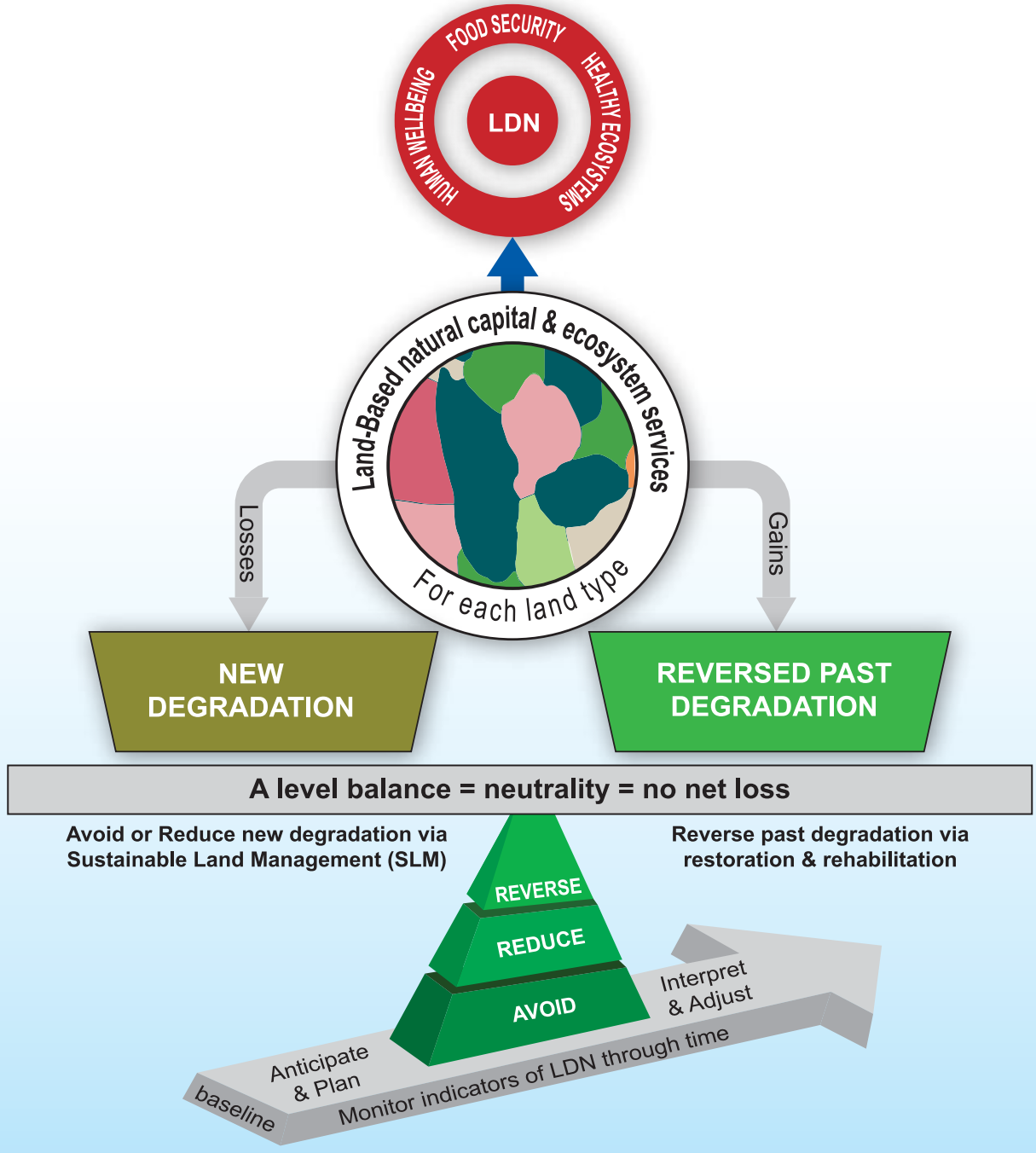
National Report on
Land Degradation Neutrality Target Setting Programme



Conceptual Framework for Land Degradation Neutrality (LDN)

Department of Environment
Ministry of Environment, Forest and Climate Change (MoEFCC)
Government of the People's Republic of Bangladesh

THE GLOBAL MECHANISM
United Nations Convention to Combat desertification

National Report on
Land Degradation Neutrality Target Setting Programme

Department of Environment
Ministry of Environment, Forest and Climate Change (MoEFCC)
Government of the People's Republic of Bangladesh

THE **GLOBAL MECHANISM**
United Nations Convention to Combat desertification

Published by:

Department of Environment (DoE)
Ministry of Environment, Forest and Climate Change (MoEFCC)
Paribesh Bhaban, E-16, Agargaon
Dhaka-1207, Bangladesh

Edited by:
Prof. Dr. Zuhurl Karim, Former Secretary, Government of the People's Republic of Bangladesh
Dr. Md. Sohrab Ali, Director, Department of Environment (DoE)
Md. Ziaul Haque, Director, Department of Environment (DoE)
Ms. Farhana Mustari, Assistant Director, Department of Environment (DoE)

Website:
www.doe.gov.bd

Published: November 2019

ISBN: 978-984-34-7534-3

Cover design:
Jalal Uddin Md. Shoaib, Project Coordinator, ENALULDEP/SLM

Printed by: Samrat Printers, 218 Fakirapool, Motijheel, Dhaka-1000, Cell: 01685 474 517

Md. Shahab Uddin, MP
Minister
Ministry of Environment, Forest and Climate Change
Govt. of the People's Republic of Bangladesh

Message

Bangladesh is one of the most populous countries in the world and concern about managing its land resources. Land is, therefore, the precious resource that deserves critical attention and care for our future generation. Degradation of land is also a global concern to ensure goods and services for all. On this ground at Ankara, an outstanding agreement reached by the global community at the twelfth Conference of the Parties (COP-12) to the United Nations Convention to Combat Desertification (UNCCD) to achieve Land Degradation Neutrality (LDN) by 2030. The parties also agreed on the indicators they will use not only to measure progress but also strengthen measures to make the land resilient to climate change and to halt the biodiversity loss that follows the destruction of ecosystems. Align with this resonance of the world community Bangladesh committed for reducing desertification or drought and land degradation, conserving biodiversity and climate change impact.

To achieve LDN by 2030 Bangladesh set a voluntary target based on the agreed indicators and in other words to attain Sustainable Development Goal (SDG) 15: Land for life. I hope the process of achieving LDN will not be much challenging in our perspective. We have proven sustainable land management technologies in the field to address different drivers of land degradation and our farmers are also resilient to handle the situation at their end. It needs effective harmonization of the activities aligned with the theme by concerned institutions. In 2015 during updating National Action Plan (NAP) has identified the total of 18 program areas with 128 activities to manage our land resources and a National Steering Committee (NSC) is in place to monitor and evaluate the process of reducing desertification and drought.

Our government is focussed on the integrated approach to attain all SDGs involving all stakeholders at all levels. The country report on Land Degradation Neutrality-Target Setting Program (LDN-TSP) is a baseline report on this issue and an outcome of a series of discussions with a large number of stakeholders of different levels. However, it will be treated as a living document that will be updated with time and space. Ministry of Environment, Forest and Climate Change (MoEFCC) as the focal point of UNCCD will coordinate with other Ministries to achieve LDN by 2030.

(Md. Shahab Uddin, MP)

Habibun Nahar, M.P
Deputy Minister
Ministry of Environment, Forest and Climate Change
Govt. of the People's Republic of Bangladesh

Message

Bangladesh expressed its commitment to be part of the Land Degradation Neutrality-Target Setting Program (LDN-TSP) on 31 December 2015. This process supports countries to set voluntary LDN targets to halt or restore or reverse land degradation by 2030 based on the three biophysical indicators-Land Cover Changes (LCC), Land Productivity Dynamics (LPD) and Soil Organic Carbon (SOC). Accordingly, LDN targets for Bangladesh were set based on the agreed indicators.

Ministry of Environment, Forest and Climate Change (MoEFCC) as National Focal Point (NFP) of UNCCD prepared the country report on LDN-TSP explaining targets to achieve LDN by 2030. To achieve the targets and strengthening compliance on behalf of the Government MoEFCC will lead the process with smarter guidance, stewardship, and knowledge to shape coherence with broader socioeconomic perspectives.

Moreover, I am confident that LDN principles will be blended to design and/or implementation of sectoral policies/strategies at all levels vide the public and private sectors. In addition through establishing better communication and outreach engaging academia, researchers, civil societies, stakeholders and the communities, the LDN process will be enhanced and upgraded with appropriate tools at large.

I strongly believe that our efforts towards Land Degradation Neutrality would re-organize with the publication of the report.

(Habibun Nahar, M.P)

Secretary
Ministry of Environment, Forest and Climate Change
Govt. of the People's Republic of Bangladesh

Message

The concept of Land Degradation Neutrality (LDN) thought was adopted by COP12 of the United Nations Convention to Combat Desertification (UNCCD). Bangladesh has through MoEFCC set LDN targets in 2017 to halt, reverse or restore land degradation with the support of the Global Mechanism (GM).

Accordingly, the government of Bangladesh has set voluntary targets to achieve LDN by 2030. It also confirms to adapt mutually inclusive processes at all levels of the country that contribute to achieving the objectives of other Conventions e.g. CBD, UNFCCC, etc. along with the Sustainable Development Goals in particular SDG 15. To this endeavor, LDN targets and measures have been set through a very comprehensive, inclusive process involving various stakeholders. Considering compatibility and consistency of the national database, default global data were used as a baseline for the LDN target setting of three indicators with an anticipation that by the time national database will be restructured for monitoring and reporting. Accordingly, the extent and distributions of three indicators will be mapped, trends will be assessed, drivers will be confirmed and attainable targets will be reset for the country.

Further, we have formulated "Bangladesh National Action Programme (NAP) to Combat Desertification, Land Degradation and Drought 2015-2024" and established a National Steering Committee (NSC) and a National Working Group (NWG) to implement the activities of NAP for addressing Desertification, Land Degradation and Drought (DLDD) issues in Bangladesh with the objective of meetings the LDN targets. This would also help us to accomplish other Sustainable Development Goals (SDGs), more specifically the target 15.3.

I am happy to note that the MoEFCC has taken land degradation as a major issue to be addressed within the next few years.

(Abdullah Al Mohsin Chowdhury)

Director General
Department of Environment (DoE)
Ministry of Environment, Forest and Climate Change (MoEFCC)
Government of the People's Republic of Bangladesh

PREFACE

Department of Environment (DoE) on behalf of MoEFCC with support of the United Nations Convention to Combat Desertification (UNCCD) and Global Mechanism (GM) set targets to achieve Land Degradation Neutrality (LDN) by 2030. The LDN targets reflect the commitment of the Government of Bangladesh in fulfillment of the decision of the Conference of Parties to the UNCCD (COP12). In the target setting process, a National Working Group (NWG) in MoEFCC was formed with the relevant institutions for guiding the process. A global database on three indicators such as Land Cover Change (LCC), Land Productivity Dynamics (LPD) and Soil Organic Carbon (SOC) of LDN was provided by UNCCD.

National data structure/format, availability and compatibility with global data were discussed in detail in two National Working Group (NWG) meetings and national workshops. Considering compatibility and consistency of national database, default global data was adopted as a baseline for LDN target setting on three indicators with an anticipation that by the time national database will be updated for monitoring and reporting and accordingly the targets will be mapped to achieve LDN by 2030.

National Action Programme (NAP) was restructured with the implication of commitments to UNCCD. Mainstreaming of national stakeholders in these sectors for interventions especially in Agriculture, Natural Resources and Climate Change issues were reorganized. Strong awareness regarding policy compliance and technology adoption for the effective implementation of commitments was ensured. By and large a strong effective implementation mechanism was set to work with all institutions/stakeholders (Public and private institutions; regional, sub-regional and local authorities; international institutions, academia, philanthropic organisations, volunteer groups, etc.) in this sector to address land degradation and seasonal drought (desertification) of the country.

It is also envisaged that the National Steering Committee (NSC) and NWG will function to set off the national database and guide the process of achieving LDN by 2030 at large.

(Dr. A.K.M. Rafique Ahammed)

Acknowledgment

Land degradation and drought are global problems and Bangladesh is not an exception to this. Owing to climate change, Bangladesh facing continuous challenges for meeting the food demand of a growing population from diminishing land resources. Having this in mind and to comply with SDG 15 target 15.3, Aichi targets, Bonn Challenges, decisions of COP12 of the United Nations Convention to Combat Desertification (UNCCD), Bangladesh decided to set voluntary Land Degradation Neutrality (LDN) target on 31 December 2015. Based on global default data, the Bangladesh LDN report was prepared through a wider stakeholder consultation at the national level.

This report provides an overview of the activities carried out and outputs prepared by the Land Degradation Neutrality Target Setting Programme (LDN-TSP), which was implemented in Bangladesh from December 2016 to February 2018. I would like to thank the Global Mechanism (GM) and the Secretariat of the UNCCD for extending technical and financial support for LDN-TSP. I would like to express my deep gratitude to Mr. Abdullah Al Mohsin Chowdhury, National Focal Point (NFP) of the UNCCD and Secretary of the Ministry of Environment, Forest and Climate Change (MoEFCC) for all-out support and approval for printing this report and Mr. Nurul Karim, Ex-Additional Secretary, MoEFCC and convenor of the National Working Group (NWG), all the members of the NWG, other officers/individuals of the MoEFCC who were directly or indirectly involved in the LDN-TSP process.

I would like to express my gratefulness to Mr. Md. Raisul Alam Mondal, Ex-Director General, Department of Environment for his kind support for LDN-TSP. My gratitude and special thanks go to Dr. A. K. M. Rafique Ahmmed, Director General, Department of Environment for his all-out support for publication of this report. I would like to express gratitude to all Directors, Deputy Directors and other colleagues of DoE for their wholehearted support for formulating the LDN report. Special thanks go to Ms. Farhana Mustari, Assistant Director, DoE for continuous support throughout the LDN-TSP process.

Finally, I would like to express my indebtedness and heartfelt thanks to all those experts, academia, stakeholders, individuals, institutions and support service providers who have directly or indirectly played a significant role in formulating this milestone report. Last but not least, my special thanks to Mr. Jalal Uddin Md. Shoaib, consultant and former CSO, SRDI for his sincere effort to accomplish this report.

(Dr. Md. Sohrab Ali)
Director, Department of Environment (DoE)
Science and Technology Corresponding (STC) to UNCCD

Table of Contents

Abbreviations

BARC	Bangladesh Agricultural Research Council
BBS	Bangladesh Bureau of Statistics
BIWTA	Bangladesh Inland Water Transport Authority
BIWTC	Bangladesh Inland Water Transport Corporation
BMD	Bangladesh Meteorological Department
BWDB	Bangladesh Water Development Board
CBD	Convention on Biological Diversity
CHTDB	Chittagong Hill Tracts Development Board
COP	Conference of the Parties
DAE	Department of Agricultural Extension
DoE	Department of Environment
ESA-CCI	European Satellite Agency- Climate Change Institute
FD	Forest Department
INDC	Intended National Determined Contribution
IASTBR	Integrated Agricultural Strategic Plan for the TBR
LA	Lead Agencies
LCC	Land cover/land cover Change
LDN-TSP	Land Degradation Neutrality Target Setting Program
LM	Lead Ministries
LPD	Land Productivity Dynamics
LULUCF	Land Use, Land Use Change & Forestry
MoA	Ministry of Agriculture
MoCHTA	Ministry of Chittagong Hill Tracts Affairs
MoEF	Ministry of Environment, Forests and Climate Change
MoF	Ministry of Finance
MoIND	Ministry of Industries
Mol	Ministry of Land
MoLGED & C	Ministry of Local Government Engineering Department & Cooperatives
MoWR	Ministry of Water Resources
NAP	National Action Program (UNCCD)
NSBAP	National Strategies Biodiversity Action Plan
NCCAP	National Climate Change Action Plan
NBSAP	National Biodiversity Strategic and Action Plan
NWG	National Working Group
SA	Supporting Agencies
SDGs	Sustainable Development Goals
SLM	Sustainable Land Management
SOC	Soil Organic Carbon
SPARSO	Space Research and Remote Sensing Organization
SRDI	Soil Resource Development Institute
TBR	Teesta Basin Region
UNFCC	United Nations Framework Convention on Climate Change
UNCCD	UN Convention to Combat Desertification
NARS	National Agricultural Research System
CGIAR	Consultative Group for International Agricultural Research

Executive Summary

This report provides an overview of the activities carried out from December 2016 to February 2018 within the framework of the Land Degradation Neutrality Target Setting Program (LDN-TSP). This program was supported by the Global Mechanism (GM) and the Secretariat of the United Nations Convention to Combat Desertification (UNCCD).

Bangladesh has committed to set national voluntary LDN targets and expressed its interest to join the LDN TSP in December 2015. Ministry of Environment, Forest and Climate Change (MoEFCC) as the focal point of UNCCD took the initiative and lead this program with other concerned ministries and institutions of the country. The contents of this report are the outcome of large numbers of stakeholders' views engaged in land utilization for various purposes.

Chapter-1: Provides information on how the LDN target setting process has been linked to relevant country initiatives. It also describes spirits of the process of the leverage plan prepared and the links of LDN to national visions and the engagement with government, non-government and private sectors to achieve LDN by 2030. The process accounted the UNCCD, Bangladesh National Action Program (NAP) to Combat Desertification, Land Degradation and Drought 2015-2024, The National Strategic Biodiversity Action Plan 2016-24 (NSBAP), Bangladesh Climate Change Strategy and Action Plan (BCCSAP), the Perspective Plan of Bangladesh (2010-2021) The National Sectorial (Investment) Programs (The 7th five year plan), Integrated Agricultural Strategic Plan for the TBR (IASTBR), Master Plan for Southern regions of Bangladesh and Land Resources Appraisal of Bangladesh for Agricultural Development (Commonly known as AEZ). All these processes will accelerate the adoption and implementation of national LDN targets by refining the National Policy Frameworks, existing investment programs of different sectors and strong stewardship as living decision making processes at all levels.

A National Working Group (NWG) and implementation mechanism was suggested to operate the process and to achieve LDN by 2030 in line with the NAP prepared under UNCCD).

Chapter-2: Describes trends and assessments of three LDN indicators, vide Land cover/Land cover Change (LCC), Land Productivity Dynamics (LPD) and Soil Organic Carbon (SOC) status and identifies direct and indirect drivers of land degradation. In the absence of national data coverage, the Land Degradation (LD) assessment and LDN baseline were set based on the global default data provided by the LDN-TSP (UNCCD) with an apprehension that national data will be integrated in the future.

Chapter-3: includes the national LDN targets and associated measures that have been identified to achieve LDN by 2030:

Target 1): To improve soil fertility and Carbon stock in 2000 km^2 of cropland area.
Target 2): To reduce land use/cover conversion in 600 km^2 of forest area.
Target 3): To reduce waterlogging in 600 km^2 area.
Target 4): To reduce soil erosion in hilly areas in 600 km^2 area.
Target 5): To protect non-saline land areas from salinity intrusion in 1200 km^2 in the coastal zone area.
Target 6): To reduce riverbank erosion @100ha/year covering 100 km^2 areas.

Chapter-4: Focuses on information relevant to the LDN leverage plan and transformative LDN projects to achieve LDN by 2030. Limited information is currently available to work with the PRAIS portal and will need to be updated on a regular basis. It is expected that the LDN National Working Group (NWG) will identify the projects and probable development partners to enhance processes to achieve the LDN targets by 2030.

Chapter-1
Leveraging Land Degradation Neutrality

1.1 Interest of country to commit to LDN and set LDN targets

The Sustainable Development Goals (SDGs) were adopted by the world leaders in New York on 25 September 2015 as bold, transformative and universal goals providing a road map for the next 15 years (i.e. until 2030). The Agenda 2030 includes a set of 17 Sustainable Development Goals and 169 associated targets.

Based on the decisions of the 12th session of the UNCCD Conference of Parties' (COP) in Ankara, Turkey, which took place on 12-23 October, 2015, the LDN-TSP was established by the UNCCD Global Mechanism, in cooperation with the UNCCD Secretariat and numerous bilateral and multilateral partners – including the GEF Secretariat - in the context of SDG 15, target 15.3, which states: 'By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought, and floods, and strive to achieve a land degradation neutral world'.

Bangladesh expressed its commitment to be part of the LDN-TSP on 31 December 2015. The LDN Target Setting Process supports countries to set voluntary LDN targets to halt or restore or reverse land degradation by 20130 based on the three biophysical indicators-Land Cover Changes (LCC), Land Productivity Dynamics (LPD) and Soil Organic Carbon (SOC).

For Bangladesh, the process provided an opportunity to accelerate the definition, formulation, and implementation of LDN targets by refining the National Policy Framework, existing investment programs of different sectors and strong stewardship in decision-making processes particularly of local government within the framework of the UNCCD National Action Programme.

The operationalization of the LDN targets will be executed by existing structures and development frameworks that are aligned not only with the UNCCD but also with the Convention on Biological Diversity(CBD) and the United Nations Framework Convention on Climate Change (UNFCC). This will contribute to the country's reporting to the respective UN Conventions and to the implementation of relevant investment programs by concerned sectors and agencies.

LDN provides the scientific framework to avoid, reduce and restore land degradation and to attain a balance between loss and gain of natural resource capitals of the country. By joining in the LDN-TSP, Bangladesh reaffirms to set voluntary LDN targets in order to achieve Land Degradation Neutrality by 2030. It also confirms to adapt mutually inclusive processes at all levels of the country that contribute to achieving the objectives of all other Conventions of the UN (CBD, UNFCCC, REDD+, DLDD, etc.) and the 2030 Sustainable Development Agenda (which are integrated and indivisible), in particular, SDG 15 and target 15.3.

1.2 Leverage opportunities identified under LDN for Bangladesh

During the LDN TSP the following leverage opportunities have been identified:

- The UNCCD National Action Program (NAP) was updated with the alignment with the commitments to key UN Conventions, taking into account National Development Strategies, particularly in the sectors concerned with Agriculture, Natural Resources and Climate Change. The NAP consists of 18 programs and 128 activities addressing sustainable Land Management (SLM) and has been aligned to the 10 Year Strategic Plan of the UNCCD. It is being implemented in all areas of the country susceptible to Desertification and Land Degradation (LD) with priority specifically in hotspots and vulnerable areas. For all programs, Lead Ministries (LM), Lead Agencies (LA) and Supporting Agencies (SA) were identified with specific activities.

- As a party of CBD Bangladesh updated the National Biodiversity Strategies and Action Plan (NBSAP) 2016-2024 defining 50 activities under 20 headline targets for biodiversity conservation.

  The National Working Group related to the NBSAP consists of members of the Climate Change Working Group and the National Focal Point (DoE). Interventions foreseen under the NBSAP relevant to LDN-TSP are:

  a. Developing principles for Sustainable Production and Consumption (SPC) maintaining safe ecological limit from the natural resources align to Strategic Goal A of Aichi target.
     (Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society)

  b. Accomplishing land zoning for important ecosystem which is aligned to Strategic Goal B of Aichi Target.
     (Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use).

  c. More specifically development of Integrated Management Plans for areas under agriculture, aquaculture, and forestry; restoration plan for degraded ecosystems and stakeholders adoption with GIS and RS technology to share Clearing House Mechanism (CHM) for ensuring sustainable conservation of biodiversity and combating desertification are the targets to achieve by 2021.

- The Bangladesh Climate Change Strategy and Action Plan (BCCSAP), 2009 is a knowledge strategy built upon the National Adaptation Programme of Action (2005 and 2009). It sets out 44 programmes to be taken by Bangladesh over the short, medium and long term within six strategic areas – Food security, Social protection and health (T1); Comprehensive disaster management (T2); Infrastructure (T3); Research and knowledge management (T4); Mitigation and low carbon development (T5); and Capacity building and institutional strengthening (T5), (MoEF,2009).

- The Perspective Plan of Bangladesh (2010-2021) is a strategic articulation of the development vision, mission, and goals of the Government in achieving a prosperous Bangladesh grounded in political and economic freedoms a reality in 2021. It was articulated through extensive consultation with stakeholders and preparation was initially done by sectors headed by MoEF&CC and enforced in the first quarter of 2017. The key factors in achieving a higher level of self-sufficiency in food production in agricultural sectors are adoption of modern technologies of production systems, efficient usage of water resources for irrigation to increase land productivity, halt or improve soil fertility and land loss due to conversation and erosion, decrease contamination of heavy metal, development of drought and submergence resistant crops, flood control and drainage etc. The strategy includes
  - Usage of balanced fertilizer, crop diversifications, crop intensification in Sylhet region, Coastal zone and char areas
  - Incentives to private sectors to increase productivity and production etc.

- The National Sectoral (Investment) Programs (The 7th five-year plan) for Agriculture and Food Security. Environment and Natural Resources and Climate Change include high priority targets for leveraging LDN. These programs provide strategic guidance for the formulation and transformation of annual programs and budgets of key line agencies that can support the implementation of LDN targets. LDN is supposed to be incorporated in the Medium-term and annual programs of the sectors. More specifically the core target set with vision and goals perspective plan and the following strategies are integrated for environmental sustainability (GED, Planning Commission, Govt of Bangladesh, Nov 2015)

- Increase productive forest coverage to 20 percent
- Improve air quality in Dhaka and other large cities and formulate Clean Air Act
- Promote Zero discharge of industrial effluents
- Urban wetlands are restored and protected in line with the Wetland Conservation Act
- At least 15% of the wetland in peak dry season is protected as aquatic sanctuary
- 500 meter wide permanent green belt established and protected along the coast
- Land zoning for sustainable land/water use completed
- Environmental, Climate Change and disaster risk reduction considerations are integrated into project design, budgetary allocations and implementation process
- Canals and natural water flows of Dhaka and other major cities restored

- **Integrated Agricultural Strategic Plan for the TBR (IASTBR):** This strategic plan is prepared for sustainable transformation of the agriculture sector into a vibrant and productive economic sector towards economic growth, social well-being, food security and poverty alleviation in Teesta Basin Region (TBR). The TBR includes the people living in 5,427 villages under 35 Upazilas stretched over 9,667 km 2 Northern parts of Bangladesh. It covers nearly 14 percent of the total cultivated land of the country and provides livelihood opportunities of approximately 9.2 million people.

The specific objectives of IASTBR are to:

- Improve integrated farming system to enhance productivity of the region;
- Promote agricultural transformation depending on low water consuming practices and emphasizing on production of high-value crops for improving household income;
- Revitalize fisheries and livestock conservation and production with improved management practices; and
- Foster marketing management and value chain development for reducing postharvest losses and improving the quality of produces both for domestic and international markets.

- **Master Plan for Agriculture Development in the Southern Region of Bangladesh** addressed the coastal region of Bangladesh and had been identified as a disadvantaged region in terms of poverty, food insecurity, environmental vulnerability, and limited livelihood opportunities. Ministry of Agriculture initiated a Master plan which covers 2013-2021. The objective of the Master Plan is to provide a road map for integrated agricultural development in the coastal districts of Bangladesh aiming at sustainable food security, poverty reduction and livelihood development for the poor. It formulated and finalized in consultation with Ministry of Water Resources, Ministry of Fisheries and Livestock, Ministry of Environment, Forest and Climate Change and also consultation with the Need elaboration National Agricultural Research System (NARS) institutes, Consultative Group for International Agricultural Research (CGIAR) centers, development partners and other stakeholders including farmers, local government institutions, the academia, Consultative Group for International Agricultural Research CBOs, private sector and the civil society.

- **Land Resources Appraisal of Bangladesh for Agricultural Development** (FAO/BARC, 1988). Agro-ecological zoning is based on the basis o combinations of soil, landform and climatic characteristics, especially climate and edaphic requirements of crops and management system under which the crops are grown. There are 30 Agro-ecological zones in Bangladesh, which were subdivided into 88 sub-regions and 536 agro-ecological units. These are categorized on the basis of some definite characteristics. They are physiography (it is defined as soil parent materials and landforms of a particular area), hydrology (it is determined on the basis of water holding capacity of soil and the water level of agricultural land), cropping pattern (it is done on the basis of Length of Rabi and Kharif growing period and major and minor agricultural crops which are cultivated in a particular area), season (it is done on the basis of the depth and duration of seasonal flooding in a

particular area), soil types and tidal activity. Each AEZ has the same ecological and soil characteristics for agricultural crop production and a similar combination of constraints and potentials for land use. So the cropping pattern of a definite AEZ is mostly the same. The homogeneity of an AEZ is more prominent in a sub-region and most prominent at a unit level. It can be focused on the targeting of recommendations designed to improve existing land use situations, either through increasing production or by limiting land degradation.

- A strong advocacy and awareness-raising program on LDN implementation with relevant stakeholders such as civil societies and farmers is key to address the multiple sectors across levels which can aim to promote and scale up good practices under SLM.

- Development Partners and External Funding for LDN. Partnerships were proposed to be established with UNDP, FAO and other national and international organizations in order to obtain their advice and assistance in formulating capacity building plans that build on previous donor efforts; as well as in tapping financing windows such as Global Environmental Facility (GEF), Green Climate Fund (GCF), etc. Opportunities at different sources is to be tapped and negotiated in agreement with UNCCD NFP, while the NWG will guide the focal institutes to prepare proposals at different levels of sectors. Close collaboration is proposed to be worked out with the Economic and Environment Partnership for Southeast Asia (EEPSEA). Economics of Land Degradation (ELD) knowledge products will particularly be important for providing economic evidence to support decision making for investments in LDN. (Lead Ministry: MoA, Supporting Ministry MoEF & CC, LGED&C, MoWR)

1.3 LDN working group – issues discussed and agreed upon:

A LDN working group was formed on 15 March 2017 with members from institutions involved in land, soil and water resources usage and research, including representatives (Focal points) from Ministry of Environment, Forests and Climate Change (MoEF&CC), Ministry of Land (MoL), Ministry of Water Resources (MoWR), Ministry of Agriculture (MoA), Ministry of Finance (MoF), Ministry of Local Government Engineering Department & Cooperatives (MoLGED&C), Department of Environment (DoE), Forest Department (FD), Bangladesh Agricultural Research Council (BARC), Department of Agricultural Extension (DAE), Soil Resource Development Institute (SRDI), Space Research and Remote Sensing Organization (SPARRSO), Bangladesh Bureau Statistics (BBS), Bangladesh Meteorological Department (BMD).

Dr. Md. Sohrab Ali, Director, Department of Environment was confirmed as a focal point in this process.

All involved institutions will participate in the formulation of policies, rules or acts related to LDN.

The Secretary, Ministry of Environment, Forest and Climate Change (MoEF&CC) as National Focal Point (NFP) and Department of Environment (DoE) will be the Lead Agency of this process.

Two NWG meetings were held on 13 April 2017 and 04 May 2017. Minutes of those meetings are annexed as Annex-7 &8. Issues discussed in those meetings include:

- Identification of potential stakeholders.
- Work plan of voluntary target setting of LDN-TSP.
- Draft Leverage plan.
- Co-option of more members such as SRDI, DAE, SPARRSO, BBS, etc.
- Workshops schedule and program for inception, including validation of LDN baseline and targets.
- Global default data and a national database, their gaps and way forward.
- Data sharing and management among different institutes.

Chapter-2
Assessing Land Degradation Neutrality (LDN)

2.1 LDN trends and drivers

Assessment of LDN trends, along with an analysis of the driving forces behind these trends, are essential steps to understand current conditions of land degradation and also figure out anomalies in identifying degraded areas. It will provide an informed evidence base from uniform/similar sources for setting sound LDN targets, making decisions about potential interventions and prioritizing efforts in areas where degradation is taking place. While setting the baseline retrospective trend analysis is essential to observe changes in values of the indicators over 10-15 years assessment period to the current condition.

Accounting temporal and spatial negative changes (2000 and 2010) in **a) Land use/Cover Change (LCC), b) land Productivity Dynamics (LPD) and c) Soil Organic Carbon (SOC)** status are assessed for trend analysis to understand land degradation context. The drivers of these indicators are not stand alone as the impact of one has a substantial influence on the other areas which are therefore could be accounted as mutually inclusive. The country has spatial and temporal data on Land Cover Changes and also of Soil organic matter content, but those data are currently not compatible with the reporting format of indicators used for UNCCD. On the other hand, there is no data available on LPD.

a) Land use/Cover Change (LCC):

Land use/Cover Changes (LCC) are manifested in six land cover categories following Intergovernmental Penal on Climate Change (IPCC) protocol. Bangladesh has data on land use/land cover changes, but spatial and temporal data on LCC from similar or equivalent sources are limited in the country. Conversion of forest cover to non-forest, cropland to non-crop, wetland to cropland or otherwise, etc are spectacular throughout the country. Relevant institutions have data in these fields.

All those data can hardly be fitted with the LCC of UNCCD on the LDN conceptual framework. FAO 2015 estimated changes forest cover in 2000 and 2010 was 14,700 and 14,400 km^2 respectively, while Bangladesh Bureau of Statistics (BBS) reported forest cover is 25,770 km^2 in 2010-11 (BBS, 2012), which is obviously due to different source of data collection and methodology. It was estimated that annual land loss from crop agriculture (Cropland to Artificial land, Rural settlements in this case) is 690 km^2 (about 0.73% of agricultural land) and land gained in rural settlement, urban and industry, and aquaculture is 308, 401 and 321 km^2 respectively during 2000-2010. During last 34 years (1976 -2010) rural settlements, urban and industrial areas occupied 260 km^2 of crop land per year (Hasan et al. 2013). There was a study on Haor areas of Sylhet region using Moderate Resolution Imaging Spectroradiometer (MODIS) data and able to detect reduction of 6.88% water bodies of the haor area, whereas vegetation (agricultural) area has been increased 8.35% during the 9 years period from 2000 to 2008 (Salauddin and Islam 2011)). All these changes referred to croplands in general but national data for specific changes land use/cover changes are very limited.

However, in the absence of national data coverage from uniform source and methodology assessment of LD indicators trends were set on the global database (as proposed by UNCCD) with an apprehension that national data will be integrated soon. Data revealed that there are two major Land Cover Changes identified from 2000 to 2010 (Annex-3). A total of 334 km^2 of forest land cover is changed to these two major land cover categories. They are 1) forest cover to either shrub/grasslands (235 km^2) or 2) to croplands (98 km^2). The LPD "decline" and showed "an early sign of stress" are 3,680 and 1,052 km^2 respectively and SOC is average 55.6 ton/ha from six categories. Other categories like "Wetlands", "Artificial areas" and "bare lands and others" were not changed between 2000 and 2010. "Decline" and "an early sign of stress" of LPD are 739 and 127 km^2 respectively and SOC is average 59.6 t/ha in the year

2000 from these three categories. (Annex-3: LDN baseline Data, Table-1). Nevertheless, there are indications of changes that occur in different land cover especially natural forest and water bodies, but could not be assessed at this stage with specificity where only " Forest" and "crop" may be set to IPCC classification.

b) Land Productivity Dynamics (LPD):

Land Productivity Dynamics are referred to the areas where signs of biomass activity decline spectacular, which is about 319 km^2 in two Land use/cover categories. Net LPD declines where land use/cover change from "forest to crops" is much higher than the change from "forest to shrubs, grass, sparsely vegetated areas, etc" and they are 9.5 and 1.5 km^2 respectively. (Annex-3: LDN baseline Data, Table-2).

Land use/cover categories "Wet land and water bodies', "Bare lands and other" and "Artificial areas" that remain unchanged have shown Net LPD value higher than the "Forest to crop" and Forest to Shrubs, grass, sparsely vegetated areas, etc" categories. The highest Net LPD value found in Bare areas where vegetation coverage was minimum at the time of assessment. On the other artificial areas and wetlands have lower NetLPD values. The NetLPD Value of Forest to crop Category depicts the early signs of decline (Fig-01).

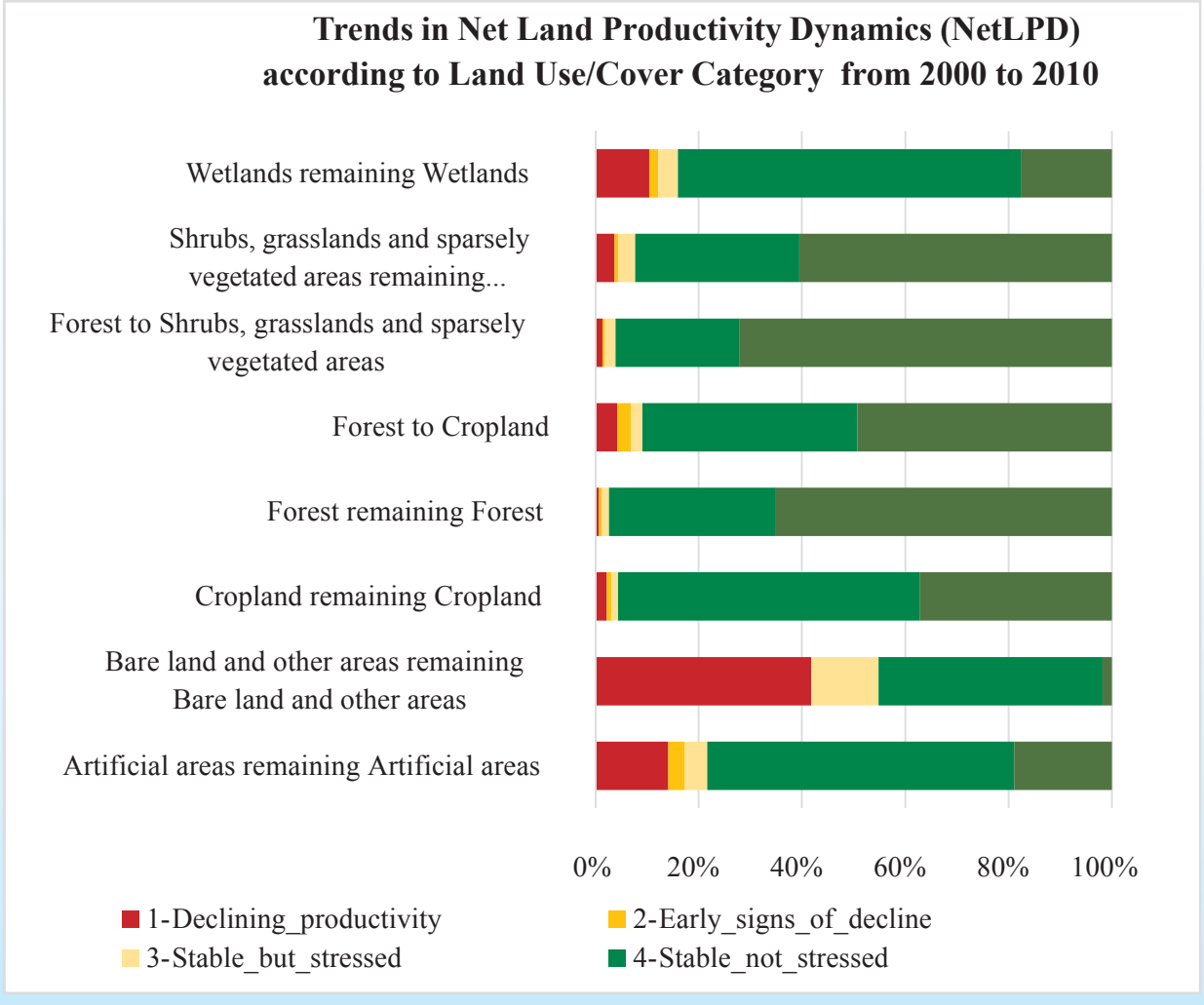


Fig-01: Trends in Net Land Productivity Dynamics (NetLPD) according to Land Use/Cover Category from 2000 to 2010.

c) Soil Organic Carbon (SOC)

Global data showed that the average Soil Organic Carbon (SOC) loss in 2000 was 56 ton/ha from only two types of land use/cover categories, i.e.processes "Forest to Cropland" and "Forest to shrubs, Grasslands, and sparsely vegetated areas". Net changed area was 334 km^2 and SOC loss from these two categories (Referred to LCC maps) in 2000 and 2010 are 131 and 115 ton/ha respectively. That makes the total SOC loss from 0-30 cm of soil is about 379,269 tons in 10 years of span which is 0.052% loss total SOC stock in the country. Detail SOC loss from these two categories of Land use/cover changes are described in Annex-3: LDN baseline data table-Table-3.

SRDI exercised a correlation between Soil Organic Carbon data of SRDI (National level) with Global data Fig-02a and derived map presented in Fig-02b and. It is to be noted that the correlation was made on the basis of data of topsoil (Generally 0-15 cm) Organic Matter, which was converted to SOC t/ha and legend was scaled to fit with the global data. The result showed a positive correlation in Haor, Gopalgonjbeel and piedmont areas, where SOC is high in both maps. But no correlation was found in Hill, Sundarban, some parts of Meghna floodplain (Specially Chandpur, Noakhali) areas. On the other hand, a positive correlation was found in western parts of Chapainowabganj and Kustia, where SOC found very low.

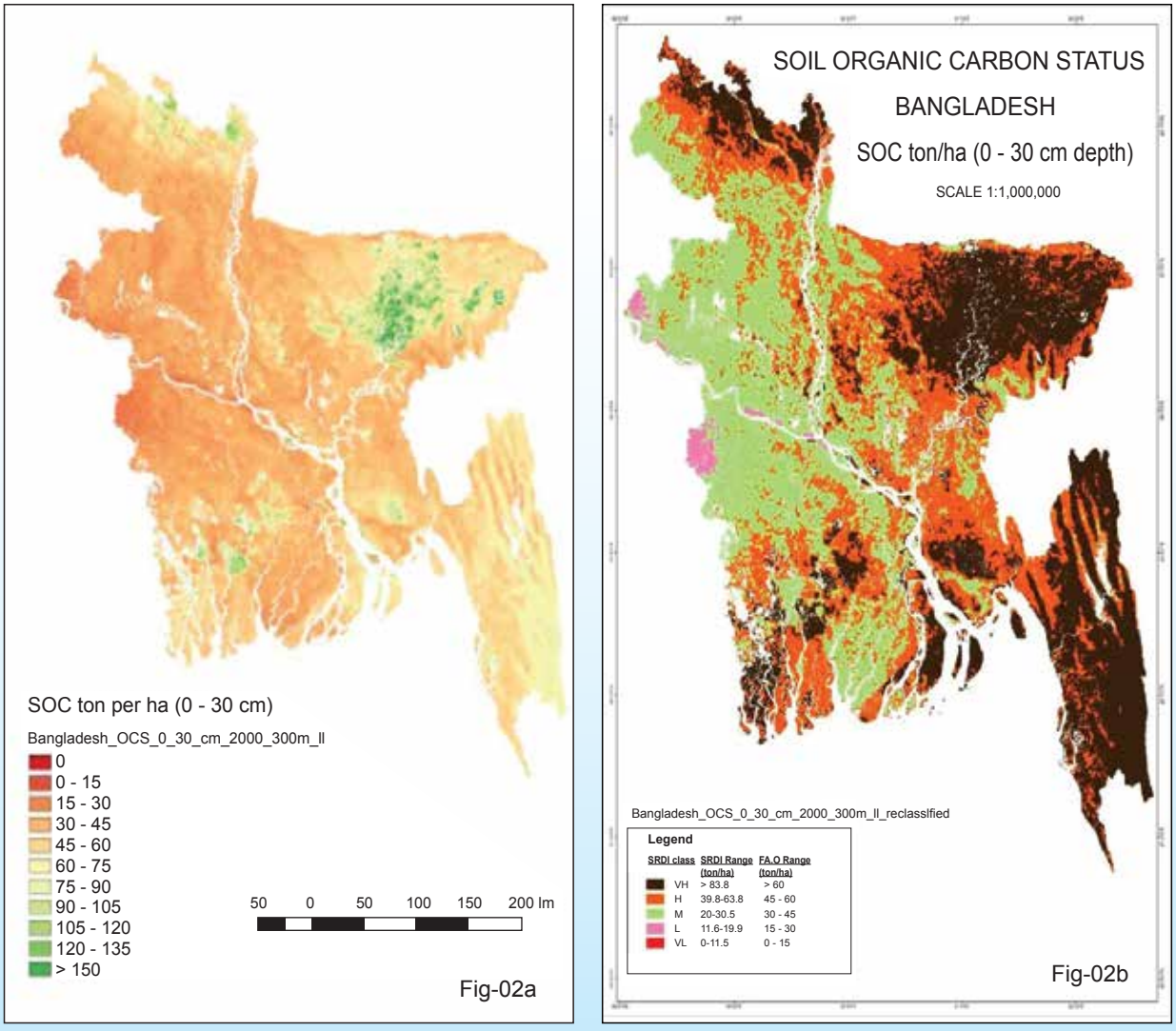


Fig-02a: Map derived from Global default data and Fig-02b: Correlation of National Data with Global data

d) The major drivers as identified by the stakeholders are:

- Land management: Includes unsuitable agronomic practices (Intensive cropping, imbalance fertilizer usage etc) that lead to soil nutrient depletion (Phosphorus, Potassium, Zinc, Molybdenum, Boron etc), soil organic matter depletion, compaction or pan formation, acidification, prolong wetness- result nutrient depletion, impede plant nutrient uptake, impede carbon sequestration etc.

  However, balance use of fertilizer, irrigation water management and use of organic compost, etc are now widely demonstrated and practiced throughout the country.

- Salinization in Coastal zone: Increase of Sodium and manganese concentration in soil (Electrical conductivity) restrict plant nutrient uptake, Loss of land productivity encourages conversion to non-agricultural use (Salt bed or Shrimp farming etc.). Soil water salinity showed an increasing trend in coastal zone mostly because of saline water intrusion from the sea. Fig-03 depicts the change of intensity of soil salinity and area from 1973 to 2000 (Source SRDI,2003) and Fig-04: depicts the change in areas and different degrees of soil salinity in coastal areas in 1999, 2000, and 2009 (Source Data Processing Section (DPS), SRDI, 2009).

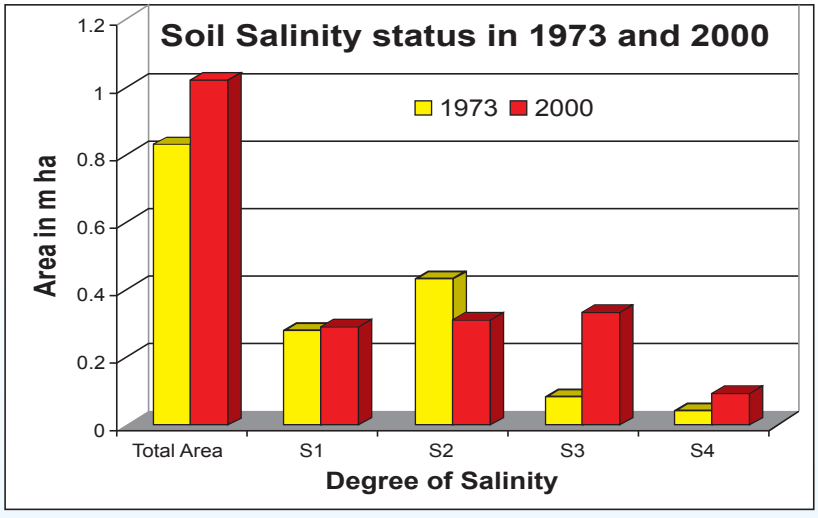


Fig-03: Soil salinity status in 1973 and 2000 (SRDI, 2016).

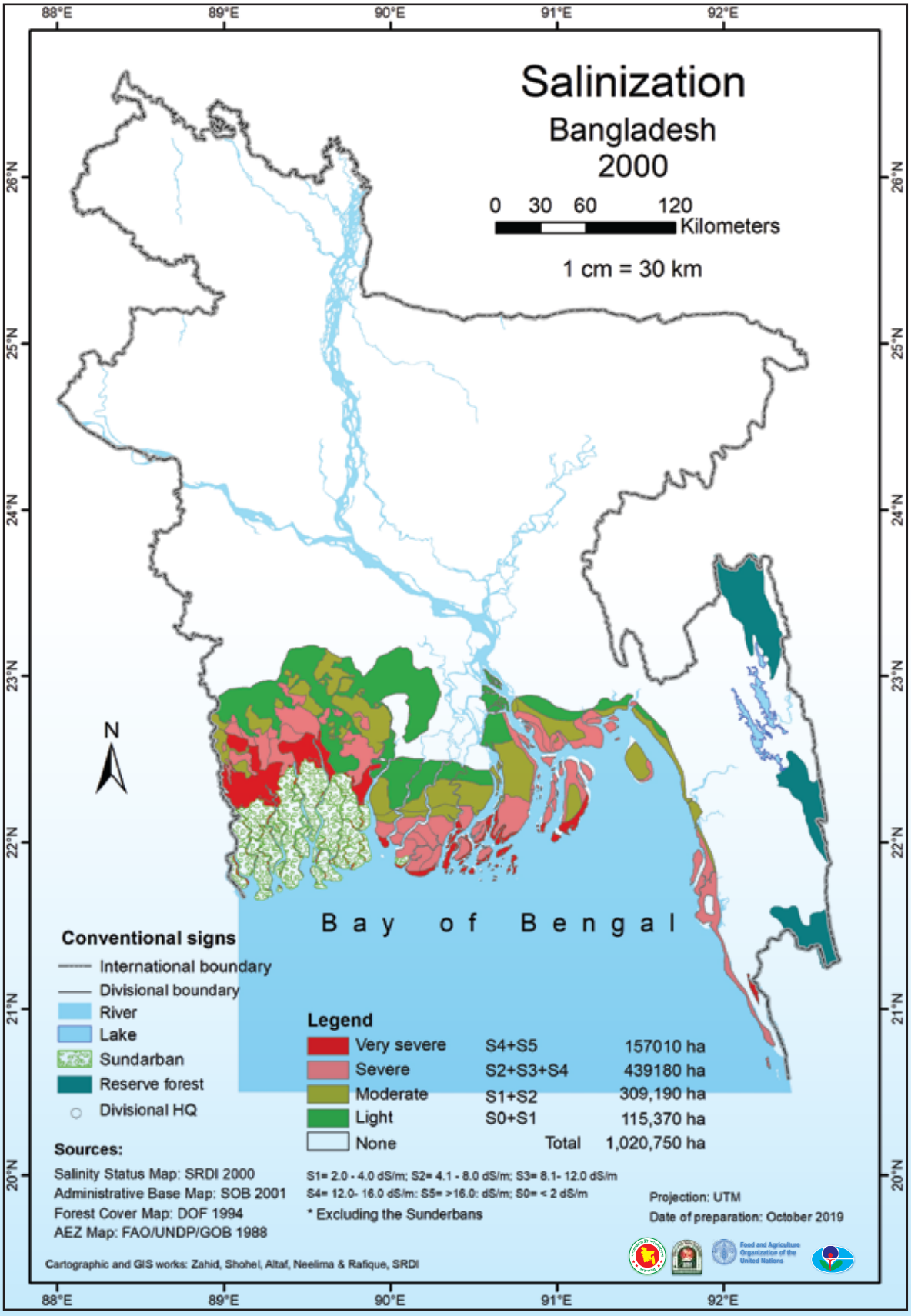


Fig-04: Soil salinity in 1999, 2000, and 2009

- **Sand spill or burial by sands or fresh alluvium (Mostly along active rivers):** Land burial by sands (Sometimes >1m) remain fallow, or land under fresh alluvium compel users for some other crops to suit with the edaphic properties of the soil.
- **Industrial effluents:** Land becomes contaminated that results from soil pollution with heavy metals (Lead, Chromium, Copper, Cadmium, Mercury, etc.), which subject be to in food chain in all lands nearby the industries.
- **Infrastructure development:** Settlements, Industries, Roads, polders, etc.: Shrinking productive lands result in soil sealing.
- **Changing land use/cover:** Brickfields, urbanization, industry, agricultural land to non-agricultural use (Fisheries, etc), prolong waterlogging due to drainage congestions where Beel Dakatia is a worst example. At present, there are about 7000 brickfields operating in the country.
- **Conflict of interest:** Crop to non-crop (Fisheries), croplands to settlements/industry, Brickfields, etc. Policies related to land administration and land use planning, Conflict between forest and industries or fisheries, especially in Madhupur Tracts and in coastal area Rice vs salt or shrimp farming, etc.
- **Water erosion:** Basically topsoil loss due to Jhum/shifting cultivation, cultivation of root crops or cropping along slope, faulty slope management.
- **Riverbank erosion (Active river areas):** Riverbank erosion results of sand mining or stone queries and also sudden increase in river flow from the upper riparian of the watersheds, loss of productive land, displacement of populace, productive land to non-productive char lands.
- **Drought:** Low rainfall, Soil properties (Texture, Bulk density, etc.), Ground water drawdown because of excessive abstraction.
- **Deforestation:** Change of forest to Crop/Fisheries or industry, settlements, etc. mostly in Madhupur tracts, Tree felling (illegal felling) and change of forest cover from 2000 to 2010 is 26300 km^2 to 23300 km^2 (BBS). Deforestation leads to topsoil loss, landslide in situ and increase in sediment load in rivers, burial by coarse sand on fertile lands of lower riparian, flood, riverbank erosion, etc.
- **Decreasing river flow from upper riparian:** It enhances salinity intrusion in the coastal zone of the country. The estimated increase in the saline area from 1999 to 2009 was 26% of coastal areas. On the other hand rivers, streams/creeks/ channels are silted and chocked either engrossment

Indirect drivers of Land Degradation:

- Land governance: Understanding and awareness at user level on policies related to land administration, land use planning, and land zoning, etc.
- Population pressure: Lands used for settlements, threat to cropland and forest cover.
- Awareness related to policy: Most of the land users are not aware of concern policies.
- Awareness related to technology: Lack of understanding, awareness, and know-how on Sustainable Land Management (SLM) best/good practices.
- Poverty: That influence choosing crops, inputs, fertilizer usage, adoption of technology, marketing, etc.
- Marketing: By and large farmers do not consider long term environmental impact while choosing very high exhaustive crops or otherwise e.g. salt bed or shrimp cultivation, Fisheries (in MadhupurTract), topsoil trading, sand/stone queries, etc.

2.2 LDN institutional and legal environment

Present scenarios of institutions and legal environment are presented as SWOT Analysis:

Strength	Weakness	Opportunities	Threats
Institutions are familiar with the LDN process and land management.	Cross- sectors in land management environment are weakly organized and lack of integration for priority setting;	DoE as a focal institution targeted to establish DLDD M&E cell; Guidelines and effective network proposed in NAP.	Frequent change of Focal points from the institutions related to the subject.
High-level government officials involved in the process of LDN;	Limited common understanding on baseline;	Related institutions have data/information related to their own discipline.	Lack of uniformity in data source and structure; tough to fit with UNCCD report format.
Non-government institutions, Civil societies engaged in the process;	Limited common understanding on baseline related to Land use/cover changes, Land Productivity Dynamics and Soil Organic Carbon status.	Technologies and approaches are present.	Lack of common or standard format for validation, documentation and upscaling.
Reconnaissance and detail level quality data on soil and land resources available.	Lack of common understanding of Data structure and information platform; Limited capacity and infrastructural facility to address national requirements.	NAP is updated with in-depth discussions and participation with the Stakeholders at all levels; The institutional approach clearly addressed.	Institutional linkages yet to be Functional as of NAP to operationalize the process of data management from uniform sources and structure.
Well-groomed policy support for mainstreaming the Knowledge and understanding of DLDD.	Lack of common understanding on of magnitude of land degradation-related risks among the cross-sectors; Lack of capacity and understanding of resource dynamics (natural and social assets) in most vulnerable areas.	Reviewed all relevant policies and identified gaps during updating the NAP; Initiate a well-structured approach to address DLDD.	Yet to be execution of NAP recommendations by sectors.
Well framed institutional approach to address LD & DLDD in NAP	National Steering Committee (NSC) yet to be functional; Regional and sub-regional levels yet to be set.	National Working Group (NWG) formed to address LDN;	Requires more integration;
SLM best practices exist	Limited standardized documentation and advocacy for common understanding at national levels;	DoE intended to work with WOCAT tools for documentations.	Limited capacity

National Action Program (NAP) was updated with the connotation of commitments to key UN Conventions, which also resets and/or reorganizes National Development Strategies particularly in the sectors concerned with Agriculture, Natural Resources and Climate Change and realigned with the UNCCD strategic framework. The Secretary of the Ministry of Environment, Forest and Climate Change (MoEF&CC) acts as National Focal Point (NFP) of UNCCD and Department of Environment (DoE) acts as operational institution in this subject.

National Focal Point (NFP) engaged senior Government Officials, representatives from relevant departments/institutions under different ministries, universities, NGOs and Civil Society Organizations (CSOs), etc. in the LDN-TSP process to attain the targets by 2030. NWG team all the way will operate within the existing implementation mechanism to make the process effective with updated baseline data from the stakeholders for NFP. The Department of Environment (DoE) will function as an operational institute in the process. It is anticipated that the whole process will help to promote all sectors to adopt Sustainable Land Management (SLM) and tap into increased financing opportunities from national and international agencies' funding processes.

LDN-TSP will follow the embedded organizational approach as recommended in NAP (Fig-5).

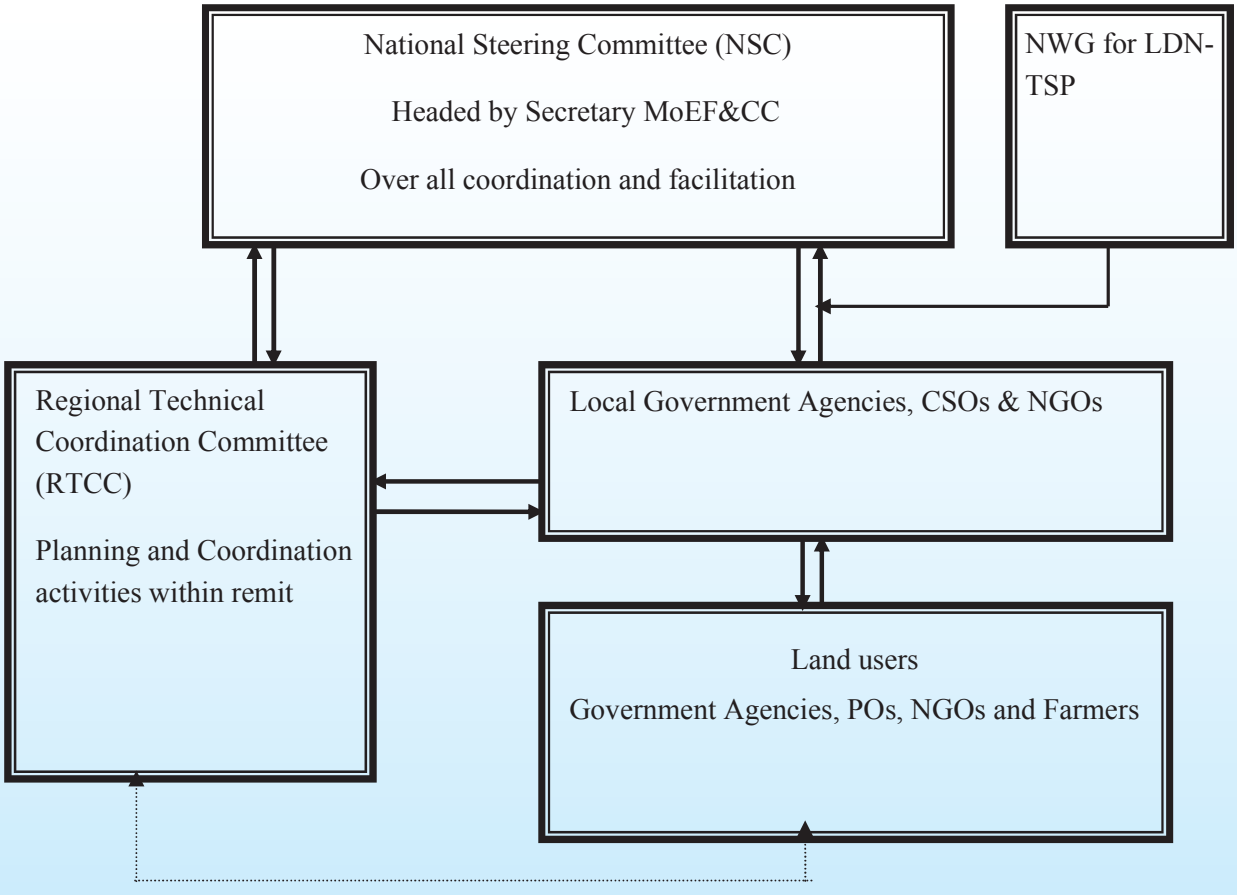


Fig-05: LDN Organizational Setting

National Steering Committee (NSC) of NAP, which could also work for LDN

1. The NSC will be established under the leadership of Secretary, MoEF&CC, and NFP of UNCCD as well. The Secretary, MoEF&CC will be the chairperson of the committee and the Director NRM division of the DoE will serve as the Secretary to the committee. The NSC will consist of representatives from public and private sector organizations, government institutions and NGOs. The members of the committee are given below.

    - Nominee by the Secretary of the Ministry of Lands not below the rank of Joint Secretary,
    - Nominee by the Secretary of the Ministry of Agriculture not below the rank of Joint Secretary,
    - Nominee by the Secretary of the Ministry of Water Resources not below the rank of Joint Secretary,
    - Nominee by the Secretary of the Ministry of Finance not below the rank of Joint Secretary,
    - Nominee by the Secretary of the Ministry of Planning not below the rank of Joint Secretary,
    - Director General, Department of Environment,
    - Chief Conservator of Forest, Bangladesh Forest Department,
    - Coordinators of the Regional Technical Coordination Committees (7),
    - Executive Chairman of Bangladesh Agricultural Research Council (BARC),
    - Director General of Department of Agricultural Extension (DAE),
    - Director General of Department of Fisheries and livestock,
    - Director, Soil Resource Development Institute,
    - Representative of Corporate sector Agencies,
    - Representative of Civil Society Organization (2),
    - Representative of NGO (2),
    - Representative of land users (2),
    - Representatives of farmers(2).

NSC will meet once in six months normally, but NFP may convene a meeting at any time if deemed necessary.

Regional Technical Coordination Committees (RTCC), which will also work for LDN-TSP

Seven RTCCs will be established at the Divisional level to coordinate the planning and implementation of programs. The RTCC will be headed by the Divisional Commissioner of the division. Members will be drawn from relevant NARS institutes and other GOs, CBOs, NGOs, and Farmers. Representative from DoE will serve as the Member-secretary at the division. The RTCC will monitor and evaluate all LDN activity within their areas. The committee can co-opt any member within the same division.
The following five RTCC are proposed:

- Barisal Regional Technical Coordination Committee,
- Chittagong Regional Technical Coordination Committee,
- Dhaka Regional Technical Coordination Committee,
- MymensinghRegional Technical Coordination Committee,
- Khulna Regional Technical Coordination Committee,
- Rajshahi Regional Technical Coordination Committee,
- RangpurTechnical Coordination Committee
- Sylhet Regional Technical Coordination Committee.

RTCC will meet once in three months normally. It will monitor LDN-TSP within their jurisdiction and report to NFP on a regular basis.

Composition of RTCC:

The RTCC will be composed of the following members:

1. Divisional Commissioner of the division -Chairman
2. Additional Director, Department of Agricultural Extension (DAE) -Member
3. Representatives from research institutions like SRDI,BARI, BRRI, BJRI, etc. -Member
4. Representatives from Department of Forestry, -Member
5. Representatives from Department of Fisheries, -Member
6. Representatives from Department of Livestock, -Member
7. Representatives from Bangladesh Rural Development Board, -Member
8. Representatives from CSO (2, one from women group)), -Member
9. Representatives from Academics, -Member
10. Representatives from NGO (2, one will be from women group), -Member
11. Representatives from farmer (2, one will be women), -Member
12. Divisional Director, Department of Environment, -Member Secretary

ToR of RTCC

Regional Technical Coordination Committee will

1. Evaluate and monitor LDN activities.
2. Facilitate scale up and enhance the extension of best practices.
3. Preserve regional LDN data and facilitate temporal and spatial data collection and or monitoring on LDN.
4. Granting best farmers awards for LDN performance.

Land Users in LDN-TSP

As recommended in NAP-UNCCD at all local levels (District/Upazila/ Union) committees will work with specific ToR related LDN-TSP and hot spots. In this issue, BRDB with DAE can take the initiative.

2.3 Setting LDN baseline (Annex-3: LDN baseline Data table).

Bangladesh has sectorial data on land use/land cover, spatial and temporal land-use changes, forest cover or reforestation/afforestation, soil nutrient depletion, and organic matter content, etc. According to national data available, there are about 50,000 km^2 of lands below the threshold for sustainable land management specifically in the North-western parts of Bangladesh. Organic matter depleted in most of the cultivable areas and yearly average change of cropland to other uses is nearly 690 km^2 in 2000-2010 of which extension to rural settlements is nearly 308 Km^2/year (Hasan et al 2013).

There is no data available at the national level on Land Productivity Decline (LPD) and Soil Organic Carbon (SOC) in relation to the six land use/land cover categories. (Annex-6: Description of six land cover categories as of IPCC)

As the global default data is consistent with reporting and monitoring related to the UNCCD and SDG target 15.3, it was agreed in the workshop on 16-17, July 2017 that for the LDN target setting process global default data will be used as LDN baseline at this stage. By the process deficiencies or gaps of integrating national data to feed the PRAIS portal will be addressed through increasing the capacity of relevant institutions.

With the above assumptions and based on the global default data provided by the UNCCD Secretariat (Annex-3: Baseline table-Table-1) related to LPD of land use/land classes, there are 3,680 and 1,052 Km^2 for decline and early sign of decline respectively. This corresponds to the estimated areas of 5,000 km^2 (<10% of total national degraded area), as it is widely manifested in different references, in particular in north-western Bangladesh.

It is assumed that global default data will be updated in the future by the respective institutions using national data.

Chapter-3

Setting Land Degradation Neutrality (LDN) targets to achieve by 2030

3.1 Bangladesh set its voluntary national LDN targets that have been validated by the LDN working group and submitted by the National Focal Point of UNCCD through the status update note on LDN. National LDN targets for Bangladesh are given below:

Target- 1: To improve soil fertility and Carbon stock in 2000 km^2 of cropland area.
Target- 2: To reduce land use/cover conversion in 600 km^2 of forest area.
Target -3: To reduce waterlogging in 600 km^2 area.
Target -4: To reduce soil erosion in hilly areas in 600 km^2 area.
Target -5: To protect non-saline land areas from salinity intrusion in 1200 km^2 in the coastal zone areas.
Target -6: To reduce riverbank erosion @100ha/year covering 100 km^2 areas.

3.2 Associated measures to achieve Degradation Neutrality (LDN)

Associated measures identified to achieve Land Degradation Neutrality (LDN) in Bangladesh by 2030 are as follows:

Target-1 : To improve soil fertility and Carbon stock in 2000 km^2 of cropland area.
Required : To improve soil fertility and Carbon stock and AWD of winter rice.
Drivers : Direct driver is land management which includes inappropriate agronomic practices, Imbalance fertilizer, and pesticide usage, weedicides inappropriate irrigation mechanism. Indirect drivers are lack of advocacy and awareness/understanding related to SLM best/good practices, unavailability of quality fertilizers, organic/farm manures, etc. In addition population pressure on land capital; lack of understanding Technology and use of crop residues or cow dung as fuel are the issues of concern.

Measures:

Agronomic measures:

- Judicious use of fertilizers and pesticides @ 10,000 farmers per year following online and offline fertilizer recommendation system of SRDI or fertilizer recommendation Guide of BARC.
- Use of organic manure, Farm compost, vermicomposting, Biochar, etc.
- Alternate wet and drying (AWD) of winter rice (boro) areas in 200 km^2.
- Incorporating leguminous crop in crop rotation.

Vegetative measures:

- Enhancement of Agroforestry/rural forestry.
- Introduction Leguminous shrubs/tree plantation or growing vegetables on field bunds as appropriate.

Management Measure:

- Effective advocacy on SLM best/good practices
- Incorporation of SLM in extension training manual.

Institutions: The Ministry of Agriculture would be the line ministry where the Department of Agricultural Extension, Bangladesh Agricultural Research Council, Soil Resource Development Institute and Bangladesh Agricultural Development Corporation would be line agencies. Ministry of Environment Forest and climate change and Ministry of Water Resources will be associated as supportive ministries and the Department of Environment as supportive agencies.

Target-2 : To reduce land use/ cover conversion in 600 km^2 of forest area.

Drivers : Direct drivers are deforestation, brickfield expansion, infrastructure development, industrial effluents in croplands and waterways.

Indirect drivers are policy on forest maintenance; population pressure and illegal or excessive felling, use as fuelwood especially for Tobacco kiln and cooking, social need and lack of awareness related to policy.

Measures:

Vegetative measures: These include Afforestation, Reforestation, Social Forestry, Agroforestry and horticulture, Agro-horticulture, etc.

Management measures: Alternative to earthen bricks, advocacy and effective implementation of existing policy and associated directives with capacity building at field level.

Institutions: Ministry of Environment, Forest and Climate Change, Ministry of Land, Ministry of Local Government and cooperatives would be the line ministry, where the Department of Environment would be line agency. Ministry of Agriculture will be associated as the supportive ministry and Department of Agricultural Extension as a supportive agency.

Target 3 : To reduce waterlogging in 600 km^2 area.

Drivers : Direct drivers are infrastructure development (Drainage congestions), housing and settlements, etc.

Indirect drivers are encroachment/siltation of waterways, derelict tanks and dumping of municipal waste.

Measures:

Structural Measures:

Provision of adequate culverts or water outlets, excavation of river bed, channels and ponds (Kash).

Institutions: Ministry of Local Government and cooperative would be the line ministry where the Local Government Engineering Department would be line agency. Ministry of Water Resources, Ministry of Environment, Forest and Climate Change, Ministry of Agriculture and Ministry of Land would be associated as supportive ministries, Department of Environment, Bangladesh Agricultural Development Corporation and Bangladesh Water development Board, Bangladesh Inland Water Transport Authority (BIWTA), Bangladesh Inland Water Transport Corporation (BIWTC), Department of Fisheries as supportive agencies.

Target 4: To reduce soil erosion in hilly areas in 600 km^2 area.

Drivers: Direct drivers are inappropriate land management on sloping land (growing tuber/root crops on sloping land), deforestation, infrastructure development, and hill cutting. Indirect drivers are population pressure, cultural practice (Shifting cultivation/Jhum Cultivation). Recent massive annexation of Rohingya refugees in hill areas, a total loss of biodiversity.

Measures:

Agronomic measures: Agroforestry/horticulture, Contour planting, SLM best/good practices e.g.zero tillage on slope.

Vegetative measures: Introduction of hedgerow across the slope by leguminous shrubs/trees and afforestation.

Structural measures: Bench terrace, half-moon terrace, etc.

Management measures: Advocacy on SLM best/good practices to avoid shifting cultivation and unsustainable land uses.

Institution: Ministry of Chittagong Hill Tracts Affairs would be the line ministry where Regional Council, Chittagong Hill Tracts Development Board and three Hill District councils would be the line agencies. Ministry of Agriculture, Ministry of Environment, Forests and Climate Change would be associated as supportive ministries. Department of Environment, Department of Agricultural Extension and Department of Forestry would be supportive agencies.

Target 5 : To protect non-saline land areas from salinity intrusion in 1200 km^2 in the coastal zone areas.
Drivers : Direct drivers are inappropriate land management, uncontrolled use of saltwater for salt bed/shrimp, weak polder management, extension of salt bed/shrimp cultivation in cropped area and reduced river flow in the transboundary rivers.
Indirect drivers are a conflict of interest, population pressure, and Climate change impacts.

Measures:
Management measures: Restricting salt and shrimp cultivation areas, introducing high-value salt-tolerant crops, increasing surface (fresh) water reserve in channels and ponds, community base polder management and awareness-raising.

Institutions: Ministry of Water Resources, Ministry of Livestock and Fisheries, Ministry of Industry, Ministry of Local Government and Cooperatives and Ministry of Land would be the line ministries. Where Ministry of Agriculture, Ministry of Environment, Forests and Climate Change would be associated as supportive ministries. Department of Environment, Department of Agricultural Extension, Bangladesh Agricultural Research Council, Department of Fisheries and Bangladesh Water Development Board as supportive agencies.

Target 6: To reduce riverbank erosion @100ha/year covering 100 km^2 areas.

Drivers: Direct driver is river morphology (Char lands in the river), sand queries.
Indirect drivers are on the rush of floodwater and char land management approach.

Measures:
Vegetative measures: Establishing a green belt, Afforestation along river banks and accreted char lands.
Management measures: River/channel dredging

Institutions: Ministry of Water Resources would be the line ministries. Ministry of Environment, Forests and Climate Change and Ministry of Land would be associated as supportive ministries. Bangladesh Water Development Board as a line agency, where the Department of Agricultural Extension and Department of Environment will work as supportive agencies.

Key policy/technical measures to achieve LDN identified
The key technical measure for each of the targets is detailed out in the Table below:

Target	Area [km^2]	**Driver**		**Measure**		Timeline		**Institutional involvement**
		Direct	Indirect	Choose an item.	Area [km^2]	50%	100%	
		Choose an item.	Choose an item.					
To improve soil fertility and Carbon stock in 2000 km^2 of cropland area.	**Total= 2000** National level (Barind, Coastal zone, Ganges, Brahmmaputra and Meghna floodplain) .	Unsustainable land management (Inappropriate agronomic practices, Imbalance fertilizer usage, pesticides, inappropriate irrigation)	Lack of advocacy and awareness related to SLM, Unavailability of quality and availability of fertilizers, Organic/farm manures, etc; Population pressure; Understanding Technology, use of crop residues as fuel,	**Agronomic measures**	**Sub Total= 1500**	2025	2030	LM: MoA; LA: DAE, BARC, SRDI, BADC; SM: MoEF & CC,, MoWR, MoLG & Cop SA; DoE
				Judicial use of pesticide and fertilizer @ 10,000 farmers per year following online and offline fertilizer recommendation system of SRDI or fertilizer recommendation Guide of BARC.	800			
				Use of organic manure, Farm compost, vermicomposting, Bio char	300			

Target	Area [km^2]	Driver		Measure		Timeline		Institutional involvement
		Direct	Indirect	Choose an item.	Area [km^2]	50%	100%	
		Choose an item.	Choose an item.					
				Alternate wet and drying (AWD) of winter rice (boro) areas	200			
				Incorporation of leguminous crop in crop rotation,	200			
				Vegetative measures	**Sub Total= 500**	2025	2030	
				Enhancement of Agroforestry/rural forestry	400			
				Introduction Leguminous shrubs/tree plantation or growing vegetables on field bunds as appropriate.	100			
				Management Measures	In the above areas			
				Effective advocacy on SLM. Incorporation of SLM in the extension manual.				
2. To reduce land use/ cover conversion in 600 km2 of forest area.	**Total= 600** (National)	Deforestation, Brickfield expansion, Infrastructure development, Industrial effluents in croplands and waterways;	Policy on forest maintenance; population pressure and illegal/excessive felling, use as fuelwood especially for Tobacco kiln and cooking, Population pressure, social need, Lack of awareness, policy, advocacy;	**Vegetative measures:**	**Sub Total= 250**	2025	2030	LM: MoEF & CC, MoLG & Cop MoIND, MoL, LA: DoE, SM: MoA, SA: DAE
				Afforestation, Reforestation, Social Forestry, Agroforestry, horticulture	250			
				Management measures:	**Sub Total= 350**			
				Alternative to earthen bricks manufacture, Advocacy and effective implementation of existing policy.	250			
				Enforcement of existing policy/laws and/or National Land policies and associated directives;	100			
3. To reduce waterlogging in 600 km^2 area.	**Total= 600** (Selected districts; Jessore, Khulna, Satkhira, Noakhali and others)	Infrastructure development, (Drainage congestions), Housing and settlements;	Encroachment/silt ation of waterways and derelict tanks, Dumping of municipal waste;	**Structural Measures:**	**Total= 600**	2025	2030	LM: MoLG & Cop, LA: LGED SM: MoWR, MoEF & CC MoL, MoA; SA; DoE, BADC, BWDB, BIWTA, BIWTC, DoF,
				Provision of adequate culverts or water out lets, Excavation of channels and ponds (Kash);	600			
4. To reduce soil erosion in hilly areas in 600 km^2 area.	**Total= 600** (Selected areas: Bandarban, Rangamati, Khagracha ri Hill districts)	Unsustainable land management on sloping land (growing tuber/root crops on sloping land), deforestation;	Population pressure, cultural practice (Shifting cultivation)	**Agronomic measures:**	**Sub Total= 300**	2025	2030	LM: MoCHTA LA: Regional Council, CHTDB, Hill District councils SM: MoA, MoEF &CC, SA: DAE, DoE,
				Agroforestry/horticulture and no-tillage on slope	300			
				Vegetative measures:	**Sub Total= 200**			
				Introducing hedgerow across the slope by leguminous shrubs	100			

Target	Area [km^2]	Driver		Measure		Timeline		Institutional involvement
		Direct	Indirect	Choose an item.	Area [km^2]	50%	100%	
		Choose an item.	Choose an item.					
				Afforestation	100			Department of Forest.& Cop.
				Management measures	**Sub Total= 100**			
				Advocacy on SLM to avoid shifting cultivation	100			
				Structural Measures	In the above areas, where feasible			
				Bench terrace. Half-moon terrace etc.				
5. To Protect nonsaline land areas from salinity intrusion.	**Total =1200** (Coastal zone)	Unsustainable land management: uncontrolled use of salt water for salt bed/shrimp, weak polder management, extension of salt bed/shrimp in cropped area;	Conflict of interest, population pressure, Climate change impacts;	**Management measures:**	**Total= 1200**	2025	2030	LM: MoWR, MoLG&Cop, MoLF, MoI, SM: MoA, MoEF&CC, SA:DAE, DoE, BARC, BWDB.
				Restricting salt and shrimp land area				
				Introducing High-value salt-tolerant crops				
				Increasing surface (fresh) water reserve in channels and ponds				
				Community base polder management				
6. To reduce riverbank erosion.	**Total = 100** @ 100 ha/yr	River morphology	On rush of flood water, Char land management	**Vegetative measures:**	**Total= 100**	2025	2030	LM: MoWR; LA: BWDB; SM: MoL, MoEF&CC; SA: DAE, DoE
				Establishing a green belt, Afforestation along river banks and char lands				
				Management measures:				
				River/channel dredging				

LM: Lead Ministry, SM: Supportive Ministry; LA: Lead Agency; SA: Supportive Agency

Chapter-4
Achieving LDN

4.1 The areas identified for interventions include:

A-1 Policy interventions: Lead Ministry: MoEF&CC; Supporting Ministry: MoL, MoWR

Harmonization of land-related development policies, legislation, regulations, and institutions will be done in following priority areas by 2021.

a. Enabling policy environment created for DLDD and implementing SLM to ascertain LDN by 2030;
b. Update relevant policies to address DLDD and SLM;
c. Sectorial guidelines to combat DLDD and to address LDN;
d. Enhance soil, land and water resource data base;
e. Conservation and increase availability of water resources;
a. Cultivation of crops as defined by crop zoning;
b. Land zoning for planned urbanization and industrialization to protect LD;
c. Controlling removal of topsoil from the agricultural field for brick making;
f. Regional cooperation for water sharing strengthen;

A-2 Operational interventions: Lead Ministry MoA; Supporting Ministry; MoEF&CC, MoWR

The following operational interventions were identified that could be implemented:

a. Soil test based fertilizer application;
b. Organic farming practice enhanced and Potential usage of livestock waste for soil rehabilitation and soil organic matter increase;
c. Application of Bio-fertilizer and introduction of Conservative farming;
d. Soil management packages for drought-prone areas;
e. Improved cultural practices for Jhum to reduce soil loss;
f. Mapping degraded forest and rehabilitation to increase forest cover;
g. Construction of Eco-friendly Rubber dam to assure availability of water for irrigation aquaculture;
h. Ground Water (GW) resources will be mapped and the status of surface water irrigation and its scope identified in addition to develop rainwater harvesting facilities.

A-3 Research and education interventions: Lead Ministry MoA; Supporting Ministry: MoEF&CC, MoE

The research and educational aspects are important to achieve long term goals and included as a continuous process. Those are:

a. Relationship among biophysical factors, socioeconomic conditions, and ecosystem degradation;
b. Development of Stress tolerant rice and other crops;
c. Documentation of relation between poverty and LD and economics;
d. Documentation of best SLM practices;

A-4 Training and awareness rising: Lead Ministry MoA; Lead agency: DAE

a. Strong and effective advocacy and training on climate-smart agriculture and conservation farming;
b. Training of women on integrated farming system in plain, hills, haors and wetland ecosystem and popularization of Integrated Crop Management (ICM) and Integrated Pest Management (IPM);
c. Training of Land users and other stakeholders especially on modification of management practices and Sustainable Land Management (SLM);

A-5 Monitoring and Evaluation: Lead Ministry: MoEF&CC; Lead Agency: DoE

An effective monitoring and evaluation system will be established in DoE by 2021. The M&E cell will look on:

a. Effective stewardship on Database development
b. An effective M & E system developed continuous evaluation of ecosystem;
c. Web-based Land Resources information system developed and implemented;

Leverage already achieved
National Action Program (NAP) is updated with the consistency of a national strategic plan and vision to cope with SDG. Institutional and implementation arrangements also suggested as an output of a wide range of stakeholder discussions. Government, non-government organizations and private sectors were involved in the process. Institutions and sectors of projections were specified.

4.2 LDN transformative projects and programs opportunities identified
Department of Environment (DoE) is going to implement the project on "Establishing National Land Use and Land Degradation Profile toward mainstreaming SLM practices in sector policies – ENALULDEP/SLM", where land-use change, land degradation, and monitoring and evaluation were specifically illustrated. The project will be implemented with other institutions e.g. DAE, SRDI, BMDA, CEGIS, etc, dedicated in this sector. The project is funded by GEF-5.
NWG will work in this issue in depth in continuation of the National Steering Committee meeting to identify potential transformative projects among the institutions.

Recommendations

- Capacity of institutions: Public institutions have skilled personnel, but capacities of the institutions are to be elevated for future programs. Public-private partnerships in these aspects will produce better output, especially socio-economic aspects of LDN-TSP.
- Global vs National data: There are wide differences in global data projection versus country land cover/land use scenario. This is also observed in the Bangladesh country profile as well. There are remarkable differences between national in-ground and the default global data. It is obvious that there will be some limitations due to scale or resolution, but for Bangladesh's case, the differences are too wide. It may happen due to resolutions and analytical/interpretation indices. Differences in default data and ground scenarios may raise a passive attitude on global estimation.
- Supervised classification with appropriate indicators/indices will help to weave anomalies that appeared during analysis. In addition, ground data feedback will increase data acceptance and adoption at the country level. There are free satellite imageries (Landsat TM) from which temporal data could be acquired.

Annex-1

List of LDN working group members

A National Working group was formed on 15 March 2017 with potential stakeholders. The members are representatives (Focal pints) from MoEF&CC, Mol, MoWR, MoA, DoE, FD, BARC, DAE, SRDI, SPARRSO, BBS, MoF, MoLG, BMD. Dr. Md. Sohrab Ali, Director, Department of Environment was confirmed as a focal point in this regard. There are two NWG meetings were held on 13-4-17 and 04-05-17.

List of Potential Stakeholders mapped

A. Ministries

1. Ministry of Environment Forest and climate change
2. Ministry of Agriculture
3. Ministry of Land
4. Ministry of Water Resources
5. Ministry of Health, Health Division
6. Ministry of Local Government, Rural Development and Cooperatives
7. Ministry of Planning
8. External Resource Division, Ministry of Finance (MoF)
9. Implementation, Monitoring and Evaluation Division, Ministry of Planing (MoP)
10. Ministry of Disaster Management and Relief
11. Ministry of Women and Children Affairs
12. Ministry of Chittagong Hill Tracts Affairs
13. Ministry of Finance
14. Ministry of Fisheries and Livestock

B. Institutions/Departments

1. Bangladesh Agricultural Research Council (BARC),
2. Department of Agricultural Extension, Tel: 02-9140857, 02-9140850, Fax: 02-9111502, Email: info@dae.gov.bd.
3. Department of Environment. Fax: 02-8181772, Email:dg@doe.gov.bd- 10 numbers
4. Department of Soil Resources Development Institute, Tel: 02-9113363, 02-9132899, Fax: 02-9110844; E-mail: director@srdi.gov.bd, moqbulh1@gmail.com
5. Department of Forestry, Tel: 8181737, Email: ccf-fd@bforest.gov.bd.
6. Bangladesh Agricultural Research Institute, Gazipur, Tel: 02-9263540, Fax: 02-9261415, Email: dg.bari@bari.gov.bd
7. Bangladesh Rice Research Institute, Gazipur, Tel: 02-9294117-21, Fax: 02-9261110, Email: dg@brri.gov.bd, brrihq@yahoo.com
8. Bangladesh Institute for Nuclear Agriculture, Mymensing. Tel: 091-67834, Fax: 091-67842, Email: dg@bina.gov.bd.
9. Bangladesh Jute Research Institute, Dhaka, Tel: 02-8121929 (PBX), Fax: 02-9118415, Email: bjriinfo@yahoo.com.
10. Agricultural Information Service, Khamarbari, Dhaka, Tel: 9112260, Fax: 02-9116168, Email: dirais@ais.gov.bd.

11. Space Research and Remote Sensing Organization, Tel: 02-9131741, Email: admin@sparrso.gov.bd,
12. Bangladesh Meteorological Department, Tel: 02-9135742, 02-9123838, Fax: 02-8118230, 02-9119230, 02-9103908. E-mail: info@bmd.gov.bd, swc@bmd.gov.bd
13. Department of Public Health Engineering, Tel: 02-9343353, Fax: 02-9343375, Email: ce@dphe.gov.bd
14. Department of Disaster Management, Tel: 02-9851481,Fax: 02-9860130, Email: dg@ddm.gov.bd.
15. Department of Haor and Wetlands Development, Ministry of Water Resources, 72 green Rd, Dhaka-1215, Tel: 880-2-8116902, 880-2- 9137312, Fax: 880-2-9144195, Email: info@bhwdb.gov.bd.
16. Shrimp Research Station, Bagherhat, Tel: 0468-62291, 01712103281, Fax: 0468-62291, E-mail: kkuabd1@yahoo.com
17. Bangladesh Fisheries Research Institute, Mymensing 2201, Tel: 091-65874, Fax: 091-66559, E-mail: dgbfri@gamail.com.
18. Bangladesh Livestock Research Institute (BLRI), Biotechnology Division, Savar, Dhaka 1341, Tel: 880-2-7791670-72, Email: infoblri@gmail.com.
19. Barendra Multipurpose Development Authority, BarendraBhaban, Head Office, Cantonment Road, Ambagan, GPO-6000, Rajshahi. Phone: +880721761368, Fax: +880721761897, Email: bmdahq@bmda.gov.bd.
20. Bangladesh Water Development Board, Director General Office, WAPDA building (1st floor), Motijeel C/A, Dhaka 1000.
21. Bangladesh Bureau of Statistics, Agriculture section, Phone: 88 02 8181415, Mobile 88 01556551769jaforbbs@yahoo.com.

C. NGO's

1. Arannyak Foundation, House# 21, Western Road, DOHS, Banani. Dhaka - 1206, Bangladesh, Phone: +880-2-8711240, +880-2-8715116, Fax: +880-2-8711592; Email: info@arannayk.org
2. Bangladesh Center for Advanced Studies, Gulshan, House # 10, Road # 16A, Gulshan-1, Dhaka-1212, Bangladesh. Tel: (+88-02) 8818124 - 7, 9852904, 9851237, Fax: (+88-02) 8851417, Email: info@bcas.net
3. Bangladesh Environmental lawyers Association (BELA), House-15A (4th Floor), Road-3, Dhanmondi R/A, Dhaka-1205, Phone: +88-02-58614283, 58610311, Fax: +88-02-58612957, Email: bela@bangla.net.
4. Bangladesh Institute of Development Studies, E-17 Agargaon, Sher-e-Bangla Nagar, Dhaka 1207, Tel: 880-8181685, 880 9143441-8, 880-2-8141722, Email: info@bids.org.bd.
5. Bangladesh Rural Advancement Committee (BRAC), BRAC center, 75 Mohakhali, Dhaka, Tel: 880-2-9881265, Email: info@brac.net.
6. Bangladesh UnnayanParishad, H# 50, Rd#08, Block-D, Niketon, Gulshan -1, Dhaka, Tel: 880-2-9853958-60, Fax: 880-2-9850036. Email: bup@citech-bd.com.
7. Bangladesh Youth Environment Initiative (BYEI), House-2, Road-1A, Baridhara, Dhaka 1212, Bangladesh, E-mail: info@byei.org, Cell: +8801841700808, +8801671179028
8. Center for Environmental and Geographic Information Service (CEGIS), H# 06, Rd#23/C, Gulshan-1, Dhaka 1212; Phone: 88 02 58817648-52; 88 02 9842581, 88 02 9842551, 88 02 9842542, Fax: 88 02 9855935; 88 02 9843128; E-mail: cegis@cegisbd.com; ed@cegisbd.com
9. IUCN, H# 16, Rd#2/3, Banani, Dhaka 1213, Phone-+880 2 9890395,+880 2 9890423, +880 2 8852743, Fax: +880 2 9892854, e-mail-ishtiaq.ahmad@iucn.org
10. Dhaka Chamber of Commerce and Industries; DCCI Building, 65-66 Motijheel C/A , Dhaka-1000, Bangladesh, Tel: 880-2-9552562, Fax : 880-2-9560830, Email : info@dhakachamber.com

11. Palli Karma Sahayak Foundation, PKSF Bhaban, Plot: E-4/B, Agargaon Administrative Area, Sher-e-Bangla Nagar,Dhaka-1207 ; Phone-880-2-9126240, Fax- 880-2-9126244, E-mail: pksf@pksf-bd.org.
12. Institute of Water Modelling (IWM), House# 496, Road# 32, New DOHS, Mohakhali, Dhaka 1206, Phone: 9844590-1, 9842105, iwm@iwmbd.org.

D. Universities

1. Department of Soil, Water and Environment, University of Dhaka, Dhaka. (Chairman), Tel 02-9661900/7470, 7481, Fax: 02-8615583, Email: swed@du.ac.bd.
2. Department of Soil Science, Bangladesh Agricultural University, Mymensing, Tel: 091-67401-6, 66016-18, FAX: +880-91-61510, Email: m.a.abedinbau.edu.bd, info@bau.edu.bd
3. Department of Soil Science, University of Chittagong, Tel: +880-1712092115, nasrin@cu.ac.bd, nasrincu@yahoo.com, ktohimu1951@gmail.com,
4. Institute of Forestry, University of Chittagong, Tel: +88-01917-094320, +88-031-2606144, +88-031-2606178 danesh@cu.ac.bd, dansforestry@yahoo.com,
5. Department of Soil Science, Sher-E- Banga Agricultural University, Dhaka, Email: webpage@sau.edu.bd, info@sau.edu.bd, Hotline: 01756333051, 01756333052; Public Relations and Publication Office, E-mail: mbashirpro1986@gmail.com, M-01716-581086
6. Department of Soil Science, University of Khulna,(ref: Dr.MizanurRahmanBhuiyan), Mobile: +88 01914 067514; PABX: +88041720171-2089
7. Department of Soil Science, Bangabandhu Sheikh MujiburRahman Agricultural University (BSMRAU), Salna, Gazipur.
8. Department of Forest and environment, Academic Building-E, Ground floor (Room no. 117), Shahjalal University of Science and Technology, Sylhet-3114, Bangladesh. Phone : +88-0821-713491,713850, 717850, 716123; Ext-273, FAX : +88-715257, E-mail : fes@sust.edu, Shahjalal University of Science and Technology,
9. Department of Water Resources Engineering, Bangladesh University of Engineering and Technology (BUET),

E. International Partners/ Foreign Organizations

1. FAO representative in Bangladesh, H#37, Rd# 08, Dhanmondi R/A, Dhaka 1205, Tel: +88 02 9126673, +88 02 8118015-8, FAX: +88 02 58152025, E-mail: FAO-BD@fao.org.
2. Australian Agency for International Development, 184 Gulshan Avenue, Gulshan-2 Phone: 02-881 3101 ,Fax:02-881 1125.
3. DFID Department for International Development, Email: dfidbangladeshenquiry@dfid.gov.uk Tel: +88 02 9842589, Fax+880 02 984 3181.
4. World Bank, Plot E 32, Sher-e-Bangla Nagar, Agargaon, Dhaka 1207,Bangladesh
5. UNDP, UN Offices, 18th Floor, IDB Bhaban,Agargaon, Sher-e-Bangla Nagar, Dhaka 1207, Bangladesh, Telephone: +880 2 55667788 Fax: +880 2 9183099

Annex-2


Dates of working group meetings and workshops, photos from events

- There are two NWG meetings were held on 13-4-17 and 04-05-17.






- Inception workshop was held on 23 May 2017 at CIRDAP auditorium and Workshop on validation of baseline data and Target setting was held on 16-17, July 2017 at the local FARS hotel.

Annex-3

LDN baseline table

Table 1 - Presentation of national basic data using the LDN indicators framework

Land Use/Cover Category	Area (2000)	Area (2010)	Net area change (2000 - 2010)	Net land productivity dynamics (NetLPD)** (km^2)						Soil organic carbon (2000)**
	km^2*	km^2	km^2	Declining	Early signs of decline	Stable but stressed	Stable not stressed	Increasing	No Data***	ton/ha
Forest	10996	10662	-334	78	51	149	3390	6824	170	63.8
Shrubs, grasslands and sparsely vegetated areas	22048	22146	98	819	147	719	6957	13260	245	62.1
Croplands	91218	91453	235	2044	728	1241	52692	33539	1210	53.0
Wetlands	4183	4183	0	408	69	149	2593	688	276	57.9
Artificial areas	1815	1815	0	255	58	78	1073	342	8	56.6
Bare land and other areas	219	219	0	76	0	24	79	3	36	64.3
SOC average (ton/ha)										**55.6**
Percent of total land area				3%	1%	2%	51%	42%	1%	
Total (sq km)	**130479**	**130479**		**3680**	**1052**	**2361**	**66784**	**54656**	**1946**	

Table-2: Land Productivity Dynamics trends

Changing Land Use/Cover Category	Net land productivity dynamics (NetLPD) trend during 2000-2010 (km^2)					
	Declining	Early signs of decline	Stable but stressed	Stable (not stressed)	Increasing	Total
Forest to Cropland	9.5	6.0	4.9	92.7	109.9	**222.9**
Forest to Shrubs, grasslands and sparsely vegetated areas	1.4	0.5	2.0	23.0	68.9	**95.7**

Table-3: Soil Organic Carbon Status

Changing Land Use/Cover Category	Net area change (2000-2010)	Soil organic carbon at 0-30 cm during 2000-2010				
	km^2	2000 (ton/ha)	2010 (ton/ha)	Total (ton in 2000)	Total (ton in 2010)	loss (ton) during 2000- 2010
Forest to Cropland	235.4	64.6	48.5	1520244	1140975	379269
Forest to Shrubs, grasslands and sparsely vegetated areas	98.4	66.7	66.7	656172	656172	0
Total	**333.8**	**131.3**	**115.2**	**2176416**	**1797147**	**379269**
Percent loss total SOC stock (country)						**0.052%**

(**) Values for NetLPD and SOC are only for areas where Land Use/Cover is unchanged from 2000-2010.

(***) 'No Data' includes snow, ice, desert areas, water bodies, and missing pixels

(****) Change in SOC due to changing Land Use/Cover derived from IPCC Good Practice Guidance for LULUCF(2006).

(*****) The areas corresponding to marine and other major international water bodies are excluded as out of LDN TSP scope which concerns degradation on terrestrial ecosystems only. Wetlands and smaller sweet water bodies are included as they are an integral part of the surrounding terrestrial areas that deliver the corresponding ecosystem services.

(^) Where LPD totals differ from the Net area change (2000-2010) in Table 3, the differences are due to LPD No Data values being excluded from Table 2

Annex-4

List of reports submitted (available in Dropbox of UNCCD)

January-2017
- Bang-LDN TSP Country Consultants report-Jan17
- Jan-Draft Stakeholders list
- Jan-LDN Working Group (proposed)

February-2017
- Bang-LDN TSP Country Consultants report-Feb17
- LDN_Leverage plan-Draft

March -2017
- Bang-LDN TSP Country Consultants report-March 17
- Attendance sheet-2
- Attendance sheet-1
- 15 March meeting
- 15 March meeting-3

April-2017
- Bang-LDN TSP Country Consultants report-April 17

May-2017
- Minutes 2nd WG-LDN
- Bang-LDN TSP Country Consultants report-May17
- BAN- LEVERAGING PLAN (First draft)

June-2017
- Bang-LDN TSP Country Consultants report-June17

July-2017
- Bang-LDN TSP Country consultants report-June17
- Workshop (16-17 July) feedback
- Targets of Bangladesh-July

August-2017
- Bang-LDN TSP Country Consultants report- Aug -17
- LDN-TSP_EN-04-08-17
- UNCCD COP 13 position paper –JS
- LDN-TSP interim report-18-08-17

September-2017
- Bang-LDN TSP Country Consultants report- Sept-17
- Comments on LDN-Bangladesh profile
- High-level note on LDN-Final
- LDN-Lesson learned

Annex-5

Description of six land cover categories as of IPCC and European Space Agency (ESA), Climate Change Initiative (CCI). (IPCC,2016)

Descriptions of Land cover categories	ESA CCI-LC classes (codes)
Forests	Tree broadleaved evergreen, Tree broadleaved deciduous, Tree needle-leaved evergreen, Tree needle-leaved deciduous, Tree mixed leaf type, Mosaic tree, shrub / HC, Tree flooded, freshwater, (50, 60, 61, 62, 70, 71, 72, 80, 81, 82, 90, 100, 160)
Shrubs, grasslands and sparsely vegetated areas	Mosaic vegetation / cropland, Mosaic HC / tree, shrub, Shrubland, Grassland, Lichens and mosses, Sparse vegetation, (40,110, 120, 121, 122, 130, 140, 150, 152, 153)
Cropland	Cropland, rainfed, Cropland irrigated / post-flooding, Mosaic cropland / vegetation (10, 11, 12, 20, 30)
Wetlands	Tree flooded saline water, Shrub or herbaceous flooded, (170,180)
Artificial areas	Urban areas (190)
Bare land and other areas	Bare areas, Permanent snow, and ice (200, 201, 202, 220)
Waterbody	Water bodies: natural/artificial, standing/flowing, inland/sea (210)

Annex-6

Government of People's Republic of Bangladesh
Ministry of Environment and Forests
Environment Branch -2
www.moef.gov.bd

Subject: Minutes of the 1" Meeting of Working Group on Land Degradation Neutrality (LDN) - Target Setting Programme (TSP)

Date : 13-04-2017
Time : 11:00 am
Venue : Conference Room, Ministry of Environment and Forests, Bangladesh Secretariat
Presided by : Md. Nurul Karim, Additional Secretary (Env.). Ministry of Environment and Forests and Conceitor of Working Group (WG) of LDN-TSP.

List of Attendees: Annex-1

The meeting was started with the welcome address of Chairman of the meeting. The purposes, obligations and focus of the meeting were briefly discussed. The discussion was substantiated by Ms Khorsheda Yasmeen, Deputy Secretary and Member-Secretary of WG as she presented LDN-TSP is a Tollow ju of Sustainab.e Development Goal (SDG) target 15.3: "By 2030 Combat desertification, restore Gearded an d soil including land effected by desertification, drought, and floods, and strive to achieve a Lann Dégradation Neutral world" LDN-TSP adopted from COP12. She also informed about the area of Working Group which was formed complying the decision of meeting held on 15 March 2017 with the Secretary of Ministry of Environment and forests (MoEF) and National Focal Point of UNCCD.

The following issues were discussed in the meeting

1. Finalization and approval of Stakeholder list for upcoming LDN-TSP inception workshops and related issues to the workshop
2. LDN-TSP voluntary target setting work plan
3. Draft Leverage plan
4. Skype meeting with Bangladesh team and UNCCD team
5. Miscellaneous

Chairman requested Country Consultant MrJalal Uddin Md. Shoaib to initiate discussion as per agenda:

Sl No	Agenda	Discussion	Decision	Implementation
1.	Finalization and approval of Stakeholder list for upcoming LDN-TSP inception Workshops	Detail discussion was held on draft list of stakeholders for upcoming LDN-TSP inception workshop. With few modifications the list was finalized. Country Consultant will update the list following the discussion and send it to the Ministry soon. Workshop venue will be selected either seminar room of Centre for International Rural Development for Asia and Pacific (CIRDAP), if not available then LGED conference room could be	1. Date of the workshop was settled as 23 May to 25 May 2017 2. List of Stakeholders to be updated. 3. Venue of the workshop will be at CIRDAP or LGED conference room	1. DoE, Consultant, MoEF 2. Consultant, DoE, MoEF

Sl No	Agenda	Discussion	Decision	Implementation
		confirm the venue in consultation with the concerned persons of Department of Environment and Ministry as well. The date of workshop also finalred in the meeting as 23 May to 25 May 2017.		
2.	LDN-TSP voluntary target setting work plan	LDN-TSP work plan was discussed and to minimize timeline upcoming workshop will include both inception and base line data validation. Instead of four day workshop it will be of 03 days. Consultant and Dr. Sohrab Al, Director, DoE Will prepare protocol or modus operandi for approval in next WG meeting	1. Inception and base line data validation will be included in the workshop. 2. Protocol and Modus operandi of the workshop will be developed.	1. DoE, Consultant 2.DoE, Consultant
3.	Draft leverage plan	Discussion on draft Leverage plan was done, why it is needed and how to work on it to achieve targets including all sectors, priorities, stakeholders, transformative processes and financial opportunities etc. The chair requested to country Consultant to finalize the plan and share with all WG members for comment and to be placed in the next meeting of WG	Country Consultant will finalize the plan and share it with all WG members for comment and will place to the next meeting of WG.	Country Consultant
4.	Skype meeting with Bangladesh team and UNCCD	Skype discussion between Bangladesh team and UNCCD was tried but due to technical error it could not reached either. But later there was a telephonic discussion between the Convenor of WG Md. Nurul Karim, Additional Secretary: MoEF and Ms Yasmeen T LWALA Asia Pacific Regional Lead, Land Degradation Neutrality Target Setting. The Global Mechanism of the UNCCD, Global Mechanism Röme Liaison Office at the Food and Agriculture Organization of the United Nations (FAO). Viale delle Terme di Caracalls, 684. The feed back of the discussion was communicated following an email.	Country Consultant will finalize the plan and share it with all WG members for comment and will place to the next meeting of WG.	Country Consultant

Sl No	Agenda	Discussion	Decision	Implementation
5.	Miscellaneous	1. Discussion was held regarding baseline data management. Considering the issue of ownership, smooth coordination and national Focal point of UNCCD as MoEF, DoE has been recommended for baseline data management institute. 2. To co-opt the member of Soil Resource Development Institute (SRDI), Department of Agricultural Extension (DAE), Department of Forest (DF) and Water Development Board (WDB) in the WG has been discussed and recommended accordingly 3. Henceforth the meeting resolution will be in English to ease communication with UNCCD and other relevant organizations. 4. The Chair requested to the members of WG to facilitate and share Country consultant at their level and departments while working with base line data. 5. At the end of May 2017 the date of next meeting of WG can be settled.	1. Department of Environment will work as baseline data management institute for LDN-TSP process. 2. The member of Soil Resource Development Institute (SRDI), Department of Agricultural Extension (DAE), Department of Forest, Water Development Board in the WG was co-opted. 3. The meeting resolution will be in English to ease communication with UNCCD and other relevant international organizations. 4. The Members of WG will facilitate and share Country consultant at their level and departments while working with base line data. 5. The date of next meeting of WG was settled on 17 May, 2017.	1. DoE, MoEF 2. MoEF 3. MoEF 4. Concerned member of the WG 5. Consultant, DoE, MoEF

The Chair concluded meeting extending thanks to the participating members.

Md. Nurul Karim
Additional Secretary (Env.), MoEF
& Convenor, WG, LDN-TSP

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
পরিবেশ ও বন মন্ত্রণালয়
পরিবেশ অধিশাখা-২

বিষয়: ১৩/০৪/২০১৭ খ্রি. তারিখ বৃহস্পতিবার বেলা ১১.০০টায় United Nations Convention to Combat Desertification (UNCCD) এর আওতায় Land Degradation Neutrality (LDN)-Target Setting Programme (TSP)-এর কার্যক্রম তত্ত্বাবধানে জন্য গঠিত ওয়ার্কিং গ্রুপ এর প্রথম সভায় উপস্থিত কর্মকর্তাবৃন্দের তালিকা।

ক্রমিক নং	কর্মকর্তার নাম ও পদবি	মন্ত্রণালয়/বিভাগ/অধিঃ/সংস্থার নাম (ফোন নম্বর, ই-মেইল)	স্বাক্ষর
১.			
২.	এ বি এম নাসিরুল আলম যুগ্মসচিব	পার্বত্য চট্টগ্রাম বিষয়ক মন্ত্রণালয়, abmnasir_61@yahoo.com [illegible]	[signature] ১৩/০৪/১৭
৩.	সুকুমার দত্ত সি. এস. ও	[illegible] duttasukumar@yahoo.com 01552349869	[signature] ১৩/০৪/১৭
৪.	এস. এম. ইমরুল হাসান সিনিয়র সহকারী প্রধান	[illegible] [illegible] imru_07@yahoo.com	I. Hasan ১৩/৪/২০১৭
৫.	ড. কে. এম. [illegible] [illegible] উপসচিব	[illegible] 01721046784 kselim602@yahoo.com	[signature] ১৩/৪/১৭
৬.	ড. মু: সোহরাব আলী পরিচালক ([illegible])	পরিবেশ অধিদপ্তর 01712125880 md.sohrab_ali@yahoo.com	[signature] ১৩/৪/১৭
৭.	[illegible] উপ-সচিব পানি সম্পদ মন্ত্রণালয়	[illegible]@hotmail.com [illegible]	[signature] ১৩/৪/১৭
৮.	[illegible] উপসচিব	jalal_shoail@yahoo.com	[signature]
৯.	JALAL UDDIN SHOAIB C.C.	বন, 01715-615188	[signature] ১৩/০৪/১৭

Annex-7

Government of People's Republic of Bangladesh
Ministry of Environment and Forests
Environment Branch -2
www.moe.gov.bd

Minutes of the second meeting of Working Group on Land Degradation Neutrality (LDN) - Target Setting Programme (TSP)

Date : 04-05-2017
Time : 3:00 pm
Venue : Conference Room, Ministry of Environment and Forests, Bangladesh Secretariat, Dhaka.
Presided by : Md. Nurul Karim, Additional Secretary (Env.), Ministry of Environment and Forests and Convenor of Working Group (WG) of LDN-TSP.

List of Attendees: Annex-1

The meeting was started with the welcome address of Chairman of the meeting. At the beginning. he shared the background information relating to LDN-TSP to the members and then requested to Country Consultant, Mr Jalal Uddin Md Shoaib to initiate discussion as per agenda. As a result, the following issues were accordingly discussed:

Sl No	Agenda	Discussion	Decision	Implementation
1.	Finalization and approval of Stakeholders list and Venue selection for upcoming LDN TSP inception workshop	1. Detail discussion on the finalization of stakeholders list and completion of approval process of this list was held for ensuring participation in the upcoming workshop on 23-25 May 2017. Nomination of the participants from concerned Ministry/Division/Department, especially participants from other cities like Chittagong, Dhaka, Gazipur, Khulna, Rajshahi and Sylhet was also discussed. 2. Significance of participation of WG members in workshop was discussed. 3. Consultant informed that UNCCD intended to get the Venue as single vendor or point, where both accommodation for participants from outside Dhaka and conference space are available as of their business standard. As follow up Pan Pacific Sonargaon, RadissionBlu, Westin and La Meridian were proposed on priority basis. UNCCD will finalize the venue as soon as a list of participants from outside Dhaka is made available to them.	1. Letters will be sent to concerned stakeholders for collecting nomination and Particulars of participants following UNCCD format 2. Concerned Ministryd Division/Depart ment will be requested to nominate WG members as their representatives to participate upcoming workshop. 3. Consultant will inform the Ministry about the confirmation of Venue	1. MoEF, DoE 2. MoEF, DoE 3. MoEF, DoE 4. DoE, Consultant

Sl No	Agenda	Discussion	Decision	Implementation
2.	LDN-TSP voluntary target setting work plan	1. Issues related to baseline data of both Global and National level were discussed. Representatives from the Department of Forest . BARC. DAE SRDI, SPARRSO and BWDB informed that they have data in their own form. Consultant suggested for validating Global and National baseline data from Department of Forestry, BARC, SRDI, SPARRSO, DAE, BWDB, BBS and Geological survey of Bangladesh by tern. 2. Discussion about a draft protocol and schedule of workshop was also made. In this perspective, Chairman requested to WG members other than DoE to participate in workshop as thematic presenter	1. Relevant institutions such as Department of Forestry BARC, SRDI, SPARRSO. DAE, BWDB, BBS and Geological Survey of Bangladesh (GSB) will share data especially land Cover Changes (LCC), Land Productivity Decline (LPD) and Soil Organic Carbon (SOC) status in Bangladesh for 2000 & 2010 or closest time line. 2. Consultant will share Global data with concerned institutions soon. 3. Consultant will propose a program to concerned institutions and Submit update in upcoming WG meeting on 17 May 2017. 4. Department of Forestry, SRDI BARC, DAE, and SPARRSO will present baseline data on LCC, LPD & SOC or relevant	1. MoEF and DoE, Forestry. BARC, SRDI, SPARRSO. DAE, BWDB, BBS and geological survey 2. DoE, Consultant 3. MoEF, DoE, Forestry. SRDI, BARC, DAE, SPARRSO will present baseline data on LCC, LPD & SOC. 4. Concerned WG members, Consultant 5. DoE, MoEF

Sl No	Agenda	Discussion	Decision	Implementation
			information in the workshop 5. Workshop schedule will be finalized and placed it to the upcoming WG meeting on 17 May 2017	
3.	Draft leverage plan	Discussion on Leverage plan was held and possibility of ncorporation of baseline data to set targets was proposed.	leverage Plan will be updated after data validation.	DoE, Consultant
4.	Miscellaneous	Finalization of the date for next WG meeting which was settled in the 1' Wá meeting was also discussed	Next WG meeting will be held on 17 May 2017 at MoEF.	MoEF DoE

The Chair conduded meeting extending thanks to the participating members.

Md. Nurul Karim
Additional Secretary (Env.), MOEF
& Convenor of WG, LDN-TSP

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
পরিবেশ ও বন মন্ত্রণালয়
পরিবেশ অধিশাখা-২

বিষয়: ০৪/০৫/২০১৭ তারিখ বিকাল ৩.০০টায় অনুষ্ঠিত United Nations Convention to Combat Desertification (UNCCD) এর আওতায় Land Degradation Neutrality (LDN)-Target Setting Programme (TSP)-এর কার্যক্রম তত্ত্বাবধানে জন্য গঠিত Working Group এর ২য় সভায় উপস্থিত কর্মকর্তাবৃন্দের তালিকা।

ক্রমিক নং	কর্মকর্তার নাম ও পদবি	মন্ত্রণালয়/বিভাগ/অধিঃ/সংস্থার নাম (ফোন নম্বর, ই-মেইল)	স্বাক্ষর
১.			
২.			
৩.			
৪.			
৫.			
৬.			
৭.			
৮.			
৯.			

ক্রমিক নং	কর্মকর্তার নাম ও পদবি	মন্ত্রণালয়/বিভাগ/অধিঃ/সংস্থার নাম (ফোন নম্বর, ই-মেইল)	স্বাক্ষর
১০.	JALALUDDIN MD. SHOAIB	Consultant. UNCCD-LDN Project. jalal.shoaib@yahoo.com.	
১১.	SYED ABUL HASANAT Asstt Director.	Bangladesh Meteorological Department hasanat2001@yahoo.com 01714202486	
১২.	Md. Belal Uddin Biswas Deputy chief	BCCDP, Office of the chief planning, WAPDA Bhaban, Motijheel, Dhaka.	belalbiswas@yahoo.com 01711264573
১৩.	Mohammad Shahid Arif Deputy Secretary	01716550@yahoo.com Local Government Division	4.5.17 01711735527
১৪.	Dr. Md. Sohrab Ali Director	DoF	Mali 04.5.17
১৫.	Khorshida Yasmeen Deputy Secretary	MOEF	04/05/17

References

1. Agri Yearbook 2012, Bangladesh Bureau of statistics (BBS), 2012.
2. Bangladesh National Action Program (NAP) for Combating Desertification, Land Degradation and Drought 2015-2024, MoEF, 2015.
3. Hasanat.el (2013). https://www.researchgate.net/publication/259951473_Agricultural_Land_Availability_in_Bangladesh
4. Good practice Guideline for LULUCF, IPCC (2016). Land Resources Appraisal of Bangladesh for Agricultural Development,1988 (BGD/81/035), FAO/BARC (1988).
5. Global Forest Resources Assessment 2015. Desk reference. Food and Agriculture Organization of the United Nations, Rome, 2015 (www.fao.org/publications) Accessed 25 July 2016, FAO (2015).
6. Bangladesh Climate Change Strategy and Action Plan (BCCAP), 2009, MoEF (2009).
7. Salaluddin. M and Islam A.K.M.S. (2011). Identification of Land Cover Changes of the Haor area of Bangladesh using MODIS Images. 3rd International Conference on Water & Flood Management (ICWFM-2011). (http://teacher.buet.ac.bd/akmsaifulislam/publication/ICWFM2011_full_paper_133.pdf)
8. Map from Data processing Section, Soil Resource Development Institute (SRDI), 2009.
9. Soil Salinity in Coastal region, Soil Resource Development Institute (SRDI) 2010, (Personal communication).

Goberment of the
People's Republic of Bangladesh

National Land Degradation Neutrality (LDN) Targets

High Level Note

Sustainable Land Management (SLM)
best Practies in Bangladesh

LDN
Land Degradation Neutrality
Target Setting Programme

THE GLOBAL MECHANISM
United Nations Convention to Combat desertification

gef

Coherence with other National Commitments from Bangladesh

As per decision of COP 13 of the UNCCD Bangladesh reaffirms the commitment to achieve Land Degradation Neutrality (LDN) by 2030.

It also confirms to adapt mutually inclusive processes at all levels of the country that contribute to achieving the objectives of all other international commitments as CBD, UNFCCC, REDD+, etc. by updating the National Action Programs and implementing the Sustainable Development Agenda (which are integrated and indivisible), in particular Sustainable Development Goal (SDG) 15 – "Land for life" and its target 15.3- "By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought, and floods, and strive to achieve a land degradation-neutral world".

Notably, the UNCCD National Action Program (NAP) of Bangladesh has been updated and National Development Strategies were reorganized particularly in the sectors concerned with Agriculture, Natural Resources (Biodiversity) and Climate Change. These plans and strategies call for targeted policy interventions, strong awareness regarding policy compliance and technology adoption, adoption of budgets and their role in ensuring accountability for the effective implementation of the commitments.

Strong effective implementation mechanisms will be established with all institutions/stakeholders, including the public and private institutions; regional, sub-regional and local authorities; international institutions, academia, philanthropic organizations, volunteer groups, etc.) to address land degradation and seasonal drought (desertification) in the country.

The default global data was used for setting national LDN targets taking into account the three LDN indicators, i.e. Land Cover, Land Productivity Dynamics (LPD) and Soil Organic Carbon (SOC). The LDN baseline will be revised while national data will be available. The LDN targets were accepted provisionally and may be adjusted in the future once additional data becomes available.

Voluntary National LDN Targets
Based on the national commitment to achieve LDN by 2030, the following preliminary LDN targets have been defined for Bangladesh:

Target 1: To improve soil fertility and Carbonstatus in 2000 km^2 of the cropland area.
Target 2: To reduce land use/ cover conversion in 600 km^2 of forest area.
Target 3: To reduce waterlogging in 600 km^2 area.
Target 4: To reduce soil erosion in hilly areas in 600 km^2 area.
Target 5: To protect non-saline land areas from salinity intrusion in 1200 km^2 in the coastal zone area.
Target 6: To reduce riverbank erosion @100ha/year covering 100 km^2 areas.

In order to meet the commitments stated above, the following areas will be strengthened to be able to successfully coordinate the implementation of measures to achieve the identified national targets:

- Political ownership to strengthen compliance of LDN with broader socioeconomic perspectives.
- National institutions will be given authority and ensure accountability to implement measures to achieve LDN ;
- LDN principles will be blended to design and/or implement sectoral policies/strategies at all levels vide public and private sectors, academia, research, civil societies, etc. through establishing better communication and outreach, engaging citizens, stakeholders, and communities;
- Upscaling the capacity for cross-sectorial innovation through the National Working Group (NWG) on Sustainable Land Management (SLM) to create conditions for sustainable, inclusive and sustained economic growth and promote gender equality, empowerment, shared prosperity and decent work for all, considering different levels of national development and capacities between now and 2030;

- Financial incentives will be provided to promote research and development (R&D) on sustainable land management in relation to land degradation, biodiversity, and climate change;
- Bangladesh Climate Change Trust Fund (BCCTF) and national accredited entities (Green Climate Fund) will be strengthened and blended to all other funding sectors, vide National and least Developed Country Fund (LDCF), and/or global partnerships, especially from the Global Environment Facility (GEF) and Global Mechanism (GM) as an accelerator to link up the financial resources.

Associated measures identified to achieve LDN

Associated measures of the above targets to achieve Land Degradation Neutrality (LDN) by 2030 are as follows:

Target-1: To improve soil fertility and Carbon status in 2000 km^2 of cropland area.

1a. Agronomic measures			*1500 km^2*
	1a.1	Balance fertilizer usage @ 10000 farmers per year following online and offline fertilizer recommendation system or fertilizer recommendation Guide	
	1a.2	Use of organic manure, Farm compost, vermicomposting, Bio char	300 km^2
	1a.3	Alternate wet and drying (AWD) of winter rice (boro) areas	200 km^2
	1a.4	Incorporation of leguminous crop in crop rotation	200 km^2
1b.Vegetative measures			*500 km^2*
	1b.1	Agroforestry/rural forestry	400 km^2
	1b.2	Introduction of leguminous shrubs/tree plantation or growing vegetable on field bunds as appropriate	100 km^2
1c. *Management measures*			
	1c.1	Advocacy on SLM practices &	
	1c.2	Incorporation of SLM practices in extension training manual in above areas	

Target-2: **To reduce land use change/ cover conversion in 600 km^2 of forest area.**

2a. Vegetative measures			*250 km^2*
	2a.1	A forestation, Reforestation, Social Forestry, Agroforestry, horticulture	250 km^2
2b. Vegetative measures			*350km^2*
	2b.1	Alternative to brick manufacture Effective advocacy on existing policy and implementation;	250 km^2
	2b.2	Enforcement of existing policy/laws and/or National Land policies and associated directives	100 km^2

Target-3: To reduce water logging in 600 km^2 area.

3a. Structural Measures			*600 km^2*
	3a.1	Alternative Provision of adequate culverts or water out lets, Excavation of channels and ponds (Kash); to brick Manufacture effective advocacy on existing policy and implementation	600 km^2

Target-4: To reduce soil erosion in hilly areas in 600 km^2

4a.Agronomic measures		*300 km^2*
4a.1	Agroforestry/horticulture and no tillage on slope	300 km^2
4b. Vegetative measures		*200km^2*
4b.1	Introducing hedgerow across the slope by leguminous shrubs	100 km^2
4b.2	Afforestation	100 km^2
4c.Management measures		100 km^2
4c.1	Advocacy on SLM to avoid shifting cultivation	100 km^2

Target-5: To protect non saline land areas from salinity intrusion in 1200 km^2

5a. Management measures		*1200 km^2*
5a.1	Restricting salt and shrimp land area	**1200km^2**
5a.2	Introducing High-value salt-tolerant crops	
5.3	Increasing surface (fresh) water reserve in channels and ponds	
5a.4	Community base polder management	

Target-6: To reducing river bank erosion @100 ha Per year in 100 km^2

6a. Vegetative measures

6a.1 Establishing green belt, Afforestation along river banks and char lands

6b.Management measures

6b.1 River/channel dredging

Institutional arrangements to achieve LDN

The following Ministries and departments will be involved in achieving LDN in Bangladesh:

Ministry of Environment, Forest and Climate Change (MoEF&CC) as lead Institution, Ministry of Agriculture (MoA), Ministry of Land (MoL), Ministry of Water Resources (MoWR), Ministry of Chittagong Hill Tracts Affairs (MoCHTA), Ministry of Finance (MoF), Ministry of Planning (MoP)-IMED, Ministry of Local Government Engineering Department (LGRD) and Cooperatives, Ministry of Disaster Management and Relief (MoDMR), Ministry of Health and Family Welfare (MoHFW) and Ministry of Women and Children Affairs (MoWCA); Department of Environment (DoE), Forest Department (FD), Bangladesh Agricultural Research Council (BARC), Department of Agricultural Extension (DAE), Soil Resource Development Institute (SRDI), Space Research and Remote Sensing Organization (SPARRSO), Bangladesh Bureau of Statistics (BBS), Bangladesh Meteorological Department (BMD).

In addition, Private Institutions, Academic, Non-Government Organizations, development partners and others those are engaged in natural resources management and research, will also be included in the LDN process.


THE GLOBAL MECHANISM
Chief Guest: Mr. Istiaque Ahmad, Secretary. Ministry of Environment and Forests.
Special Guest: Mr.Nurul Karim, Additional Secretary, Ministry of Environment and Fores
Environment and Forests (MOE
Convention to Combat Dese on (UNCCD)