Final Country Report LDN Target Setting Programme - Republic of Seychelles

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Summary

The government of the Republic of Seychelles has over the past two decades become very aware of the threats of land degradation. Land degradation in Seychelles mainly occurs due to forest fires, clearing of forest for development purposes (agriculture, including plantations; housing; tourist facilities; infrastructure), effects of invasive alien species, unsustainable agriculture, construction practices and landslides / rock falls. In 1997 it ratified the United Nations Convention to Combat Desertification (UNCCD), and ever since the country has been an active party to it. Land degradation in Seychelles has been addressed since then through a number of government funded schemes as well as related UNDP/GEF funded projects such as:

- Coastal erosion adaptation and rehabilitation programs
- Capacity building for sustainable land management (SLM);
- Expansion and strengthening of the protected area subsystem of the outer islands of Seychelles and its integration into the broader land and seascape;
- Mainstreaming biodiversity management into production sector activities (the development and implementation of land, water and coastal use plans).

In 2012 the National Action Plan (NAP) for SLM was approved at cabinet level and planned for implementation under the Seychelles Sustainable Development Strategy 2012-2020. The NAP sets out long term strategies aimed at achieving land management within the country mainly through the precautionary approach such as policy review, capacity building, awareness raising and education on SLM. The NAP has six specific goals:

1. Land use planning and management is supportive of sustainable land management;
2. Forested land and watersheds are sustainably managed;
3. Agricultural land and water is sustainably managed and contributing to food security in the Seychelles;
4. Physical infrastructure developments and coastal zone developments are supportive of sustainable land management;
5. Integrated water management and sustainable land management are mutually supportive;
6. Climate change adaptation measures are adequate to combat land degradation.

In May 2018, the Republic of Seychelles validated its Land Degradation Neutrality (LDN) targets and associated measures under the LDN Target Setting Programme (TSP) of the United Nations Convention to Combat Desertification (UNCCD) as contribution to the Sustainable Development Goals for 2030.
OVERALL LDN TARGETS TO MINIMIZE AND REVERSE LAND DEGRADATION TO ACHIEVE LDN BY 2030

Overall LDN Targets:

- Maintain forest cover through sustainable management of forest and biodiversity over an area of 287 Km² (2,870 Ha);
- Maintain and restore coastal wetlands and mangroves forests over an area of 7.93 Km² (793 Ha);
- Expand and promote good/smart agricultural/agronomic measures and practises over an area of 6.82 Km² (682 Ha);
- Apply effective LDN and SLM/ land use planning and contain urban/artificial areas within an overall area of 56.6 Km² (5660 Ha);
- Put in place an LDN monitoring system (GIS & Remote Sensing) and develop adequate human resources skills at the national level to continuously assess and review the land use/cover carrying capacity/LDN measures of each sector annually to achieve LDN.

Key LDN Measures:

Forest and Biodiversity Cover:

- Rehabilitate/restore degraded lands on steep slopes and maintain overall forest cover;
- Manage invasive alien species, restoration and expansion of the protected area networks in key biodiversity areas adjoining native forests earmarked in the Seychelles Strategic Land Use development Plan (SSLUP) Spatial Strategy Map;
- Forest Fire Management Plan (maintaining a fire breaks forest-settlement interface and key biodiversity areas, protected areas (National Parks and Nature Reserves).

Wetland and Mangroves Cover:

- Ecosystem based adaptation projects in wetland restoration and shoreline management plan as LDN preventive measures against saline water intrusion;
- Apply Ridge to Reef approaches in managing productive landscapes to achieve LDN.

Agricultural Land Cover:

- Protect highly productive agricultural land from land conversion for development purposes;
- Promote SLM and good agricultural practises;
- Provide financial and technical incentives to farmers to maintain and encourage agronomic and agroforestry expansion with stewardship schemes.

Urban /Artificial Areas Land Cover:

- Prepare specific LDN land use planning and detailed urban design guidelines (scale, height, floor areas ratio, plot coverage) for artificial areas /urban development including steep slopes;
- Minimise impervious layers wherever possible;
- Define effective building plot coverage to achieve LDN;
- Promote vertical extension rather than horizontal sprawl of artificial areas /urban settlement expansion;
- Promote tree/forest conservation and native plants as soft landscaping features on at least 65 % of the overall plot area;
- Encourage step building design and construction adapted to contour /slope minimise cut and fill(excavation);
- Encourage water sensitive urban designs and minimise impervious layers wherever possible;
- Implement Sustainable Urban Drainage System (using natural processes/System to manage urban runoff water.
1.0 Introduction

The Seychelles is an island archipelago in the Western Indian Ocean located between 3 and 10 degrees south of the equator and between longitude 46 and 57 degrees east. The total land mass of Seychelles is 455 square km, and it has an Exclusive Economic Zone (EEZ) covering 1.374 million square km. Seychelles consists of 155 islands, of which 42 are granitic and the rest of coralline origin. The granitic islands of the Seychelles consisting of the main islands of Mahe, Praslin, Silhouette and La Digue are composed of a core of ancient granitic rock which forms the steep uplands, with narrow surrounding coastal plains formed by beach sand. Both types of soils are physically and chemically poor. Approximately 80% of Seychelles land area is under some form of forest or vegetation cover, and the remaining area is more or less urbanized in the main islands. The remaining coralline islands are small in size and known as the “outer islands”.

Source: Capacity Building for Sustainable land Management Project for Seychelles UNDP/GEF

Figure 1: Location of Granitic Islands Seychelles.
2.0 Land Degradation in Seychelles

Land degradation in Seychelles, mainly occurs due to forest fires, clearing of forest for development purposes (agriculture, including plantations; housing; tourist facilities; infrastructure), impacts of invasive alien species, unsustainable agriculture, construction practices and landslides / rock falls. The Seychelles Damage, Loss, and Needs Assessment (DaLA) carried out in 2013 and the Floods report from January 2013 assessed the (possible effects of climate change tropical cyclones forming nearer to Seychelles’ islands) and indicated that heavy rains resulting from the tropical cyclone Felleng caused severe flooding and landslides in the Seychelles. The intense rainfall over two days overwhelmed existing natural and constructed drainage systems and retaining walls, causing floods, landslides, rock falls, and resulting in serious damage to homes and public buildings, roads, bridges, drainage systems, water and sanitation systems, crops, and farms.

The UNCCD National Action Plan (NAP) 2012 identified the causes of Land degradation in Seychelles as:

- Forest fires though infrequent have been identified as one of the major causes of deforestation specifically on Praslin island, which results in a loss of forest cover, leading to further land degradation;
- The conversion of land for agriculture, building of settlements and associated infrastructures on ecologically sensitive marginal lands and steep slopes;
- The unsustainable harvesting of forest products, cultural tradition of burning refuse and vegetation as well as the uncontrollable invasion of alien creepers in forest areas are causes of land degradation;
- Unsustainable agriculture is another threat leading to land degradation. When the topsoil vegetation cover is removed on cultivated upland slopes, the soil becomes impoverished. Farming activities have migrated upland due to the increasing development pressures on the flat coastal plains to accommodate for the tourism industry and housing. Consequently, the loss of the fertile topsoil leads to a decrease in the infiltration capacity of the soil, which increases run-off especially after torrential rains, causing soil erosions, landslides and rock falls. Furthermore, reduced fallow period from intensive crop farming leads to depletion in essential soil nutrients;
- Other causes of land degradation include unauthorized constructions and reclamations of Wetlands, inadequate soil conservation measures and insecure land tenure ship, having little incentives to invest in sustainable land management;
- Erosion, pollution and the loss of fertility of agricultural land, and urban encroachment onto agriculture land;
- Climate change, is a threat to forests, agricultural land and land in coastal areas (coastal erosion and salt water intrusion);
- Land development pressure to develop residential areas, tourism projects and other developments which can disfigure land and cause erosion, both in coastal areas and in pristine forests.

Land degradation in Seychelles is being addressed through a number of government funded schemes as well as related UNDP/GEF funded projects such as:
- Coastal erosion adaptation and rehabilitation programs
- Capacity building for SLM;
- Expansion and strengthening of the protected area subsystem of the outer islands of Seychelles and its integration into the broader land and seascape;
- Mainstreaming biodiversity management into production sector activities (development and implementation of Land, Water and Coastal Use Plans).

2.1 Legal and Institutional Environment

Seychelles has an extensive legislative framework for land and environment management covering most of the land use sectors. Some legislation should be reviewed to reflect the present situations and take into account the country’s challenges to combat land degradation, disaster risk reduction and the effect of climate change. The main objectives of the Environment Protection Act 2016 are to eliminate fragmented legislations and strengthen environment protection at a broader level. Other legislation on land and environment currently under development are:
- the Protected Areas Bill,
- the Biodiversity Bill,
- the Physical Development Act

These new legislations will further harmonize and consolidate SLM and environment conservation in Seychelles. The existing legislations related to land management in Seychelles are:

- **The Environment Protection Act (EPA, 2016)** has been revised and up scaled to better protect, improve and preserve the environment and provide policies for environmental impact assessment process, the establishment of sensitive areas, wetland protection, coastal zone management, waste management standards and makes provision for prevention, control and abatement of environmental pollution.
- Under the EPA, the **Environment Impact Assessment (EIA)** Regulation requires that, for certain categories of projects or activities, an EIA must be prepared, and an environmental authorization issued. This Regulation aims to ensure that new infrastructure developments do not cause land degradation;

- **The Town and Country Planning Act of 1972** is under review to be replaced by the **Physical Development Act** to bring it up to speed with the pace of development with regards to National physical development strategy and local district land use plans.

- **Seychelles Strategic Land Use development Plan (2014-2040)** approved at cabinet level sets the national strategic land use planning framework for Seychelles.

- **National Parks and Nature Conservancy Ordinance** (1971, amended in 1973 and 1982) covers the establishment of National Parks and Special Reserves;

- **State Land and River Reserves Act** (Cap 150) of 1903 establishes the role for forest rangers, and establishes the concept of watershed protection zones along rivers and rivulets.

- **Lighting of Fires (Restriction) Ordinance** (Cap 232) of 1940 establishes the concept of areas where lighting fires is banned, by order of the Minister responsible for agriculture. Fire bans can be seasonal however significant to Forest Fire prevention and disaster risk reduction;

- **Breadfruit and Other Trees Act** (Cap 122) of 1917, amended in 1988 and 1994. This provides guidance for harvesting more than 30 species of fruit and non-fruit trees and practise of agroforestry;

- **Forest Reserves Ordinance** (Cap 153) of 1955, makes provision for the designation and protection of some specific type of forest land into reserves;

- **The Coco de Mer (Management Decree)** of 1979, amended in 1994, provides for the protection of this fruit tree and national symbol;

- **Cabinet Decision (2002)** on ensuring that all designated agricultural land is only used for agriculture;

- **The National Policy on Disaster Management (2006)** aims at addressing the increasing incidences and emergence of disasters. The National Disaster Secretariat is carrying out a country wide risk and vulnerability assessment, and produces land movements risk map for every district.

- **Landscape and Waste Management Agency Regulations (2009)**, provides landscaping competences to the designated waste agency.

The Integrated Financing Strategy (IFS) 2012 for SLM has also identified the following threats to the implementation of SLM in Seychelles:
• There is no clear institution responsible for advancing work in sustainable development and SLM and to align economic development with environmental and social aspirations.

• Institutions are often lacking financial and human capacity. There is a shortage of personnel qualified and inadequate financial resources to implement a number of capital-intensive projects.

• There is the need for the local population to be sensitized on the long-term benefits of SLM. For example, many farmers lack awareness of environmental implications of unsustainable agricultural practices.

• The key government agencies involved with economic planning, trade and investment do not necessarily factor environmental conditions in their planning and implementation processes.

• Environmental economics and land use carrying capacity assessment is not adequately considered in development permitting processes. Many of the reasons for land and environment degradation is the absence of appropriate cost benefit analysis, economic valuation, impact assessment for economic decision-making in both government and private sector.

• Decision-making in both government and business is often made in spite of lack of appropriate scientific information on factors leading to land degradation as well as their interactions with islands ecosystems.

• The policy framework concerning the lease agreements by farmers and livestock farmers is not conductive to best practices of SLM.

• The enforcement of legislation is poor due to weak institutional capacity and lack of skilled human resources for development control.

2.2 The LDN National Working Group (Technical Advisory Committee)

The LDN national working group was established on the 26 May 2017 after the LDN inception workshop. The LDN national working meeting was held at Conference Room, Ministry of Environment, Energy and Climate Change English River Victoria in Mahe. The national working group was termed as “LDN Technical Advisory Committee (TAC)” as per the local practises to be the custodian of LDN with the objective to steer the LDN target setting process, promote LDN mainstreaming, stimulate participation and stakeholder ownership and contribute to the national reporting mechanism to SDGs. The LDN TAC adopted the following terms of reference:

• Mobilize key national stakeholders and provide a transparent and inclusive platform for LDN through participatory planning, involving government bodies, civil society organization, interest groups and private sector groups;
• Provide high level orientation and technical guidance for the LDN target setting process and beyond.
• Ensure cross sectoral collaboration and knowledge sharing between institutions, CSOs and private organisations, for LDN and SDGs targets, access to key documents, land and environment information systems, LDN relevant geographic information data, remote sensing imagery, etc.
• Steer the LDN target setting process and promote LDN mainstreaming as well as stimulate participation and stakeholder ownership for a successful LDN process;
• Ensure that the LDN TSP develops in accordance with national development objectives, goals, policies and SDGs.
• Identifies leverage opportunities and ensures the integration, synergies and coordination of LDN with other related government and donor-funded initiatives.
• Support the mainstreaming and endorsement of national LDN target setting and LDN indicators;
• Identifies strategic LDN measures, programmes, projects and pilot sites and facilitate implementation;
• Develop an LDN monitoring and reporting system (Review and validation of national reports, work plans)
• Support for national outreach activities, sensitization and communication campaigns on LDN.

2.3 Leveraging Land Degradation Neutrality and SDGs

LDN is intrinsic to the SLM process, which enables the setting of specific measurable targets for the advancement of the SLM agenda in the Seychelles. The National Action Plan (NAP) for SLM was validated and endorsed and approved by Cabinet in July 2012 and incorporated as part of the national implementation mechanism of the Seychelles Sustainable Development Strategy 2012-2020. The NAP for SLM of Seychelles has six specific goals:

1. Land use planning and management is supportive of sustainable land management;
2. Forested land and watersheds are sustainably managed;
3. Agricultural land and water are sustainably managed and contributing to food security in the Seychelles;
4. Physical infrastructure developments and coastal zone developments are supportive of sustainable land management;
5. Integrated water management and sustainable land management are mutually supportive;
6. Climate change adaptation measures are adequate to combat land degradation.
The review of the National Development Strategy of Seychelles in view of its alignment to the Sustainable Development Goals (SDGs) 2030 and Programme Based Budgeting creates further leverage for LDN with SDG target 15.3. This can be achieved by setting up a SDG monitoring and reporting system (under the Ministry of Finance, Trade and Economic planning and the Bureau of Statistics Seychelles). SDG Target 15.3 directly contributes to maintain or enhance the land natural capital and associated ecosystem functions (landscapes) and services to other SDGs, including those relating to:

- climate change mitigation and adaptation,
- biodiversity conservation,
- ecosystem restoration,
- food and water security,
- disaster risk reduction, and
- poverty reduction;

Other significant LDN related leverage opportunities under implementation:

- Seychelles Strategic Land Use development Plan (2014-2040)
- Tourism Masterplan -Situational Analysis (2018)
  - National Parks and Nature Reserves,
  - Key biodiversity areas and invasive alien species management;
  - Protected Areas Network Expansion;
  - Wetland and Mangroves Restoration
- FAO National Forest Inventory and Policy, Seychelles 2017-2018

The UNDP Seychelles Office - Programme Coordinating Unit PCU/GOS/ UNDP/GEF is also working and implementing several LDN related projects on:

- SLM projects to reverse land degradation;
- Ecosystem based adaptation projects in Wetland restoration and shoreline management plan as preventive measures against saline water intrusion;
- Ridge to Reef approaches in managing productive landscapes as part of the proposed GEF 7 allocation for land degradation.
3.0 Land Degradation Neutrality Indicators

Setting the LDN baseline is a stock-taking exercise where a snapshot of the current land-based natural capital is taken; it does not provide direct information on the present status of land degradation.

A temporal assessment of land degradation trends, coupled with an analysis of the driving forces behind these trends, is an essential step in terms of understanding current conditions of land degradation, revealing anomalies and identifying degraded areas. Such an assessment has provided an indication of the evidence base for setting sound LDN targets, making decisions about potential interventions and prioritising efforts in areas where degradation is taking place. The trends of land degradation can be identified using the LDN default data provided by the UNCCD, mapping out indicators showing changes over a 10-15-year period and alignment of locally available data and overlaid and verified by digitized from Google Earth in figure 2 below.

![Map of LDN Baseline Indicators](image)

Figure 2: Mahe Digitised Artificial Area, Google Earth 2015.

3.1 LDN Baseline Indicators and Default Data

LDN is measured through three main national indicators to monitor change over a time span of 10-15 years. The indicators are complementary rather than additive and the components of land condition should be
analysed separately. However, land cover, while being an important indicator in its own right, should also be
used to stratify the other two indicators.

As per guidance of the LDN TSP, the baseline has been calculated by estimating, for each of the following
indicators, the average value across the 10-15-
year baseline period (t0):

1. land cover;
2. land productivity (metric: net primary
productivity); and
3. Carbon stocks above and below ground
(metric: SOC).

The use of this small set of comparable
indicators is recommended for LDN baseline
setting, detecting changes over time and
reporting progress towards LDN targets. For the
purposes of LDN, it is important to note that the
three indicators provide good coverage of the
land-based ecosystem services underpinning
LDN and together can be used to monitor the
quantity and quality of land-based natural
capital and the ecosystem services that flow
from that land base. In addition, the indicators address change in the system in different yet highly relevant
ways. Land cover provides a first indication of a reduction or increase in vegetation, habitat fragmentation
and land conversion. Land productivity captures relatively fast changes while SOC reflects slower changes
that suggest trajectory and proximity to thresholds. As mentioned above, these indicators can, however, be
complemented and enhanced by national (or subnational) level indicators to provide full coverage of the
ecosystem services and qualitative LDN measures and associated land use management strategies, policies,
action plans as well as institutional effectiveness in:

- avoiding land degradation through land use planning that fully accounts for the potential and
  resilience of land resources;
- adopting SLM policies and practices in order to minimize current land degradation;
- Rehabilitating / restoring of degraded lands.
With support of the Global Support Programme, the LDN TSP has provided the Seychelles with data derived from global data sets related to all three indicators for review, validation or substitution by nationally available data sets.

3.2 Land Cover

Land cover geographic higher resolution data was made available from the period 2000-2015 for Seychelles islands. The data sets consist of land cover change mapping over a 15-year period by using a combined series varying satellite image resolution of up to 30 mts pixel as per “Methodological note to set national voluntary LDN targets using the UNCCD indicator framework”\(^1\), which is aligned with the Guidelines for National Greenhouse Gas Inventories adopted by the Intergovernmental Panel on Climate Change (2006).

Activities in the LULUCF sector provides a relatively cost-effective way of offsetting emissions, either by increasing the removals of greenhouse gases from the atmosphere (e.g. by planting trees or managing forests), or by reducing emissions (e.g. by curbing deforestation). Under Article 3.4 of the Kyoto Protocol, Parties could elect additional human-induced activities related to LULUCF, specifically, forest management, cropland management, grazing land management and revegetation, to be included in its accounting for the first commitment period.

The land classification/category used to capture land use change is as follows:

- Forest
- Shrubs, grasslands and sparsely vegetated areas
- Croplands
- Wetlands
- Artificial areas
- Bare lands
- Water bodies

3.3 Land Productivity and Soil Carbon Content

The other derived land degradation indicators captured based on land use cover changes are:

- Land Productivity Dynamics (LPD)
- Soil Carbon Content (SOC)

The LDN Conceptual Framework, which was adopted by the 13th session of the UNCCD Conference of Parties, stipulates the three indicators together are suitable proxies for the ecosystem services provided by the land-based natural capital, there is no scientific basis for combining these into a composite indicator to give a single aggregated value. Aggregation would mask the changes detected in the individual measures and would prevent the interpretation of individual measures at the national level, based on local knowledge.

Positive change in one of the indicators cannot compensate for negative change in another because all are complementary, but not necessarily additive components of land-based natural capital. Therefore, if one of the indicators shows a negative change, degradation is considered to occur, even if the others are positive. However, land degradation occurs wherever negative land covers changes occurs over the specified time period (2000-2015), even though land productivity and soil carbon content increases in over time. The UNCCD default LPD data captured for the period 2000-2015 is shown in figure 4 below is summarised as follows as:

<table>
<thead>
<tr>
<th>VALUE</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Declining productivity</td>
</tr>
<tr>
<td>2</td>
<td>Early signs of decline</td>
</tr>
<tr>
<td>3</td>
<td>Stable, but stressed</td>
</tr>
<tr>
<td>4</td>
<td>Stable, not stressed</td>
</tr>
<tr>
<td>5</td>
<td>Increasing productivity</td>
</tr>
</tbody>
</table>

- There is a declining LPD adjoining artificial areas due to significant expansion of artificial settlement and infrastructure resulting loss of Vegetation/Forest cover;
- There are early signs of further vegetation loss due to slash and burn, forest fire, proliferation of Invasive alien plant species in forest areas and sparsely vegetated areas;

Figure 4: LDN Net Land Productivity Map 2000 (above)-2015
Coastal areas are stressed due to loss of coastal vegetation, wetlands, saline water intrusion, coastal erosion and potential climate change and induced disaster impacts (flash flood, drought etc.).

Thus, it is essential that LDN national and local institutions be involved to contextualise and interpret changes in the indicators to reflect the national and local conditions. Changes in land cover may be characterised as positive or negative when contextualised with national or local information. Some critical transitions are generally considered as negative, for instance those from natural and semi-natural land cover classes to cropland or to artificial areas; from natural and semi-natural land cover classes or cropland to artificial areas (i.e. urbanization); as well as from forest land to other land cover classes (i.e. deforestation).

3.4 National Land Cover Data

The updated satellite land use cover with a higher resolution data of 30 mt pixel provided by the LDN TSP was presented and discussed in the LDN Validation Workshop held on 29 May 2018. It was agreed by participants, that default data be combined with national local data for small islets. The national local data has been sourced from existing GIS data on land use cover from 1993 existing at the Ministry of Environment, Energy and Climate Change (MEECC) and the Government of Seychelles and the UNDP-GEF project on mainstreaming biodiversity management into production sector activities-Mapping Seychelles habitat-types on Mahé, Praslin, Silhouette, La Digue and Curieuse; (Senterre and Wagner, 2014). However, after reviewing the data, overlaid on Google Earth (GE), it was found that only the national forest/vegetation cover data could be used. The built up (artificial areas) data digitized by the MoHL, showed the cadastral demarcated settlement zoning rather than the existing built up cover/ artificial areas. Moreover, the GIS section of the MoHL confirmed the unavailability of recent aerial or satellite imagery for capturing changes in land use cover over a 10-year time series. The land cover classes used to detect land use changes in Seychelles are as follows:

<table>
<thead>
<tr>
<th>VALUE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Forest</td>
</tr>
<tr>
<td>2</td>
<td>Shrubs, grasslands and sparsely vegetated areas</td>
</tr>
<tr>
<td>3</td>
<td>Cropland</td>
</tr>
<tr>
<td>5</td>
<td>Artificial areas</td>
</tr>
<tr>
<td>6</td>
<td>Bare land and other areas</td>
</tr>
<tr>
<td>7</td>
<td>Waterbody</td>
</tr>
</tbody>
</table>
The present data as shown in the Map-Mahe above were captured from high resolution from the land cover data provided by the LDN TSP overlaid by the SSLDP map and compared with the existing forest cover for Mahe, Praslin, La Digue, Silouette and other islets. The gap (as shown in figure 8-SSLDP Map below) in between the forest area as earmarked by the SSLDP and the existing built up area indicates the trends in future expansion of the artificial areas in the forest area. Hence, an overall decrease in the forest cover and an increase in the artificial areas have been noted. The representative of the Ministry of Agriculture informed that as per national data the land area estimated under agriculture/cropland is 600 ha and that part of the agricultural land has been abandoned (now under forest cover). Hence the agricultural land has not been captured by image supervised classification and has been aggregated with national spatial data from the MoHL.
4.0 Assessing Land Degradation

The relevant indicator that has been used for Seychelles to map significant changes is land (use) cover changes. The areas of disaster occurrences in Seychelles are also significant locations of potential land degradation hotspot areas, as they are exposed to:

- Flash flood
- Forest fire
- Landslide and soil erosion
- Coastal erosion
- Coastal saline water intrusion
- Areas of water scarcity (Drought, Low level of water table)
- Loss of biodiversity
- Proliferation of invasive alien species.

These changes have been mapped out, the potential direct and indirect causes/drivers of land degradations have been identified and the hotspot areas and level of interventions have been established. The levels of proposed interventions necessary to reach LDN in Seychelles are as follows:

- **National Level** (High Priority Disaster Risk Areas, Productive Landscapes; Ridge to Reef processes);
- **Local/Regional Level** (Eco systemic restoration – Drainage basin, River Ecosystem, Wetlands, Coastal, Forest & Biodiversity rehabilitation etc.);
- **Site level** (In Situ site level interventions & restoration projects).

### 4.1 Land Degradation Change Analysis

The changes in land cover may be summarised as the following critical transitions based on national land use cover changes (see Change Detection islands Maps Annex 2) identified and local information on disaster risk area occurrences;

- from forest land to other land cover classes (i.e. deforestation);
- from natural or semi-natural (grassland, sparsely vegetated areas) land cover classes to artificial areas, infrastructure and settlements (i.e. urbanisation).
- from natural wetland land cover classes to settlements artificial areas;

The change value identifier shows land cover changes occurred from and various land cover the year 2000-2015. The value 12 shown on the Land cover change map figure 7 below represents conversion of the land use from 1 (forest cover) to 2 (Shrubs, grassland and sparsely vegetated Areas. The land cover changes identified are described in the table below:
<table>
<thead>
<tr>
<th>Change value Identifier</th>
<th>Land Use Cover Change/Conversion Occurrence 2000-2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Forest (Tree Cover) – Shrubs, Grassland &amp; Sparsely Vegetated Areas</td>
</tr>
<tr>
<td>13</td>
<td>Forest (Tree Cover) – Cropland &amp; Grassland Deer Grazing-Pasture Areas</td>
</tr>
<tr>
<td>15</td>
<td>Forest (Tree Cover) - Artificial areas</td>
</tr>
<tr>
<td>16</td>
<td>Forest (Tree Cover) - bare land (landslide, rock mining areas)</td>
</tr>
<tr>
<td>21</td>
<td>Shrubs, Grassland &amp; sparsely Vegetated areas – Forest</td>
</tr>
<tr>
<td>23</td>
<td>Shrubs, Grassland &amp; sparsely Vegetated areas -Croplands</td>
</tr>
<tr>
<td>25</td>
<td>Shrubs, Grassland &amp; sparsely Vegetated areas -Artificial Areas</td>
</tr>
<tr>
<td>62</td>
<td>Bare land-Forest (Tree Cover)</td>
</tr>
<tr>
<td>65</td>
<td>Bare lands- Artificial areas</td>
</tr>
</tbody>
</table>

Figure 7 map of land cover change detection 2000-2015 shows the change value 15 is predominant, indicating most of the land change occurring due to the expansion of artificial areas (built up) encroaching on forest (tree cover) areas and water bodies (lagoon and wetlands) due to increasing development pressure requiring more land for housing and infrastructure.
4.2 Assessing Land Degradation Trends and Drivers

Land use cover changes identified at landscape and ecosystem level are human induced socio-economic pressures on land. They are direct drivers of land degradation and potential disaster risk areas. The trends and drivers of land degradation were presented and discussed during the inception workshop and in the LDN Technical Advisory Committee. The main direct drivers of land degradation in Seychelles reviewed and confirmed in the LDN Technical Advisory Committee as follows:

- Expansion of Urban built up sprawl - increase in (artificial areas) impervious layers
- Loss of wetlands - Expansion of Artificial Area, increasing demand for affordable Housing
- Land mining & rock quarrying - Increasing demand for construction Materials for infrastructure and economic, tourism development
• Land re-profiling change in drainage pattern causing soil erosion- Increase cut and fill in steep slope areas for local housing and tourism development

• Climate change- Disaster Risk Areas:
  - Flash Floods
  - Landslides
  - Invasive Alien Species proliferation
  - Forest Fire
  - Saline water intrusion and sea level rise

• Intensive farming and unsustainable agricultural practices.
4.3 Land Degradation Hotspots Area

The interface between the forest cover and urban built up areas are considered as the hotspot areas for land degradation, i.e. the loss of forest cover into artificial areas. Figure 8 SSLDP map below shows the potential land degradation hotspot area in the North of Mahe at Glacis, over an area of 319 Ha, where LDN measures may be implemented to minimise land degradation.

![SSLDP Strategy Map overlaid with GE Artificial Area 2015.](image)

The identified LDN hot spots in selected areas will require further assessments to fully understand the historical and current drivers behind observed land degradation dynamics using additional indicators, data sources, including field assessment and visits. LDN hotspots may be considered as priority disaster risk areas and LDN measures/transformative projects should aim to reduce/mitigate potential disaster occurrences. Other potential land degradation hotspots of Seychelles are presented in Annex 6, they are located in:

1. Praslin Island
2. La Digue island
3. Silouhette island
4. Aldabra Atoll
5. Alphonse island
6. Bird Island
7. Coetivy Island
8. Denis island
9. Desroches island
10. Farquar island
11. Frigate Island
12. Poivre Island
5.0 LDN Baseline Validation

The LDN baseline data has been contextualised based on the locally sourced data from various institutions and presented in the LDN National Validation Workshop.

The accuracy of the default data may be accounted to the accuracy at 30 mt pixel imagery, variation and discrepancies of the land cover data captured relative to the climatic conditions affecting land cover during the year such as rainy or dry season affecting the vegetation cover and the accuracy in detecting change. The default data has been combined with the local data sets and gaps have been filled in determining the baseline indicators.

As per the default data provided by the LDN TSP, land cover data the extent of forest land 2015 amounts to 28710 ha and artificial areas for the main island of Mahe is estimated at 3411 ha. The artificial land cover expansion from 2000-2015 for Seychelles has increased by approximately 2642 ha. Forest cover has decreased by 5211 ha and grasslands, shrubs sparsely vegetated area has increased by 2698 ha over the last 15 years.

The LDN national working group (Technical Advisory Committee) validated the UNCCD, LDN TSP baseline default land cover data, which is summarized in the following table.
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Forest</td>
<td>339.20</td>
<td>287.13</td>
<td>106.5</td>
<td>24.03</td>
<td>6.39</td>
<td>150.21 -52.07</td>
</tr>
<tr>
<td>Shrubs, grasslands and sparsely vegetated areas</td>
<td>43.32</td>
<td>70.30</td>
<td>3.50</td>
<td>3.64</td>
<td>0.13</td>
<td>63.03 26.98</td>
</tr>
<tr>
<td>Croplands</td>
<td>6.00</td>
<td>4.05</td>
<td>3.35</td>
<td>0.55</td>
<td>0.15</td>
<td>0.00 -1.95</td>
</tr>
<tr>
<td>Inland water bodies</td>
<td>1.00</td>
<td>1.00</td>
<td>0.85</td>
<td>0.10</td>
<td>0.05</td>
<td>0.00</td>
</tr>
<tr>
<td>Artificial areas</td>
<td>26.60</td>
<td>53.02</td>
<td>34.11</td>
<td>8.50</td>
<td>2.26</td>
<td>8.15 26.42</td>
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<tr>
<td>Bare land and other areas</td>
<td>30.62</td>
<td>31.95</td>
<td>5.17</td>
<td>1.65</td>
<td>0.44</td>
<td>24.69 1.33</td>
</tr>
<tr>
<td>Coastal Wetland</td>
<td>8.56</td>
<td>7.19</td>
<td>1.66</td>
<td>0.64</td>
<td>0.31</td>
<td>4.58 -1.37</td>
</tr>
<tr>
<td>Total</td>
<td>455</td>
<td>455</td>
<td>155</td>
<td>39</td>
<td>9.3</td>
<td>250.7 0</td>
</tr>
</tbody>
</table>

Table 1: LDN Baseline Indicators (LDN TSP default data)
6.0 Achieving Land Degradation Neutrality Targets

LDN target setting is a voluntary process aiming to identify LDN targets, measures and opportunities for transformative projects to achieve LDN.

During several consultative meetings, including meetings of the Technical Advisory Committee conducted in 2017, the relevant land degradation indicators, trends and data sources for the islands of Seychelles were discussed among members. It was concluded that the indicators on LPD and SOC are not accurate enough to measure land degradation trends in Seychelles’ context as most of the agricultural land are under vegetative cover and are well managed to keep soil fertility and soil carbon content at an acceptable level. However, it was agreed on the need to put in place a land degradation monitoring unit to continuously measure LPD, SOC and land use/cover change. It was also agreed that land cover changes were most suitable to capture land degradation due to rapid land use conversion to urbanised/artificial areas. These indicators should be complemented by national (or subnational) level indicators to provide full coverage of the ecosystems and overall landscape. The qualitative LDN measures, associated with existing and proposed land use management strategies, National sectoral policies and action plans as well as institutional effectiveness, are critical to:

- avoid land degradation through land use planning that fully accounts for the potential and resilience of land resources;
- adopt SLM policies and practices in order to minimize current land degradation;
- Rehabilitate / restore degraded lands.

6.1 LDN Measures and Transformative Projects

The LDN response hierarchy guides decision makers in planning measures to achieve LDN. The response hierarchy of Avoid > Reduce > Reverse land degradation is based on the recognition that “prevention is better than cure”. Priority for intervention is placed first on land where prevention or avoidance of land degradation is possible, followed by land where reducing degradation through sustainable land management practices is suited, and lastly on reversing degradation through restoration, rehabilitation or reclamation measures.

The concept of neutrality involves counterbalancing anticipated losses with measures to achieve equivalent gains. Counterbalancing losses and gains should be managed within the same land type or land cover class (i.e. counterbalance “like for like”) taking into account the national land use planning system.
The potential options for measures are as diverse as the forms and drivers of degradation. The same diversity applies to the level and scale of activities (e.g. national, local). Countries therefore should set their measures in line with the trends and drivers of land degradation identified. Addressing only the symptoms of land degradation will fall short of making real progress towards LDN. Hence measures may address the following:

- **Policy or technical issues** and be implemented in the form of **programmes or projects** that should be tailored to a specific area at a given geographical and temporal scale.

- **Policy measures** to mainly address the indirect drivers of land degradation (e.g. land tenure, education, governance) and should be identified drawing on the assessment of the drivers of land degradation and the legal and institutional environment.

- Technical measures to mainly address the direct drivers of land degradation and can for example be classified in **agronomic, vegetative, structural and management measures**.

The ongoing projects and programme linked to the land degradation neutrality were identified during the consultative process and in the National working group meetings. The national programmes and projects directly contributing to the LDN indicators as well as the technical and policy measures were mapped. Potential transformative projects to achieve LDN were earmarked in the relevant land use sectors for future implementation. The LDN transformative projects were further discussed in the LDN TSP validation workshop where the stakeholders contributed in the evaluation of options, which is critical to successful planning and implementation of Land Degradation Neutrality.

### 6.2 LDN Target Setting Consultative Meetings

Several technical meetings and working session were held with Governmental representatives, development partners to gain leverage on existing LDN measures. Multiple linkages were established during the Technical Advisory Committee sessions and potential LDN targets were identified through both formal and informal participatory discussions. Site visits were also conducted to identify land degradation hotspots areas as well as sustainable land management good practises for the following islands of Seychelles:

- Mahe
- Praslin
- La Digue
Each of the islands has its own specific landscape and ecosystem. Human induced socio-economic development requirements and pressure varies substantially between the islands. Hence, they were assessed separately and with specific LDN targets and measures based on their productive sectors and ecosystem. The remaining islands of Seychelles, human induced land cover changes (land degradation) are non-significant due very small number of inhabitants and the same LDN measures as that of La Digue Island have been applied.
The potential LDN Targets and Measures for each land use sector and sub sectors for each island were aligned with the national land use strategies, policies, programs and action plans. They were further reviewed by the main stakeholders during the Technical Advisory Committee meetings and presented for validation in the validation workshop on 29 May 2018. Linkages were established among the institutions responsible for the respective national strategies and sectoral policies. Furthermore potential LDN targets were identified. One of the main linkages established and leveraged on LDN is the Seychelles Strategic Land Use development Plan (2014-2040- see figure 7 below) promoting and supporting the following outcomes:

- **making best use of land** and scarce resources including the delivery of the existing development pipeline;
- **defining a settlement hierarchy** which guides the location of development through designating national, regional and local centres depending on their size, function and services;
- **strengthening the role of Victoria** as the national capital and the centre of government, finance and industry;
- **concentrating development in regional hubs** at Anse Royale, Anse Boileau, Baie Ste Anne and Beau Vallon;
- **providing opportunities** for Grand Anse Mahé, Anse Etoile-Ile Aurore and Anse aux Pins- Ile Soleil to become...
regional centres over the lifetime of the Plan;

- **consolidating local centres** to provide services for the local catchment population;
- **providing land in appropriate locations** to accommodate growth of key economic sectors including the blue economy;
- **diversifying the tourism offer** away from traditional beach resorts;
- **providing the necessary transport and utilities infrastructure** and community facilities to support planned levels of growth;
- **reflecting a presumption** against the conversion of agricultural land for development;
- **protecting and enhancing** key environmental and heritage assets; and
- **addressing issues of climate change** and resilience in locating new development

The leveraging process further minimised potential cross sectoral/institutional conflicts and duplication, helped in better streamlining of efforts and initiatives to achieve LDN. The leverage gains of LDN were achieved through sharing of knowledge, data, alignment of targets and common objectives as identified the leverage plan. (See LDN Leverage Plan table Annex 3).

6.4 LDN Target Setting and Measure Validation

The validation workshop was held on 29 May 2018. The objectives of the validation workshop were to:

- Present the LDN baseline indicators, trends and drivers for Seychelles
- Present the LDN measures and targets for Seychelles
- Discuss and validate the LDN measures, transformative projects and targets for each land use sectors for the Republic of Seychelles.

The baseline indicators, trends and drivers for Seychelles were presented and potential LDN measures for each land use sector discussed. Land use sector groups were formed, comprising of multiple stakeholders. There were twenty-nine participants present in the validation workshop from various government institutions, NGOs, private sector representatives and international development partners (please refer to Annex 1). The main stakeholders present comprised of the following technical representatives from:

- Ministry of Environment, Energy and Climate Change
The following Land use Cover/sector discussions groups were formed to propose and discuss LDN targets & associated measures for each sub sector to be achieved by 2030:

1. Mahe island
2. Praslin island
3. La Digue Island:

Each group recognised the trend and drivers of land degradation of their island and worked towards identifying the responses to the causes of land degradation for each sector and sub sector and proposed the associated LDN measures to be achieved by 2030. The outcomes of each working groups were presented the
designated Team leader. The LDN targets and measures were further discussed, agreed and validated at the end the workshop. The validated LDN targets and measures are presented in the following tables below.

6.5 Overall LDN Targets 2030 and Measures

The key LDN 2030 targets and associated measures discussed and validated for Seychelles are:

Overall LDN Targets:

- Maintain forest cover through sustainable management of forest and biodiversity over and area of 287 Km2 (2,870 ha);
- Maintain and restore coastal wetlands and mangroves forests over an area of 7.93 Km2 (793 ha);
- Expand and promote good/smart agricultural/agronomic measures and practises over an area of 6.82 Km2 (682 ha);
- Apply effective LDN and SLM/ land use planning and contain urban/artificial areas within an overall area of 56.6 Km2 (5660 ha);
- Put in place an LDN monitoring system (GIS & Remote Sensing) and develop adequate human resources skills at the national level to continuously assess and review the land use/cover carrying capacity/LDN measures of each sector annually to achieve LDN.

Key LDN Measures:

Forest and Biodiversity Cover:

- Rehabilitate/restore degraded lands on steep slopes and maintain overall forest cover;
- Manage invasive alien species, restoration and expansion of the protected area networks in key biodiversity areas adjoining native forests earmarked in the Seychelles Strategic Land Use development Plan (SSLUP) Spatial Strategy Map
- Forest Fire Management Plan (maintaining a fire breaks forest-settlement interface and key biodiversity areas, protected areas (National Parks and Nature Reserves).

Wetland and Mangroves Cover:

- Ecosystem based adaptation projects in wetland restoration and shoreline management plan as LDN preventive measures against saline water intrusion;
- Apply Ridge to Reef approaches in managing productive landscapes to achieve LDN.

Agricultural Land Cover:

- Protect highly productive agricultural land from land conversion for development purposes;
- Promote SLM and good agricultural practises;
- Provide financial and technical incentives to farmers to maintain and encourage agronomic and agroforestry expansion with stewardship schemes.
Urban /Artificial Areas Land Cover:

- Prepare specific LDN land use planning and detailed urban design guidelines (scale, height, floor areas ratio, plot coverage) for artificial areas /urban development including steep slopes;
- Minimise impervious layers wherever possible;
- Define effective building plot coverage to achieve LDN;
- Promote vertical extension rather than horizontal sprawl of artificial areas /urban settlement expansion;
- Promote tree/forest conservation and native plants as soft landscaping features on at least 65% of the overall plot area;
- Encourage step building design and construction adapted to contour /slope minimise cut and fill(excavation);
- Encourage water sensitive urban designs and minimise impervious layers wherever possible;
- Implement Sustainable Urban Drainage System (using natural processes/System to manage urban runoff water.

7.0 Overall achievements and lessons learned

Land requirement for socio-economic development in the Republic of Seychelles is ever increasing due to local population increase and growth of the tourism sector. Land use planning and the urbanization processes in Seychelles are more complex due to the limited flat land area available for housing and infrastructure development. Over the last 15 years, the forest cover has been reduced by 5211 Ha, resulting from increased expansion of urban areas into forest lands.

Moreover, small islands developing states such as the Republic of Seychelles are also continuously under the threat of climate change, the impacts of land degradation. Unpredictable changes in the climatic patterns have made daily weather forecast unreliable and becoming a challenge for local communities to take timely preventive measures.

Achieving LDN across landscapes and ecosystems is crucial in building more resilience in communities to adapt to the impacts of climate change. Identifying common grounds and having a balanced, win-win approach among the stakeholders including private economic operators and NGOs have been beneficial in setting national LDN targets in Seychelles. Likewise, leveraging on the objectives of the NAP for SLM, and on the need for SDGs progress indicators, has further consolidated the LDN target setting process and boosted the implementation of the UNCCD in Seychelles.

The LDN TSP in the Republic of Seychelles has adopted an integrated response (landscape and ridge to reef) to the impacts of climate change and land degradation. It has leverage on the multiple initiatives of various land use sectors and stakeholders to set LDN targets, also contributing to several SDGs by 2030.
Capturing higher resolution satellite imagery of land cover for (Small islands) has enabled identifications of temporal trends and drivers of land degradation as well as hotspot areas and potential disaster risk areas. However, it essential to highlight the urgent need to put in place an LDN monitoring system (GIS & Remote Sensing) and develop adequate human resources skills at the national level to continuously assess, and review the land use carrying capacity / LDN measures of each sector annually to achieve Land Degradation Neutrality by 2030.
## Annexes

### Annex 1: List of Technical Advisory Committee (LDN Working Group) Members

<table>
<thead>
<tr>
<th></th>
<th>Name</th>
<th>Designation</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mrs Nanette Laure</td>
<td>Director General, National Focal Point (UNCCD)</td>
<td>Ministry of Environment, Energy and Climate Change</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Seychelles</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Director General</td>
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<td></td>
<td></td>
<td>Waste Enforcement and Permit Division</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Mrs Marie May Jeremie Muzungaile</td>
<td>Director General, Biodiversity Conservation and</td>
<td>Ministry of Environment, Energy and Climate Change</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Management Division</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Mr John Quilindo</td>
<td>Principal Forest Officer</td>
<td>Ministry of Environment, Energy and Climate Change</td>
</tr>
<tr>
<td>4</td>
<td>Mr Roland Alcindor</td>
<td>Senior Programme Manager-Head Responsible Officer</td>
<td>UNDP, Seychelles Office</td>
</tr>
<tr>
<td>5</td>
<td>Mr Jean Marc Baptiste</td>
<td>Responsible Officer</td>
<td>Seychelles Island Foundation</td>
</tr>
<tr>
<td>6</td>
<td>Ms Kendra Sofola</td>
<td>Technical Officer</td>
<td>Terrestrial Restoration Action Society of Seychelles (TRASS)</td>
</tr>
<tr>
<td>7</td>
<td>Mr Jason Jacqueline</td>
<td></td>
<td>Seychelles National Parks Authority</td>
</tr>
<tr>
<td>8</td>
<td>Mr Terrence Athanase</td>
<td></td>
<td>Seychelles National Parks Authority</td>
</tr>
<tr>
<td>9</td>
<td>Ms Shirley Joubert</td>
<td>Praslin La Digue Coordination officer</td>
<td>Ministry of Environment, Energy and Climate Change</td>
</tr>
<tr>
<td>10</td>
<td>S.Leukovic</td>
<td></td>
<td>Tourism Department</td>
</tr>
<tr>
<td>11</td>
<td>Mr Lyroy Camille</td>
<td>Technical Officer</td>
<td>Department of Risk and Disaster Management</td>
</tr>
<tr>
<td>12</td>
<td>Ms Mermedah Moustache</td>
<td></td>
<td>Seychelles Agricultural Agency-Ministry of Agriculture and Fisheries</td>
</tr>
<tr>
<td>13</td>
<td>Mr Joseph Francois</td>
<td>Chief Executive</td>
<td>Seychelles Planning Authority-Ministry of Habitat, infrastructure and land Transport</td>
</tr>
<tr>
<td>14</td>
<td>Mr Francis Coeur de Lion</td>
<td>GIS officer</td>
<td>GIS Unit- Ministry of Habitat, infrastructure and land Transport</td>
</tr>
<tr>
<td>15</td>
<td>Ms Elhe Talma</td>
<td>Technical Officer/IUCN focal point</td>
<td>Mangroves for Future</td>
</tr>
<tr>
<td>16</td>
<td>Ms Julie Low</td>
<td>Planning Officer</td>
<td>Seychelles Planning Authority-Ministry of Habitat, infrastructure and land Transport</td>
</tr>
<tr>
<td></td>
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<tr>
<td>17</td>
<td>Mr Bernard Belle</td>
<td>Planning Officer</td>
<td>Seychelles Planning Authority-Ministry of Habitat, infrastructure and land Transport</td>
</tr>
<tr>
<td>18</td>
<td>Mr Johan Mendez</td>
<td></td>
<td>Ecosystem Based Adaptation Project – PCU/UNDP</td>
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<tr>
<td>19</td>
<td>Ms Lindy Bastienne</td>
<td>Coordinator</td>
<td>GEF/SGP/UNDP</td>
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Annex 2: Working Group Meetings and Workshops

<table>
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<tr>
<th>LDN Meetings</th>
<th>Description of Meetings objectives</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical Advisory Committee/National Working Group</td>
<td>Introduction of LDN TSP process and Steps to achieve LDN-Work plan; Establishment of LDN TSP National Working Group - Presentation and discussions of LDN Leverage plan Synergies with National Strategies/Policies/SDGs; - Identifying LDN Hotspots; - LDN Innovative Funds - LDN work plan approval</td>
<td>25 May 2017</td>
</tr>
<tr>
<td>Inception Workshop</td>
<td>- To introduce of the LDN target setting process and the UNCCD support programme to stakeholders (CSOs, Government Institutions, Private Sector, Farmers Association, Environment/Biodiversity conservation NGOs, etc.); - To inform senior government and major international partners on LDN in Seychelles; - To discuss and validate the LDN leverage plan and Land Degradation trends and drivers</td>
<td>09 March 2017</td>
</tr>
<tr>
<td>Technical Advisory meetings</td>
<td>Presentation and Discussions of Baseline</td>
<td>22-24 May 2018</td>
</tr>
<tr>
<td>Technical Advisory meetings</td>
<td>Presentation and discussions of draft LDN Targets</td>
<td>28 May 2018</td>
</tr>
<tr>
<td>LDN Validation Workshop</td>
<td>- Present the LDN baseline indicators, trends and drivers for Seychelles - Present the LDN measures and targets for Seychelles - Discuss and validate the LDN measures and targets for each sector for the Republic of Seychelles.</td>
<td>29 May 2018</td>
</tr>
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## Annex 3- LDN Leverage Plan

<table>
<thead>
<tr>
<th>LDN Stakeholder</th>
<th>Contributions and Synergies to leverage Land Degradation Neutrality</th>
<th>Multi Linkages to National Policies &amp; Strategies</th>
</tr>
</thead>
</table>
| **Ministry of Habitat, Infrastructure and land Transport** | The Ministry is a member of the Technical Advisory Committee (TAC) /National Working Group of Land Degradation Neutrality Target Setting Process (LDN TSP) and is responsible for the implementation of the Town and Country Planning Act. **The Planning Authority** falls under MLUH contributing to the LDN land cover baseline and target setting process. It is responsible for reviewing requests for any buildings or constructions for developing local and national land use plans directly. Its GIS Centre is currently preparing a database of land classification and current land use. | • Seychelles Strategic Land Use Development Plan 2014-2040  
• District land use plans |
| **Ministry of Environment, Energy and Climate Change** | The **MEECC** is a member of the Technical Advisory Committee (TAC) /National Working Group of LDN TSP, has the primary responsibility for environmental management and sustainable development processes, Forest and biodiversity management. The DoE is the focal point for all three Rio Conventions. It therefore has a leading role in ensuring national implementation of LDN TSP in the Seychelles, and for reporting to the Convention Secretariats. The DOE consists of three Divisions, each headed by a Director General:  
- **Energy and Climate Change Division** (National Climate Change Strategy, the Seychelles Sustainable Development Strategy)  
- **Waste Enforcement and Permit Division** (Environment Assessment and Land degradation UNCCD focal point, Forestry Service)  
- **Biodiversity Conservation and Management Division** (Wildlife Enforcements and Permits)  
  | • National Forest Inventory (FAO)  
• Forest Reserves  
• National Action Plan- Sustainable land Management  
• Integrated Financing Strategy (IFS) for Sustainable land Management.  
• Key Biodiversity Areas  
• Seychelles Sustainable Development Strategy  
• National Biodiversity Strategy and Action Plan |
<p>| <strong>Ministry of Agriculture and Fishing</strong> | The Ministry of Agriculture and Fishing the parent ministry of the <strong>Seychelles Agricultural Agency</strong> (SAA) is responsible for food security, increasing agricultural production and the modernization and development of the agricultural sector. The <strong>Seychelles Agricultural Agency (SAA)</strong> is responsible for food security, increasing agricultural land productivity through modernization and contributing to the management of cropland/ agricultural land use as LDN targets. Its Functions include providing | • Agriculture Investment Framework /plan 2015-2020 |</p>
<table>
<thead>
<tr>
<th>Division of Risk and Disaster Reduction</th>
<th>The Division for Risks and Disaster Management (DRDM) is a member of the Technical Advisory Committee (TAC) /National Working Group of LDN TSP is responsible for coordinating efforts to prevent and fight fires, including forest fires. DRDM is similarly responsible for identification of disaster hotspot areas such as landslides and flash floods.</th>
<th>• Disaster risk management and identification of potential Land degradation hotspot areas.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Foreign Affairs and International relations</td>
<td>Is a member of the Technical Advisory Committee (TAC) /National Working Group of LDN TSP supports the socio-economic and environmental development of the country by assisting in the mobilization of development assistance, both financial and technical, and in promoting the country among potential investors. The Ministry focus on cooperation and exchanges with the European Union, traditional bilateral partners, regional groupings in particular the African Union, Indian Ocean Commission, COMESA, SADC and the ACP, as well as within regional financial institutions.</td>
<td>• SDGs Focal point.</td>
</tr>
</tbody>
</table>
| Ministry of Finance, Trade and Economic Planning | The ministry is a member of the Technical Advisory Committee (TAC) /National Working Group of LDN TSP and is responsible to allocate ministerial budgets, developing financial legislation and implementing fiscal reforms. | • National Development Strategy  
• Sustainable Development Goals (SDGs) 2030  
• Programme based budgeting |
| Tourism Department, Ministry of Tourism Civil Aviation Ports and Marine | The tourism masterplan (situational analysis) of the Ministry of Tourism has been consulted during the LDN TSP, as hotels are to some extent engaged in biodiversity and Forest conservation activities, especially the high end hotels on private islands (North, Denis, Bird, Frégate, Cousine), or on the larger granitic islands hotels such as (Lemuria, Banyan Tree, Constance Ephelia), mostly in collaboration with Environmental NGOs, contribution to the Wetlands and Forest cover of Seychelles. | • Tourism Masterplan – situational analysis |
| Seychelles National Parks Authority | The Seychelles National Parks Authority (SNPA) is a Government body/authority under the general supervision of the MEECC is a member of the Technical Advisory Committee (TAC) /National Working Group of LDN TSP. It is responsible for managing most national parks, with responsibilities covering vast areas of forested land. SNPA is also responsible for fighting forest fires on the land that it manages – both inside and outside of protected areas. For privately owned forested land, the exact allocation of regulatory roles is not fully clear. | • Protected Area Network Expansion  
• Invasive Alien Species Management  
• National Parks /Key Biodiversity Areas |
| **Seychelles Island Foundation (SIF)** | SIF is a member of the Technical Advisory Committee (TAC) /National Working Group of LDN TSP, manages two UNESCO World Heritage Sites in Seychelles, research and public awareness. SIF was created by Government Decree to manage the Aldabra Atoll World Heritage Site (WHS). The Foundation has the responsibility for the management of the Vallée de Mai WHS on Praslin and has contributed in the LDN target setting process of Praslin and other islands. | Management  
- National Biodiversity Strategy and Action Plan  
- Vallee de Mai Management Plan  
- Multi-partnered project ‘Strengthening Seychelles’ protected area system through NGO management modalities’, UNDP/GEF |
| **United Nation Development Programme, Seychelles (UNDP)** | The UNDP office Seychelles is an active member of the Technical Advisory Committee (TAC) /National Working Group has directly contributed to the LDN TSP for the Seychelles in terms of their Portfolio projects on land degradation projects under implementation under the **Programme Coordination Unit (PCU)**. It has also provided valuable technical, financial and administrative support. | Ecosystem based adaptation projects in Wetland restoration and shoreline management plan as preventive measures against saline water intrusion;  
- Ridge to Reef approaches in managing productive landscapes as part GEF 7 allocation for land degradation |
| **Programme Coordinating Unit PCU/GOS/ UNDP/GEF** | The MEECC has established a **Programme Coordination Unit (PCU)**, which is currently responsible for executing all GEF projects in Seychelles. All current GEF projects are implemented through UNDP. This PCU manages projects addressing climate change, biodiversity and SLM. The PCU helps ensuring coordination, linkages and synergies across implementation of the three conventions. | Sustainable land management projects  
- Mainstreaming Biodiversity Management into Production Sector Activities. |
| **Seychelles Farmers Associations** | The Seychelles Farmers Association includes the Praslin and La Digue farmers have been consulted during the LDN TSP site visits. | Loss of soil fertility  
- Saline water intrusion in |
| **Sustainability for Seychelles** | Sustainability for Seychelles (S4S) is a non-government organisation (NGO), which seeks to promote sustainable, “green” living in Seychelles in collaboration with citizens, the Government, other NGOs and the private sector. S4S participated in the inception workshop of the LDN TSP and its main mission is to ”work towards social, ecological, economic & technological sustainability, and to inspire, inform & enable people to live, work & play in ways that benefit human & natural communities”. | • Irrigation wells  
• Inadequate technical and financial support  
• Agricultural land conversion due to development pressure (housing, tourism)  
• Ecosystem based adaptation – Coastal land/Wetlands conservation and management |
| **Terrestrial Restoration Action Society of Seychelles (TRASS)** | TRASS is an active member of the Technical Advisory Committee (TAC)/National Working Group for LDN TSP and is an NGO responsible restoration of degraded Forest land specifically on Praslin, which can be extended to other island of Seychelles. | • TRASS is mostly working on Praslin:  
• Invasive Alien Species Management  
• Soil Erosion Monitoring  
• Developed a Public Private Partnership with private land owners to restore degraded land.  
• Native Forest Cover restoration on degraded land (40% of Praslin).  
• Supports Forest and biodiversity conservation, including research, public education and training. |
## Annex 4: LDN Target and Measures

### Table 2-LDN 2030 Target-Mahe Island

<table>
<thead>
<tr>
<th>Land Use Subsector</th>
<th>Forest Cover</th>
<th>Shrubs, grasslands and sparsely</th>
<th>Croplands</th>
<th>Water Bodies</th>
<th>Artificial area</th>
<th>Bare and Other</th>
<th>Coastal Wetlands</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>National Parks Est</td>
<td>Terrestrial Nature Reserves and Areas of Outstanding Natural Beauty (Landscape corridor)</td>
<td>Key Biodiversit y Areas (55%) Outside National Park Est</td>
<td>Forest Land Mixed Forest Est</td>
<td>Forest - Coconut Plantations - AgroForest Mixed Tourism EcoLodges Est</td>
<td>IAS Invaded/Degraded Forest Est</td>
<td>Total</td>
<td>Agriculture Farming</td>
</tr>
<tr>
<td>Mahe</td>
<td>3125</td>
<td>1522</td>
<td>1929</td>
<td>2637</td>
<td>1209</td>
<td>10422</td>
<td>25</td>
<td>485</td>
</tr>
<tr>
<td>LDN Baseline 2015 (ha)</td>
<td>3125</td>
<td>1522</td>
<td>1929</td>
<td>2637</td>
<td>1209</td>
<td>10422</td>
<td>25</td>
<td>485</td>
</tr>
<tr>
<td>LDN Target 2030 (ha)</td>
<td>3125</td>
<td>1522</td>
<td>1929</td>
<td>2637</td>
<td>1209</td>
<td>10422</td>
<td>25</td>
<td>485</td>
</tr>
</tbody>
</table>

**LDN Measures**

- **Protect and Expand to include KBAs**: Protect and expand to include KBAs in National Parks and restore Native Forest.
- **Protect Forest Reserves, National Forestry Policy and Legislation**: Protect and maintain sustainable Forest Management and Alien Species management to restore native biodiversity species.
- **Restore and Manage Invasive Species**: To protect highly productive cropland and minimize conversion to Artifical areas. To restore productive cropland to agroforestry and farming.
- **To maintain and apply Sustainable Forest Management**: The need for the provision of land for affordable housing. Infrastructure and Tourism development was highlighted based on the land use assessment and infrastructure requirement of the SSLDP 2014-2025. The application of LDN measures was recognised as high priority to minimize impervious layers, to encourage higher density and vertical extension of Buildings and minimise building footprint based land use categories (coastal, steep slopes, ESA, National Parks and reserves).
- **Protect, maintain and restore mangrove forests and wetlands**: Protect, maintain and restore mangrove forests and wetlands as a LDN measure to reduce disaster risks against flash floods, Saline water intrusion, Coastal erosion, Ocean and lagoon siltation/degredation.
- **Use Ecosystem based Adaptation**: Use Ecosystem based Adaptation against saline water intrusion, coastal erosion, Restoration of Wetlands, mudflats and mangroves forest areas to reduce ocean and lagoon degradation and protect marine ecosystem as well as fish spawning areas.

### Land Use Cover/Sector

<table>
<thead>
<tr>
<th>Land Use Cover/Sector</th>
<th>National Parks Est</th>
<th>Terrestrial Nature Reserves and Areas of Outstanding Natural Beauty (Landscape corridor)</th>
<th>Key Biodiversity Areas (55%) Outside National Park Est</th>
<th>Forest Land Mixed Forest Est</th>
<th>Forest - Coconut Plantations - AgroForest Mixed Tourism EcoLodges Est</th>
<th>IAS Invaded/Degraded Forest Est</th>
<th>Total</th>
<th>Agriculture Farming</th>
<th>Mix Agriculture/Residential</th>
<th>Total</th>
<th>Urban/Resident Areas - R Higher Density (G+1)</th>
<th>Mixed Lower density Residential Agriculture (G)</th>
<th>Tourism/Hotel Rooms</th>
<th>Mix Industrial/Commercial/Infrastructure</th>
<th>Total</th>
<th>Total</th>
<th>Coastal Wetlands</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shrubs, grasslands and sparsely</td>
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<td>Bare and Other</td>
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<td>Coastal Wetlands</td>
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</tbody>
</table>

**Note**: Table 2-LDN 2030 Target-Mahe Island provides a comprehensive overview of the LDN target and measures for Mahe Island. The table outlines the current land use baseline, the target for 2030, and the measures to achieve these targets. The information includes detailed land use categories such as National Parks, Terrestrial Nature Reserves, Forest Land, Agriculture, Croplands, Urban/Rural, and Wetlands, along with specific measures for each category to protect and enhance biodiversity and ecosystem services.
## Table 3: LDN 2030 Target - Praslin Island

<table>
<thead>
<tr>
<th>Land Use/Cover Category</th>
<th>Forest Cover</th>
<th>Shrubs &amp; sparsely vegetated areas</th>
<th>Croplands</th>
<th>Water Bodies</th>
<th>Artificial area</th>
<th>Bareland and Other</th>
<th>Coastal Wetlands</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Use Sub-Sectors</td>
<td>National Parks Est</td>
<td>Terrestrial Nature Reserves and Areas of Outstanding Natural Beauty (landscape corridor)</td>
<td>Key Biodiversity Areas Outside National Park Est</td>
<td>Forest Land Mixed Forest (Est)</td>
<td>Forest - Coconut/Plantations - Agroforestry</td>
<td>Tourism EcoLodges Est</td>
<td>IAS Invaded/degraded (60%)/Forest Est</td>
<td>Total</td>
</tr>
<tr>
<td>Praslin</td>
<td>305.8</td>
<td>39.2</td>
<td>55.2</td>
<td>564.6</td>
<td>110</td>
<td>706.4</td>
<td>1760</td>
<td>1209</td>
</tr>
<tr>
<td>LDN Baseline 2015 (Ha)</td>
<td>300.0</td>
<td>40.0</td>
<td>55.2</td>
<td>564.6</td>
<td>110</td>
<td>706.4</td>
<td>1760</td>
<td>1209</td>
</tr>
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<td>LDN Target 2030 (Ha)</td>
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<td>564.6</td>
<td>110</td>
<td>706.4</td>
<td>1760</td>
<td>1209</td>
</tr>
</tbody>
</table>

### LDN Measures
- **Protect and expand to include KBAs**: 10% out of 19.5 ha has been restored to high biodiversity area.
- **Protect**: National Forestry System, National Parks and Reserves.
- **Preserve**: Native Forest.
- **Maintain and apply Sustainable Forest Management**.
- **Manage biodiversity, remove IAS and restore to native species**.
- **National Forestry Inventory System**.
- **LDN Monitoring system**.
- **Potential for Nature based Farming tourism**.
- **High Potential for Agroforestry and Farm tourism**: Vanilla, Cocoa, Breadfruit, Tropical Fruits, organic farming etc.
- **Prepare detailed planning policy urban design guidelines for Sensitive Areas**: Steep slopes, ESA, National Parks and Reserve Areas to implement LDN measures.
- **Ecosystem based Adaptation** to saline water intrusion, coastal erosion, restoration of Wetlands, mudflats and mangroves forest areas.

- **To protect and include KBAs**: Protect and expand to include KBAs.
  - 10% out of 19.5 ha has been restored to high biodiversity area.

- **To protect and expand to include KBAs**: Protect and expand to include KBAs.
  - National Forestry System, National Parks and Reserves.
  - Native Forest.
  - Maintain and apply Sustainable Forest Management.

- **To expand (So Shrubs to Bareland)**: To expand (So Shrubs to Bareland) maintain and apply Sustainable Forest Management.
  - Ongoing Restoration by TRASS (outside National Parks).

- **To restore to Forest Cover and cropland**: To Expand and protect highly productive cropland and minimise conversion to Artificial areas.
  - Ongoing Restoration by TRASS (outside National Parks).

- **To expand to agroforestry and mixed agro; Residential**: The need for the provision of land for affordable housing, infrastructure and Tourism development was highlighted based on the land use assessment and infrastructure requirement of the SSLDP 2014-2025. The application of LDN measures was recognised as high priority to minimise impervious layers, to encourage higher density and vertical extension of Buildings and minimise building footprint based land use categories (coastal, steep slopes, ESA, National Parks and reserves).
  - To restore to agroforestry and mixed agro; Residential.

- **Protect, maintain and restore mangrove forest and wetlands as a LDN measure to reduce disaster risks against flash floods, Saline water intrusion, Coastal erosion, Ocean and lagoon siltation/degradation**: TRASS to restore wetlands (Anse Gouvernment, Cap Samy, Nouvelle Decouverte).

- **Prepare detailed planning policy urban design guidelines for Sensitive Areas**: Steep slopes, ESA, adjoining Wetlands, River Reserves, Bioswales drainage system, National Parks and Reserve Areas to implement LDN measures.

- **Ecosystem based Adaptation**: Ecosystem based Adaptation to saline water intrusion, coastal erosion, restoration of Wetlands, mudflats and mangroves forest areas.
## Table 4 - LDN 2030 Targets - La Digue island

<table>
<thead>
<tr>
<th>Land Use/Cover Category</th>
<th>Forest Cover</th>
<th>Shrubs and sparsely vegetated areas</th>
<th>Croplands</th>
<th>Water Bodies</th>
<th>Artificial area</th>
<th>Bareland and Coastal Wetlands</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Land Use Sub Sectors</strong></td>
<td><strong>National Parks Est</strong></td>
<td><strong>Terrestrial Nature Reserves and Areas of Outstanding Natural Beauty (Landscape corridor)</strong></td>
<td><strong>Key Biodiversity Areas Outside National Park Est</strong></td>
<td><strong>Forest Land (Mixed Forest) Est</strong></td>
<td><strong>Forest - Coconut/Plantations - Agroforestry - Mix Tourism Ecotourism  Est</strong></td>
<td><strong>IAS Invaded/degraded Forest Est</strong></td>
<td><strong>Total</strong></td>
</tr>
<tr>
<td><strong>La Digue</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LDN Baseline 2015 (Ha)</strong></td>
<td>7.0</td>
<td>382</td>
<td>83</td>
<td>16</td>
<td>488.9</td>
<td>252.0</td>
<td>15</td>
</tr>
<tr>
<td><strong>LDN Targets 2030 (Ha)</strong></td>
<td>7.0</td>
<td>100</td>
<td>382</td>
<td>83</td>
<td>16</td>
<td>588.9</td>
<td>243.5</td>
</tr>
<tr>
<td><strong>LDN Measures</strong></td>
<td>Protect and expand to include KBAs</td>
<td>Protect and include in National Parks</td>
<td>Protect Maintain Forest Reserves National Forestry Policy and Legislation</td>
<td>To maintain and apply Sustainable Forest Management</td>
<td>To Restore to Forest Cover</td>
<td>To protect highly productive cropland and minimise conversion to Artificial areas</td>
<td>To protect and maintain</td>
</tr>
<tr>
<td></td>
<td>Manage and remove IAS and restore to native species</td>
<td>National Forestry Inventory System LDN Monitoring system</td>
<td>Potential for Nature based Farming tourism</td>
<td>Potential for Agroforestry and Farm tourism (Vanilla, Cocoa, Breadfruit, Tropical Fruits, organic farming etc)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Annex 5: List of LDN Reports

- LDN TSP – Inception Report
- Land Degradation Neutrality Institutional Environment / Leverage Plan report
- Land Degradation Baseline, Trends and Drivers report
- Land Degradation Target and Measures Validation Report
Annex 6: Maps of LDN Hotspots Islands of Seychelles

(Based on UNCCD, LDN TSP default data 2000-2015)