers were commercial afforestation for quick return, local people are not involved in policy making, and population pressure. The social leadership in the KIIs identified five reasons for deforestation and five for forest degradation. The deforestation drivers were illegal felling, population pressure, lack of law implementation, settlement, and agriculture use of forestland. The degradation

drivers identified in KIIs were illegal tree felling, corruption, population pressure, small agriculture, and other infrastructures.However, the top reasons found in the socioeconomic study were illegal tree felling, population pressure, corruption, small agriculture, weak law enforcement, weak forest policy, fuel wood collection, land ownership, cattle grazing, and poverty. Similarly, the top five forest degradation agents were illegal felling, corruption, population pressure, small agriculture, and other infrastructures.

The meeting also came up with a number of candid suggestions on how to combat the drivers to restore country's forest resources. Some of the salient recommendations to the solution of the D&D problem were empower Forest Department with staffs and logistic, strict implementation of forest law, strengthen monitoring and coordination, increase transparency and reduction of corruption, political commitment, reduce forest dependency, avoiding forest for development work, collaboration of all stakeholders, eviction of all industries from forest land, and reconsider the forest villagers issue.

3. Conclusions

The Chittagong consultation workshop was quite successful in terms of identifying some important drivers of deforestation and forest degradation. The FGD and KII came out with some important suggestions as to what steps are needed to address the identified drivers of D&D.

Annex – 1: FGD Process

A typical FGD process followed in UN-REDD D&D study consisted the following steps

(1) Introducing everyone: A typical FGD starts with the self-introduction of all people present in the discussion.

(2) An Introductory lecture: The speaker or facilitator delivers a preliminary lecture to the focus group (FG) detailing the differences between Deforestation and forest Degradation (D&D). Relevant examples help the FG understand the differences between the two.

(3) Guiding the discussion: The FGD is requested to identify the drivers of Deforestation and forest Degradation separately. We normally start with Deforestation and end up with forest Degradation. It is important to clarify in advance that, ***notwo person should repeat the same driver(s)***, else the discussion continues for no conclusion. Female participants, non-beneficiary (of Social Forestry Program), and the people in the back rows can be instigated repeatedly to speak out.

(4) The method: We normally follow the '**snowball'** method where the facilitator provokes the participants to speak out on the drivers of D&D. At certain point after repeated efforts, the FG's intension to describe the D&D drivers diminishes almost to zero.

(5) Scoring the responses: Once the drivers (of each Ds) are identified, we normally read the listed drivers to the FG and request them to choose the most important (destructive) drivers. This can be done by picking up a driver (say, X) and requesting the FG members to raise their hands if they consider that X is the most important (No.1) driver for Deforestation (or the other D). The number of raised hands can be counted and recorded to search out the top most drivers for the Ds.

(6) Duration of discussion: A fixed amount of time (roughly 1.5 hours) was allotted for each of the FGDs. This facilitated the spontaneity and ensured unbiased outcomes of the FGDs.

10.5 Rangamati: Hill forest zone, Chittagong Hill Tracts

Workshop Report On

Identification of Drivers of Deforestation and Forest Degradation in Bangladesh: Hill Forest Zone, Rangamati

27-29 November 2016
Parjatan Holiday Complex, Rangamati, Bangladesh

Programme Management Unit (PMU)
UN-REDD Bangladesh National Programme
Bangladesh Forest Department

09December 2016

UN-REDD Bangladesh National Programme

The UN-REDD Bangladesh National Programme is implemented by Bangladesh Forest Department under the leadership of Ministry of Environment and Forests. United Nations Development Programme (UNDP) and Food and Agriculture Organization (FAO) are the two implementing partners.

Citation

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Disclaimer

The materials/information presented on this meeting/event report/publication is the presenters'/participants'. UN-REDD Bangladesh National Programme makes no statements, representations, or warranties about the presented opinions and this do not necessarily represent those of the United Nations, UN-REDD Programme's implementing agencies including UNDP, FAO and UNEP or its Member States.

09 December 2016

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Executive Summary

The depletion of forest resources is a major environmental issue especially in the developing countries. Identification of drivers of deforestation and forest degradation is critical and mandatory to formulate effective and meaningful national strategies to save forest resources across the country. The UN-REDD Bangladesh National Programme of Bangladesh Forest Department (BFD) has amassed a team of international and national consultants to identify the direct and indirect drivers that are deemed responsible for deforestation and forest degradation (D&D) in the country. The team is composed of Dr. Ian Thompson - an international consultant with expertise in REDD+, Dr. Mohammed Jashimuddin as Governance Specialist, Dr. Mohammad Mahfuzur Rahman as a Natural Resource Economist, and Mr. Saiful Islam Khan as a GIS expert. Apart from the methodology validation workshop in Dhaka, the D&D study team has planned a total of nine workshops at eight different administrative divisions of the country plus one at the Rangamati District of Chittagong Hill Tracts (CHTs). This report is the summary of the fifth workshop held during 27-29 November 2016 in Rangamati, Bangladesh.The meeting started with a welcome speech from Mr. Sayeed Mahmud Riadh, REDD+ Governance Activity Coordinator, UN-REDD Bangladesh National Programme. To set the context of the study, a Bangla power point presentation on REDD+ and the drivers of forest degradation and deforestation across the world was presented by Dr. Mohammad Jashimuddin on the team's behalf. It was immediately followed by the socioeconomic questionnaire survey conducted by Dr. Mohammad Mahfuzur Rahman. The meeting was chaired by Mr. Mohammad Shamsul Azam, Conservator of Forests, Rangamati Circle. A lively open discussion took place immediately after these presentations, which was participated by all corners of the society. However, the workshop was concluded with the formal speeches delivered respectively by Mr. Brisaketu Chakma, Chairman Rangamati Hill District Council, Barrister Raja Devashis Roy, Chakma Circle Chief, Rangamati, Deputy Commissioner, Rangamati, Mr. Md. Yunus Ali, Chief Conservator of Forests, Bangladesh, Mr. Mohammad Shamsul Azam, Conservator of Forests, Rangamati Circle, Bangladesh Forest Department. Each of the speakers tried to highlight on what the major threats to forest resources were and why and what we need to do to save the planet from the destruction of climate change.

Beside the formal workshop and open discussion among all parties present in the meeting, the D&D study team also conducted a number of key informant interviews (KIIs) and two focused group discussion (FGDs). The KIIs and FGDs were conducted by Dr. Mahfuzur Rahman, Mr. Saiful Islam Khan and Dr. Mohammed Jashimuddin. The team interviewed school teachers, college professors, social workers, political leaders, local government leaders, Forest Department (FD) officials, and high officials from the Chittagong Hill Tracts. The two FGDs were conducted at forest dependent communities of Sapchari, Gagra, Kaptai Upazila and Barkal Upazila 0f Rangamati Hill District.

The workshop, FGDs, and KII participants identified a number of drivers. The major drivers for deforestation were illegal felling of trees, collection of firewood, bamboo and timber, commercial use of forests, population pressure, poverty, *jhum* with low fellow period, displacement due to government policy related to forest reservation, population migration, hydroelectric power plant, high timber demand, *jote* permit, corruption, lack of coordination between different agencies and FD, conflicts in existing laws and policies, land encroachment, lack of alternative livelihoods, nationwide furniture demand, etc.

The drivers of forest degradation were more or less similar if not the same. The D&D team identified a number of drivers of forest degradation. Some of these drivers are population pressure and its impact on forest resources for fuel wood and food, weak social forestry policy, monoculture plantation,teak or rubber plantation, poverty, forest land encroachment, lack of sincerity, and insufficient care and maintenance by the FD to create and manage new forests.

The participants in the RangamatiProgramme emphasized on a number of issues to be resolved as soon as possible to stop the ongoing D&D in Chittagong Hill Tracts. People that are marginally dependent on forest resources should be ensured with some kind of livelihood supports (like AIGAs). Proper implementation of existing laws and policies, building awareness among general public, good governance, motivating local people to conserve forests, resolving land conflicts, FD alone can't conserve forests, CMC to be strengthen and engaged in forest management trough legal structure, VCF should be legally recognized, Headwater inhabitants need to be benefitted to conserve forests, no *Jote* permit within certain distance from reserve forests, everyone should play their role collectively, FD should select those indigenous species in all plantation activities, especially which are not economically valuable, people should get cash benefit to conserve forests, there should have win-win partnership between government and forest dependent communities, and sawmills and brick fields should be controlled to stop illegal cutting of trees.

1 UN-REDD Bangladesh National Programme

1.1. *Background*

In August of 2010, Government of the People's Republic of Bangladesh became a partner country of the UN-REDD Programme. The UN-REDD Programme is the United Nations collaborative Programme on reducing emission from deforestation and forest degradation. The Programme assists developing countries like Bangladesh to build capacity to reduce emissions and to participate in a future REDD+ mechanism.

In subsequent years, Bangladesh took several key steps i.e., established the National REDD+ Steering Committee; the REDD+ Preparation Proposal (R-PP) was approved in end of 2013 by UN-REDD Policy Board. The UN-REDD National Programme Document was approved by national counterparts & participating UN organization in 2015. Finally, the government approved the UN-REDD Bangladesh National Programme in 19 June 2016.
The Forest Department (FD) of the Ministry of Environment and Forests (MoEF) is the lead Implementing Partner for the UN-REDD National Programme, headed by a National Project Director (NPD), supported by Programme Management Unit (PMU). The United Nations Development Programme (UNDP) and Food and Agriculture Organization (FAO) are the two co-implementing partners helping the PMU. The duration of the NP is from July 2015 to June 2018.
The UN-REDD Bangladesh National Programme has the objective to support the Government of Bangladesh in initiating the implementation of its REDD+ Readiness Roadmap (i.e., R-PP) by establishing necessary REDD+ management processes, identifying strategic readiness options for completing its National REDD+ strategy, and developing the capacities required to begin implementation of REDD+.

1.2. *Scope of the Report*

The primary aim of this report is to document the preliminary outcomes of the consultation workshop, FGDs, and KIIs conducted in Rangamatito capture the major drivers of deforestation and forest degradation in Chittagong Hill Tracts (CHT) held on 27-29 November 2016 organized by the UN-REDD Bangladesh National Programme.

1.3. *Organization of the Report*

Section 1 introduces the Background of UN-REDD Programme; Section 2 elaborates on the details of the workshops. Relevant annexes – i.e., presentation on UN-REDD Bangladesh National Programme, presentation by consultant team and list of participants are appended at the end of report.

2 Workshop on Drivers of Deforestation &Forest Degradation (D&D)

2.1. *Background of the Drivers of Deforestation &Forest Degradation Study*

Bangladesh is a signatory to the UN Framework Convention on Climate Change (UNFCCC). The Conference of the Parties (COP) to the UNFCCC has taken a number of decisions in recent

years to encourage developing country Parties to take climate change mitigation actions in forestry sector. The role of forests and reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) have been fully recognised and enshrined in the Paris Agreements.

As part of the country's long-term strategy to reduce GHG emissions, largely described in its Intended Nationally Determined Contributions (INDC), the Government of Bangladesh has taken initial steps to contribute to this global effort to address climate change, and one of such steps is to develop its capacity to implement REDD+. The Government of Bangladesh prepared and endorsed its REDD+ Readiness Roadmap in 2012.

To support this effort, the UN-REDD Bangladesh National Programme was established to provide technical capacity development assistance to the Government of Bangladesh in designing and implementing its National REDD+ Strategy and in meeting the international requirements under the UNFCCC Warsaw Framework to receive REDD+ results-based finance.

One of the key components of the REDD+ readiness process is to identify public policy approaches and interventions, including incentive mechanisms to effectively address key drivers and causes of deforestation and forest degradation (D&D). In order to identify such approaches, a clear understanding of drivers and causes of D&D in Bangladesh must first be developed.

To develop such an understanding, UN-REDD Bangladesh National Programme amassed a team comprised of international and national consultants. The team accordingly developed a methodology and planned a total of 9 regional workshops distributed across the country. The Rangamati workshop and aligned FGDs and KIIs were conducted aiming at the following objectives:

- To identify the most important drivers of deforestation and forest degradation in the in the Chittagong Hill Tracts area and
- To focus on the historical background of the drivers and potential solution(s) to the problems of D&D.

2.2. *Organization of the Workshop*

List of Invitees: Participants list was developed by Divisional Forest Officer, Rangamati Forest Division based on criteria put forward to the study team. In general, the criteria put forward by study team suggested inclusion from – local administration, departments, educational institutions, NGOs, Indigenous communities, local leaders, business representatives and people living adjacent to the forested areas. A letter of invitation was prepared by Project Director, which was distributed by the departmental staff to help the project.

Workshop Presentations and Information Materials: The primary objective of the workshop was to identify Drivers of Deforestation and Forest Degradation for the CHT region by the relevant stakeholders and to fine tune the methodology. Accordingly three presentations were made by Mr. Sayeed Mahmud Riadh, Dr. Mohammed Jashimuddin, Dr. Mohammad

Mahfuzur Rahman to set the context (Table 1). A number of awareness materials (Table 2) were shred among the participants of the workshop.

Table 1: List of Presentations

Sl	Presentation on	Basic Message	Presentation by
15.	REDD+ in Bangladesh	Introduction on REDD+ in Bangladesh	Mr. Sayeed Mahmud Riadh, Govrnance Co-ordinator, UN-REDD Bangladesh
16.	Drives of Deforestation and Forest Degradation	Context of Drives of Deforestation and Forest Degradation Study and requirement	Dr. Mohammed Jashimuddin, National Consultant, D & D study team
17.	Socioeconomic study	Identification of major socioeconomic drivers responsible for D&D in Rangamati	Dr. Mohammad Mahfuzur Rahman, National Consultant, D & D study team

Table 2: List of Awareness Materials shared during the Workshop

Sl	Item	Information shared
25.	REDD+ and National Programme Leaflet in Bangla	What is UN-REDD Programme; what is REDD+, what are the five activities of REDD+, Warsaw Frameworks, why REDD+ is important, its relevance, why REDD+ is important for Bangladesh; evolution the NP and the targeted outcomes.
26.	National Programme Leaflet in English	Relevance of REDD+ in Bangladesh, evolution of REDD+ Programme, phased approach and outputs, Warsaw framework, National Programme Objective, duration, budget, outcomes and outputs, project management.
27.	Document folder	What is REDD+, short brief on National Programme, phased approach of UN-REDD Programme and institutional framework proposed for REDD+ Programme in Bangladesh.
28.	Note book	What is REDD+, its five activities, UN-REDD Programme, Warsaw elements, Bangladesh National Programme, targeted outputs and delivery schedule.
29.	Branded Pen	With UN-REDD, Government and Forest Department's logo.
30.	Bangla Presentation on REDD+	What are drivers of deforestation and forest degradation, why study is required?

2.3. *Programme Schedule*

The entire Programme comprises of 3 days of activity (Table 3), where 1st day involves reaching the destination and coordination and communication with local Forest Department officials and internal team meeting. The second day of the Rangamati activities consists of the consultation workshop itself with socioeconomic survey and KIIs before lunch at Parjatan Holiday Complex, Rangamati followed by a FGD in the afternoon at Sapchari Para, Gagra, Kaptai, Rangamati. The third day consists of a FGD in the morning with the forest dependent communities of Barkal Upazila, Rangamati and heading back to Chittagong in the afternoon (Tables 3&4).

Table 3. Detailed Programme Schedule for Rangamati, Chittagong Hill Tracts		
Day 01Nov. 2016, 27: Sunday	**Activity**	**Remarks**
0AM 00 :7	Leave for Airport	ByRoad
AM AM-08.45 08.00	Travel Dhaka to Chittagong	By Air
-AM 09.002:00 PM	Travel Chittagong to Rangamati	By Road
PM 00.PM – 03 2.00	Check in to the Guest House/ Hotel	Guest House/ HotelRangamati ,
PM PM-05.00 03.00	Meeting with CF and DFO	DFO OfficeRangamati (N) ,
PM PM-06.00 05.00	Back to the Guest House / Hotel	Guest House/ Hotel, Rangamati
06:00 PM –07:00 PM	Preparatory Meeting	Guest House/ Hotel Rangamati ,
07:30 PM	Dinner	Night stay at Guest HouseHotel Rangamati//
Day 2 28 :Nov .2016Monday,		
:0730 AM	Break fast	
08:30 AM –10:30 AM	Preparation for the workshop	
10:30 AM -02:00 PM	Workshop, Key Informant Interview, Questionnaire Survey and Lunch	Detailed programme is attached herewith.
02:00 PM –04:30 PM	Field vists at Sapchari Para, Gagra, Kaptai, Rangamati for FGD	
04:30 PM -05:00 PM	Back to the Guest House / Hotel , Rangamati	
07:30 PM	Dinner	Night stay at Guest House/ Hotel,Rangamati
Day 329 : Nov.2016Tuesd,ay		
0AM 30 :7	Break fast	
-AM 09.001PM 00.	Field Visit at Barkal Upazila, Rangamati for FGD	
1.00 PM-2.00 PM	Lunch	
2.00 PM-5.00 PM	Travel to Chittagong	By Road
5.00 – PM 5.3PM 0	Check in to the Guest House/ Hoteland Lunch	Guest House/ Hotel Chittagong ,
5.3-PM 06.3PM 0	Meeting with CF and DFO	DFO OfficeChittagong (N) ,
6.30-PM 7.00PM	Back to the Guest House / Hotel ,Chittagong	Guest House/ Hotel Chittagong ,
7:30 PM –8:00 PM	Preparatory Meeting	Guest House/ Hotel , Chittagong
8:00 PM	Dinner	Night stay at Guest House / Hotel,Chittagong

Table 4. Detailed activities of the consultation workshop in Rangamati, Chittagong Hill Tracts		
Time	**Activity**	**Presenter / Facilitator**
10.00 hrs.- 10.30 hrs.	Registration	
10.30 hrs.-10.50 hrs.	Brief introduction and Presentation on REDD+ in Bangladesh	Sayeed Mahmud Riadh, Governance Coordinator, UN REDD Bangladesh National Programme

10.50 hrs.-11.10 hrs.	Presentation on the study of Drivers of Deforestation and Forest Degradation	Dr. Mohammad Jashim Uddin, Professor, IFESCU & National Consultant, D & D study team
11.10 hrs.-11.45 hrs.	Questionnaire Survey	Dr. Mohammad Mahfuzur Rahman, Associate Professor, IFESCU & National Consultant, D & D study team
11.45 hrs. – 11.50 hrs.	Remarks by the Special Guest	Mr. Brisaketu Chakma, Chairman Rangamati Hill District Council
11.50 hrs. -12.50 hrs.	Open Discussion	Facilitated by Mr. Md. Yunus Ali, CCF, BFD, and Mr. Rakibul Hasan Mukul, ACCF, Development Planning Unit, BFD & National Project Director UN REDD Bangladesh National Programme
12.50 hrs. – 12.55 hrs.	Remarks by the Special Guest	Barrister Raja Devashis Roy
12.55 hrs. – 01.00 hrs.	Remarks by the Special Guest	Deputy Commissioner, Rangamati
01.00 hrs.-01.10 hrs.	Remarks by the Chief Guest	Mr. Md. Yunus Ali, Chief Conservator of Forests, Bangladesh
01.10 hrs.-01.15 hrs.	Remarks by the Chair	Mr. Mohammad Shamsul Azam, Conservator of Forests, Rangamati Circle, Bangladesh Forest Department
01.15 hrs.-01.30 hrs.	Key Informant Interview	Dr. M. Jashimuddin, Dr. M. Mahfuzur Rahman and Mr. Saiful Islam Khan
01.30 hr.-02. 00 hrs.	Lunch and Paryer	

The workshop meeting was started with the welcome speech delivered by Mr. Sayeed Mahmud Riadh, REDD+ Governance Activity Coordinator, UN-REDD Bangladesh National Programme. Mr. Riadh continued with his detailed presentation on the background, objectives, and roadmaps of REDD+ in Bangladesh. This was followed by presentation given by Dr. Mohammed Jashimuddin on the overview of D&D study and REDD+ in Bangladesh and beyond. The third presentation was conducted by Dr. Mohammad Mahfuzur Rahman on administering the socioeconomic survey on the D&D drivers and their underlying causes. After all these presentations a lively open discussion with constructive criticisms and suggestions on the drivers of deforestation and forest degradation continued with concluding remarks from Mr. Brisaketu Chakma, Chairman, Rangamati Hill District Council, Raja Devashi Roy, Deputy Commissioner of rangamati, Mr. Md. Yunus Ali, Chief Conservator of Forests, Bangladesh, and finally from the chair of the meeting Mr. Mohammad Shamsul Azam, Conservator of Forests, Rangamati Circle, Bangladesh Forest Department (Table 4). The open discussion was facilitated the chief guset Mr. Md. Yunus Ali, CCF. After the meeting a total of 10-12 KIIs were conducted by Dr. Mahfuzur Rahman and Mr. Saiful Islam Khan. The summary of the activities can be given in Table 5.

Table 5. The activities conducted in the Rangamati Field Trip

Name of activities	No. of activities	Participants
Presentations	03	03 presenters and around 130 participants
Socioeconomic Survey	01	50 respondents
FGDs	02	60 (30 in each FGD) forest dependent people
KIIs	10	Government officials School and college teacher Forest officers Union council chairman and members Other important personnel

2.4. *Major Drivers of D&D (Sequentially from the most important driver)*

The Drivers of Deforestation	The Drivers of Forest Degradation	Overall comments/ recommendations
1.Illegal cutting of trees. 2. Collection of firewood, bamboo and timber 3. Commercial use of forests 4. Population pressure 5. Poverty and high dependency for livelihoods 6. *Jhum* or shifting cultivation with low fellow period 7. Forest reservation, population migration, hydroelectric power plant, population displacement and insufficient rehabilitation programs 8. High timber demand 9. Development activities, e.g., cutting trees for infrastructure, cantonment, road construction, etc. No coordination between FD and other agencies. 10. *Jote* permit (illegal timber also transported along with legal or permitted timber) 11. Brick fields and sawmills 12. Political and social influence. 13.Corruption of both administration and general public. 14. Lack of good governance 15. Conflicts in existing laws and policies.	1. Population Pressure 2. Firewood collection 3. Monoculture plantation of Teak, Rubber, etc. 4. Insufficient care and maintenance (silvicultural operation) by FD. 5. Insufficient forestation activities by the FD 6. Forest land encroachment 7. Poverty 8. Lack of sincerity of FD	Issues need to be accomplished right away: 1.Governance system, policies and laws need assessment and improved 2. Proper implementation of existing laws and policies. 3.General people should be made aware and motivated to conserve forests and biodiversity. 4.Brick fields and sawmill to be controlled 5. There should have good coordination between FD and other agencies. 6. Indigenous people get their livelihoods from forests. They do not destroy forests 7. Everyone should play responsible role. 8. Traditionally forest is conserved at *mouza* level. Village common forests (VCF) or *para ban*can be good example for forest conservation. 9. VCF could be awarded prize under REDD+. VCF should be legally recognized. So people will be encouraged. 10. NGOs are playing positive role in sustainable forest management. ANANDO is implementing a project to increase forest cover through reforesting naked hills in Dighinala, Khagrachari, 11. Co-management system is positive. CMC should have legal basis. 12. Mother trees to be identified for conservation 13. Headwater inhabitants need to be benefitted to conserve forests. PES system may help.

The Drivers of Deforestation	The Drivers of Forest Degradation	Overall comments/ recommendations
16. Forest land encroachment. 17. *Jhum* land were registered as Khas land during 1975-76 land survey that displaced thousands of indigenous people. 18. Lack of alternative livelihoods. 19. Reforestation rate is low compared to deforestation. 20. Furniture manufacturing and transportation.		14. "No rights, No REDD+" may be considered in formulating REDD policy. 15. There should have win-win partnership between government and forest dependent communities. 16. There should be no *Jote* permit within certain distance from reserve forests. 17. Forest or land zoning may help. 18. Everyone should play their role collectively. 19. Creation of alternative livelihoods 20. Tree planting movements may help. 21. Higher tax may be imposed on timber extraction. 22. Religious or cultural harmony is necessary. 23. Circle head (Raja), Headmen, District administration and FD should work in coordination with each other. 24. Indigenous people should be made part of forest management. People living in the reserve forests should be made forest participants. 25. Sources of furniture to be identified and permitted by FD to stop illegal trafficking of furniture. 26. People should get cash benefit to conserve forests. 27. Shifting cultivation is not responsible for deforestation. Research is needed to find out whether it destroys forests. 28. FD should select those indigenous species in all plantation activities, especially which are not economically valuable. 29. Profit and conservation cannot go concurrently.

2.5. *Summary of the outputs*

The discussion was quite lively and open to clearly identify some salient drivers of deforestation and forest degradation in Rangamati. It was not easy to single out a top driver since the drivers differed significantly from place to place. However, some common and important deforestation drivers the D&D team identified were illegal felling of trees, collection of firewood, bamboo and timber, commercial use of forests, population pressure, poverty, *jhum* with low fellow period, displacement due to government policy related to forest reservation, population migration, hydroelectric power plant, high timber demand, *jote* permit, corruption, lack of coordination between different agencies and FD, conflicts in

existing laws and policies, land encroachment, lack of alternative livelihoods, nationwide furniture demand, etc.

The drivers of forest degradation were more or less similar if not the same. The D&D team identified a number of drivers of forest degradation. Some of these drivers are population pressure and its impact on forest resources for fuel wood and food, weak social forestry policy, monoculture plantation,teak or rubber plantation, poverty, forest land encroachment, lack of sincerity, and insufficient care and maintenance by the FD to create and manage new forests.

The participants in the RangamatiProgramme emphasized on a number of issues to be resolved as soon as possible to stop the ongoing D&D in Chittagong Hill Tracts. People that are marginally dependent on forest resources should be ensured with some kind of livelihood supports (like AIGAs),proper implementation of existing laws and policies, building awareness among general public, good governance, motivating local people to conserve forests, resolving land conflicts, FD alone can't conserve forests, CMC to be strengthen and engaged in forest management trough legal structure, VCF should be legally recognized, headwater inhabitants need to be benefitted to conserve forests, no *Jote* permit within certain distance from reserve forests, everyone should play their role collectively, FD should select those indigenous species in all plantation activities, especially which are not economically valuable, people should get cash benefit to conserve forests, there should have win-win partnership between government and forest dependent communities, and sawmills and brick fields should be controlled to stop illegal cutting of trees.

3 Conclusions

The Rangamati meetings were quite successful in terms of identifying some important drivers of deforestation and forest degradation. The FGDs and KIIs came out with some important suggestions as to what steps are needed to address the identified drivers of D&D.

Annex – 1: FGD Process

A typical FGD process followed in UN-REDD D&D study consisted the following steps

(1) **Introducing everyone:** A typical FGD starts with the self-introduction of all people present in the discussion.

(2) **An Introductory lecture**: The speaker or facilitator delivers a preliminary lecture to the focus group (FG) detailing the differences between Deforestation and Forest Degradation (D&D). Relevant examples help the FG understand the differences between the two.

(3) **Guiding the discussion:** The FGD is requested to identify the drivers of Deforestation and Forest Degradation separately. We normally start with Deforestation and end up with Forest Degradation. It is important to clarify in advance that, ***notwo person should repeat the same driver(s)***, else the discussion continues for no conclusion. Female participants, non-beneficiary (of Social Forestry Programme), and the people in the back rows can be instigated repeatedly to speak out.

(4) **The method**: We normally follow the '**snowball'** method where the facilitator provokes the participants to speak out on the drivers of D&D. At certain point after repeated efforts, the FG's intension to describe the D&D drivers diminishes almost to zero.

(5) **Scoring the responses**: Once the drivers (of each Ds) are identified, we normally read the listed drivers to the FG and request them to choose the most important (destructive) drivers. This can be done by picking up a driver (say, X) and requesting the FG members to raise their hands if they consider that X is the most important (No.1) driver for Deforestation (or the other D). The number of raised hands can be counted and recorded to search out the top most drivers for the Ds.

(6) **Duration of discussion**: A fixed amount of time (roughly 1.5 hours) was allotted for each of the FGDs. This facilitated the spontaneity and ensured unbiased outcomes of the FGDs.

10.6 Sreemangal: Hill forest zone, Sylhet

Workshop Report On

Identification of Drivers of Deforestation and Forest Degradation in Bangladesh: Hill Forest Zone, Sylhet

20-22 November 2016
Hotel Grand Sultan, Sreemangal, Bangladesh

Programme Management Unit (PMU)
UN-REDD Bangladesh National Programme
Bangladesh Forest Department

28 November 2016

UN-REDD Bangladesh National Programme

The UN-REDD Bangladesh National Programme is implemented by Bangladesh Forest Department under the leadership of Ministry of Environment and Forests. United Nations Development Programme (UNDP) and Food and Agriculture Organization (FAO) are the two implementing partners.

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28 November 2016

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Beside the formal workshop and open discussion among all parties present in the meeting, the D&D study team also conducted a number of key informant interviews (KIIs) and two focused group discussion (FGDs). The KIIs and FGDs were conducted by Dr. Mahfuzur Rahman, Mr. Saiful Islam Khan and Dr. Mohammed Jashimuddin. The team interviewed school teachers, college professors, social workers, political leaders, local government leaders, Forest Department (FD) officials, and high officials from the Moulvibazar Administrations. The two FGDs were conducted at forest dependent communities of Aliachora Khasia Punjee, Lawachara, Moulvibazar and Satchari National Park, Habigonj.

The workshop, FGDs, and KII participants identified a number of drivers. The major drivers for deforestation were population pressure, poverty, firewood collection, illegal felling of trees, dual administration on forest land for leasing, weakness of the FD in terms of its logistics and limited staffs, unclear boundary of forestland, corruption of both administration and general public, weakness of existing laws and policies, land encroachment, etc.

The drivers of forest degradation were more or less similar if not the same. The D&D team identified a number of drivers of forest degradation. Some of these drivers are population pressure and its impact on forest resources for fuel wood and food, weak social forestry policy, hill cutting, monoculture plantation, uncontrolled movement of people inside the forests, forest land encroachment and insufficient care and maintenance by the FD to create and manage new forests.

The participants in the SreemangalProgramme emphasized on a number of issues to be resolved as soon as possible to stop the ongoing D&D in Sylhet forest division. Both forest- and non-forest government officials were convinced to chalk out that forestland boundary must be demarcated or ownership problems to be resolved before any issue could be solved. People that are marginally dependent on forest resources should be ensured with some kind of livelihood supports (like AIGAs). Proper implementation of existing laws and policies, building awareness among general public, good governance, motivating local people to love trees, indigenous multilayer tree planting around homesteads, resolving land conflicts, planned land leasing, planned housing or settlement may help to improve the current situation, FD alone can't conserve forests, CMC to be strengthen and engaged in forest management trough legal structure, politicians to be evaluated based on their role in forest conservation. Sawmills should be brought under stringent regulations so that illicit felling can be checked.Finally, strict government order may help better forest conservation like, government's recent stand against terrorism.

1 UN-REDD Bangladesh National Programme

1.1. *Background*

In August of 2010, Government of the People's Republic of Bangladesh became a partner country of the UN-REDD Programme. The UN-REDD Programme is the United Nations collaborative Programme on reducing emission from deforestation and forest degradation. The Programme assists developing countries like Bangladesh to build capacity to reduce emissions and to participate in a future REDD+ mechanism.

In subsequent years, Bangladesh took several key steps i.e., established the National REDD+ Steering Committee; the REDD+ Preparation Proposal (R-PP) was approved in end of 2013 by UN-REDD Policy Board. The UN-REDD National Programme Document was approved by national counterparts & participating UN organization in 2015. Finally, the government approved the UN-REDD Bangladesh National Programme in 19 June 2016.
The Forest Department (FD) of the Ministry of Environment and Forests (MoEF) is the lead Implementing Partner for the UN-REDD National Programme, headed by a National Project Director (NPD), supported by Programme Management Unit (PMU). The United Nations Development Programme (UNDP) and Food and Agriculture Organization (FAO) are the two co-implementing partners helping the PMU. The duration of the NP is from July 2015 to June 2018.
The UN-REDD Bangladesh National Programme has the objective to support the Government of Bangladesh in initiating the implementation of its REDD+ Readiness Roadmap (i.e., R-PP) by establishing necessary REDD+ management processes, identifying strategic readiness options for completing its National REDD+ strategy, and developing the capacities required to begin implementation of REDD+.

1.2. *Scope of the Report*

The primary aim of this report is to document the preliminary outcomes of the consultation workshop, FGDs, and KIIs conducted in Sreemangal, Moulvibazarand Satchari, Habigonj to capture the major drivers of deforestation and forest degradation in Sylhet Forest Division held on 20-22 November 2016 organized by the UN-REDD Bangladesh National Programme.

1.3. *Organization of the Report*

Section 1 introduces the Background of UN-REDD Programme; Section 2 elaborates on the details of the workshops. Relevant annexes – i.e., presentation on UN-REDD Bangladesh National Programme, presentation by consultant team and list of participants are appended at the end of report.

2 Workshop on Drivers of Deforestation &Forest Degradation (D&D)

2.1. *Background of the Drivers of Deforestation &Forest Degradation Study*

Bangladesh is a signatory to the UN Framework Convention on Climate Change (UNFCCC). The Conference of the Parties (COP) to the UNFCCC has taken a number of decisions in recent

years to encourage developing country Parties to take climate change mitigation actions in forestry sector. The role of forests and reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) have been fully recognised and enshrined in the Paris Agreements.

As part of the country's long-term strategy to reduce GHG emissions, largely described in its Intended Nationally Determined Contributions (INDC), the Government of Bangladesh has taken initial steps to contribute to this global effort to address climate change, and one of such steps is to develop its capacity to implement REDD+. The Government of Bangladesh prepared and endorsed its REDD+ Readiness Roadmap in 2012.

To support this effort, the UN-REDD Bangladesh National Programme was established to provide technical capacity development assistance to the Government of Bangladesh in designing and implementing its National REDD+ Strategy and in meeting the international requirements under the UNFCCC Warsaw Framework to receive REDD+ results-based finance.

One of the key components of the REDD+ readiness process is to identify public policy approaches and interventions, including incentive mechanisms to effectively address key drivers and causes of deforestation and forest degradation (D&D). In order to identify such approaches, a clear understanding of drivers and causes of D&D in Bangladesh must first be developed.

To develop such an understanding, UN-REDD Bangladesh National Programme amassed a team comprised of international and national consultants. The team accordingly developed a methodology and planned a total of 9 regional workshops distributed across the country. The Sreemangal workshop and aligned FGDs and KIIs were conducted aiming at the following objectives:

- To identify the most important drivers of deforestation and forest degradation in the Sylhet area and
- To focus on the historical background of the drivers and potential solution(s) to the problems of D&D.

2.2. *Organization of the Workshop*

List of Invitees: Participants list was developed by Divisional Forest Officer, Sylhet Forest Division based on criteria put forward to the study team. In general, the criteria put forward by study team suggested inclusion from – local administration, departments, educational institutions, NGOs, Indigenous communities, local leaders, business representatives and people living adjacent to the forested areas. A letter of invitation was prepared by Project Director, which was distributed by the departmental staff to help the project.

Workshop Presentations and Information Materials: The primary objective of the workshop was to identify Drivers of Deforestation and Forest Degradation for the Sylhet region by the relevant stakeholders and to fine tune the methodology. Accordingly three presentations were made by Mr. Sayeed Mahmud Riadh, Dr. Mohammed Jashimuddin, Dr. Mohammad Mahfuzur Rahman to set the context (Table 1).

Table 1: List of Presentations			
Sl	**Presentation on**	**Basic Message**	**Presentation by**
18.	REDD+ in Bangladesh	Introduction on REDD+ in Bangladesh	Mr. Sayeed Mahmud Riadh, Govrnance Co-ordinator, UN-REDD Bangladesh
19.	Drives of Deforestation and Forest Degradation	Context of Drives of Deforestation and Forest Degradation Study and requirement	Dr. Mohammed Jashimuddin, National Consultant, D & D study team
20.	Socioeconomic study	Identification of major socioeconomic drivers responsible for D&D in Sylhet	Dr. Mohammad Mahfuzur Rahman, National Consultant, D & D study team

Table 2: List of Awareness Materials shared during Inception Workshop		
Sl	**Item**	**Information shared**
31.	REDD+ and National Programme Leaflet in Bangla	What is UN-REDD Programme; what is REDD+, what are the five activities of REDD+, Warsaw Frameworks, why REDD+ is important, its relevance, why REDD+ is important for Bangladesh; evolution the NP and the targeted outcomes.
32.	National Programme Leaflet in English	Relevance of REDD+ in Bangladesh, evolution of REDD+ Programme, phased approach and outputs, Warsaw framework, National Programme Objective, duration, budget, outcomes and outputs, project management.
33.	Document folder	What is REDD+, short brief on National Programme, phased approach of UN-REDD Programme and institutional framework proposed for REDD+ Programme in Bangladesh.
34.	Note book	What is REDD+, its five activities, UN-REDD Programme, Warsaw elements, Bangladesh National Programme, targeted outputs and delivery schedule.
35.	Branded Pen	With UN-REDD, Government and Forest Department's logo.
36.	Bangla Presentation on REDD+	What are drivers of deforestation and forest degradation, why study is required?

2.3. *Programme Schedule*

The entire Programme comprises of 3 days of activity (Table 3), where 1st day involves reaching the destination and coordination and communication with local Forest Department officials and internal team meeting. The second day of the Sreemangal activities consists of the consultation workshop itself with socioeconomic survey and KIIs before lunch at Hotel Grand Sultan, Sreemangal followed by a FGD in the afternoon at Aliachara Khasia Punjee, Sreemangal FGDs and KIIs. The third day consists of a FGD in the morning with the forest dependent communities of Satchari National Park, Habigonj and heading back to Dhaka in the afternoon (Tables 3&4).

Table 3. Detailed Programme schedule for Sylhet Division		
Day 0120 : Nov .2016 Sunday	Activity	Remarks

0:800 AM	Leave for Sreemangal	ByRoad
:0100 PM	Arrive at Sreemangal	
01:00 PM-01:30 PM	Check in to the Hotel	Guest House/ Hotel at Sreemangal
01:30 PM-2:30 PM	Lunch and Prayer	Guest HouseHotel /
02:30 PM -04:30 PM	Field visit to the adjacent forest area for FGD	LNP
04:30 PM -05:00 PM	Back to the hotel /guest house	By road
06:00 PM –07:00 PM	Preparatory Meeting	
07:30 PM	Dinner	Night stay at Guest House / Hotel at Sreemangal
Day 221 : Nov.2016 Monday		
07:30 AM	Break fast	
08:30 AM –10:30 AM	Preparation for the workshop	
10:30 AM -03:00 PM	Workshop, Key Informant Interview , Questionnaire Survey and Lunch	Detailed programme is attached herewith .
03:00 PM –04:30 PM	Field visit at Lawachara Punji for FGD	
04:30 PM -05:00 PM	Back to the Guest House	
07:30 PM	Dinner	Night stay at Guest House/ Hotel
Day 3 :22 Nov.2016 Tuesday		
0:730 AM	Break fast	
8:30 AM 10:00 – AM	Travel from Sreemangal to Satchari NP	
10:00 AM -1200: AM	Fiedl visit for FGD	
1 2:00 AM 0 –4 30:PM	Travel from Satchari to Dhaka	Lunch at High Way Inn

Table 4. Detailed activities of the consultation workshop in Sreemangal, Sylhet Division

Time	Activity	Presenter /Facilitator
10:30 hrs -.10:40 hrs.	Registration	
10:40 hrs-.10:45 hrs.	Brief introduction	Sayeed Mahmud Riadh, Governance Coordinator, UN REDD Bangladesh National Programme, UNDP
10:45 hrs-.11:10 hrs.	Presentation on the study of Drivers of Deforestation and Forest Degradation	Dr .Mohammed Jashimuddin, Professor, IFESCU & National Consultant , D & D study team
11:10 hrs-.11:35 hrs.	Questionnaire Survey	Dr. Mohammad Mahfuzur Rahman, Associate Professor,

		IFESCU & National Consultant, D & D study team
11:35 hrs- .12:30 hrs.	Open Discussion	Facilitated byMr. Rakibul Hasan Mukul, ACCF, Development Planning Unit & National Project Director UN REDD Bangladesh National Programme
12:30 hrs-.01:15 hrs.	Remarks by the Guest of Honour	1. Mr. Mihir Kumar Doe, DFO, Wildlife Management & Nature Conservation Division, Habigonj, 2. Mr. RSM Monirul Islam, DFO, Sylhet Forest Division, 3. Mr. Mohammad Masukoor Rahman Sikdar, ADC (General), Moulvibazar District, 4. Mr. Zakaria, Deputy Secretary, Moulvibazar District
01:15 hrs-.01:30 hrs.	Concluding remarks by the Chair	Mr. Rakibul Hasan Mukul, Asst. Chief Conservator of Forests, Development Planning Unit & National Project Director UN REDD Bangladesh National Programme
12:30 hrs-.01:30 hrs.	Key Informant Interview	Dr .Jashimuddin, Dr . Mahfuzur Rahman and Mr. Saiful Islam Khan
01:30 hr-.02:00 hrs.	Lunch and Prayar	

The workshop meeting was started with the welcome speech delivered by Mr. Sayeed Mahmud Riadh, REDD+ Governance Activity Coordinator, UN-REDD Bangladesh National Programme. Mr. Riadh continued with his detailed presentation on the background, objectives, and roadmaps of REDD+ in Bangladesh. This was followed by presentation given by Dr. Mohammed Jashimuddin on the overview of D&D study and REDD+ in Bangladesh and beyond. The third presentation was conducted by Dr. Mohammad Mahfuzur Rahman on administering the socioeconomic survey on the D&D drivers and their underlying causes. After all these presentations a lively open discussion on the drivers of deforestation and forest degradation continued with concluding remarks from the special guests and finally from the chair of the meeting Mr. Rakibul Hasan Mukul. After the meeting a total of 10-12 KIIs were conducted by Dr. Mahfuzur Rahman and Mr. Saiful Islam Khan. The summary of the activities can be given in Table 5.

Table 5. The activities conducted in the Sreemangal Field Trip

Name of activities	No. of activities	Participants
Presentations	03	03 presenters and 54 participants

Socioeconomic Survey	01	40 respondents
FGDs	02	60 (30 in each FGD) forest dependent people
KIIs	11	Government officials School and college teacher Forest officers Union council chairman and members Other important personnel

2.4. *Major Drivers of D&D (Sequentially from the most important driver)*

The Drivers of Deforestation	The Drivers of Forest Degradation	Overall comments/ recommendations
1.Illegal cutting of trees (both individually and organized cutting through syndicate). 2. Firewood collection 3. Development activities, e.g., cutting trees for electric line, road construction without permission from FD 4. Political and social influence 5. Weakness of the FD in terms of its logistics and limited staffs 6. Population pressure 7. Poverty 8.Corruption of both administration and general public. Forest products are transported through 'Token'. 9. Land leasing for tea garden, lemon, malta and pineapple cultivation. 10. Railway tracks (through train or trolleys) are used to transport forest products illegally in connivance with officials 11. Lack of good governance 12. Weakness of existing laws and policies. For example, illegal cutters get bail after being submitted to the court by FD. 13. People don't own the forest 14. Forest land encroachment. 15. Weak, unskilled and aged staff of FD. Lack of sufficient staff of FD. 16. Lack of logistic facilities of FD (Vehicles, Arms, Ammunitions, etc.)	1. Population Pressure 2. Firewood collection 3. Monoculture plantation 4. Weak social forestry policy 5. Insufficient care and maintenance (silvicultural operation) by FD 6. Insufficient forestation activities by the FD 7. Forest land encroachment 8. Hill cutting is important 9) Uncontrolled human movement inside the forests	Issues need to be accomplished right away: 1) Forest land demarcation 2) Creating AIGA opportunity like, veterinary training, cattle and poultry, doll making, fish farming, etc. 3) Proper implementation of existing laws and policies. 4) General people should be made aware and motivated to conserve forests and biodiversity. 5) Good governance – transparency, accountability, efficiency. 6) Sawmill to be controlled 7) Land leasing plan/guideline necessary 8) Betel leaf cultivation shouldn't be done everywhere. 9) Social and political commitment important 10) There should have good coordination between FD and co-management committee (CMC) in sustaining forests and trees. Experience of CMC need to be considered. 11) Everyone should play responsible role. 12) Forest offence should be non-bailable. 13) Social forestry policies are not fully implemented. Poor people in some cases didn't become participant rather influential people became participant. 14) One corrupt forest officer can damage more than 10 illegal cutters. 15) Strict government order is need for forest conservation like, government's recent stand against terrorism. 16) FD should be equipped with sufficient skilled manpower. FD should

The Drivers of Deforestation	The Drivers of Forest Degradation	Overall comments/ recommendations
17) Real culprits are not punished. Sometimes general people are harassed through fake allegation. 18) Dual administration on forest land. Sometimes forest lands (PF) are leased out by Ministry of Land. 19) Expansion of agricultural land inside the forests.		adopt digital system in forest management and administration 17) FD alone can't conserve forests, CMC to be engaged along with FD. 18) Natural regeneration to be protected. 19) Politicians to be evaluated based on their role in forest conservation

2.5. Summary of the outputs

The discussion was quite lively and open to clearly identify some salient drivers of deforestation and forest degradation in Sreemangal. It was not easy to single out a top driver since the drivers differed significantly from place to place (beat to beat, range to range). However, some common and important deforestation drivers the D&D team identified were population pressure, poverty, firewood collection, illegal felling of trees, dual administration on forest land for leasing, weakness of the FD in terms of its logistics and limited staffs, unclear boundary of forestland, corruption of both administration and general public, weakness of existing laws and policies, land encroachment, etc.

The drivers of forest degradation were more or less similar if not the same. The D&D team identified a number of drivers of forest degradation. Some of these drivers are population pressure and its impact on forest resources for fuel wood and food, weak social forestry policy, hill cutting, monoculture plantation, uncontrolled movement of people inside the forests, forest land encroachment and insufficient care and maintenance by the FD to create and manage new forests.

The participants in the SreemangalProgramme emphasized on a number of issues to be resolved as soon as possible to stop the ongoing D&D in Sylhet forest division. Both forest- and non-forest government officials were convinced to chalk out that forestland boundary must be demarcated or ownership problems to be resolved before any issue could be solved. People that are marginally dependent on forest resources should be ensured with some kind of livelihood supports (like AIGAs). Proper implementation of existing laws and policies, building awareness among general public, good governance, motivating local people to love trees, indigenous multilayer tree planting around homesteads, resolving land conflicts, planned land leasing, planned housing or settlement may help to improve the current situation, FD alone can't conserve forests, CMC to be strengthen and engaged in forest management trough legal structure, politicians to be evaluated based on their role in forest conservation. Sawmills should be brought under stringent regulations so that illicit felling can be checked.Finally, strict government order may help better forest conservation like, government's recent stand against terrorism.

3 Conclusions

The Sreemangal meetings were quite successful in terms of identifying some important drivers of deforestation and forest degradation. The FGDs and KIIs came out with some important suggestions as to what steps are needed to address the identified drivers of D&D.

Annex – 1: FGD Process

A typical FGD process followed in UN-REDD D&D study consisted the following steps

(1) **Introducing everyone:** A typical FGD starts with the self-introduction of all people present in the discussion.

(2) **An Introductory lecture**: The speaker or facilitator delivers a preliminary lecture to the focus group (FG) detailing the differences between Deforestation and Forest Degradation (D&D). Relevant examples help the FG understand the differences between the two.

(3) **Guiding the discussion:** The FGD is requested to identify the drivers of Deforestation and Forest Degradation separately. We normally start with Deforestation and end up with Forest Degradation. It is important to clarify in advance that, ***notwo person should repeat the same driver(s)***, else the discussion continues for no conclusion. Female participants, non-beneficiary (of Social Forestry Programme), and the people in the back rows can be instigated repeatedly to speak out.

(4) **The method**: We normally follow the '**snowball'** method where the facilitator provokes the participants to speak out on the drivers of D&D. At certain point after repeated efforts, the FG's intension to describe the D&D drivers diminishes almost to zero.

(5) **Scoring the responses**: Once the drivers (of each Ds) are identified, we normally read the listed drivers to the FG and request them to choose the most important (destructive) drivers. This can be done by picking up a driver (say, X) and requesting the FG members to raise their hands if they consider that X is the most important (No.1) driver for Deforestation (or the other D). The number of raised hands can be counted and recorded to search out the top most drivers for the Ds.

(6) **Duration of discussion**: A fixed amount of time (roughly 1.5 hours) was allotted for each of the FGDs. This facilitated the spontaneity and ensured unbiased outcomes of the FGDs.

Workshop Report On

Identification of Drivers of Deforestation and Forest Degradation in Bangladesh: Coastal Forest Zone, Barisal

13-16 November 2016
Hotel Grand Park, Barisal, Bangladesh

Programme Management Unit (PMU)
UN-REDD Bangladesh National Programme
Bangladesh Forest Department

22 November 2016

UN-REDD Bangladesh National Program

The UN-REDD Bangladesh National Program is implemented by Bangladesh Forest Department under the leadership of Ministry of Environment and Forests. United Nations Development Program (UNDP) and Food and Agriculture Organization (FAO) are the two implementing partners.

Citation

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Disclaimer

The materials/information presented on this meeting/event report/publication is the presenters'/participants'. UN-REDD Bangladesh National Program makes no statements, representations, or warranties about the presented opinions and this do not necessarily represent those of the United Nations, UN-REDD program's implementing agencies including UNDP, FAO and UNEP or its Member States.

22 November 2016

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Executive Summary

The depletion of forest resources is a major environmental issue especially in the developing countries. Identification of drivers of deforestation and forest degradation is critical and mandatory to formulate effective and meaningful national strategies to save forest resources across the country. The UN-REDD Bangladesh National Programme of Bangladesh Forest Department (BFD) has amassed a team of international and national consultants to identify the direct and indirect drivers that are deemed responsible for deforestation and forest degradation (D&D) in the country. The team is composed of Dr. Ian Thompson - an international consultant with expertise in REDD+, Dr. Mohammed Jashimuddin as Governance Specialist, Dr. Mohammad Mahfuzur Rahman as a Natural Resource Economist, and Mr. Saiful Islam Khan as a GIS expert. Apart from the methodology validation workshop in Dhaka, the D&D study team has planned a total of nine workshops at eight different administrative divisions of the country plus one at the Rangamati District of Chittagong Hill Tracts (CHTs). This report is the summary of the third workshop held during 13-16 November 2016 in Barisal, Bangladesh.

The meeting started with a welcome speech from Mr. Sayeed Mahmud Riadh, REDD+ Governance Activity Coordinator, UN-REDD Bangladesh National Program. To set the context of the study, a Bangla power point presentation on REDD+ and the drivers of forest degradation and deforestation across the world was presented by Dr. Mohammad Jashimuddin on the team's behalf. It was immediately followed by the socioeconomic questionnaire survey conducted by Mr. Saiful Islam Khan. The meeting was chaired by Mr. Abu Naser Khan, Conservator of Forests (CF), Coastal Circle. A lively open discussion took place immediately after these presentations, which was participated by all corners of the society. A comprehensive presentation on status of forest in Barisal Social Forestry Division was given byMr. Mohammad Golam Quddus Bhuiyan, Divisional Forest Officer (DFO), Barisal Social Forestry Division, Bangladesh Forest Department. The DFO's presentation was explicitly focused to indicating to the major drivers of deforestation and forest degradation in Barisal. However, the workshop was concluded with the formal speeches delivered respectively by Mr. Ahsan Habib, Additional Divisional Commissioner (Revvenue), Barisal District, Mr. Humaiyun Kabir, Additional Superintendent of Police, Barisal District, Mr. Mohammad Ruhul Amin, DFO, Bhola Forest Division, Mr. Ajit Kumar Rudra, DFO, Patuakhali Forest Division, and the chair of the meeting Mr. Abu Naser Khan, CF, Coastal Circle. Each of the speakers tried to highlight on what the major threats to forest resources were and why and what we need to do to save the planet from the destruction of climate change.

Beside the formal workshop and open discussion among all parties present in the meeting, the D&D study team also conducted a number of key informant interviews (KIIs) and two focused group discussion (FGDs). The KIIs and FGDs were conducted by Dr. Jashimuddin and Mr. Khan. The team interviewed school teachers, professors of college, social workers, political leaders, local government leaders, Forest Department (FD) officials, and high officials from the Barisal Administrations. The two FGDs were conducted at Karnakatti, Char Kawa Union, Barisal Sadar Upazila, Barisal and South Bahal Ghachia, Kalikapur Union, Patuakhali Sadar Upazila, Patuakhalil.

The workshop, FGDs, and KII participants identified a number of drivers. The major drivers for deforestation were population pressure, poverty, firewood collection, illegal felling of trees, illegal land leasing, natural calamities, weakness of the FD in terms of its logistics and limited staffs, unclear boundary of forestland, poor forest governance andpolitical malignancy, illegal brickfield and sawmills, and weak policies with respect to rotation age of trees planted under

social forestry programme. On the other hand, the drivers of forest degradation were more or less similar if not the same. The D&D team identified a number of drivers of forest degradation. Some of these drivers are river erosion, buffalo grazing, weak social forestry policy, population pressure and its impact on forest resources for fuel wood and food, and insufficient care and maintenance by the FD to create and manage new forests.

The participants in the Barisal program emphasized on a number of issues to be resolved as soon as possible to stop the ongoing D&D in Barisal forest division, such as, proper implementation of existing laws and policies, building awareness among general public, good governance, motivating local people to love trees, indigenous multilayer tree planting around homesteads, resolving land conflicts, planned land leasing, planned housing or settlement.

1 UN-REDD Bangladesh National Programme

1.1. *Background*

In August of 2010, Government of the People's Republic of Bangladesh became a partner country of the UN-REDD Programme. The UN-REDD Programme is the United Nations collaborative programme on reducing emission from deforestation and forest degradation. The program assists developing countries like Bangladesh to build capacity to reduce emissions and to participate in a future REDD+ mechanism.

In subsequent years, Bangladesh took several key steps i.e., established the National REDD+ Steering Committee; the REDD+ Preparation Proposal (R-PP) was approved in end of 2013 by UN-REDD Policy Board. The UN-REDD National Programme Document was approved by national counterparts & participating UN organization in 2015. Finally, the government approved the UN-REDD Bangladesh National Programme in 19 June 2016.
The Forest Department (FD) of the Ministry of Environment and Forests (MoEF) is the lead Implementing Partner for the UN-REDD National Programme, headed by a National Project Director (NPD), supported by Programme Management Unit (PMU). The United Nations Development Programme (UNDP) and Food and Agriculture Organization (FAO) are the two co-implementing partners helping the PMU. The duration of the NP is from July 2015 to June 2018.
The UN-REDD Bangladesh National Programme has the objective to support the Government of Bangladesh in initiating the implementation of its REDD+ Readiness Roadmap (i.e., R-PP) by establishing necessary REDD+ management processes, identifying strategic readiness options for completing its National REDD+ strategy, and developing the capacities required to begin implementation of REDD+.

1.2. *Scope of the Report*

The primary aim of this report is to document the preliminary outcomes of the consultation workshop, FGDs, and KIIs conducted in Barisal to capture the major drivers of deforestation and forest degradation in Barisal Social Forestry Division held on 15 November 2016 organized by the UN-REDD Bangladesh National Programme.

1.3. *Organization of the Report*

Section 1 introduces the Background of UN-REDD programme; Section 2 elaborates on the details of the workshops. Relevant annexes – i.e., presentation on UN-REDD Bangladesh National Programme, presentation by consultant team and list of participants are appended at the end of report.

2 Workshop on Drivers of Deforestation & Degradation

2.1. *Background of the Drivers of Deforestation & Degradation Study*

Bangladesh is a signatory to the UN Framework Convention on Climate Change (UNFCCC). The Conference of the Parties (COP) to the UNFCCC has taken a number of decisions in recent

years to encourage developing country Parties to take climate change mitigation actions in forestry sector. The role of forests and reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) have been fully recognised and enshrined in the Paris Agreements.

As part of the country's long-term strategy to reduce GHG emissions, largely described in its Intended Nationally Determined Contributions (INDC), the Government of Bangladesh has taken initial steps to contribute to this global effort to address climate change, and one of such steps is to develop its capacity to implement REDD+. The Government of Bangladesh prepared and endorsed its REDD+ Readiness Roadmap in 2012.

To support this effort, the UN-REDD Bangladesh National Programme was established to provide technical capacity development assistance to the Government of Bangladesh in designing and implementing its National REDD+ Strategy and in meeting the international requirements under the UNFCCC Warsaw Framework to receive REDD+ results-based finance.

One of the key components of the REDD+ readiness process is to identify public policy approaches and interventions, including incentive mechanisms to effectively address key drivers and causes of deforestation and forest degradation (D&D). In order to identify such approaches, a clear understanding of drivers and causes of D&D in Bangladesh must first be developed.

To develop such an understanding, UN-REDD Bangladesh National Programme amassed a team comprised of international and national consultants. The team accordingly developed a methodology and planned a total of 9 regional workshops distributed across the country. The Barisal workshop and aligned FGDs and KIIs were conducted aiming at the following objectives:

- To identify the most important drivers of deforestation and forest degradation in the Barisal area and
- To focus on the historical background of the drivers and potential solution(s) to the problems of D&D.

2.2. *Organization of the Workshop*

List of Invitees: Participants list was developed by Divisional Forest Officer, Barisal Social Forestry Division based on criteria put forward to the study team. In general, the criteria put forward by study team suggested inclusion from – local administration, departments, educational institutions, NGOs, Indigenous communities, local leaders, business representatives and people living adjacent to the forested areas. A letter of invitation was prepared by Project Director, which was distributed by the departmental staff to help the project.

Workshop Presentations and Information Materials: The primary objective of the workshop was to identify Drivers of Deforestation and Degradation for the Barisal region by the relevant stakeholders and to fine tune the methodology. Accordingly four presentations were made

by Mr. Sayeed Mahmud Riadh, Dr. Mohammed Jashimuddin, Mr. Mohammad Golam Quddus Bhuiyanand Mr. Saiful Islam Khan to set the context (Table 1).

Table 1: List of Presentations			
Sl	**Presentation on**	**Basic Message**	**Presentation by**
21.	REDD+ in Bangladesh	Introduction on REDD+ in Bangladesh	Mr. Sayeed Mahmud Riadh, Govrnance Co-ordinator, UN-REDD Bangladesh
22.	Drives of Deforestation and Degradation	Context of Drives of Deforestation and Degradation Study and requirement	Dr. Mohammed Jashimuddin, National Consultant, D & D study team
23.	Status of Forests of Barisal Social Forestry Division	Overall status of forest resources in Barisal, major threats to D&D, potential recommendations	Mr. Mohammad Golam Quddus Bhuiyan, DFO, Barisal Social Forestry Division.
24.	Socioeconomic study	Identification of major socioeconomic drivers responsible for D&D in Barisal	Mr. Saiful Islam Khan, GIS expert and National Consultant, D & D study team

Table 2: List of Awareness Materials shared during Inception Workshop		
Sl	**Item**	**Information shared**
37.	REDD+ and National Programme Leaflet in Bangla	What is UN-REDD programme; what is REDD+, what are the five activities of REDD+, Warsaw Frameworks, why REDD+ is important, its relevance, why REDD+ is important for Bangladesh; evolution the National Programme (NP) and the targeted outcomes.
38.	National Programme Leaflet in English	Relevance of REDD+ in Bangladesh, evolution of REDD+ programme, phased approach and outputs, Warsaw framework, National Programme Objective, duration, budget, outcomes and outputs, project management.
39.	Document folder	What is REDD+, short brief on National programme, phased approach of UN-REDD programme and institutional framework proposed for REDD+ programme in Bangladesh.
40.	Note book	What is REDD+, its five activities, UN-REDD programme, Warsaw elements, Bangladesh National Programme, targeted outputs and delivery schedule.
41.	Branded Pen	With UN-REDD, Government and Forest Department's logo.
42.	Bangla Presentation on REDD+	What are drivers of deforestation and forest degradation, why study is required?

2.3. *Programme Schedule*

The entire programme comprises of 4 days of activity (Table 3), where 1st day involves reaching the destination and coordination and communication with local Forest Department officials and internal team meeting. The second day of the Barisal activities consists of the FGDs and KIIs in two locations, one in Barisal Sadar Upazila and the other one in Patuakhali

Sadar Upazila. The third day consists of consultation workshop itself with KIIs, and socioeconomic survey. The fourth day consists of heading back to Dhaka.

Table 3. Detailed Program schedule for Barisal Division		
Day 01 13 : Nov .2016 Sunday	Activity	Remarks
0:900 AM	Leave for Airport	ByRoad
:1045 AM -1115 : AM	Travel Dhaka to Barisal	By Air
11:30 AM -12:00 PM	Check in to the Hotel	Guest House/ Hotel at Barisal
12:30 PM -01:30 PM	Meeting with DFO	DFO OfficeBarisal ,
01:30 PM-2:30 PM	Lunch and Prayer	Guest HouseHotel /
02:30 PM -03:30 PM	Meeting within team for the preparation	Guest HouseHotel /
03:30 Pm -04:30 PM	Meeting with DFO for finalizing the preparation of the workshop and field visit	DFO OfficeBarisal ,
04:00 PM -05 :00 PM	Back to the Guest House Hotel , / Barisal	
06:00 PM –07:00 PM	Preparatory Meeting	
07:30 PM	Dinner	Night stay at Guest House / Hotel at Barisal
Day 214 : Nov .2016 Monday		
08:00 AM	Break fast	
08:30 AM - 04:00 PM	Field visit)FGD and KII(	
04:00 PM –05:00 PM	Back to Guest house/ Hotel Barisal ,	
06:00 PM –07:00 PM	Preparatory Meeting	
07:30 PM	Dinner	Night stay at Guest House/ Hotel at Barisal
Day 315 : Nov.2016 Tuesday		
07:30 AM	Break fast	
08:30 AM –10:30 AM	Preparation for the workshop	
10:30 AM -03:00 PM	Workshop, Key Informant Interview , Questionnaire Survey and Lunch	Detailed programme is attached herewith .
03:00 PM –04:30 PM	KII at the district and divisional level officers Barisal	
04:30 PM -05:00 PM	Back to the Guest HouseBarisal	
07:30 PM	Dinner	Night stay at Guest House/ Hotel at Barisal
Day 4 :16 Nov.2016 Wednesday		
0:800 AM	Break fast	
9:00 AM –05:00 AM	Travel from Barisal to Dhaka	By Road

Table 4. Detailed activities of the consultation workshop in Barisal Division		
Time	Activity	Presenter / Facilitator
10.00 hrs.- 10.30 hrs.	Registration	
10.30 hrs.-10.50 hrs.	Brief introduction and Presentation on REDD+ in Bangladesh	Sayeed Mahmud Riadh, Governance Coordinator, UN

		REDD Bangladesh National Programme
10.50 hrs.-11.10 hrs.	Presentation on the study of Drivers of Deforestation and Forest Degradation	Dr. Mohammed Jashimuddin, Professor, IFESCU & National Consultant, D & D study team
11.10 hrs.-11.20 hrs.	Presentation on Social Forest Division, Barisal	Mr. Mohammad Golam Quddus Bhuiyan, DFO, Social Forestry Division Barisal
11.20 hrs.-12.40 hrs.	Questionnaire Survey	Mr. Saiful Islam Khan, National Consultant, D & D Study Team
11.40 hrs.-01.00 hrs.	Open Discussion	Facilitated by Dr. Mohammed Jashimuddin, Professor, IFESCU & National Consultant, D & D study team
01.00 hrs.-01.05 hrs.	Remarks by the Guest of Honour-4	Mr. Ahsan Habib, ADC (Rev.), Barisal District
01.05 hrs.-01.10 hrs.	Remarks by the Guest of Honour-3	Mr. Humaiyun Kabir, Additional SP, Barisal District
01.10 hrs.-01.15 hrs.	Remarks by the Guest of Honour -2	Mr. Mohammad Ruhul Amin, DFO, Bhola Forest Division
01.15 hrs.-01.20 hrs.	Remarks by the Guest of Honour-1	Mr. Ajit Kumar Rudra, DFO, Patuakhali Forest Division
01.20 hrs.-01.25 hrs.	Remarks by the Chair	Mr. Abu Naser Khan, CF, Coastal Circle
01.25 hrs.-01.50 hrs.	Key Informant Interview	Dr. Mohammed Jashimuddin and Mr. Saiful Islam Khan
01.50 hr.-02.30 hrs.	Lunch and Paryer	

The workshop meeting was started with the welcome speech delivered by Mr. Sayeed Mahmud Riadh REDD+ Governance Activity Coordinator, UN-REDD Bangladesh National Program. Mr. Riadh continued with his detailed presentation on the background, objectives, and roadmaps of REDD+ in Bangladesh. This was followed by presentation given by Dr. Mohammed Jashimuddin on the overview of D&D study and REDD+ in Bangladesh and beyond. The third presentation was delivered by Mr. Mohammad Golam Quddus Bhuiyan, DFO, Barisal Social Forestry Division on the status of forests in Barisal managed by Barisal Social Forestry Division. The fourth presentation was conducted by Mr. S.I. Khan on administering the socioeconomic survey on the D&D drivers and their underlying causes. After presentations a lively discussion on the drivers of deforestation and forest degradation continued with concluding remarks from the special guests and finally from the chair of the meeting Mr. Abu Naser Khan. After the meeting a total of 6-8 KIIs were conducted by Dr. Jashimuddin and Mr. S.I. Khan. The summary of the activities can be given in Table 5.

Table 5. The activities conducted in the Barisal Field Trip

Name of activities	No. of activities	Participants
Presentations	04	04 presenters and around 54 participants
Socioeconomic Survey	01	40 (roughly) respondents
FGDs	02	60 (30 in each FGD) Social Forestry Beneficiaries
KIIs	10-12	Government officials

		School and college teacher Forest officers Union council chairman and members Other important personnel

2.4. *Major Drivers of D&D (Sequentially from the most important driver)*

The Drivers of Deforestation	The Drivers of Forest Degradation	Overall comments/ recommendations
1.Uncontrolled brickfields and sawmills 2. Development activities, e.g., cutting trees for road construction without permission 3. Weakness of the FD in terms of its logistics and limited staffs 4. Population pressure 5. Poverty 6. Illegal felling of trees 7. Lack of Good Goverance in the society particularly, both public and private sector. 8. Illegal land leasing 9. Natural calamities	1. Population Pressure 2. Firewood collection 3. Monoculture plantation 4. Weak social forestry policy 5. Poor care and maintenance (silvicultural operation) by FD 6. Inadequateafforestation activities by the FD 7. River erosion induced migration (to forest area). 8. Buffalo grazing in char lands	Issues need to be accomplished right away: 1) Forest land demarcation 2) Improving Social Forestry programs 3) Alternative Income Geberating Activities (AIGAs) 4) Proper implementation of existing laws and policies. 5)Biodiversity conservation and security act to be implemented to conserve aged trees 6) Awareness build up 7) Good governance – transparency, accountability, efficiency. 8) Brick field/Sawmill to be controlled 9) Motivation is important 10) Land leasing plan/guideline necessary 11) Need village/house plan. Building high-rise apartments may save spaces for planting trees 12) Indigenous multilayer tree planting around homesteads with raintree, fruit trees (coconut, malta, etc.), bamboos, etc. 13) Govt. initiatives needed to resolve land conflicts 14) FD plays strong role in land accretion in the coastal areas through afforestation 14) Everyone should play their respective role.

2.5. Pictorial presentation of the Barisal activities

Picture 1: Distinguished guests of the programme, Grand Park Hotel, Barisal

Picture 2: Participants of the programme, Grand Park Hotel, Barisal

Picture 3: FGD at Karnakatti, Char Kawa Union, Barisal Sadar Upazila

Picture 4: FGD at South Bahal Ghachia, Kalikapur Union, Patuakhali Sadar Upazila

2.6. Summary of the outputs

The discussion was quite lively and open to clearly identify some salient drivers of deforestation and forest degradation in Barisal. It was not easy to single out a top driver since the drivers differed significantly from place to place (beat to beat, range to range). However, some common and important deforestation drivers the D&D team identified were population pressure, poverty, firewood collection, illegal felling of trees, illegal land leasing, natural calamities, weakness of the FD in terms of its logistics and limited staffs, unclear boundary of forestland, poor forest governance and political malignancy , illegal brickfield and sawmills, and weak policies with respect to rotation age oftrees planted under social forestry programme.

The drivers of forest degradation were more or less similar if not the same. The D&D team identified a number of drivers of forest degradation. Some of these drivers are river erosion, buffalo grazing, weak social forestry policy, population pressure and its impact on forest resources for fuel wood and food, and poor care and maintenance by the FD to create and manage new forests. The participants in the Barisal program emphasized on a number of issues to be resolved as soon as possible to stop the ongoing D&D in Barisal forest division. Both forest- and non-forest government officials were convinced to chalk out that forestland must have to get its boundary before any issue could be solved. People that are marginally dependent on forest resources should be ensured with some kind of livelihood supports (like AIGAs). Proper implementation of existing laws and policies, building awareness among general public, good governance, motivating local people to love trees, indigenous multilayer tree planting around homesteads, resolving land conflicts, planned land

leasing, planned housing or settlement may help to improve the current situation. Many people do not understand the importance of forest for our very survival on earth. So, environmental education should be incorporated at every level of our education system. Finally, brickfields and sawmills should be brought under stringent regulations so that illicit felling can be checked.

3 Conclusions

The Barisal meetings were quite successful in terms of identifying some important drivers of deforestation and forest degradation. The FGDs and KIIs came out with some important suggestions as to what steps are needed to address the identified drivers of D&D.

Annex – 1: FGD Process

A typical FGD process followed in UN-REDD D&D study consisted the following steps

(1) **Introducing everyone:** A typical FGD starts with the self-introduction of all people present in the discussion.

(2) **An Introductory lecture**: The speaker or facilitator delivers a preliminary lecture to the focus group (FG) detailing the differences between Deforestation and forest Degradation (D&D). Relevant examples help the FG understand the differences between the two.

(3) **Guiding the discussion:** The FGD is requested to identify the drivers of Deforestation and forest Degradation separately. We normally start with Deforestation and end up with forest Degradation. It is important to clarify in advance that, ***notwo person should repeat the same driver(s)***, else the discussion continues for no conclusion. Female participants, non-beneficiary (of Social Forestry Program), and the people in the back rows can be instigated repeatedly to speak out.

(4) **The method**: We normally follow the '**snowball'** method where the facilitator provokes the participants to speak out on the drivers of D&D. At certain point after repeated efforts, the FG's intension to describe the D&D drivers diminishes almost to zero.

(5) **Scoring the responses**: Once the drivers (of each Ds) are identified, we normally read the listed drivers to the FG and request them to choose the most important (destructive) drivers. This can be done by picking up a driver (say, X) and requesting the FG members to raise their hands if they consider that X is the most important (No.1) driver for Deforestation (or the other D). The number of raised hands can be counted and recorded to search out the top most drivers for the Ds.

(6) **Duration of discussion**: A fixed amount of time (roughly 1.5 hours) was allotted for each of the FGDs. This facilitated the spontaneity and ensured unbiased outcomes of the FGDs.

10.8 Rangpur: Plain land Sal forest

Workshop Report On

Identification of Drivers of Deforestation and Forest Degradation in Bangladesh: Plain Land Sal Forest, Rangpur

7-10 November 2016
Parjatan Motel, Rangpur, Bangladesh

Programme Management Unit (PMU)
UN-REDD Bangladesh National Programme
Bangladesh Forest Department

18 November 2016

UN-REDD Bangladesh National Program

The UN-REDD Bangladesh National Program is implemented by Bangladesh Forest Department under the leadership of Ministry of Environment and Forests. United Nations Development Program (UNDP) and Food and Agriculture Organization (FAO) are the two implementing partners.

Citation

UN-REDD Bangladesh National Program. 2016. Workshop Report on the Study of Drivers of Deforestation and Forest Degradation in Bangladesh: Plain Land Sal Forest, Rangpur. UN-REDD Bangladesh National Program, Bangladesh Forest Department. Rangpur Workshop Proceedings held on 7-10 November 2016.

Disclaimer

18 November 2016

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Executive Summary

The depletion of forest resources is a major environmental issue especially in the developing countries. Identification of drivers of deforestation and forest degradation is critical and mandatory to formulate effective and meaningful national strategies to save forest resources across the country. The UN-REDD Bangladesh National Programme of Bangladesh Forest Department (BFD) has amassed a team of international and national consultants to identify the direct and indirect drivers that are deemed responsible for deforestation and forest degradation (D&D) in the country. The team is composed of Dr. Ian Thompson - an international consultant with expertise in REDD+, Dr. Mohammed Jashimuddin as Governance Specialist, Dr. Mohammad Mahfuzur Rahman as a Natural Resource Economist, and Mr. Saiful Islam Khan as a GIS expert. Apart from the methodology validation workshop in Dhaka, the D&D study team has planned a total of nine workshops at eight different administrative divisions of the country plus one at the Rangamati District of Chittagong Hill Tracts (CHTs). This report is the summary of the second workshop held during 07-10 November 2016 in Rangpur, Bangladesh.

The meeting started with a welcome speech from Mr. Sayeed Mahmud Riadh, REDD+ Governance Activity Coordinator, UN-REDD Bangladesh National Program. To set the context of the study, a Bangla power point presentation on REDD+ and the drivers of forest degradation and deforestation across the world was presented by Dr. Mohammad Mahfuzur Rahman on the team's behalf. It was immediately followed by the socioeconomic questionnaire survey conducted by Mr. Saiful Islam Khan. A lively open discussion took place immediately after these presentations, which was participated by all corners of the society. However, a comprehensive presentation on status of forest in Rangpur Social Forestry Division was given by the Divisional Forest Officer, Rangpur Social Forestry Division, Bangladesh Forest Department. The DFO's presentation was explicitly focused to indicating to the major drivers of deforestation and forest degradation in Rangpur. However, the workshop was concluded with the formal speeches delivered respectively by the Additional Deputy Commissioner (general) of Rangpur, Additional DIG of Police, Rangpur, Additional Divisional Commissioner, Rangpur, and the Divisional Commissioner, Rangpur. Each of the speakers tried to highlight on what the major threats to forest resources were and why and what we need to do to save the planet from the destruction of climate change.

Beside the formal workshop and open discussion among all parties present in the meeting, the D&D study team also conducted a number of key informant interviews (KIIs) and two focused group discussion (FGDs). The KIIs and FGDs were conducted by Dr. Rahman and Mr. Khan. The team interviewed school teachers, college professor, social workers, political leaders, local government leaders, Forest Department (FD) officials, and high officials from the Rangpur Administrations. The two FGDs were conducted at Mithapukur and Lohani Para, Rangpur.

The workshop, FGDs, and KII participants identified a number of drivers. The major drivers for deforestation were lengthy dismissal of forest lawsuits, inappropriate selection of social forestry beneficiaries, weakness of the FD in terms of its logistics and limited staffs, population and pressure, encroachment of forestland, and unclear boundary of forestland. Forest degradation was attributed to similar reasons too. However, some major drivers of forest degradation were long rotation of Sal and short rotation of Acacia, natural disasters, monoculture in social forestry practices (SF policy) etc.

1 UN-REDD Bangladesh National Programme

1.1. *Background*

In August of 2010, Government of the People's Republic of Bangladesh became a partner country of the UN-REDD Programme. The UN-REDD Programme is the United Nations collaborative programme on reducing emission from deforestation and forest degradation. The program assists developing countries like Bangladesh to build capacity to reduce emissions and to participate in a future REDD+ mechanism.

In subsequent years, Bangladesh took several key steps i.e., established the National REDD+ Steering Committee; the REDD+ Preparation Proposal (R-PP) was approved in end of 2013 by UN-REDD Policy Board. The UN-REDD National Programme Document was approved by national counterparts & participating UN organization in 2015. Finally, the government approved the UN-REDD Bangladesh National Programme in 19 June 2016.
The Forest Department (FD) of the Ministry of Environment and Forests (MoEF) is the lead Implementing Partner for the UN-REDD National Programme, headed by a National Project Director (NPD), supported by Programme Management Unit (PMU). The United Nations Development Programme (UNDP) and Food and Agriculture Organization (FAO) are the two co-implementing partners helping the PMU. The duration of the NP is from July 2015 to June 2018.
The UN-REDD Bangladesh National Programme has the objective to support the Government of Bangladesh in initiating the implementation of its REDD+ Readiness Roadmap (i.e., R-PP) by establishing necessary REDD+ management processes, identifying strategic readiness options for completing its National REDD+ strategy, and developing the capacities required to begin implementation of REDD+.

1.2. *Scope of the Report*

The primary aim of this report is to document the preliminary outcomes of the consultation workshop, FGDs, and KIIs conducted in Rangpur to capture the major drivers of deforestation and forest degradation in Rangpur social forestry division held on 22 November 2016 organized by the UN-REDD Bangladesh National Programme.

1.3. *Organization of the Report*

Section 1 introduces the Background of UN-REDD programme; Section 2 elaborates on the details of the workshops. Relevant annexes – i.e., presentation on UN-REDD Bangladesh National Programme, presentation by consultant team and list of participants are appended at the end of report.

2 Workshop on Drivers of Deforestation & Degradation

2.1. *Background of the Drivers of Deforestation & Degradation Study*

Bangladesh is a signatory to the UN Framework Convention on Climate Change (UNFCCC). The Conference of the Parties (COP) to the UNFCCC has taken a number of decisions in recent

years to encourage developing country Parties to take climate change mitigation actions in forestry sector. The role of forests and reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) have been fully recognised and enshrined in the Paris Agreements.

As part of the country's long-term strategy to reduce GHG emissions, largely described in its Intended Nationally Determined Contributions (INDC), the Government of Bangladesh has taken initial steps to contribute to this global effort to address climate change, and one of such steps is to develop its capacity to implement REDD+. The Government of Bangladesh prepared and endorsed its REDD+ Readiness Roadmap in 2012.

To support this effort, the UN-REDD Bangladesh National Programme was established to provide technical capacity development assistance to the Government of Bangladesh in designing and implementing its National REDD+ Strategy and in meeting the international requirements under the UNFCCC Warsaw Framework to receive REDD+ results-based finance.

One of the key components of the REDD+ readiness process is to identify public policy approaches and interventions, including incentive mechanisms to effectively address key drivers and causes of deforestation and forest degradation (D&D). In order to identify such approaches, a clear understanding of drivers and causes of D&D in Bangladesh must first be developed.

To develop such an understanding, UN-REDD Bangladesh National Programme amassed a team comprised of international and national consultants. The team accordingly developed a methodology and planned a total of 9 regional workshops distributed across the country. The Rangpur workshop and aligned FGDs and KIIs were conducted aiming at the following objectives:

- To identify the most important drivers of deforestation and forest degradation in the Rangpur area and
- To focus on the historical background of the drivers and potential solution(s) to the problems of D&D.

2.2. *Organization of the Workshop*

List of Invitees: Participants list was developed by Divisional Forest Officer, Dhaka Division based on criteria put forward to the study team. In general, the criteria put forward by study team suggested inclusion from – local administration, departments, educational institutions, NGOs, Indigenous communities, local leaders, business representatives and people living adjacent to the forested areas. A letter of invitation was prepared by Project Director, which was distributed by the departmental staff to help the project.

Workshop Presentations and Information Materials: The primary objective of the workshop was to identify Drivers of Deforestation and Degradation for the Gazipur, Rajendrapur area by the relevant stakeholders and to fine tune the methodology. Accordingly two presentations were made. One by Dr. and one presentation given by Divisional Forest Officer, to set the context.

Table 1: List of Presentations			
Sl	**Presentation on**	**Basic Message**	**Presentation by**
25.	Drives of Deforestation and Degradation	Context of Drives of Deforestation and Degradation Study and requirement	Dr. Mohammed Mahfuzur Rahman, National Consultant, D & D study team
26.	Status of Forests of Rangpur division	Overall status of forest resources in Rangpur, major threats to D&D, potential recommendations	Divisional Forest Officer, Dhaka Division.
27.	Socioeconomic study	Identification of major socioeconomic drivers responsible for D&D in Rangpur	Mr. Saiful Islam Khan, GIS expert and National Consultant, D & D study team

Table 2: List of Awareness Materials shared during Inception Workshop		
Sl	**Item**	**Information shared**
43.	REDD+ and National Programme Leaflet in Bangla	What is UN-REDD programme; what is REDD+, what are the five activities of REDD+, Warsaw Frameworks, why REDD+ is important, its relevance, why REDD+ is important for Bangladesh; evolution the NP and the targeted outcomes.
44.	National Programme Leaflet in English	Relevance of REDD+ in Bangladesh, evolution of REDD+ programme, phased approach and outputs, Warsaw framework, National Programme Objective, duration, budget, outcomes and outputs, project management.
45.	Document folder	What is REDD+, short brief on National programme, phased approach of UN-REDD programme and institutional framework proposed for REDD+ programme in Bangladesh.
46.	Note book	What is REDD+, its five activities, UN-REDD programme, Warsaw elements, Bangladesh National Programme, targeted outputs and delivery schedule.
47.	Branded Pen	With UN-REDD, Government and Forest Department's logo.
48.	Bangla Presentation on REDD+	What is drivers of deforestation and forest degradation, why study is required.

2.3. *Programme Schedule*

The entire preogramme comprises of 3 days of activity (Table 3), where 1st day involves reaching the destination and coordination and communication with local Forest Department officials and internal team meeting. The second day of the Rangpur activities consists of the consultation workshop itself with KIIs, socioeconomic survey, and FGDs after the workshop in couple of places. The third day consists of conducting the final FGD and heading back to Dhaka.

Table 3. Detailed Program schedule for Rangpur Division		
Day 1 : 7 Nov. 2016 Monday	Activity	Remarks
08:30 AM	Leave for Saidpur	By Air
09:30 AM	Arrive at Saidpur	By Air

09:45 AM -11: 30 AM	Travel from Saidpur to Rangpur	By Road
11:30 AM -12:00 PM	Check in to the Hotel	RDRS Guest House
12:30 PM- 01:30 PM	Meeting with DFO	DFO Office
01:30 PM-2:30 PM	Lunch and Prayer	RDRS Guest House
02:30 PM- 03:30 PM	Meeting within team for the preparation	RDRS Guest House
03:30 Pm- 04:30 PM	Meeting with DFO for finalizing the preparation of the workshop and field visit	DFO Office
04:00 PM- 05 :00 PM	Back to the Guest House	
06:00 PM – 07:00 PM	Preparatory Meeting	
07:30 PM	Dinner	Night stay at RDRS Guest House
Day 2: 8 Nov. 2016 Tuesday		
08:00 AM	Break fast	
09:30 AM – 10:00 AM	Meeting with DFO/ACF	
10:00 AM- 04:00 PM	Field visit (FGD and KII)	Mithapukur range
04:00 PM – 05:00 PM	Back to RDRS Guest house	
06:00 PM – 07:00 PM	Preparatory Meeting	
07:30 PM	Dinner	
06:00 PM – 07:00 PM	Preparatory Meeting	
07:30 PM	Dinner	Night stay at RDRS Guest House
Day 3: 9 Nov.2016 Wedday		
07:30 AM	Break fast	
08:30 AM – 10:30 AM	Preparation for the workshop	
10:30 AM- 03:00 PM	Workshop, Key Informant Interview , Questionnaire Survey and Lunch	Detailed programme is attached herewith .
03:00 PM – 04:30 PM	KII at the district and divisional level officers	
04:30 PM- 05:00 PM	Back to the RDRS Guest House	
06:00 PM – 07:00 PM	Preparatory Meeting	
07:30 PM	Dinner	Night stay at RDRS Guest House
Day 4: 10 Nov.2016 Thursdayday		
07:00 AM	Break fast	
07:30 AM – 09:30 AM	Travel from Rangpur to Saidpur	By road
10:00 AM- 11:00 AM	Saidpur- Dhaka	By Air
11:00 AM – 12:30 PM	Travel from Airport to Office	By Road

The second day of the Rangpur activities consists of the consultation workshop itself (Table 4) with KIIs, socioeconomic survey, and FGDs after the workshop in couple of places. The third day consists of conducting the final FGD and heading back to Dhaka.

Table 4. Detailed activities of the consultation workshop in Rangpur Division		
Time	Activity	Presenter / Facilitator

10.30 hrs.- 10.40 hrs.	Registration	
10.40 hrs.-10.50 hrs.	Brief introduction	Sayeed Mahmud Riadh, Governance Coordinator, UN REDD Bangladesh National Programme
10.50 hrs.-11.00 hrs.	Presentation on REDD+ in Bangladesh	Sayeed Mahmud Riadh, Governance Coordinator, UN REDD Bangladesh National Programme
11.00 hrs.-11.20 hrs.	Presentation on the study of Drivers of Deforestation and Forest Degradation	Dr. Mohammad Mahfuzur Rahman, Associate Professor, IFESCU & National Consultant , D & D study team
11.20 hrs.-11.45 hrs.	Questionnaire Survey	Mr. Saiful Islam Khan, National Consultant, D & D Study Team
11.45 hrs. -12.00 hrs.	Open Discussion	Facilitated by Mohammad Mahfuzur Rahman, Associate Professor, IFESCU & National Consultant, D & D study team
12.00 hrs.-12.10 hrs.	Remarks by the Guest of Honour	
12.10 hrs.-12.20 hrs.	Concluding remarks by the Chair	DFO, Rangpur
12.20 hrs.-01.00 hrs.	Key Informant Interview	Dr. Mahfuz and Mr. Khan
01.00 hr.-01. 30 hrs.	Lunch and Paryer	

The workshop meeting was started with the welcome speech delivered by Mr. Sayeed Mahmud Riadh REDD+ Governance Activity Coordinator, UN-REDD Bangladesh National Program. Mr. Riadh continued with his detailed presentation on the background, objectives, and roadmaps of REDD+ in Bangladesh. This was followed by presentation given by Dr. Mohammad Mahfuzur Rahman on the overview of D&D and REDD+ in Bangladesh and beyond. The third presentation was delivered by Mr. Saiful Islam Khan on administering the socioeconomic survey on the D&D drivers and their underlying causes. The meeting was concluded by the speech of the DFO, Rangpur Social Forestry Division. The summary of the activities can be given in Table 5.

Table 5. The activities conducted in the Rangpur Field Trip

Name of activities	No. of activities	Participants
Presentations	04	04 presenters and around 50 participants
Socioeconomic Survey	01	35 (roughly) respondents
FGDs	02	60 (30 in each FGD) Social Forestry Beneficiaries
KIIs	12-14	Add DIG of Police, Add DC (general), Add Div Commissioner, Divisional Commissioner – Rangpur School and college teacher Forest officers Union council chairman and members Other important personnel

2.4. *Major Drivers of D&D (Sequentially from the most important driver)*

The Drivers of Deforestation	The Drivers of Forest Degradation	Overall comments
1. Lengthy dismissal of forest lawsuits 2. Inappropriate selection of social forestry beneficiaries 3. Weakness of the FD in terms of its logistics and limited staffs 4. Population pressure 5. Encroachment of forestland 6. Unclear boundary of forestland 7. Corruption of FD and local politicians 8. Brickfield and sawmills	1. Long rotation of Sal and quick return from Acacia 2. Monoculture plantation 3. Weak social forestry policy 4. Population Pressure 5. Fuel wood collection 6. Insufficient care and maintenance (silvicultural operation) by FD 7. Insufficient forestation activities by the FD 8. River erosion induced migration (to forest area).	Issues need to be accomplished right away: 1) Forest land demarcation 2) Improving SF programs 3) AIGAs 4) PES for Sal restoration 5) Awareness build up 6) Good governance – transparency, accountability, efficiency. 7) Brick field/Sawmill to be controlled

2.5. *Summary of the outputs*

The discussion was quite lively and open to clearly identify some salient drivers of deforestation and forest degradation in Rangpur. It was not easy to single out a top driver since the drivers differed significantly from place to place (beat to beat, range to range). However, some common and important deforestation drivers the D&D team identified were Lengthy dismissal of forest lawsuits, inappropriate selection of social forestry beneficiaries, weakness of the FD in terms of its logistics and limited staffs, population pressure, encroachment of forestland, unclear boundary of forestland, corruption of FD and local politicians, and illegal brickfield and sawmills.

The drivers of forest degradation were more or less similar if not the same. The D&D team identified a number of drivers of forest degradation. Some of these drivers are long rotation of Sal and quick return from Acacia, monoculture plantation and soil degradation, weak social forestry policy and people's mistrust into FD for getting their right share from SF programs, population pressure and its impact on forest resources for fuel wood and food, and insufficient care and maintenance by the FD to create and manage new forests.

The participants in the Rangpur program emphasized on a number of issues to be resolved as soon as possible to stop the ongoing D&D in Rangpur forest division. Both forest- and non-forest government officials were convinced to chalk out that forestland must have to get its boundary before any issue could be solved. People that are marginally dependent on forest resources should be ensured with some kind of livelihood supports (like AIGAs). Many people do not understand the importance of forest for our very survival on earth. So, environmental education should be incorporated at every level of our education system. Finally, brickfields and sawmills should be brought under stringent regulations so that illicit felling can be checked.

3 Conclusions

The Rangpur meetings were quite successful in terms of identifying some important drivers of deforestation and forest degradation. The FGDs and KIIs came out with some important suggestions as to what steps are needed to address the identified drivers of D&D.

Annex – 1: FGD Process

A typical FGD process followed in UN-REDD D&D study consisted the following steps

(1) **Introducing everyone:** A typical FGD starts with the self-introduction of all people present in the discussion.

(2) **An Introductory lecture**: The speaker or facilitator delivers a preliminary lecture to the focus group (FG) detailing the differences between Deforestation and forest Degradation (D&D). Relevant examples help the FG understand the differences between the two.

(3) **Guiding the discussion:** The FGD is requested to identify the drivers of Deforestation and forest Degradation separately. We normally start with Deforestation and end up with forest Degradation. It is important to clarify in advance that, ***notwo person should repeat the same driver(s)***, else the discussion continues for no conclusion. Female participants, non-beneficiary (of Social Forestry Program), and the people in the back rows can be instigated repeatedly to speak out.

(4) **The method**: We normally follow the '**snowball'** method where the facilitator provokes the participants to speak out on the drivers of D&D. At certain point after repeated efforts, the FG's intension to describe the D&D drivers diminishes almost to zero.

(5) **Scoring the responses**: Once the drivers (of each Ds) are identified, we normally read the listed drivers to the FG and request them to choose the most important (destructive) drivers. This can be done by picking up a driver (say, X) and requesting the FG members to raise their hands if they consider that X is the most important (No.1) driver for Deforestation (or the other D). The number of raised hands can be counted and recorded to search out the top most drivers for the Ds.

(6) **Duration of discussion**: A fixed amount of time (roughly 1.5 hours) was allotted for each of the FGDs. This facilitated the spontaneity and ensured unbiased outcomes of the FGDs.

Workshop Report On

Identification of Drivers of Deforestation and Forest Degradation in Bangladesh: Plain Land Sal Forest, Gazipur

19-21 October 2016
BRAC-CDM, Rajendrapur, Gazipur, Bangladesh

Programme Management Unit (PMU)
UN-REDD Bangladesh National Programme
Bangladesh Forest Department

22 October 2016

UN-REDD Bangladesh National Program

The UN-REDD Bangladesh National Program is implemented by Bangladesh Forest Department under the leadership of Ministry of Environment and Forests. United Nations Development Program (UNDP) and Food and Agriculture Organization (FAO) are the two implementing partners.

Citation

UN-REDD Bangladesh National Program. 2016. Workshop Report on the Study of Drivers of Deforestation and Forest Degradation in Bangladesh: Plain Land Sal Forest, Gazipur. UN-REDD Bangladesh National Program, Bangladesh Forest Department. Rajendrapur Workshop Proceedings held on 19-21 October 2016.

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22 OCTOBER 2016

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Executive Summary

The depletion of forest resources is a major environmental issue especially in the developing countries. Identification of drivers of deforestation and forest degradation is critical and mandatory to formulate effective and meaningful national strategies. The UN-REDD Bangladesh National Programme of Bangladesh Forest Department (BFD) has amassed a team of international and national consultants to identify the direct and indirect drivers that are deemed responsible for deforestation and forest degradation (D&D) in the country. The team is composed of Dr. Ian Thompson - an international consultant with expertise in REDD+, Dr. Mohammed Jashimuddin as Governance Specialist, Dr. Mohammad Mahfuzur Rahman as a Natural Resource Economist, and Mr. Saiful Islam Khan GIS expert. Apart from the methodology validation workshop in Dhaka, the D&D study team has planned a total of nine workshops at eight different administrative divisions of the country plus one at the Rangamati District of Chittagong Hill Tracts (CHTs). This report is the summary of the first workshop held during 19-21 October 2016 at Rajendrapur, Dhaka Division.

The meeting started with a welcome speech from Mr. Sayeed Mahmud Riadh, REDD+ Governance Activity Coordinator, UN-REDD Bangladesh National Program. To set the context of the study, a Bangla power point presentation on REDD+ and the drivers of forest degradation and deforestation across the world was presented by Dr. Mohammed Jashimuddin on-behalf of the team. A comprehensive presentation on status of forest in Gazipur area was given by Mr. Bokhtiar Nur Siddiquee, Divisional Forest Officer. A lively open discussion took place immediately after these presentations, which was participated by all corners of the society. The Rajnedrapur workshop was ended up with a socioeconomic survey by Dr. Mohammad Mahfuzur Rahman and a number of FGDs and KIIs in the later part of the day and the next day.

The workshop participants identified a number of drivers. The single most important drivers they identified for deforestation was the large population density in the area. It was followed by the illegal felling, unplanned construction of roads and communication network, unclear property rights on land, and corruption. In regards to forest degradation, population size was identified as the largest drivers, followed by illegal felling, unclear property rights on forestland, unplanned road construction, and fuelwood collection. However, other important reasons the meeting attendees identified for D&D were political malignancy, unplanned industrialisation, weakness of the Forest Department (both logistic and legal), and accumulation of a large number of law suits awaiting the verdicts for quite a long time.

This was the first workshop the team has conducted. This was, in a true sense, an opportunity for the team to test its questionnaire and study plan at the field level. Even though the first field workshop has come up with a good number of D&D drivers identified, the team would probably make some adjustment in their study plan based on the responses obtained from Rajendrapur, Gazipur.

1 UN-REDD Bangladesh National Programme

1.1. Background

In August of 2010, Government of the People's Republic of Bangladesh became a partner country of the UN-REDD Programme. The UN-REDD Programme is the United Nations collaborative programme on reducing emission from deforestation and forest degradation. The program assists developing countries like Bangladesh to build capacity to reduce emissions and to participate in a future REDD+ mechanism.

In subsequent years, Bangladesh took several key steps i.e., established the National REDD+ Steering Committee; the REDD+ Preparation Proposal (R-PP) was approved in end of 2013 by UN-REDD Policy Board. The UN-REDD National Programme Document was approved by national counterparts & participating UN organization in 2015. Finally, the government approved the UN-REDD Bangladesh National Programme in 19 June 2016.
The Forest Department (FD) of the Ministry of Environment and Forests (MoEF) is the lead Implementing Partner for the UN-REDD National Programme, headed by a National Project Director (NPD), supported by Programme Management Unit (PMU). The United Nations Development Programme (UNDP) and Food and Agriculture Organization (FAO) are the two co-implementing partners helping the PMU. The duration of the NP is from July 2015 to June 2018.
The UN-REDD Bangladesh National Programme has the objective to support the Government of Bangladesh in initiating the implementation of its REDD+ Readiness Roadmap (i.e., R-PP) by establishing necessary REDD+ management processes, identifying strategic readiness options for completing its National REDD+ strategy, and developing the capacities required to begin implementation of REDD+.

1.2. Scope of the Report

The primary aim of the workshop report is to document the outcome of the consultation workshop on Methodology for Drivers of Deforestation & Degradation Study held on 22 October 2016, organized by the UN-REDD Bangladesh National Programme with participation from different ministries, departments, research institutions, universities, NGOs, civil society organizations, ethnic groups.

1.3. Organization of the Report

Section 1 introduces the Background of UN-REDD programme; Section 2 elaborates on the details of the workshops. Relevant annexes – i.e., presentation on UN-REDD Bangladesh National Programme, presentation by consultant team and list of participants are appended at the end of report.

2 Workshop on Drivers of Deforestation & Degradation

2.1. Background of the Drivers of Deforestation & Degradation Study

Bangladesh is a signatory to the UN Framework Convention on Climate Change (UNFCCC). The Conference of the Parties (COP) to the UNFCCC has taken a number of decisions in recent

years to encourage developing country Parties to take climate change mitigation actions in forestry sector. The role of forests and reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) have been fully recognised and enshrined in the Paris Agreements.

As part of the country's long-term strategy to reduce GHG emissions, largely described in its Intended Nationally Determined Contributions (INDC), the Government of Bangladesh has taken initial steps to contribute to this global effort to address climate change, and one of such steps is to develop its capacity to implement REDD+. The Government of Bangladesh prepared and endorsed its REDD+ Readiness Roadmap in 2012.

To support this effort, the UN-REDD Bangladesh National Programme was established to provide technical capacity development assistance to the Government of Bangladesh in designing and implementing its National REDD+ Strategy and in meeting the international requirements under the UNFCCC Warsaw Framework to receive REDD+ results-based finance.

One of the key components of the REDD+ readiness process is to identify public policy approaches and interventions, including incentive mechanisms to effectively address key drivers and causes of deforestation and forest degradation (D&D). In order to identify such approaches, a clear understanding of drivers and causes of D&D in Bangladesh must first be developed.

To develop such an understanding, UN-REDD Bangladesh National Programme amassed a team comprised of international and national consultants. The team accordingly developed a methodology and planned a total of 9 regional workshops distributed around the country. The first workshop was held at Gazipur, Rajendrapur area. Objective of the workshop was to:

- To identify the most important drivers of deforestation and forest degradation in the Gazipur area and
- To test the questionnaire and study plan for the proposed D&D study.

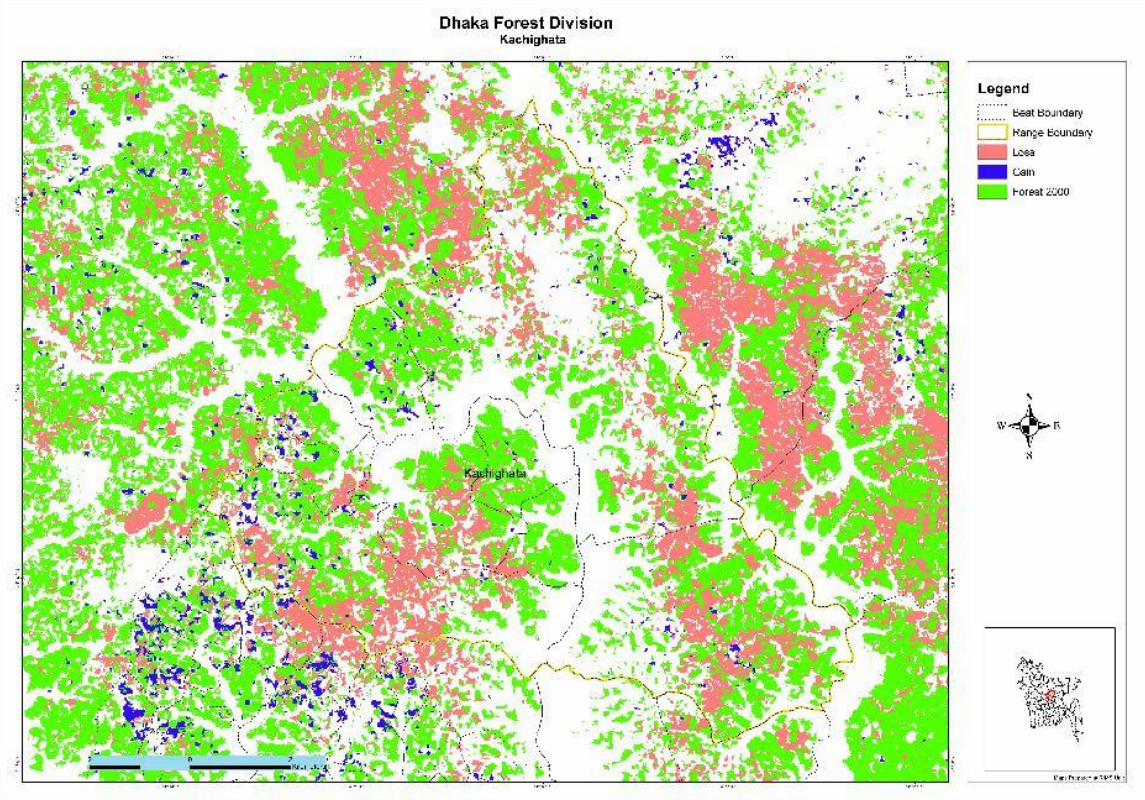
2.2. *Organization of the Workshop*

List of Invitees: Participants list was developed by Divisional Forest Officer, Dhaka Division based on criteria put forward to the study team. In general, the criteria put forward by study team suggested inclusion from – local administration, departments, educational institutions, NGOs, Indigenous communities, local leaders, business representatives and people living adjacent to the forested areas. A letter of invitation was prepared by Project Director, which was distributed by the departmental staff to help the project.

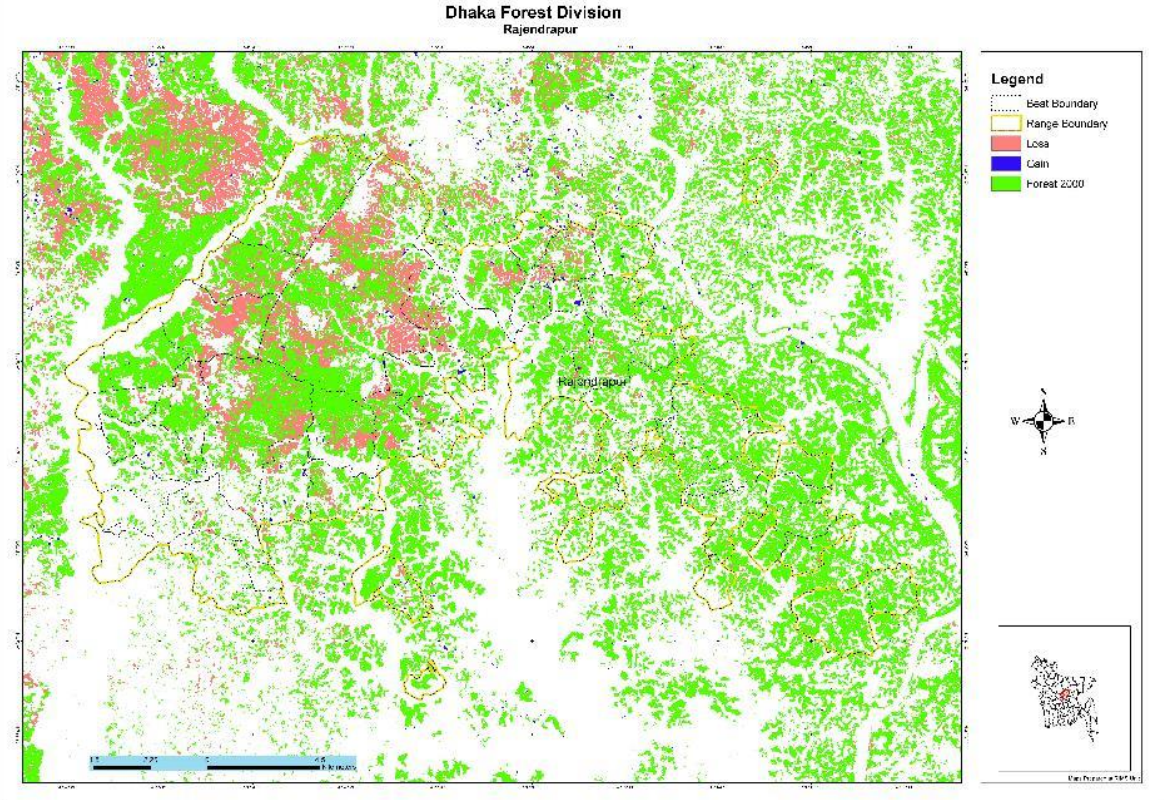
Workshop Presentations and Information Materials: The primary objective of the workshop was to identify Drivers of Deforestation and Degradation for the Gazipur, Rajendrapur area by the relevant stakeholders and to fine tune the methodology. Accordingly two presentations were made. One by Dr. and one presentation given by Divisional Forest Officer, to set the context.

Table 1: List of Presentations			
Sl	**Presentation on**	**Basic Message**	**Presentation by**
28.	Drives of Deforestation and Degradation	Context of Drives of Deforestation and Degradation Study and requirement.	Dr. Mohammed Jashimuddin, National Consultant, D & D study team
29.	Status of Forests of Gazipur, Rajendrapur Area	What was the status of Gazipur forests, and what remains today; what are the factors of changes.	Mr. Bokhtiar Nur Siddiquee, Divisional Forest Officer, Dhaka Division.
30.	Map Presentation	Rajendrapur; Sreepur, Kaliakair & Kachighata area forest loss & gain from 2000 to 2014 (Map produced by RIMS-GIS unit)	Mr. Saiful Islam Khan, GIS expert

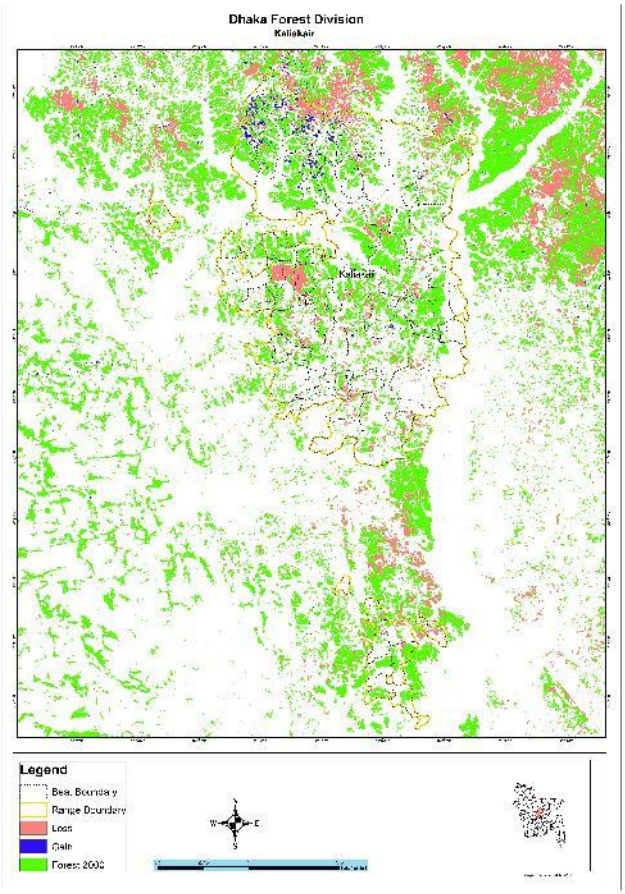
Table 2: List of Awareness Materials shared during Inception Workshop		
Sl	**Item**	**Information shared**
49.	REDD+ and National Programme Leaflet in Bangla	What is UN-REDD programme; what is REDD+, what are the five activities of REDD+, Warsaw Frameworks, why REDD+ is important, its relevance, why REDD+ is important for Bangladesh; evolution the NP and the targeted outcomes.
50.	National Programme Leaflet in English	Relevance of REDD+ in Bangladesh, evolution of REDD+ programme, phased approach and outputs, Warsaw framework, National Programme Objective, duration, budget, outcomes and outputs, project management.
51.	Document folder	What is REDD+, short brief on National programme, phased approach of UN-REDD programme and institutional framework proposed for REDD+ programme in Bangladesh.
52.	Note book	What is REDD+, its five activities, UN-REDD programme, Warsaw elements, Bangladesh National Programme, targeted outputs and delivery schedule.
53.	Branded Pen	With UN-REDD, Government and Forest Department's logo.
54.	Bangla Presentation on REDD+	What is drivers of deforestation and forest degradation, why study is required.



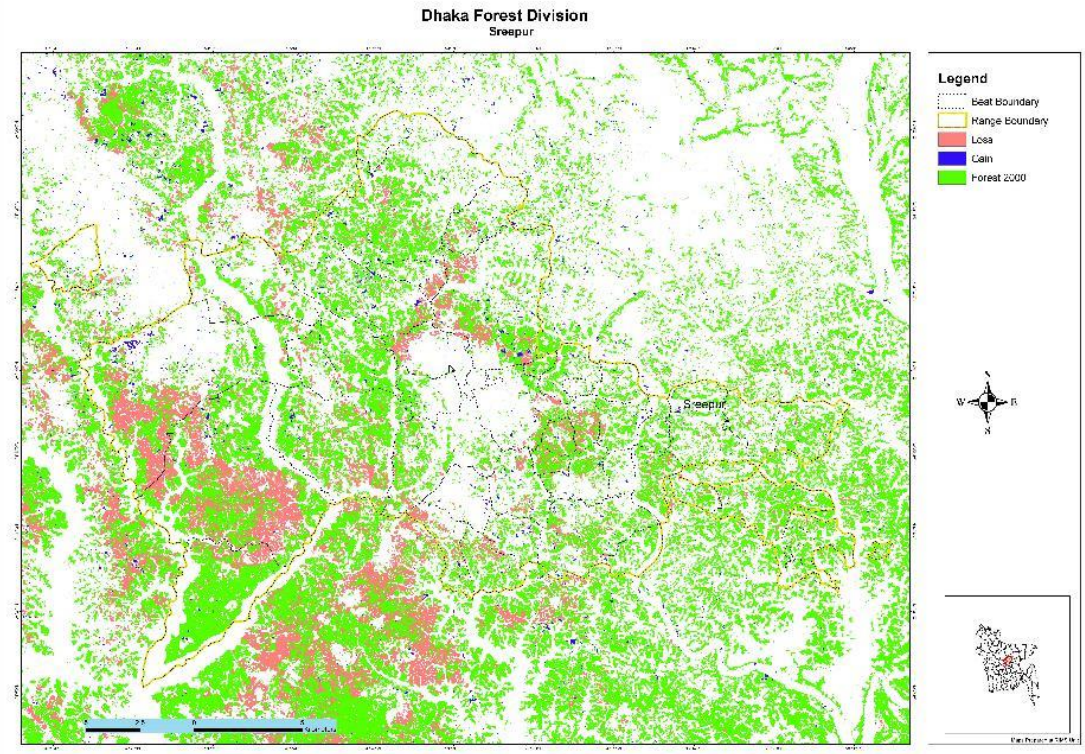
Map 1: Map of Kachighata Area showing losses and gains of forest areas



Map 2: Map of Rajendrapur Area showing losses and gains of forest areas



Map 3: Map of Kaliakair Area showing losses and gains of forest areas



Map 4: Map of Sreepur Area showing losses and gains of forest areas

2.3. Programme Schedule

The entire preogramme comprises of 3 days of activity (Table 3), where 1st day involves reaching the destination and coordination and communication with local Forest Department officials and internal team meeting. The second day consists of the workshop itself with Key Informant Interview, questionnaire survey and Focus Group Discussions (FGD) after the workshop in couple of places. The third day consists of again FGD and heading back to Dhaka.

Table 3. Overall Program Schedule for Rajendrapur Trip

Day	Activity	Remarks
Day 1 : 19 Oct.2016		
03:00 PM	Leave for Gazipur	
05:00 PM	Arrived at Gazipur and Check in	Night stay at BRAC CDMA Gazipur
06:00 PM – 07:00 PM	Preparatory Meeting	
07:30 PM	Dinner	
Day 2: 20 Oct. 2016		
07:30 AM	Break fast	
08:30 AM – 10:30 AM	Preparation for the workshop	
10:30 AM- 02:15PM	Workshop, Key Informant Interview, Questionnaire Survey and Lunch	Detailed programme is attached herewith.
02:15 PM – 02:45 PM	Travel from CDMA to FGD site of Dhaka Forest Division	Kachikata Beat
02:45 PM – 04:30 PM	Focus Group Discussion	Kachikata beat
04:30 PM- 05:00 PM	Back to CDMA	
06:30 PM- 07:30 PM	Internal Meeting	
07:30 PM	Dinner	
Day 3: 21 Oct.2016		
08:30 AM	Break fast	
08:30 AM – 09:30 AM	Travel from CDMA to FGD site	Sreepur Forest Range
09:30 AM- 11:30 AM	FGD	
11:30 PM – 12:00 PM	Travel from FGD site to CDMA	
12:30 PM – 02:00 PM	Lunch and Jumma Prayer	
02: 30 PM- 04:30 PM	Back to Dhaka	

The workshop meeting was started with the welcome speech delivered by Mr. Sayeed Mahmud Riadh REDD+ Governance Activity Coordinator, UN-REDD Bangladesh National Program. The meeting had three presentations. The first presentation was given by Dr. Ian Thompson (in English) and Dr. Mohammed Jashimuddin (in Bangla) on the over view of D&D and REDD+. The second presentation was delivered by Mr. Bokhtiar Nur Siddiquee on the overall conditions of Gazipur forest area, and the third one was delivered by Dr. Mohammad Mahfuzur Rahman on administering the socioeconomic survey on the D&D drivers and their underlying cause. The meeting was concluded by the speech of the Gazipur DC. Detailed workshop schedule is given in Table 3. The summary of the activities can be given by the following table.

Table 4. Local Consultation Workshop on Drivers of Deforestation and Forest Degradation Study		
Time	**Activity**	**Presenter / Facilitator**
10.30 - 10.40	Registration	
10.40 -10.50	Brief introduction	Sayeed Mahmud Riadh, Governance Coordinator, UN-REDD Bangladesh National Programme
10.50 -11.10	Presentation on the study of Drivers of Deforestation and Forest Degradation	Ian Thomson, International Consultant- Team Leader of the study team / Dr. Mohammed Jashimuddin, Professor, IFESCU & National Consultant, D & D study team
11:10 - 11:20	Presentation on Status of Forests of Gazipur Area	Mr. Bokhtiar Nur Siddiquee, Divisional Forest Officer, Dhaka Division.
11.20 -11.40	Questionnaire Survey	Dr. Jashim and Dr. Mahfuz
11.40 -12.30	Open Discussion	Facilitated by Sayeed Riadh, DFO, and DC Gajipur.
12.30 -12.35	Remarks by the Guest of Honour	UNO, Gazipur Sadar/ AC Land - Gazipur Sadar
12.35 -12.40	Concluding remarks by the Chair	DFO, Dhaka Forest Division
01.00 - 01.45	Key Informant Interview	Dr. Jashim and Dr. Mahfuz
01.45 -02.15	Lunch	

Table 5. The activities conducted in the Rajendrapur Field Trip		
Name of activities	**No. of activities**	**Participants**
Presentations	04	04 presenters and around 50 participants
Socioeconomic Survey	01	40 (roughly) respondents
FGDs	02	40 (20 in each FGD) Social Forestry Beneficiaries
KIIs	08	Gazipur DC An Ex. MP A College Principal A technical college teacher A Journalist and Poet Couple of Forest Department Officials and Other important personnel

2.4. *Major Drivers of D&D (Sequentially from the most important driver)*

The Drivers of Deforestation	**The Drivers of Forest Degradation**	**Overall comments**
1. Population Pressure 2. Illicit Felling 3. Road Construction 4.Unclear Property Rights of Forest Land 5. Corruption 6. Political power 7. Industrial development 8.Weaknesses of Forest Department	1. Population Pressure 2. Illicit Felling 3.Unclear Property Rights of Forest Land 4. Road Construction 5. Fuel wood collection 6. Political power 7. Industrial development 8.Weaknesses of Forest Department	Four issues need to be accomplished right away: 1) Land zoning (based on uses) 2) Strong law enforcement 3) Control of corruption 4) Forest land recording and clear demarcation of forest land boundary 5) Reclaim encroached land through rehabilitation of

The Drivers of Deforestation	The Drivers of Forest Degradation	Overall comments
9. Longer time for forest law suits to be settled.	9. Longer time for forest law suits to be settled.	encroachers by adopting new laws and/or policies. Multistoried buildings may save space. 6) Good governance – transparency, accountability, efficiency. 7) Brick field/Sawmill to be controlled 8) Need strong regulation to stop transfer of privately owned *Bait* land. 9) Inter ministerial/sectoral coordination

Picture 1: Distinguished guests of the programme

Picture 2: Participants of the programme

Picture 3:FGD at Sreepur Sadar Beat site

Picture 4:FGD at Sreepur Sadar Beat site

2.5. *Summary of the outputs*

The discussion was quite lively and open to clearly identify some salient drivers of deforestation and forest degradation. The single most important driver for deforestation was the huge population pressure in the area. According to the respondents, since the urbanization and industrialization are quite a bit rapid in the Gazipur area, it is attracting people from all districts of the country. The increased people are exerting pressure on forestland for their living and many other needs. It was followed by the illegal felling,

unplanned construction of roads and communication network, unclear property rights on land, and corruption.

The drivers of forest degradation were more or less the same. Larger population size was identified as the most important driver for forest degradation. It was followed by illegal felling, unclear property rights on forestland, unplanned road construction, and fuel wood collection.

However, other important reasons the meeting attendees identified for D&D were political corruption, unplanned industrialisation, weakness of the Forest Department (both logistic and legal), and accumulation of a large number of law suits awaiting the verdicts for quite a long time.

3 Conclusions

The Rajendrapur meeting was quite successful in terms of identifying some important drivers of deforestation and forest degradation. The FGDs and KIIs came out with some important suggestions as to what steps are needed to address the identified drivers. From the first field workshop activities, the team found some adjustment needed for their D&D studies. Some of the adjustment or improvements needed were - keeping the rank option (of questionnaire open), the focused group (for FGDs) should be more heterogeneous, and at least one question should be asked on participants' income or livelihoods.

Annex – 1: List of Participants

UN-REDD Bangladesh National Programme
Local Consultation Workshop on the Study Drivers of Deforestation and Degradation Study
Date :20 Oct .2016
VenueBRAC-CDM, Rejendrapur, Gazipur :

Sl.	Name	Designation	Organization
1.	Kazi Mozammel Hoque	Ex. MP, Dist Commander, Gazipur Dist. Unit Command	Political leader
2.	S.M. Alam	D.C. Gazipur	District Admin
3.	Md. Mahmud Hasan	Add. Dup. Commissioner, Gazipur	District Admin
4.	Md. Baktiar Nur Siddique	DFO Dhaka Forest Division	Forest department
5.	A S AM Jahir Uddin Akan	Divisional Forest officer	Forest department
6.	Md. Mozammel Hossain	Range officer, Sreepur Range, Dhaka	Forest department
7.	Md. Abu Kabar Khan	Forest Ranger, Dhaka Forest Division	Forest department
8.	Tapan Samyal	Forest Ranger, Kaliakur Range	Forest department
9.	Shah Md. Hossain	Range Officer, Wild life division Dhaka	Forest department
10.	Md. Kazi Nazmul Hoque	Wild life Ranger, Wild life division Dhaka	Forest department
11.	Md. Dewan Ali	Forester-Rajendrapur	Forest department
12.	Md. Md. Moklesur Rahman Khan	Forester-Rajendrapur-Range	Forest department
13.	S M Anisur Rahman	Beat Officer, Rathura Beat	Forest department
14.	Md. Abdus Salek Probin	Deputy Forester, Dhaka	Forest department
15.	Md. Salahuddin	Forester Beat officer	Forest department
16.	Md. Abdur Rahman	Beat officer, National park	Forest department
17.	Md. Ali Hossain	Beat office, Chandra	Forest department
18.	Md. Moklesur Rahman	Chandra Beat	Forest department
19.	Md. Shahidul Islam	Chandra Beat	Forest department
20.	Md. Shamsul Haque	Sreepur Sadar Beat	Forest department
21.	Md. Momen Hossain	Under Salna Beat	Forest department
22.	Md. Habibur Rahman		Forest department
23.	Md. Abdul Haque		Forest department
24.	Md. Fazar Ali	Mauchak Beat	Forest department
25.	Md. Rahaj	Mouchak Beat	Forest department
26.	Md. Anisur Rahman	Wild Life Supervisor, Bangabandu Safari park, Gazipur	Forest department
27.	Shaheen Shahabuddin	Journalist	Media
28.	Md. Jashim Uddin	District Training Officer	Agriculture department
29.	Ranjit Lal Chohan	Business	
30.	Babul Hossain Khan	Lawyer	Lawyer
31.	Joynul Abideen	Teacher	Teacher
32.	Md. Hadekul Islam	President	
33.	Md. Nazimuddin	Sreepur	
34.	Md. Mizanur Rahman	Chairman, Chandpur-Kapsia	
35.	Md. Bashir Uddin	Chairman	
36.	Alfaj Md. Ziaul Haque Sarker	Chairman, Beneficiary Somity	
37.	Md. Ajgor Ali	Khalishjani Beat	
38.	Most. Insa banu	Khalishjani Beat	

Sl.	Name	Designation	Organization
39.	Professor S M A Bari	Ex. Principal, Gazipur Govt. Mohila College	
40.	Md. Abdul Alim	Khalishjani Pulbaria, Kaliakur Gazipur	
41.	Dipok Chandra Barbon		
42.	Md. Oshman Mia		
43.	Sayeed Mahmud Riadh	Governance Activity Coordinator	UN-REDD
44.	Mr .Kaumal Kumar Ghosh	Programme Support Officer	UN-REDD
45.	Mr .Santu Das	Communications Officer	UN-REDD
46.	Ian Thampson	International Consultant	UN-REDD
47.	Md. Saiful Islam Khan	Local Consultant	UN-REDD
48.	Mohmmad Mahfuzur Rahman	Local Consultant	UN-REDD
49.	Md. Jashimuddin	Local Consultant	UN-REDD