

# Sri Lanka's REDD+ Potential: Myth or Reality?

Unna Chokkalingam & S. Anuradha Vanniarachchy



**Forest Carbon Asia Country Profile Report No. 1: Sri Lanka**

May 2011



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## Forest Carbon Asia

Forest Carbon Asia is a web-based information, research and networking service that seeks to provide up-to-date, objective and insightful information and analysis on forest carbon policies, players, resources and issues across the Asian region. FCA's mission is to raise awareness and understanding about forest carbon-related issues; and promote sustainable forest carbon activities and investments in Asia that are also good for the environment and the local communities. Our website seeks to serve as an information and resource hub providing a synopsis and review of forest carbon information pertinent to Asia, current news and views, feature articles, directories of forest carbon players, a comprehensive reference library and other useful resources. The site provides a platform for communication and exchange among forest carbon players across and beyond the region, and looks to bring Asian issues and voices to the global forest carbon arena.

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## Foreword

It is my great pleasure to write a foreword to this report namely “Sri Lanka’s REDD+ Potential: Myth or Reality” which will be of immense value to Sri Lanka in its efforts to reap benefits from REDD+ implementation. At this juncture I should congratulate Dr. Unna Chokkalingam and S. Anuradha Vanniarachchy for compiling a comprehensive report despite lack of data, vague policy elements and also lack of clarity among various stakeholders in the subject area.

After going through the report, I can assure that they have done a wonderful job in compiling this report. I sincerely hope that various stakeholders will use this as one of the base documents in their efforts to implement REDD+ in Sri Lanka.

I finally like to wish the authors and Forest Carbon Asia well in their future endeavors in the field of climate change and forest carbon related activities.

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## Glossary

ACR	American Carbon Registry
ADB	Asian Development Bank
AG	Above ground
AR	Afforestation and Reforestation
AusAID	Australian Government Overseas Aid Program
BCEF	Biomass Conversion and Expansion Factor
BG	Below ground
CBO	Community Based Organisation
CDM	Clean Development Mechanism under the Kyoto Protocol
CSR	Corporate Social Responsibility
DNA	Designated National Authority
DoF	Department of Forest
DWLC	Department of Wildlife Conservation
EIA	Environmental Impact Assessment
ETM	Enhanced Thematic Mapper
FAO	Food and Agriculture Organization
FCPF	Forest Carbon Partnership Facility
FDI	Foreign Direct Investment
FMP	Forestry Master Plan
FPIC	Free Prior Informed consent
FRA	Forest Resources Assessment Report, FAO
FSC	Forest Stewardship Council
FSMP	Forestry Sector Master Plan
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GOSL	Government of Sri Lanka
IUCN	International Union for Conservation of Nature
LFHD	Low forest cover high deforestation rate
LFLD	Low forest cover low deforestation rate
LiDAR	Light Detection and Ranging
LoA	Letter of Approval
LRC	Land Reform Commission
LTTE	Liberation Tigers of Tamil Eelam
MCG	Mahinda Chinthana Goal
MRV	Monitoring, Reporting & Verification

NCR	National Conservation Review
NFI	National Forest Inventory
NGO	Non Governmental Organization
NWFP	Non Wood Forest Product
PDD	Project Design Document
PES	Payments for Environmental Services
PIN	Project Idea Note
REDD	Reducing Emissions from Deforestation and Forest Degradation
REDD+	Reducing Emissions from Deforestation and Forest Degradation, Conservation and Enhancement of Forest Carbon Stocks, and Sustainable Management of Forest
REL	Reference Emissions Level
SLSPC	Sri Lanka State Plantation Corporation
STC	State Timber Corporation
tC/ha	tons Carbon per hectare
TROF	Tree Resources outside Forests
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNESCO	United Nations Education and Scientific
UNFCCC	United Nations Framework Convention on Climate Change
UN-REDD	United Nations Collaborative Programme on REDD
USA	United States of America
USAID	United States Agency for International Development
US\$	United States Dollar
VCS	Verified Carbon Standard
WM3b	Wet Mid-country 3 agro-ecological zone of Sri Lanka



## Executive Summary

This report provides relevant background information and assesses the scope and potential for forest carbon related activities in Sri Lanka. It tracks what is known in terms of forest extent and quality, carbon stocks, forest trends and drivers, key players and their activities, tenure issues, and forest and land-related legislation and policies. Given the background situation, it then assesses the scope and opportunities for forest carbon activities and investments in Sri Lanka, the implementation challenges and steps to move forward. The report is based on a desktop review of literature and legislation, as well as interviews of relevant agencies and individuals.

Does Sri Lanka have REDD+ potential? The answer is “Maybe likely” at this point in time. Sri Lanka’s forest estate is relatively small at two million+ hectares covering 30% of the land area. The remaining natural forest areas have high biological diversity with many endemic species, and are also critical for soil conservation and flood control. Most of Sri Lanka’s timber (70%), fuelwood (>80%) and NWFP supply comes from private smallholder TROF (trees outside forest areas) systems such as home gardens, coconut and rubber plantations that cover 1.8 million hectares (another 27% of the land area). The first field studies suggest that different forest (wet zone natural forests 286 and 345 tC/ha) and agroforestry systems (90-100 tC/ha in one area) hold substantial carbon stocks, far higher than estimated using national level data and global conversion factors.

However, the scope and opportunities for REDD (*Reducing Emissions from Deforestation and Forest Degradation*) depend on whether Sri Lanka has a continued high deforestation and/or forest degradation rate with substantial loss of carbon stocks. Current deforestation and degradation rates in the national forest estate and their causes are unclear. Extrapolations from the 1990s suggest that natural forest cover, in particular closed-canopy forest cover in Sri Lanka is still on the decline but a district-wise analysis suggests a possible rise already in the late 1990s. A 2010 national forest cover assessment currently being finalized may help shed more light.

If national forest cover and condition is found to be relatively stable, room for REDD is reduced though the country may still be able to benefit from the plus activities – conservation, sustainable management and enhancement. Either way, there may be certain high-potential areas (forest types, ownership types, specific sites or districts) for REDD and REDD+ actions. Site-level activities could focus on these areas in a nested approach with appropriate policy directives and national-level monitoring and accounting for reducing leakage. If carbon savings to be made are not sufficient to warrant intensive national-level

activity, project-level activities can still be conducted in high-potential areas using voluntary carbon markets.

Information on forest land ownership and management is unclear. Two State agencies, DoF and DWLC administer most of Sri Lanka's forest lands and bulk of it is gazetted for conservation and non-extractive uses. Clear land classification and tenure issuance is critical for managing the areas, be it for conservation, production or carbon benefits.

Policies in the colonial and post-colonial periods attempted to protect the forests for exclusive use by the administration and local community use was highly restricted and penalized. Management priorities have since shifted from forest exploitation to conservation, restoration and sustainable management for various products and environmental services, and to support local livelihoods. Current policies seek to enhance private and community participation in conservation and production activities and are open to exploring alternative tenure, financing and benefit-sharing options. These policy developments in principle allow for public participation in and benefit from REDD+ in public and private lands.

As per current national policy directives, forest carbon activities could potentially be conducted in all categories of the national forest estate and in agroforestry systems with appropriate partnerships and institutional arrangements. However, field data and pilots are needed to determine whether these systems can provide truly additional carbon sequestration and storage services over baseline scenarios in order to receive payments for the same. To determine whether forest carbon activities and payments can help to meet Sri Lanka's forestry sector objectives which include biodiversity conservation, soil and watershed protection, poverty alleviation, and sustainable timber and fuelwood production. To determine the safeguards required to avert counter-productive outcomes.

Sri Lanka has had little forest carbon, CDM and PES activity so far, both at the national level and on the ground. Awareness of global forest carbon opportunities and what they could mean for Sri Lanka, its forests and local communities is just evolving. The Forest Department believes that REDD+ could help Sri Lanka combat ongoing deforestation and forest degradation problems. A national UN-REDD supported program for building REDD readiness over the period 2011-14 is currently being drafted with some limited stakeholder participation.

Implementation challenges are many. A key one is getting the government to recognize and include the forestry sector as a potentially-important component in Sri Lanka's climate change mitigation and adaptation strategy. At present the forestry sector has been given minimal attention in the country's climate change-related activities. Others include resolving

the information and awareness gaps, providing and clarifying land tenure and carbon rights, implementing social and governance safeguards, setting up RELs and an effective forest monitoring system, and setting up supportive legal and institutional frameworks.

## 1. Introduction

Global warming and its associated effects arising from high levels of industrial activity in the 1900s to present have emerged as a key concern for the global community in the 21<sup>st</sup> century. Numerous actions have been proposed and adopted to reduce anthropogenic greenhouse gas emissions and keep climate change at a “manageable” level. Among the many actions discussed to mitigate climate change are forest-related actions such as reducing forest carbon emissions and enhancing forest carbon sequestration and storage.

Tropical areas in particular are viewed as prime venues for forest-related mitigation activities. Tropical forests continue to have high deforestation and degradation rates due to conversion to oil palm and other plantations, unsustainable timber extraction and widespread fires. At the same time they have large carbon absorption and storage potential. If planned and implemented appropriately, forest carbon investments could potentially help tropical countries meet other environmental and socio-economic objectives as well such as biodiversity and watershed conservation and poverty alleviation.

A few forest carbon schemes are evolving or under way at present in international, national and sub-national fora. On the international stage, the [Clean Development Mechanism](#) (CDM) under the [Kyoto Protocol](#) allows developing countries to undertake [afforestation and reforestation \(AR\) projects](#) as per prescribed guidelines and obtain payments for the same. Developed countries can use the net carbon sequestered by such projects to offset their greenhouse gas emissions and meet their mandated emission reduction targets.

Now a new expanded concept [REDD+](#) (*Reducing Emissions from Deforestation and Forest Degradation, Conservation and Enhancement of Forest Carbon Stocks, and Sustainable Management of Forest*) is under negotiation at the United Nations Framework Convention on Climate Change ([UNFCCC](#)). REDD+ is to be conducted in developing countries with funding from developed countries. REDD+ moves beyond project activities to national-level monitoring and accounting for net carbon emissions or sequestration in forests, and national-level rewards for reductions below an agreed reference emission level. Numerous requirements and safeguards are being discussed to ensure real and credible emissions reductions with positive socio-economic and environmental benefits.

Some prime tropical forest countries are preparing for REDD+ implementation with support from multilateral programs such as the World Bank’s Forest Carbon Partnership Facility ([FCPF](#)) and the United Nations Collaborative Programme on REDD ([UN-REDD](#)); and bilateral support from countries such as [Norway](#), [Germany](#), [Australia](#) and Japan. [Brazil](#) and various Amazon forest states within have operational forest carbon schemes in place.

Indonesia, Guyana, Laos and other developing countries are working towards developing REDD+ strategies and monitoring systems. REDD and other [forest carbon projects](#) are also being conducted in numerous countries as pilot activities. Numerous developed and developing countries (71 as of January 1, 2011) have forged a [REDD+ Partnership](#) as an interim platform to promote early action on REDD+.

Besides state-level mechanisms, there is also a voluntary market for forest carbon credits that emerged in areas outside the regulated schemes (such as in the USA). In the past, the voluntary markets were the key buyers of forest carbon credits across the globe. This was before large bilateral pledges from Norway and other countries came into vogue for supporting REDD+ action. Site-level projects increasingly subscribe to numerous [voluntary standards](#) assuring real and independently-verified emissions reductions with environmental and social co-benefits as demanded by the buyers. Available standards for developing countries include the Verified Carbon Standard ([VCS](#)), the American Carbon Registry ([ACR](#)), [Plan Vivo](#) and [CarbonFix](#); and the [Panda Standard](#) solely for Chinese projects. The voluntary forest carbon markets may co-exist as an alternative mechanism alongside regulated markets as and when they emerge.

Sri Lanka has had little forest carbon-related activity so far, both in the existing and proposed compliance mechanisms, as well as in the international voluntary markets. Little of its original forest cover remains following decades of conversion and degradation pressures. The remaining forests are critical hotspots harbouring much of Sri Lanka's rich biodiversity, providing watershed and other environmental services, and supporting a large rural population that depends on fuelwood and NWFPs for their livelihoods. Little information exists on the true extent and nature of the remaining forest resources, the current trends and driving forces, and the scope for using "Payments for carbon and other environmental services" to meet Sri Lanka's environmental and socio-economic objectives.

This report is an attempt to provide relevant background information and assess the scope and potential for forest carbon related activities in Sri Lanka. It tracks what is known in terms of forest extent and quality, carbon stocks, forest trends and drivers, key players and their activities, tenure issues, and forest and land-related legislation and policies. Given the background situation, the report then assesses the scope and opportunity for forest carbon activities and investments in Sri Lanka, the implementation challenges and steps to move forward. The report is based on a desktop review of literature and legislation, as well as interviews of relevant agencies and individuals. We hope it will be useful for policy makers, communities, NGOs, donors, developers and investors looking for background information and the scope for engaging in sustainable forest carbon activities in Sri Lanka.

## 2. A Geography and History Brief

The Democratic Socialist Republic of Sri Lanka (previously called Ceylon) is a tropical island located in the Indian Ocean, to the southeast of the Indian subcontinent. It covers an area of approximately 65,610 km<sup>2</sup> and has a 1,585 km long coastline of sandy beaches, dunes, lagoons, estuaries, mangroves and marshes.

The south-central mountainous region covers 20% of the land area and has 162 peaks ranging in elevation from 1000-2500 m<sup>1</sup> (Figure 1). Pidurutalagala is the highest peak at 2524 m. This region is the catchment area of all major rivers in the country. Broad lowland plains (0-100 m above sea level) stretch from the coasts to the south-central uplands.



Figure 1. Map of Sri Lanka.  
Source: [OurLanka.com](http://OurLanka.com)

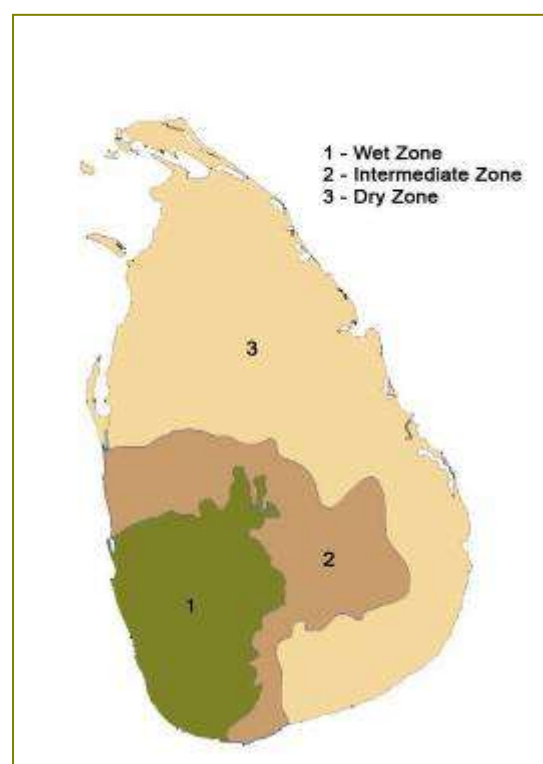


Figure 2. Climactic Zones of Sri Lanka.  
Source: Adapted from [Department of Agriculture](http://Department of Agriculture)

Based on rainfall patterns, the country has been divided into wet (>2500 mm annual rainfall), intermediate (1750-2500 mm) and dry (<1750 mm) zones (Figure 2)<sup>2</sup>. The country is further divided into 24 agro-ecological regions based on rainfall expectancy, altitude, soil class and land form<sup>3</sup>. There are two distinct annual rainfall periods: south-west monsoon (May-September) and north-east monsoon (December-February). The mean annual temperature ranges from 26 to 28.0°C in the plain areas and from 15 to 19°C in the uplands.

<sup>1</sup> State of Environment in Sri Lanka. January 2002. Ministry of Environment & Natural Resources. ISBN: 955-9120-09-3.

<sup>2</sup> [Department of Agriculture](http://Department of Agriculture), Sri Lanka.

<sup>3</sup> Sri Lanka Environment Outlook. 2009. Ministry of Environment & Natural Resources Sri Lanka and United Nations Environment Programme. ISBN: 978-955-0033-10-2.

Human settlements in the country date back to thousands of years. Various kingdoms governed the territory till 1815 when the British took over and established colonial rule. The territory became independent from British rule in 1948 and established a multi-party democracy. There were major changes to the constitution in 1972 and 1978. Tensions between the two major ethnic groups, the Sinhalese and Tamil, led to a bitter 30-year long civil war from the 1980s onwards. The war claimed thousands of lives and displaced thousands. The military conflict ended in 2009 with the overthrow of the dominant Tamil rebel group LTTE (Liberation Tiger Tamil Ealam) by Government forces.

Sri Lanka is divided into nine provinces which are further subdivided into 25 districts in total. Sri Lanka has a relatively high road density and all major towns and economic centres are connected by road and rail<sup>4</sup>. The country is now using foreign aid to rehabilitate and rebuild its road networks and other infrastructure in the north and east after the end of the conflict<sup>5</sup>.

## People

The population was estimated to be 20.4 million in 2009 with an annual growth rate of 1.1% (down from 1.4-1.5% in 2000-02)<sup>6</sup>. Sri Lanka is one of the most densely populated countries in Asia. Population density rose from 54 people per km<sup>2</sup> in 1900 to 139 people in 1956<sup>7</sup> and to 326 people per km<sup>2</sup> in 2009. Abundant natural resources and favourable climatic conditions have resulted in higher population density in the wet zone (650 persons per km<sup>2</sup>) as compared to the dry zone (175 persons per km<sup>2</sup>).

Most of the country's population (72.2%) lives in the rural areas, while 21.5% lives in urban areas and 6.3% in upland plantation estates. Ethnic groups include the Sinhalese (73.9%), Sri Lankan Tamil (12.7%), Indian Tamil (5.5%), Muslim (7.1%) and others (0.8%)<sup>8</sup>. Majority (69.3%) of the population is Buddhist while 15.5% is Hindu, 7.6% Islam, 7.6% Christian and 0.8% from other religions.

Sri Lanka has four indigenous communities, the Kinnara, Ahikuntaka, Roddhi and Veddah<sup>9</sup>. They are scattered around Sri Lanka and their populations have declined over time. The Kinnara use various non-timber forest products to produce handicrafts.

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<sup>4</sup> [Sri Lanka Country Assistance Program Evaluation: Transport Sector](#). August 2007. Bestari, N. Asian Development Bank.

<sup>5</sup> [Sri Lanka push for roads after ending war: official](#). 4 Nov 2010. Lanka Business Online. [Sri Lanka to invest \\$1bn in post-war road network](#). 4 Nov 2010. The Peninsula.

<sup>6</sup> [Sri Lanka socio-economic data 2010. Volume XXXIII](#). June 2010. Central Bank of Sri Lanka.

<sup>7</sup> [Impacts and effectiveness of logging bans in natural forests: Sri Lanka](#). 2001. Bandarattillake, H.M. Chapter 5 in Forests out of bounds: Impacts and effectiveness of logging bans in natural forests in Asia-Pacific. Edited by Patrick B. Durst, Thomas R. Waggener, Thomas Enters and Tan Lay Cheng. FAO, Bangkok, Thailand.

<sup>8</sup> [Sri Lanka socio-economic data 2010. Volume XXXIII](#). June 2010. Central Bank of Sri Lanka.

<sup>9</sup> Shri Lankawe Prathamika Janathawa. 2001. Samarasekara, S. S. Godage & Brothers. 238 pages. ISBN: 955-20-4760-9

The Veddah, possible descendants of the island’s first inhabitants, have had close connections to the forest for over 2,500 years. Their traditional hunter-gatherer lifestyle and culture has been impacted by loss of forest land to large-scale irrigation and other development schemes, and the establishment of conservation areas with prohibitive regulations such as a hunting ban. They have been compelled to shift their livelihood base from hunting and gathering to agriculture. Their traditional lifestyle has also changed due to increased access and mainstream education which has resulted in their integration into other societies.

### Economy

Sri Lanka opened its economy to foreign investment in the late 1970s and liberalised its industrial and trade policies<sup>10</sup>. It has since changed from an agriculture-based economy to a service and industrial economy with the service and industrial sectors contributing 58% and 30% of its Gross Domestic Product (GDP) respectively in 2009<sup>11</sup>. The agriculture sector contributed about 12% of the GDP in 2009 while employing 32.5% of the population. Forestry activities made up 8% and estate crops (tea, rubber, coconut and minor export crops) 24% of the agriculture sector’s contributions to the GDP (Figure 3). The economic contribution of forestry is likely underestimated due to incomplete data on collection and use of timber, fuelwood and non-wood forest products<sup>12</sup>. Only marketed products are included and household use of fuelwood and other resources are not documented.

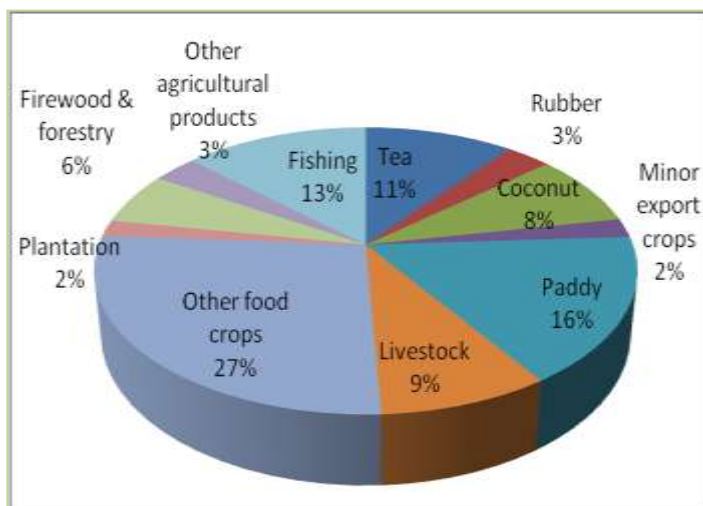


Figure 3. Agriculture sector’s contribution to Gross Domestic Product in 2009. Source: [Department of Census & Statistics – Sri Lanka](#)

<sup>10</sup> [Background Note: Sri Lanka](#)

<sup>11</sup> [Sri Lanka socio-economic data 2010. Volume XXXIII](#), June 2010. Central Bank of Sri Lanka.

<sup>12</sup> [Forest certification in Sri Lanka](#). November 1 2006. Perera, P., Vlosky, R. P., Amarasekera, H. S., De Silva, N. Forest Products Journal.



Land-based resources and commodities are partly protected with Foreign Direct Investment (FDI) permitted only up to 40 percent ownership unless otherwise approved<sup>13</sup>. This includes growing and primary processing of tea, rubber, coconut, cocoa, rice, sugar and spices; mining and primary processing of non-renewable resources; and timber-based industries using local timber.

The Sri Lankan economy registered strong growth in the last ten years despite the long civil war and a major tsunami in 2004. GDP growth rate averaged 5% from 2000-2009 and is estimated at 7% for 2010<sup>14</sup>. Per capita income exceeded US\$ 2,000 in 2009 but there are regional disparities. Approximately 15% of Sri Lankans live below the official poverty line of Sri Lankan Rs. 3087 (US\$ 30.87) a month and poverty is more pronounced in the rural areas and outside the western region<sup>15</sup>.

According to the Climate Change Secretariat, Ministry of Environment (2010)<sup>16</sup>, Sri Lanka's macroeconomic policies are pro-growth and pro-poor while continuing to be market oriented. The country's economic growth and poverty alleviation programs focus on regionally-balanced growth with small and medium scale entrepreneurs and rural sector development. The official national vision for the future<sup>17</sup> is a Sri Lanka with a green environment, rapid development and a middle income economy.

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<sup>13</sup> [Investment Policy Review: Sri Lanka](#). 2004. United Nations, New York and Geneva. United Nations Conference on Trade and Development (UNCTAD), 2003.

<sup>14</sup> [Sri Lanka county report](#). Global Finance.

<sup>15</sup> [Poverty situation and policy in Sri Lanka](#). 2001. Kelagama, S. Paper delivered at the Asia and Pacific forum on poverty, Asian Development Bank, Manila, 5-9 February, 2001.

<sup>16</sup> [Sector Vulnerability Profiles: Biodiversity and Ecosystem Services](#). November, 2010. SVP Development Team. Climate Change Secretariat, Ministry of Environment

<sup>17</sup> [Mahinda Chintana: Vision for the future](#). 2010. Department of National Planning, Ministry of Finance and Planning, Sri Lanka

### 3. Forest and Forest Carbon: Unclear Extent and Status



*Little of Sri Lanka's original forest cover remains, perhaps around 2 million hectares or 30% of the land area. Bulk of the forest estate consists of natural forests and is mainly situated in the dry zone of the island. Forest status and trends since the turn of the 21<sup>st</sup> century are unclear and a 2010 national forest cover assessment currently being finalized may help shed more light. Extrapolations from the 1990s suggest that natural forest cover, in particular closed-canopy forest cover in Sri Lanka is still on the decline but a district-wise analysis suggests a possible rise already in the late 1990s. Carbon calculations using available data from the 1980s-90s and global conversion factors suggest low carbon content in Sri Lankan forests (lowland rainforest 199 tC/ha, rest < 65 tC/ha). However, site-level research in some wet zone forests shows far higher carbon values (286 and 345 tC/ha). Data from the ground and in different zones and forest types is needed to answer the question: Can carbon incentives be used to help conserve and improve the quality of the remaining forests, and restore degraded forests and lands to meet environmental and socio-economic objectives?*

#### **Defining a forest**

As per the latest definition submitted by the Climate Change Secretariat<sup>18</sup>, Ministry of Environment to the UNFCCC in late 2010, a forest in Sri Lanka is now defined as follows: a minimum land area of 0.05 hectares with a minimum tree canopy cover of 20% and a

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<sup>18</sup> [Designated National Authority – Sri Lanka](#)

canopy height of 3 m. The definition does not specify whether species such as rubber, bamboo and palm trees are included.

### Forest cover – what, where, how much?

The Survey Department with Canadian assistance conducted the first systematic forest inventory in 1956 using aerial photo interpretation<sup>19</sup>. The next inventory was conducted in 1983 by the Forest Department with assistance from UNDP and FAO. They used aerial photographs, satellite imagery and field surveys to produce a nationwide forest cover map<sup>20</sup>. Subsequent nationwide forest cover mapping of vegetation type and canopy density using remotely-sensed data was conducted by the Forest Department in 1992<sup>21</sup> and 1996<sup>22</sup> (Table 1).

**Table 1. Area in different forest types in 1992 and 1996.**

Forest Type	1992 (ha)	1996 (ha)	1996 (% land area)	Stocking m <sup>3</sup> /ha*	AG + BG** biomass (tons/ ha)	Carbon in live biomass (tons/ha)	Carbon stocks (million tons)
Montane Forest	3,108	3,099	0.0	9	30.2	14.2	0.0
Sub-Montane Forest	68,838	65,792	1.0	9	30.2	14.2	0.9
Lowland Rain Forest	141,549	124,340	1.9	126	423.4	199.0	24.7
Moist Monsoon Forest	243,877	221,977	3.4	29	97.4	45.8	10.2
Dry Monsoon Forest	1,094,287	1,027,544	15.5	15	50.4	23.7	24.3
Riverine Dry Forest	22,411	18,352	0.3	15	50.4	23.7	0.4
Mangroves	8,687	9,530	0.1	10	33.6	15.8	0.2
Sparse Forest	463,842	471,583	7.1	5	16.8	7.9	3.7
<b>Total Natural Forest Cover</b>	<b>2,046,599</b>	<b>1,942,217</b>	<b>29.4</b>		<b>70.7</b>	<b>33.2</b>	<b>64.6</b>
Forest Plantations (excluding rubber)	72,340	79,940	1.2	40	134.4	63.2	5.0
<b>Total Forest Cover</b>	<b>2,118,939</b>	<b>2,022,157</b>	<b>30.6</b>	<b>21.8</b>	<b>73.2</b>	<b>34.4</b>	<b>69.6</b>

Source: Legg and Jewell (1995) and GOSL (2000) in [FRA \(2010\)](#)<sup>23</sup>. \*Volume data from 1984 (NFI 1986) and 1993 (GOSL 1995) in [FRA \(2010\)](#). \*\* (AG – aboveground, BG- belowground)

<sup>19</sup> Forest Surveys in Sri Lanka using Remote Sensing Methods. Fernando, A.D.N. 1986. The Sri Lanka Forester, Vol. XVII, Nos. 3 & 4, pp. 63-69.

<sup>20</sup> Forest Surveys in Sri Lanka using Remote Sensing Methods. Fernando, A.D.N. 1986. The Sri Lanka Forester, Vol. XVII, Nos. 3 & 4, pp. 63-69.

<sup>21</sup> Legg and Jewell. 1995. A 1:50,000 scale Forest Map of Sri Lanka: The basis for National Geographic System. Christopher Legg and Nicholas Jewell. The Sri Lanka Forester. Special Issue 1995.

<sup>22</sup> GOSL. 2000. Forest Cover Mapping 2000. Forest Inventory Division. Forest Department. Sri Lanka in [FRA \(2010\)](#)

<sup>23</sup> [Global Forest Resources Assessment Country report Sri Lanka](#). 2010. FAO, Rome.

The Forest Department prepared a national forest cover map for 1999 based on satellite image analyses (Table 2, Figure 4). Estimations were made for the war-torn northeast of the country where field visits were not possible. In 2010 the Forest Department conducted nationwide forest cover assessment using IRS (Indian Remote Sensing) images and field verification. The report is currently being finalised.

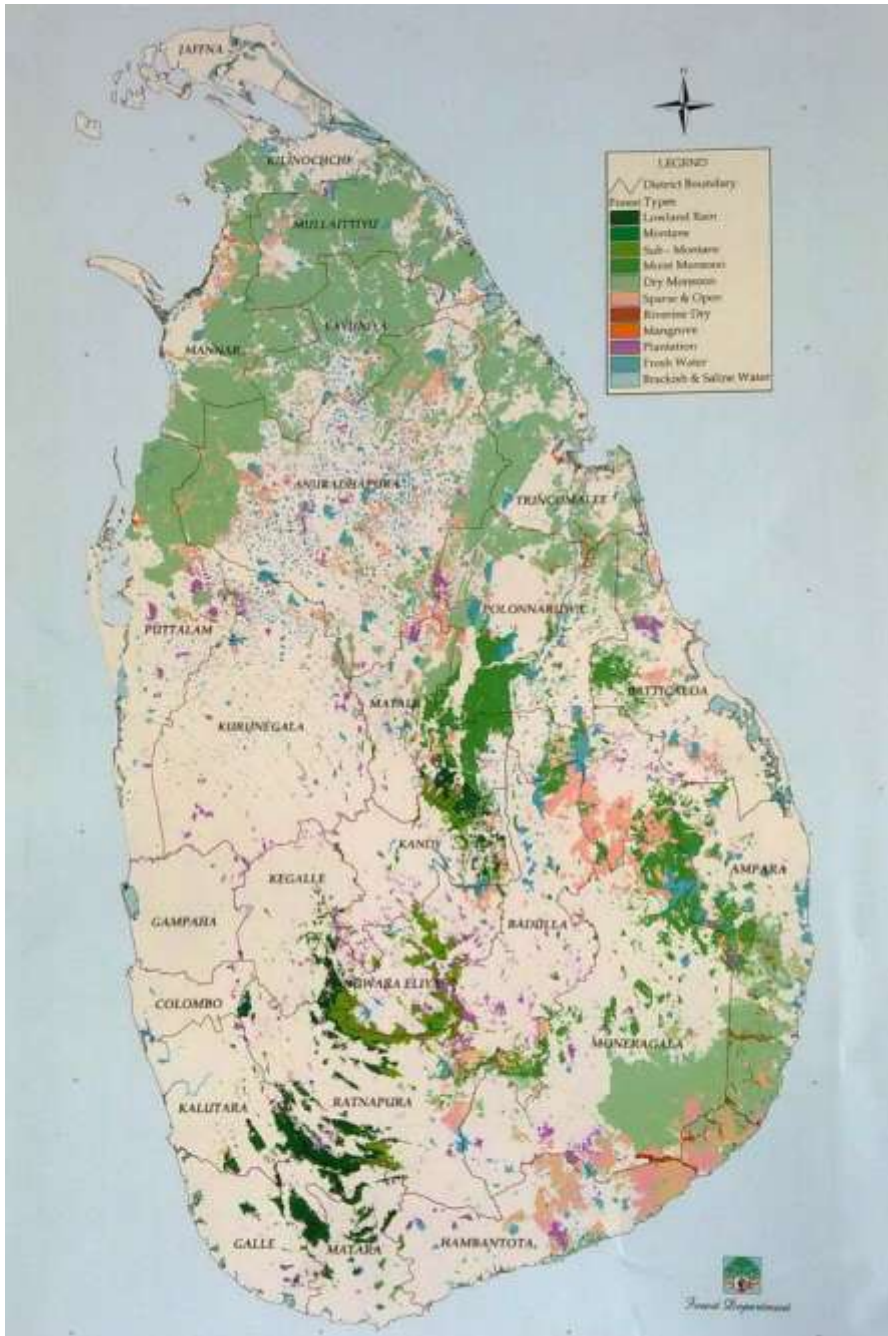


Figure 4. Sri Lanka forest cover 1999. Source: Forest Department.

Sri Lanka's forest cover was estimated at 2.1 million hectares in 1992 and 2.0 million hectares in 1996, representing 32% and 30.6% of the total land area respectively (Table 1). Most of it (2 million in 1992 and 1.9 million hectares in 1996) was natural forest with <80,000

hectares in plantations. The 1999 analysis estimated forest cover at 2.0 million hectares, with natural forest of 1.9 million hectares and plantations of 93,000 hectares (Figure 4, Table 2)<sup>24</sup>.

**Table 2. Forest area in 1999.**

Category	Extent 1999 (ha)	% of land area
Dense forests	1,462,900	22.4
Sparse forests	460,600	7.0
Forest plantations	93,000	1.4
<b>Total</b>	<b>2,016,500</b>	<b>30.8</b>

Source: *Bandaratillake and Fernando*<sup>25</sup> (2003)

Most natural forests (86%) occur in the dry and intermediate zones<sup>26</sup>. These two zones contain 85% of the closed-canopy natural forests (>70% canopy cover<sup>27</sup>) and 90% of the sparse and open-canopy forests (<70% canopy cover).

Forests in Sri Lanka are officially classified into nine categories: Montane, sub-montane, lowland rainforest, moist monsoon, dry monsoon, riverine, mangroves, sparse forest, and forest plantations excluding rubber. Tropical rain forests are found in the wet zone, sub-montane forests in the central highlands and dry monsoon forest in the dry zone<sup>28</sup>. In 1992 and 1996, dry monsoon forests covered the largest area making up >50% of the total forest cover, followed by sparse forests (> 21%), moist monsoon forests (11% in both years) and lowland rainforests (6% in both years).

### **Trends in forest cover – still on the decline?**

The forest cover in Sri Lanka declined drastically over the past century. Early inventories suggest that Sri Lanka's closed canopy forest cover declined from about 84 percent of the land area in 1881, to 44 percent in 1956 and to 27 percent in 1983<sup>29</sup> (Figure 5). Closed-canopy forest cover declined further to 24% (1.58 million hectares) in 1992 and 22.4% (1.47

<sup>24</sup> [National forest policy review Sri Lanka](#). 2003. Bandarattillake, H.M. and Fernando, M.P.S. 20 pages.

<sup>25</sup> [National forest policy review Sri Lanka](#). 2003. Bandarattillake, H.M. and Fernando, M.P.S. 20 pages.

<sup>26</sup> Silva, P. 2001. Land Use Changes in Sri Lanka. Report number 03. Background information for preparation of National Physical Planning Policy – 2001. National Physical Planning Department, Government of Sri Lanka in [District-wise forest area variation in Sri Lanka from 1992 to 2001 for supporting the National Physical Planning Policy](#). 2002. Ratnayake, J., Abeykoon, M. and Chemin, Y. National Physical Planning Department, Government of Sri Lanka.

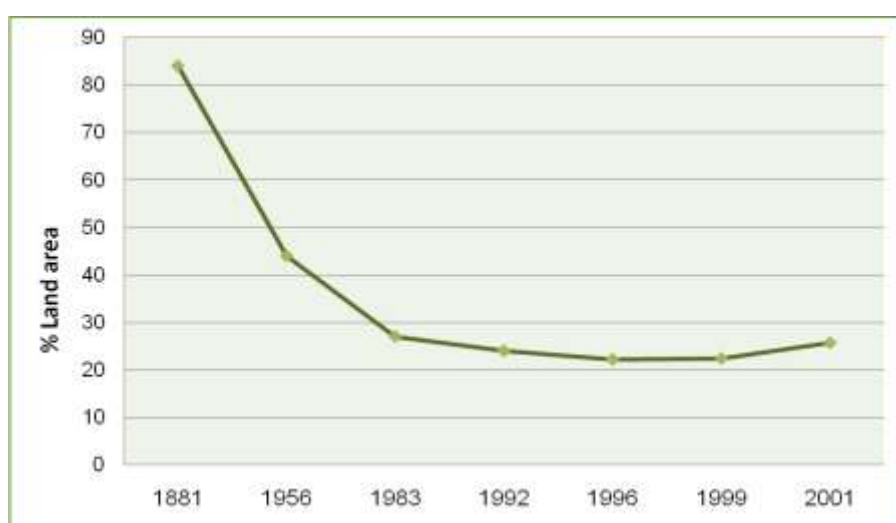
<sup>27</sup> [Biodiversity Conservation in Sri Lanka – A framework for Action](#). 1999. Ministry of Forestry & Environment, Battaramulla, Sri Lanka.

<sup>28</sup> [Impacts and effectiveness of logging bans in natural forests: Sri Lanka](#). 2001. Bandarattillake, H.M.

<sup>29</sup> [Impacts and effectiveness of logging bans in natural forests: Sri Lanka](#). 2001. Bandarattillake, H.M.

million hectares) in 1996 (from Table 1). Bandaratillake and Fernando (2003)<sup>30</sup> also suggest a figure of 22.4% (1.46 million hectares) in 1999.

A district-wise forest inventory for the nation using Landsat 7 ETM+ data from 1999-2001 conducted by the National Physical Planning Department suggests that closed-canopy forest cover actually increased to 1,688,442 hectares or 25.7% of the total land area<sup>31</sup>. In the district-wise analysis, dense forest cover was mapped by semi-automatically updating a previously available map. Of the 25 districts, six had significant change (>6%) in closed canopy forest cover from 1992 to 2001: four districts in the North (Mannar, Puttalam, Trincomalee and Vavuniya) showed a significant decline while Kandy and Badulla districts in the uplands showed a significant increase.



*Figure 5. Closed canopy forest cover change (as percentage of land area) in Sri Lanka.*

Based on the above estimates, Bandaratillake and Fernando (2003) suggest that closed-canopy forests declined by 42,000 hectares per year on average from 1956 to 1992, and 17,000 hectares per year from 1992 to 1999. We, the authors, derive 28,000 hectares per annum decline in closed-canopy forests from 1992 to 1996 from Table 1, about 1.8% per year. The district-level analysis suggests that closed-canopy forest cover increased subsequent to this period but accuracy of this data is unclear.

Natural forest cover overall declined by 26,095 hectares per annum from 1992 to 1996 (Table 1), at a rate of 1.27%. Adding in plantations reduces the rate of decline to 1.1%. FRA (2010)<sup>32</sup> provide the following estimations of forest cover for 1990 to 2010 based on best available information and expert consultations (Table 3). These estimates indicate a decline

<sup>30</sup> [National forest policy review Sri Lanka](#). 2003. Bandaratillake, H.M. and Fernando, M.P.S. 20 pages.

<sup>31</sup> [District-wise forest area variation in Sri Lanka from 1992 to 2001 for supporting the National Physical Planning Policy](#). 2002. Ratnayake, J., Abeykoon, M. and Chemin, Y. National Physical Planning Department, Government of Sri Lanka.

<sup>32</sup> [Global Forest Resources Assessment Country report Sri Lanka](#). 2010. FAO, Rome.

in forest cover over the time period though at a reducing annual rate of decline (-1.1% to -0.3%). However, the data is based purely on extrapolation.

**Table 3. Estimated forest cover and change from 1990 to 2010.**

(Adapted from FRA 2010).

Item	1990	2000	2005	2010
Forest excluding rubber (ha)	2,167,000	1,925,000	1,804,000	1,743,000
Forest cover (% land area)	33.0	29.3	27.5	26.6
		<b>1990-2000</b>	<b>2000-2005</b>	<b>2005-2010</b>
Annual change rate (ha)		-24,200	-12,100	-6,100
Annual change rate (%)		-1.1	-0.6	-0.3

A forest cover of  $\leq 30\%$  and annual deforestation rates of 0.3 to 1.1% puts Sri Lanka in a new category “low forest cover but high deforestation rate (LFHD)”<sup>33</sup> rather than in the low forest cover low deforestation rate (LFLD) category where it is commonly thought to belong<sup>34</sup>. However, it is unknown whether natural forest cover, in particular closed-canopy forest cover in Sri Lanka is still on the decline or has turned the corner and risen. To obtain actual figures on forest cover trends over the last decade, we will have to await the results of the nationwide forest cover assessment being finalised by the Forest Department.

Sparse forests increased by 7741 hectares from 1992 to 1996, 0.1% per year, indicating that some level of forest degradation was ongoing in that period. Remote sensing probably failed to pick up more subtle ongoing degradation effects and the relative importance of forest degradation in Sri Lanka is unclear.

### **National carbon guesstimates**

Carbon stocks for Sri Lanka’s forests in 1996 have been calculated using NFI (1986) values as referenced in FRA (2010)<sup>35</sup>. Calculations were made for the year 1996 because this was the last year for which inventory data by forest type was readily available. There is a lack of original data allowing for calculation of parameters such as biomass conversion and expansion factor (BCEF) and carbon conversion factors for Sri Lankan forests. Therefore conversion factors as applied in FRA (2010) for Sri Lanka have been used as follows:

- The BCEF of 2.8 for humid tropical zone has been applied to the growing stock.

<sup>33</sup> [No Forest Left Behind](#). Published online 2007 August 14. Gustavo A. B da Fonseca, Carlos Manuel Rodriguez, Guy Midgley, Jonah Busch, Lee Hannah, and Russell A Mittermeier. PLoS Biol. 5(8): e216. doi: [10.1371/journal.pbio.0050216](https://doi.org/10.1371/journal.pbio.0050216).

<sup>34</sup> a) [Reference emissions levels for REDD](#). June 2009. The Nature Conservancy Policy Brief. b) [Implications of REDD baseline methods for different country circumstances during an initial performance period](#). Bronson Griscom, David Shoch, Bill Stanley, Rane Cortez, Nicole Virgilio.

<sup>35</sup> [Global Forest Resources Assessment Country report Sri Lanka](#). 2010. FAO, Rome.

- Considering an above ground biomass >20 tons per hectare and a tropical dry forest biome, the root-shoot ratio of 0.20 was chosen.
- A carbon conversion factor of 0.47 was applied to the biomass.

Carbon stocks in different forest types and overall for Sri Lankan forests in 1996 are presented in Table 1. Lowland rainforests contained the highest living biomass of 423 tons per hectare and carbon stocks of 199 tons per hectare. Plantations and moist monsoon forests ranked a distant second and third with 63 and 46 tons of carbon per hectare. Living biomass across forest types overall equalled 73 tons per hectare and carbon stocks were 34 tons per hectare.

Total carbon stock in Sri Lankan forests in 1996 can thus be estimated at 69.6 million metric tons, of which 64.6 million tons was in natural forest. Dry monsoon forests because of its large area and lowland rainforests because of its carbon richness made up bulk of the stocks with >24 million tons of carbon in each of them. Moist monsoon forests had >10 million tons. Sparse forests had little carbon content despite the sizeable area.

As per this analysis, the total value (69.6 million tons) and per hectare value (34 tons) of forest carbon stocks in Sri Lanka rank among the lowest in Asia. Countries of East, South and Southeast Asia are estimated to have 30 to 188 tons of carbon per hectare and 61 to 13,017 million tons of carbon in their forest biomass in 2010<sup>36</sup>.

#### **Site-level research in the wet zone shows higher carbon values**

However, some field studies conducted on carbon stocks in forest types in the wet zone suggest higher carbon values than estimated using nationwide data in Table 1. Nissanka and Pathinayake (2009)<sup>37</sup> assessed carbon content in the 8500 hectare<sup>38</sup> Sinharaja Forest Reserve, a UNESCO World Heritage site dominated by lowland rainforests. Using Landsat image analysis supported by field measurements, they estimated that the Reserve stores about 2.437 million metric tons of carbon in total with an above-ground carbon stock of 1.624 million tons. If we divide the 2.437 million tons by 8500 hectares, we derive a carbon stock of 286 tons per hectare in these forests, much higher than the 199 tons per hectare estimated for lowland rainforests in Table 1.

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<sup>36</sup> Table 11 in [Global forest resources assessment 2010 Main report](#). FAO Forestry paper 163. FAO, Rome.

<sup>37</sup> [Estimation of above ground carbon stock in Sinharaja forest using Remote sensory data](#). 2009. S.P. Nissanka and P.S.Pathinayake, Department of Crop Science, Faculty of Agriculture, University of Peradeniya

<sup>38</sup> [Sinharaja Forest Reserve - UNESCO](#)



Dharmaparakrama et al. (2009)<sup>39</sup> assessed carbon storage in five land use types in the Knuckles mountain region, a National Man and Biosphere Reserve located in the central highlands of Sri Lanka. Total carbon stock in the natural forests was highest at 345 metric tons per hectare in the WM3b agro ecological zone (wet mid-country zone 3). Cardamom forests contained 143 to 155 tons of carbon per hectare, pine plantations between 113 and 175 tons/hectare, while tea plantations and grasslands had 50-64 tons/hectare. The figures for wet zone natural forests, cardamom forests and even pine plantations are way higher than the general range of carbon values estimated in Table 1 (199 tons/hectare in lowland rainforests, all else below 65 tons/hectare).

### **Lack of data**

Available information on the forest and land use sector in Sri Lanka is limited. Some information exists on forest use and trends but little exists on species-specific growth data (such as tree height, form, diameter, biomass expansion factors, root-shoot ratio, wood densities) that are important for accurately estimating carbon stocks. There are some carbon stock studies in high profile wet zone forests but not in intermediate and dry zones of the country where most of the forests are.

The first National Communication<sup>40</sup> to the UNFCCC in October 2000 included information about the forest and land use sector but the biomass estimates provided were rough approximates. The report specifically noted that forest area and rate of conversion to other land use was not properly documented and not freely available. Numbers reported for recent years in FAO forest assessment reports and by the Department of Census and Statistics in Sri Lanka<sup>41</sup> are based on extrapolation of data gathered in a particular period.

The Forest Department is currently finalising an updated forest cover map with the help of 2010 satellite imageries that aims to clarify the national forest situation. Sri Lanka has finalized the Second National Communication for submission to the UNFCCC but results are not publicly available yet.

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<sup>39</sup> [Carbon Stores of the Major Land Use Types in the Knuckles Forest and Surrounding Region in Sri Lanka](#) (2009). A.L.S. Dharmaparakrama, K.U. Tennakoon, C.V.S. Gunatilleke, I.A.U.N. Gunatilleke and G. Glatzel. Conference on Global Climate Change and its Impacts on Agriculture, Forestry and Water in the Tropics, 10-11 Sept. 2009, Kandy, Sri Lanka

<sup>40</sup> [Initial National Communication under United Nations Framework Convention on Climate Change](#) - Sri Lanka (October 2000)

<sup>41</sup> [Statistical Abstract 2010](#), Department of Census & Statistics – Sri Lanka

## 4. Drivers of Deforestation & Degradation: Tea and Population Boom



*Upland forest clearance for coffee, tea, rubber, and other estate crops continued in the post-colonial period. Further rising population and development pressures led to large-scale conversion for agricultural and residential purposes. Land use change drivers since the 1990s (including the civil war and economic boom) and their effects on forests are uncertain. Urbanisation, cash crop development, illegal logging and encroachment could be continuing to affect the remaining forests. Clarity is required on the key deforestation and degradation drivers at present in different districts and forest areas to assess whether and how they can be addressed through REDD+ measures.*

Through an 1840 “Encroachment upon Crown Lands Ordinance”<sup>42</sup>, the British declared all lands that had no legal documents as the property of the Queen of England. The British used the crown lands for establishing plantations including tea, rubber and coffee. Vast areas of natural forest in the uplands were cleared to establish coffee plantations. The coffee plantations were destroyed by coffee blight and the British switched to tea planting. More forests were then cleared and labour brought in from India to establish vast tea plantations. Most of the uplands were colonized as a result. Other major deforestation factors during the colonial period include road and rail construction, infrastructure development and logging.

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<sup>42</sup> [State Land Encroachments Chapter 288](#). Contains consolidated amendments to Ordinance from 1840 to 1954.

High deforestation rates continued in the post-colonial period after 1948 due to rising population pressures and development programmes. Little attention was paid to the environment in the implementation of development programmes<sup>43</sup>. By the 1990s, nearly 809,000 hectares of natural forest had been lost to agricultural, residential and other conversion schemes<sup>44</sup>. The Mahaweli Development Project alone converted 243,000 hectares of forests and helped irrigate large areas in the dry zone. The deforestation rate declined in the 1990s mainly because most large-scale agricultural expansion projects were completed<sup>45</sup>.

Reports such as Bandarathillake (2001)<sup>46</sup>, Bandarathillake and Fernando (2003)<sup>47</sup>, Review of Environmental Legislation in Sri Lanka (1994)<sup>48</sup> and White (2006)<sup>49</sup> discuss the drivers of deforestation and degradation around the 1990s. We, the authors, summarise below the main causes identified by them. Minimal areas are said to be affected by fire and drought<sup>50</sup>.

#### Major causes of deforestation and forest degradation cited:

- Land use change (urbanization; conversion to cash crops like coffee, tea, rubber, coconut; Mahaweli development up to 1996),
- Inappropriate tourism development projects around forest lands,
- Illegal logging and over logging (increasing timber demand from households and industries, particularly in accessible high-value forest plantations),
- Gemstone mining,
- Encroachment into state forest areas (expanding swidden and cash cropping), and
- Prawn/ Shrimp farming in some coastal areas

#### Underlying causes cited:

- Lack of a national land-use policy and coordinated planning with other sectoral policies and development activities,
- Lack of a comprehensive forest management plan and monitoring system,
- Lack of clear forest boundaries to prevent illegal felling and encroachment,
- Widespread poverty and landlessness causing pressure on natural resources,
- Inadequate enforcement of existing regulations,
- Lack of policy instruments such as incentive schemes and credit to encourage the private sector to develop alternative wood resources, and
- Recognizing only the State as the forest manager and not allowing for effective participation of other people.

<sup>43</sup> [Sri Lanka Country Profile](#) Implementation of Agenda 21. November 1997. Information provided by the Ministry of Forestry and Environment, Sri Lanka to the United Nations Commission on Sustainable Development, New York.

<sup>44</sup> [Impacts and effectiveness of logging bans in natural forests: Sri Lanka](#). 2001. Bandarathillake, H.M.

<sup>45</sup> [National forest policy review Sri Lanka](#). 2003. Bandarathillake, H.M. and Fernando, M.P.S. 20 pages.

<sup>46</sup> [Impacts and effectiveness of logging bans in natural forests: Sri Lanka](#). 2001. Bandarathillake, H.M.

<sup>47</sup> [National forest policy review Sri Lanka](#). 2003. Bandarathillake, H.M. and Fernando, M.P.S. 20 pages.

<sup>48</sup> Review of Environmental Legislation in Sri Lanka, Volume 1. 1994. Central Environmental Authority, Ministry of Environment & Parliamentary Affairs, Sri Lanka.

<sup>49</sup> [Macroeconomic Policy Framework for Reducing Deforestation](#). April, 2006. White, R. Master of Arts in Law and Diplomacy Thesis. The Fletcher School of Law & Diplomacy, Tufts University, USA.

<sup>50</sup> [Global Forest Resources Assessment Country report Sri Lanka](#). 2010. FAO, Rome.

Both forest trends and land use change drivers since the 1990s are not well documented. There are media reports that the years of civil war may have led to substantial forest clearing<sup>51</sup>. Government soldiers cleared forests that provided cover for rebel forces (also mentioned in Bandaratilake 2001), especially along the roads. Rebel forces harvested trees for construction. Fighting displaced farmers who then sought new lands in forested areas. However, many ecosystems may have benefitted from being left alone through the war years. Reconstruction efforts after the 2004 tsunami in Sri Lanka may have increased pressure on other Asian rainforests. The effect of post-war reconstruction and economic developments on forest resources in Sri Lanka is still unknown.

Greater clarity is required on the key deforestation and forest degradation drivers at present to assess whether and how they can be addressed through REDD+ actions. Pressures may also be different from district to district given that the 1999 to 2001 district-wise forest inventory showed differential trends in forest cover. The kind of pressures in each district and overall would determine the most effective mix of measures that could be applied such as policy changes, law enforcement actions, participatory approaches, forest carbon project activities on the ground and other.

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<sup>51</sup> [Sri Lanka: Environmental Profile](#). mongabay.com; [An interview with Dr. Ranil Senanayake, chairman of Rainforest Rescue International: Sri Lanka's rainforests fast-disappearing but hope remains](#). November 6, 2006. mongabay.com

## 5. Forest Zoning, Administration & Tenure: Creating Room for Non-Government Actors



Two State agencies, DoF and DWLC administer most of Sri Lanka's forest lands and bulk of it is gazetted for conservation and non-extractive uses. A proportion gazetted for multiple use, particularly for local community needs, are also protected indeterminately as per a logging ban on natural forests instituted in 1990. Private companies and individuals are said to manage about 7% of the country's forest land. However information on forest land ownership and management is unclear and varied. The "village forest" category that appears in the regulations ceased to exist on the ground by year 2009. Community ownership and participation has been very limited in the past and mainly a result of recent donor-funded community forestry projects which have provided some valuable experience. Recent government policies aim to actively promote a) community-based forest management outside the protected area system for a variety of goods and services, and b) private sector investment in new forest plantations to meet increased wood demand. Thus there is potential for community and private sector participation in upcoming REDD+/forest carbon activities if appropriate mechanisms are developed. Clear land delineation, classification and tenure issuance is a critical first step for managing the areas, be it for conservation, production or carbon benefits.

### Mainly State lands

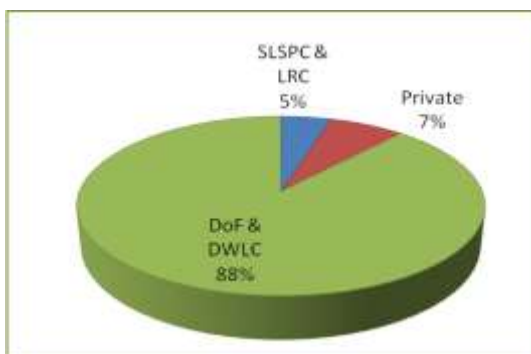


Figure 6. Land ownership in Sri Lanka.  
Source: FRA, 2010

Presently 93% of all forest lands in Sri Lanka are administered by the State<sup>52</sup> (Figure 6). Bulk (95%) of the state forest estate is managed by two Departments – the Department of Forests (DoF) under the Ministry of Environment and the [Department of Wildlife Conservation \(DWLC\)](#)<sup>53</sup> under the Ministry of Agrarian Services and Wildlife. The Sri Lanka State Plantation

<sup>52</sup> [Global Forest Resources Assessment 2010, Main Report](#), October, 2010. FAO Forestry Paper 163. Rome, Italy.

<sup>53</sup> [Global Forest Resources Assessment Country report Sri Lanka](#). 2010. FAO, Rome.

Corporation (SLSPC) and the Land Reform Commission (LRC) administer <5% of state forest lands which consists mainly of the natural forest patches within state tea and rubber plantations.

### Area under the Department of Forests

As per Table 4 below, the Department of Forests was responsible for 1.9 million hectares of natural forests and 95,037 hectares of plantations in 2008. Roughly half the closed-canopy natural forests were gazetted as forest reserves and proposed reserves for conservation and non-extractive uses<sup>54</sup>. The other half was gazetted as other state forests and allocated for multiple use, i.e. sustainable management for a mix of wood and non-wood products and environmental services, in particular for the rural poor.

**Table 4. State forest land zoning and administration.**

Category	Area (hectares)		
	2001	2004	2008
<b>1. Natural forests</b>			
1.1 Closed canopy natural forests			
a. Forest Reserve		289,824	289,824
b. Proposed Reserve		252,540	252,540
c. Other state forests		503,927	503,927
Total		<b>1,046,291</b>	<b>1,046,291</b>
1.2 Sparse forests		366,848	366,848
1.3 Mangroves		8,815	8,815
<b>Total</b>		<b>1,421,954</b>	<b>1,421,954</b>
<b>2. Forest Plantations</b>			
a. Teak		31,700	31,972
b. Mahogany		3,700	5,255
c. Eucalyptus/ Acacia		28,275	28,506
d. Pine/ Bamboo		16,440	15,923
e. Teak/ <i>Khaya senegalensis</i> mixed		-	463
f. Other Species		12,885	12,918
<b>Total</b>		<b>93,000</b>	<b>95,037</b>
<b>Total forest lands under Forest Department*</b>		<b>1,514,954</b>	<b>1,516,991</b>
National parks	498,643	510,079	513,688
Strict nature reserves	31,574	31,574	31,574
Nature reserves	48,487	51,606	51,736
Jungle corridors	10,364	19,141	19,141
Sanctuaries	305,538	312,078	307,315
<b>Total land area under Dept of Wildlife Conservation**</b>	<b>894,606</b>	<b>924,478</b>	<b>923,454</b>

\*Source: Area of Forests 2004-2009, Department of Forests<sup>55</sup>.

\*\*Source: Area of Wild life reserves 2001-2009, Department of Wildlife Conservation<sup>56</sup>.

<sup>54</sup> [Global Forest Resources Assessment Country report Sri Lanka](#). 2010. FAO, Rome.

<sup>55</sup> [Department of Census & Statistics](#), Sri Lanka

<sup>56</sup> [Department of Census & Statistics](#), Sri Lanka

However logging has been banned in these and all natural forests since 1990 to prevent further degradation and loss of natural forest cover, and rehabilitate heavily degraded forests<sup>57</sup>. The ban is to remain in place till the forests have recovered and management plans are in place with the active participation of local communities.

The Forest Ordinance was amended in 1995 to incorporate a new category called “conservation forests” under the Forest Department<sup>58</sup>. Estimates of area in conservation forests (76,525 hectares in 1997 and 91,859 hectares in 2009) are provided separately as part of the national protected area system in Table 5. The 145,754 hectares of protected areas under the Forest Department in 2009 was created using lands belonging to the categories Forest Reserves and Proposed Reserves in Table 4.

**Table 5. Protected areas in Sri Lanka (hectares)**

Category	1997 <sup>59</sup>	2009 <sup>60</sup>
<b>Department of Forests</b>		
International Biosphere Reserves	9,376	42,768
National Biosphere Reserves	63,384	-
National Heritage and Wilderness Areas	11,187	11,127
Conservation Forests	76,525	91,859
Sub-total	160,472	-
<b>Sub-total Corrected*</b>	<b>149,909</b>	<b>145,754</b>
<b>Department of Wildlife Conservation</b>		
National Parks	462,448	522,263
Nature Reserves	33,372	53,829
Strict Natural Reserves	31,574	31,574
Sanctuaries	284,117	270,863
Jungle corridors	-	19,141
<b>Sub-total</b>	<b>821,871</b>	<b>897,670</b>
<b>Total</b>	<b>971,780</b>	<b>1,043,424</b>

\* Corrected for International and National Biosphere Reserves that are located in National Heritage and Wilderness Areas and Conservation Forests.

Another variable set of figures for natural forests by management agency and objective is provided by Bandaratilake (2001) as in Table 6.

<sup>57</sup> [Impacts and effectiveness of logging bans in natural forests: Sri Lanka](#). 2001. Bandaratilake, H.M.

<sup>58</sup> [Impacts and effectiveness of logging bans in natural forests: Sri Lanka](#). 2001. Bandaratilake, H.M.

<sup>59</sup> [Impacts and effectiveness of logging bans in natural forests: Sri Lanka](#). 2001. Bandaratilake, H.M.

<sup>60</sup> [Area of Forests 2004-2009](#), Department of Forests.

**Table 6. Sri Lanka's natural forests by production and protection classifications**

Management agency	Production* (ha)	Protection (ha)	Total (ha)
Forest Department	975,600	174,900	1 150,500
Department of Wildlife Conservation	0	821,900	821,900
Local administration	74,100	0	74,100
<b>Total Area</b>	<b>1 ,049,700</b>	<b>996,800</b>	<b>2, 046,500</b>
<b>% of total forests</b>	<b>51.3</b>	<b>48.7</b>	<b>100.0</b>

\*Currently subject to the logging ban

Source: [Impacts and effectiveness of logging bans in natural forests: Sri Lanka](#). 2001. Bandarattillake, H.M.

Forest land categories under the Forest Department and area in each needs to be reconciled to obtain a consolidated view of the lands under the administration of the Forest Department along with their management objectives. The Statistics Department has put out [figures](#) for forest area under different categories in 2009 but the Forest Department indicates that those numbers are invalid and they will be providing amended figures soon.

As per Table 4, the Forest Department's plantation area increased by about 2000 hectares from 2003-2008. About 50% of the Department's plantations are of exotic species such as pine, eucalyptus, acacia and mahogany. A third (64%) of the plantations as per plantation management plans of 1998 is meant for production purposes, while the remaining is meant to serve protection (28%) and conservation (8%) functions.

#### **Area under the Department of Wildlife Conservation**

The Department of Wildlife Conservation established in 1949 administers 897,670 hectares (as of 2009) of forest lands gazetted into five categories: national parks (15 parks), strict nature reserves (3), nature reserves (4), jungle corridors and sanctuaries (55) (Table 5)<sup>61</sup>. National parks are accessible by the public and used for ecotourism activities. Strict nature reserves are strictly for biodiversity conservation. Nature reserves are focused on conservation and allow restricted visitor activities. Development activities of all lands managed by the DWLC are controlled by the Fauna and Flora Protection Ordinance. The national parks receive significant number of visitors and generate substantial revenue<sup>62</sup>.

The overall area under their jurisdiction has been fluctuating from 971,780 hectares in 1997 (Table 5) to 894,606 in 2001, 924,478 in 2004, 923,454 in 2008 (Table 4) and 897,670

<sup>61</sup> [Department of Wildlife Conservation](#), Ministry of Environment; [Global Forest Resources Assessment Country report Sri Lanka](#). 2010. FAO, Rome.

<sup>62</sup> [Impacts and effectiveness of logging bans in natural forests: Sri Lanka](#). 2001. Bandarattillake, H.M.



hectares in 2009 (Table 5). Mr. Channa Suraweera of the DWLC indicated that the main reason for this fluctuation is gazetting and degazetting of areas as protected areas at different times. In certain situations sanctuaries were degazetted and upgraded into national parks. If village areas were located within a protected area, those areas were given to the local communities by degazetting.

### **Role of the State Timber Corporation**

The State Timber Corporation (STC) established in 1968 extracts, processes and markets timber from state forest lands (from forest plantations and natural forest areas); and also purchases some timber from private lands<sup>63</sup>. Since the logging ban introduced in 1990, official logging in natural forests has only been conducted for security reasons and for permitted development projects. The extent of such clearing is not publicly available. STC's contribution to domestic timber supply has fallen from 14% in 1986 to 5.5% in 1995, and private sector contribution has increased<sup>64</sup>. STC's estimated production from January to September 2010 was 102,159 m<sup>3</sup> of logs and 3,633 m<sup>3</sup> of sawn timber<sup>65</sup>. FRA (2010) provides an extrapolated (from 1995 values) estimate of total industrial roundwood removals of 763,000 m<sup>3</sup> in 2005<sup>66</sup>. True volumes are unknown.

### **Private Sector involvement**

Private companies and individuals are said to manage around 7% of the country's forest land which consists of natural forests within estate crop plantations and commercial timber



Teak (*Tectona grandis*) plantation in Puttlam

plantations. However Prof. Hemanthi Ranasinghe from the University of Sri Jayewardenepura believes that 7% may be an overestimate. Plantations are mainly monocultures and of exotic species (see Table 4). Private companies and individuals are not allowed to harvest the natural forest patches in estate crop plantations. According to the National Environmental regulations in 1993<sup>67</sup>, environmental impact assessment and approval<sup>68</sup> is required for timber extraction

<sup>63</sup> [State Timber Corporation](#), Ministry of Environment and Natural Resources.

<sup>64</sup> [Impacts and effectiveness of logging bans in natural forests: Sri Lanka](#). 2001. Bandarattillake, H.M.

<sup>65</sup> Progress Report 2010 and Action Plan 2011. Ministry of Environment, Sri Lanka

<sup>66</sup> [Global Forest Resources Assessment Country report Sri Lanka](#). 2010. FAO, Rome.

<sup>67</sup> [Gazette Extra Ordinary No. 772/22 dated 24.06.93](#)

<sup>68</sup> [Steps in EIA process](#), Central Environmental Authority, Sri Lanka

over more than five hectares of land or conversion of more than one hectare of forest into non-forest use.

As per the National Forestry Policy of 1995<sup>69</sup>, the government planned to establish large areas of new forest plantations with private sector involvement to meet increased wood demand. The government has since been awarding long-term land leases to the private sector to establish commercial forest plantations and aims to provide adequate policy, legislative and financial support<sup>70</sup>. In 2002, 26 agreements were signed between the Forest Department and private sector investors to develop commercial scale plantations<sup>71</sup>. Foreign investors can also invest in forestry projects in the country in association with local partners and substantial tax benefits are provided by the Sri Lanka Board of Investment<sup>72</sup>.

One model of private sector involvement is planting fast-growing species such as Eucalyptus and Acacia for timber and fuelwood in barren and abandoned lands in tea and rubber estates. The companies raise their own funds.

Another model is private company planting of timber species such as teak, mahogany, agarwood and sandalwood. The general public can invest in these plantations and the company manages the trees on their behalf until harvest which is usually 20 or more years after which they derive income from timber sales. Examples of companies adopting this model are [Touchwood Investments](#), [Sadharitha Plantations Limited](#) and Help Green. Touchwood Investments has about 1400 hectares of plantations of seven species including mahogany, bamboo, agarwood, sandalwood. Sadharitha Plantations has over 405 hectares of teak and 30 hectares of sandalwood at present and plans to establish 80 hectares of teak and 80 hectares of sandalwood per year over the next 10 years. Help Green had established 1909 hectares of Teak plantations in the dry zone of Sri Lanka. Following a liquidity crisis and inability to pay its debts, Help Green has a law suit filed against it in court.

Precise area in private sector plantations; and in different models, species and investment sources is unknown at present. The private sector indicated that their plantation operations were constrained by lack of suitable land (sizeable areas for cost-effective operation),

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<sup>69</sup> National Forestry Policy and Executive Summary (November, 1995). Forestry Sector Development Division, Ministry of Agriculture, Lands and Forestry

<sup>70</sup> [Plantation Forestry in Sri Lanka: Challenges and Constraints](#). September, 2007. Subasinghe, S.M.C.U.P. Presidential Address at the AGM of Institute of Biology Sri Lanka

<sup>71</sup> [Sri Lanka: Conflict and timber overview](#). ARD, Inc. USAID, Washington DC.

<sup>72</sup> Weerawardena, N.D.R. 2003. Challenges and opportunities in forestry for the new millennium environment in Sri Lanka in [Forest certification in Sri Lanka](#). November 1 2006. Perera, P., Vlosky, R.P., Amarasekera, H.S., De Silva, N. Forest Products Journal.

unclear land titles and complicated tax regulations. Similar constraints were reported by Subasinghe (2007)<sup>73</sup>.

### **What role for communities?**

Bandaratillake (2001)<sup>74</sup> estimated that about 30 percent of Sri Lanka's rural population of 12.8 million people at that time lived near the forests and depended at least partly on forest resources for fuel, NWFPs and grazing land. However, involvement of rural people and communities in forestry development activities has been limited in the past<sup>75</sup>. Forest policies before 1995 recognized the state as the primary forest manager and communities that lived in and around forest areas and depended on them for their livelihoods were treated as intruders. Their collective use was not recognized through formal tenure processes and they were not involved in forest policy development or area management.

A whole category of forests called village forests which was under the administration of Divisional Secretariats (local district governments) did not appear in the statistics on forest land ownership and administration, either national or global FRA reports. Mr. Sarath Fernando (ex-Conservator General of Forests) indicates that this was the only category under local administration in the past and they had the authority to decide on allocating and utilizing these village forests. "Lands under this category were used for various purposes including village expansion and development activities and village forest areas gradually declined to become extinct by 2009," observed Mr. Fernando. However, village forests continued to be mentioned in the forest laws (Forest (amended) Act No 65 of 2009 – see Chapter 8) even though they ceased to exist on the ground by year 2009.



Farmers Woodlot in Anuradhapura

From the 1950s to the 1980s, the government established large-scale plantations of teak and eucalyptus in the dry zone and pines in the wet zone to meet timber and fuelwood demand and reduce pressure on natural forests. From the mid-1980s to 1990s, more participatory community forestry approaches were used to establish fuelwood plantations and community woodlots on degraded government lands in a number of districts

<sup>73</sup> [Plantation Forestry in Sri Lanka: Challenges and Constraints](#). September, 2007. Subasinghe, S.M.C.U.P. Presidential Address at the AGM of Institute of Biology Sri Lanka

<sup>74</sup> [Impacts and effectiveness of logging bans in natural forests: Sri Lanka](#). 2001. H.M. Bandaratillake.

<sup>75</sup> [Forest policies in Sri Lanka](#). 2002. Fernando, S. Forestry Department. Proceedings of the Forest Policy Workshop Kuala Lumpur, Malaysia 22-24 January, 2002. Edited by Thomas Enters and Robin N. Leslie. FAO, Bangkok, Thailand.

with funding from the Asian Development Bank (ADB Community Forestry Project)<sup>76</sup>. Farmers could lease degraded government land for 25 years and produce timber and firewood for sale or use<sup>77</sup>. Other woodlots were established for soil and water conservation purposes. More community forestry programs followed with Australian<sup>78</sup>, World Bank, UK, USAID and UNDP-GEF funding<sup>79</sup>. There is currently one ongoing program (2010-2014) funded by AusAID.

The main focus of these programs were the forests under the control of the Forest Department in the dry and intermediate zones, which were classified under the category of



Community forestry project of 23.4 hectares and 55 farmers - Forest Department

“multiple use”, and especially forests that were under increasing pressure and risk from encroachment, illegal harvesting and human-induced fire. The programs aimed to avoid further deforestation and forest degradation in these areas. Project reviews suggest that these community forestry projects contributed significantly to community livelihoods and helped to develop the Forest Department’s capacity to implement community forestry activities<sup>80</sup>.

The National Forest Policy of 1995<sup>81</sup> identified participatory management as a key approach to forest resource management, both for protection and production purposes. It emphasized the need to develop partnerships with local people, communities, non-governmental organizations (NGOs) and the private sector and clearly defined roles and responsibilities of the different partners. The forests (natural forests and plantations) outside the protected area system are to be managed on a sustainable basis through community-based forest management for a variety of goods and services. Communities may develop management plans to prohibit extractive uses in selected parts of these forests and allow harvesting in other parts, thus meeting livelihood needs and achieving long-term conservation objectives.

<sup>76</sup> [Participatory forest resource management in Sri Lanka – Past, present and future directions](#) (2005) Sathurusinghe, A. and Hunt, S. 17<sup>th</sup> Commonwealth Forestry Conference, Colombo.

<sup>77</sup> [Project Information Document](#), Asian Development Bank

<sup>78</sup> [Department of Government Information](#), Sri Lanka

<sup>79</sup> [Community Forest Management in Sri Lanka “Lesson Learnt and Future Direction”](#). September, 2009. Dangal S.P. and De Silva P.M.A. Paper presented at the Community Forestry International Workshop, Pokhara, Nepal.

<sup>80</sup> [Community Forest Management in Sri Lanka “Lesson Learnt and Future Direction”](#). September, 2009. Dangal S.P. and De Silva P.M.A. Paper presented at the Community Forestry International Workshop, Pokhara, Nepal

<sup>81</sup> National Forestry Policy and Executive Summary (November, 1995). Forestry Sector Development Division, Ministry of Agriculture, Lands and Forestry

With regard to the status of implementation of these policy directives, Mr. Sarath Fernando (ex-Conservator General of Forests) said, “The Government and the Forest Department identified local community participation in forest management as an important component but are still in the process of developing a mechanism to involve them.”

### **Unclear and variable information**

Precise area under the jurisdiction of the Forest Department and in different management categories is unclear. Figures available from different sources are widely variable. The village forest category did not appear in any data and disappeared on the ground despite its continuing mention in the forest legislation. Doubts are raised about the area presumed to be under private sector management.

Our best guess suggests a state forest estate of around 2.56 million hectares based on 2008 figures from Table 4 above after adding in 5% forest land presumably held by SLSPC and LRC. Adding the possible 7% held by the private sector gives a total estimated forest land area of 2.76 million hectares in Sri Lanka. FRA 2010 timber production estimates are based on extrapolation and volume supplied by different sources is unknown.

Clarifying the numbers and areas – who administers or is to administer which forest land and for what purpose – is critical for effective management of Sri Lanka’s forest lands, be it for conservation, production or carbon benefits.

## 6. Trees outside Forest Areas: Rising to meet Sri Lanka's Timber and NWFP Needs



*Most of Sri Lanka's timber (70%), fuelwood (>80%) and NWFP supply comes from trees outside forest areas such as home gardens, coconut and rubber plantations, and trees in tea plantations and farms. These areas are largely under private ownership, most of it by smallholders. Home gardens are expanding in area and have a variety of tree species grown for multiple purposes including timber. Tea, rubber and other perennial crop plantations cover 12% of the land area and provide important commercial timber. The government plans to support these areas as the main source of timber and fuelwood for meeting rising household and market demand by providing appropriate conditions and incentives. Initial studies suggest substantial carbon stocks in home gardens and other agroforestry systems. Now whether these systems can provide truly additional carbon sequestration and storage services over baseline scenarios in order to receive payments for the same is worth investigating.*

Logging in natural forests has been banned since 1990 and timber and fuelwood supply is mainly from trees outside forest areas augmented by imports<sup>82</sup>. Total wood production from home gardens was estimated at 2,552,000 m<sup>3</sup> in 2005<sup>83</sup> and per hectare production at 124.4 m<sup>3</sup> in 2009<sup>84</sup>. Home gardens, coconut and rubber plantations, trees in tea plantations and farms, roadside and other perennial plantations provide more than 70 percent of Sri Lanka's industrial timber and more than 80 percent of the fuelwood needs<sup>85</sup>. Also fuelwood supplies approximately 40 percent of Sri Lanka's energy, and 90 percent of the country's population uses fuelwood as the main source of fuel<sup>86</sup>.

<sup>82</sup> [Impacts and effectiveness of logging bans in natural forests: Sri Lanka](#). 2001. Bandarathillake, H.M.

<sup>83</sup> Sri Lanka Environment Outlook. 2009. Ministry of Environment & Natural Resources Sri Lanka and United Nations Environment Programme. ISBN: 978-955-0033-10-2.

<sup>84</sup> [Estimation of Wood Volume of Trees outside Forests \(TROF\) in Nuwara Eliya District of Sri Lanka as a Mechanism of Estimation of C Stock](#) (2009) K.T. Premakantha, D.K.N.G. Pushpakumara and T. Sivananthawerl. Conference on Global Climate Change and its Impacts on Agriculture, Forestry and Water in the Tropics, 10-11 Sept. 2009, Kandy, Sri Lanka

<sup>85</sup> [Assessment of tree resources in the home gardens of Sri Lanka](#). 2002. Ariyadasa, K.P. FAO, Bangkok.

<sup>86</sup> [Impacts and effectiveness of logging bans in natural forests: Sri Lanka](#). 2001. Bandarathillake, H.M.

## Home gardens

Home gardens are mixed cropping systems with a variety of tree species that provide food, fruits, timber, medicine and spices<sup>87</sup>. They covered about 858,000 hectares in 1992 and increased to 977,000 hectares in 2005<sup>88</sup>.

A 1996 survey of home gardens by the Ministry of Forestry and Environment found more than 400 woody species planted or occurring naturally in home gardens. The most common home garden species were coconut, rubber and jak (*Artocarpus heterophyllus*), and these were grown for multiple purposes including timber. Majority of the tree species are indigenous with multiple uses but more exotic species have been introduced recently. Five (teak, mahogany, *Albizia molucana*, *Alstonia macrophylla* and eucalyptus) of the top 10 species grown are exotic timber species and account for 15 percent of the total number of trees recorded and 40 percent of the total timber volume. Most home garden tree species are well distributed over the country and are found in all three climatic zones.

## Perennial plantations

Other tree crop plantations include rubber, coconut, cinnamon, cashew, oil palm, palmyrah and cocoa. Tea and other perennial (such as coffee, pepper, cardamom) plantations also tend to have some trees. In 2009, rubber, coconut, tea<sup>89</sup> and minor export crop<sup>90</sup> plantations covered 817,985 hectares, equivalent to 12% of the land area of Sri Lanka (Table 7). Tea plantations increased in extent from 188,970 hectares in 1994 to 221,969 hectares in 2009, while rubber plantations decreased from 160,910 hectares in 1994 to 124,000 hectares<sup>91</sup>.

**Table 7. Area of different crop plantations in Sri Lanka (2009)**

Crop	Area (ha)
Coconut	394,836
Tea	221,969
Rubber	124,000
Minor export crops (cinnamon, coffee, pepper, cocoa and cardamom)	77,180
<b>Total</b>	<b>817,985</b>

Source: [Department of Census and Statistics, Sri Lanka](#).

<sup>87</sup> [Assessment of tree resources in the home gardens of Sri Lanka](#). 2002. Ariyadasa, K.P. FAO, Bangkok.

<sup>88</sup> Sri Lanka Environment Outlook. 2009. Ministry of Environment & Natural Resources Sri Lanka and United Nations Environment Programme. ISBN: 978-955-0033-10-2.

<sup>89</sup> [Agriculture and Environment Statistics Division Department of Census and Statistics, Sri Lanka](#). Table H04-1 Extent, Production and Cost of Production (COP) of Tea, Rubber and Coconut: 1994 – 2009.

<sup>90</sup> [Department of Census & Statistics](#), Sri Lanka

<sup>91</sup> [Agriculture and Environment Statistics Division, Department of Census and Statistics](#), Sri Lanka



Coconut intercropping with Gliricidia, Puttlam

Rubber, coconut, tea and minor export crop plantations are generally under private ownership. Smallholders holding less than 20 hectares own 42% of the rubber plantations. There is rising international demand for FSC-certified rubber wood from Sri Lanka<sup>92</sup>. Of the 16 large-scale estates, four are FSC-certified. A large majority of the coconut plantations are classified as smallholdings of less than 1.2 hectares<sup>93</sup>.

Commercial use of coconut wood started in the 1970s as entire plantations became over-aged and was harvested<sup>94</sup>. Use is mostly for the domestic markets.

### Source of timber and NWFP products

According to the Forestry Sector Master Plan (1995)<sup>95</sup>, demand for sawn wood was rising at an average annual rate of 2 percent and is projected to reach 885,000 m<sup>3</sup> by 2020. The National Forest Policy (1995)<sup>96</sup> and Forestry Sector Master Plan (1995) identified home gardens, other agroforestry systems and trees on non-forest lands as the main future sources of timber and fuelwood for household and market needs in Sri Lanka. The Government planned to provide extension support and create favourable tenure and market conditions for possible further expansion of activities<sup>97</sup>.

### Carbon potential

Dissanayake et al. (2009)<sup>98</sup> estimated aboveground carbon content in home gardens at 89.98 tons per hectare in Kandy district and 103.9 tons per hectare in Matale District which are both in the central-uplands in the wet zone. The study extrapolated these figures to the entire Kandyan home garden area in these two districts and presented a value of 5.5 million tons of carbon for Kandy district and 2.1 million tons of carbon for Matale district. These

<sup>92</sup> [Forest certification in Sri Lanka](#). November 1 2006. Perera, P., Vlosky, R.P., Amarasekera, H.S., De Silva, N. Forest Products Journal.

<sup>93</sup> [Asia-Pacific Forestry Sector Outlook Study: Focus on Coconut Wood](#). October 1997. Romulo N. Arancon, Jr.. Working Paper No: APFSOS/WP/23. FAO, Rome and Bangkok.

<sup>94</sup> [Non-forest tree plantations](#). Based on the work of W. Killmann. Edited by D. J. Mead. 2001. Working Paper FP/6. FAO, Rome.

<sup>95</sup> [Forest certification in Sri Lanka](#). November 1 2006. Perera, P., Vlosky, R.P., Amarasekera, H.S., De Silva, N. Forest Products Journal

<sup>96</sup> National Forestry Policy and Executive Summary (November, 1995). Forestry Sector Development Division, Ministry of Agriculture, Lands and Forestry.

<sup>97</sup> [FRA 2000 - Forest resources of Sri Lanka - Country report](#). 2001. FAO, Rome.

<sup>98</sup> [Estimation of carbon stocks in Kandyan Homegardens located in Kandy and Matale Districts in Sri Lanka](#) (2009) Dissanayake, W.A.S., Ranasinghe, D.M.S.H.K., Wahala, S., Proceedings of the 14<sup>th</sup> International Forestry and Environment Symposium, Department of Forestry and Environmental Science, University of Sri Jayewardenepura



districts are some of the key traditional home garden areas in Sri Lanka. The per hectare value of carbon estimated in these home gardens is far greater than the average 34 tons estimated for natural forests in Table 1. Research on carbon content in home gardens in other districts are needed to obtain a comprehensive picture.

Premakantha et al. (2009)<sup>99</sup> conducted a study to assess the carbon sequestration potential of TROF (Trees Outside Forests) systems in Nuwara Eliya District in the central-uplands. They found that TROF systems in the district held an estimated 1.208 million tons of carbon, with home gardens (711,800 tons) and tea plantations (441,000 tons) making up the bulk. A study assessing carbon in coconut plantations reported wet zone stocks of 63 tC/ha, intermediate zone stocks of 54 tC/ha and dry zone stocks of 37 tC/ha<sup>100</sup>.

The data above suggests substantial carbon stocks in home gardens and other agroforestry systems. Now whether these home gardens and other agroforestry systems can provide truly additional carbon sequestration services over baseline scenarios in order to receive payments for the same is worth investigating. Are they prone to conversion and degradation pressures? Can carbon sequestration and storage be enhanced through improved management practices? Is there scope for substantial carbon savings over baseline scenarios to make it worthwhile? Or does the scope lie in developing such systems on degraded lands?

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<sup>99</sup> [Estimation of Wood Volume of Trees outside Forests \(TROF\) in Nuwara Eliya District of Sri Lanka as a Mechanism of Estimation of C Stock](#) (2009) K.T. Premakantha, D.K.N.G. Pushpakumara and T. Sivananthawerl. Conference on Global Climate Change and its Impacts on Agriculture, Forestry and Water in the Tropics, 10-11 Sept. 2009, Kandy, Sri Lanka

<sup>100</sup> Carbon sequestration potential in Coconut plantations (2009). Coconut Research Institute, Lunuwila, Sri Lanka

## 7. Global Conservation Hotspot: Can Carbon Rewards support Biodiversity Protection in Sri Lanka?



*Sri Lanka's forests, in particular the remaining lowland wet and montane forests, have high biological diversity with many endemic species. They are also critical for soil conservation and flood control. However, much of the forest area is threatened by habitat loss and degradation. Since the 1990s, most of the remaining natural forest has been set aside for conservation and sustainable use under state management. Private agroforestry systems also increasingly provide biodiversity and other environmental services. Can carbon rewards be carefully directed to preserving Sri Lanka's rich biodiversity and other ecological services in its state forest estate and private home gardens? What safeguards are required to avert counter-productive outcomes?*

Sri Lanka like other tropical islands has high biological diversity with a high degree of endemism (species exclusively native to Sri Lanka). The island has over 3500 flowering plants and around 24% are endemic. Most (92%) of these endemic species inhabit lowland wet and montane forests. Climax forests in the dry zone are of secondary origin and have developed only during the past 500-800 years while climax forests in the wet zone have a Deccan-Gondwana ancestry when a vast unbroken stretch of forest covered both India and Sri Lanka<sup>101</sup>. Sri Lanka's rich biodiversity has been highly threatened by habitat loss and degradation. Conservation International identified Sri Lanka as one of the world's [key biodiversity hot spots](#) which would benefit from conservation efforts. A 1991-1996 study

<sup>101</sup> de Rosayro, 1961 in Conservation of Natural Forests in Sri Lanka. Gunatilleke I.A.U.N. and Gunatilleke C.V.S. 1983. The Sri Lanka Forester, Vol. XVI, Nos. 1 & 2, pp. 39-56.

“National Conservation Review” found that the natural forests in the wet and intermediate zones were more important for soil conservation and flood control than the ones in the dry zone<sup>102</sup>.

The National Policy for Wildlife Conservation adopted in 1990 sought to maintain ecosystems, preserve biodiversity and ensure sustainable use. It emphasized the urgent need to redress the drastic imbalance of protected areas (90% located in the dry zone) and establish more protected areas in the wet zone. Much of the remaining natural forest has since been set aside for biodiversity conservation purposes in National Parks, strict nature reserves, nature reserves and forest reserves. Land use in sanctuaries on public and private lands is regulated by the Fauna and Flora Protection Ordinance. Of the forest plantations, 36% are for protection and conservation purposes. The 1995 National Forest Policy emphasizes strict conservation of the remaining natural forests for soil, water and biodiversity conservation while increasing tree cover in other areas to meet the demand for forest products and services<sup>103</sup>.

However, little of the original forest cover remains in the wet zone. What remains is highly fragmented and subject to encroachment for small-scale cultivation and extraction of forest products. The National Environment Policy of 2003 calls for biodiversity conservation actions such as linking residual forest fragments in the wet zone, legislation for private sector involvement in conservation activities such as nature concessions, developing benefit-sharing mechanisms and seeking sustainable international financing options.

Outside the state forest estate, private home gardens and agroforestry systems are rising in importance as refuges for biodiversity and also provide other environmental functions such soil, water and carbon conservation. Carbon and other environmental service payments could help further the environmental services provided by these areas while supporting local livelihoods and meeting wood and NWFP demand.

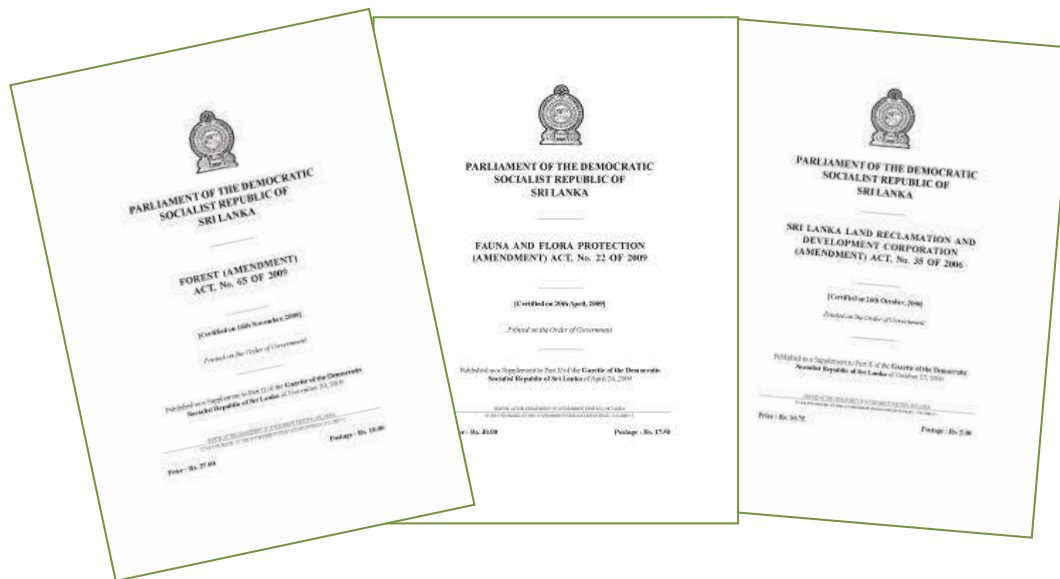
Sri Lanka’s REDD+ policies needs to consider whether carbon rewards can be carefully directed to preserving Sri Lanka’s rich biodiversity and other forest ecosystem services in its state forest estate and private home gardens. What safeguards are required to avert counter-productive outcomes?

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<sup>102</sup> [Biodiversity Conservation in Sri Lanka: A Framework for Action](#) 1999. Ministry of Forestry and Environment. ISBN 955-9120-03-4

<sup>103</sup> National Forestry Policy and Executive Summary. November, 1995. Forestry Sector Development Division, Ministry of Agriculture, Lands and Forestry

## 8. Land and Forest Policy and Legislation: From State Control to Public Participation?



*Forestry legislation in Sri Lanka originated with attempts to protect the forests for exclusive use of timber and other resources by the British colonial administration. The same policies continued in the post-colonial period and local community use was highly restricted and penalized. Management priorities have since shifted from forest exploitation to conservation, restoration and sustainable management for various products and environmental services, and to support local livelihoods. The country aims to increase forest cover to 28% by 2015 (35% by 2020) and REDD+ could potentially help achieve this goal. Payments for carbon and other environmental services provided by forests and agroforestry systems are not specifically mentioned in current policies. However, they seek to enhance private and community participation in conservation and production activities and are open to exploring alternative tenure, financing and benefit-sharing options. These policy developments in principle allow more room for public participation in and benefit from REDD+ in public and private lands. What actually happens depends on whether and how the policies are implemented.*

**The Forest Ordinance** No. 16 was enacted in 1907 by the British administration. Cap 283<sup>104</sup> includes amendments until 1979 which was followed by three further amendments in 1982, 1988, 1995 and 2009<sup>105</sup>. Under the ordinance and its amendments, any land could be acquired by the State and declared as Reserve forest. Activities such as clearing, fires, grazing and forest product extraction were not allowed in Reserve forests and violations were subject to penalties. The original focus of this Ordinance was the protection of what used to be ample forest resources, for the exclusive exploitation by the administration, based on their economic value<sup>106</sup>. To achieve this, restrictions were imposed on public use of forest resources. Local communities who had been extracting forest resources for generations were alienated from their livelihood base and their actions declared illegal.

<sup>104</sup> [FAO Legal Office Database](#)

<sup>105</sup> [Forest \(Amendment\) Act No 65 of 2009](#)

<sup>106</sup> Review of Environmental Legislation in Sri Lanka, Volume 1. 1994. Central Environmental Authority, Ministry of Environment & Parliamentary Affairs, Sri Lanka.

The ordinance also allowed for any forest area to be declared a village forest (to be used by village communities) or to be removed from village forest status. Listed timber species (in Schedule 1) in village forests were declared to be state property and off-limits to the villagers. The ordinance also declared prohibitions for use of forests outside identified reserve and village forests; and rules for transit of timber and other forest produce. Post-colonial amendments further strengthened the protective function of and state control over forests. Conservation forest was a new category incorporated in 1995 with similar restrictions on public use as for Reserve forests. By 2009, village forest areas disappeared on the ground with allocation to other uses<sup>107</sup>, though they still continued to appear in the legislation.

**The Fauna and Flora Protection Ordinance** which was first enacted in 1937<sup>108</sup> and amended in 1964, 1970, 1993 and 2009<sup>109</sup> provides for five categories of protected areas for biodiversity conservation to be administered by the Department of Wildlife Conservation (DWLC) established in 1948. They are Strict Nature Reserves, National Parks, Nature Reserves, Jungle Corridors and Intermediate Zones. Use of these zones and the produce within is subject to strict regulations. New protected areas have been established in recent years under this legislation.

### **Land-related laws**

There are numerous laws and amendments to the same that relate to state acquisition and disposal of land. The earliest, the State Lands Encroachment Ordinance of 1840 (various amendments up to 1954<sup>110</sup>) declared all forest, unoccupied, uncultivated and chena (shifting cultivation) lands to be the property of the State unless it could be proved otherwise. Penalties were defined for encroachment. The report "Review of Environmental Legislation in Sri Lanka" (1994)<sup>111</sup> identified that 80% of the land in Sri Lanka was state-owned while a large percentage of the population remained landless. Landlessness and poverty often resulted in forest encroachment.

Roughly 20% of the land area of Sri Lanka was in private hands (mostly freehold with little in grants) in 1991 and governed by many distinct sets of personal laws<sup>112</sup>. However the State continues to retain strong powers to acquire land from private holders for various public

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<sup>107</sup> According to Mr. Sarath Fernando (ex Conservator General of Forests)

<sup>108</sup> [FAO Legal Office Databases](#)

<sup>109</sup> [Fauna & Flora Protection \(Amendment\) Act, No. 22 of 2009](#)

<sup>110</sup> CAP 288. [FAO Legal Office Databases](#)

<sup>111</sup> Review of Environmental Legislation in Sri Lanka, Volume 1. 1994. Central Environmental Authority, Ministry of Environment & Parliamentary Affairs, Sri Lanka

<sup>112</sup> [Investment Policy Review: Sri Lanka](#). 2004. United Nations Conference on Trade and Development (UNCTAD)

purposes through the Land Acquisition Act No. 9 of 1950<sup>113</sup> (last amended in 1986). Plantations were first nationalized in the 1970s and then reversed again in the 1990s to allow the private sector to lease land and develop plantations to meet timber needs<sup>114</sup>. Long lease of 99 years allowed at first was subsequently amended to 30-year leases extendable to 50-years with special approval<sup>115</sup>.

State Lands Ordinance No. 8<sup>116</sup> of 1947 deals with the power of the State to sell, lease, grant or otherwise dispose of State lands for management and control. The Land Development Ordinance of 1935 (last amended in 1996)<sup>117</sup> provides for the systematic development and alienation of state land in Sri Lanka. The Land Settlement Ordinance (1931, latest amendment 1996) addresses ownership disputes between the State and individuals<sup>118</sup>. The Land Commissioner General's Department controls and administers state lands, issues state lands to people and institutions for various purposes, and formulates and implements land-related policies<sup>119</sup>.

Land titles and records are unclear, especially in rural areas<sup>120</sup>. The Registration of Title Act<sup>121</sup> (No. 21 of 1998) aimed to redress this issue. The Bim Saviya program was launched in 2007 by the Ministry of Land and Land Development to survey and demarcate lands, issue titles and strengthen land ownership within a time frame of 15 years<sup>122</sup>. It will establish a Digital Land Information System.

**The National Environmental Act 1980** (No. 47<sup>123</sup>, last amended Act No. 53 of 2000) reflects changing forest management priorities. The Act highlights rational exploitation of forest resources, regulating the marketing of threatened forest resources, conserving threatened floral species and promoting efforts on reforestation, timber stand improvement, forest protection, land classification, forest occupancy management, industrial tree plantation, parks & wildlife management, multiple use forest, timber management and forest research. The Act calls for a rational scheme for the use and conservation of land resources including land inventory and classification and determination of present land uses. The Act also has clauses related to obtaining environmental approval of investment projects.

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<sup>113</sup> [FAO Legal Office Databases](#)

<sup>114</sup> [Investment Policy Review: Sri Lanka](#). 2004. United Nations Conference on Trade and Development (UNCTAD)

<sup>115</sup> [Lets obtain a deed of long-term lease](#). 2006. Brochure. Land Commissioner General's Department. Ministry of Land and Land Development

<sup>116</sup> Review of Environmental Legislation in Sri Lanka, Volume 1. 1994. Central Environmental Authority, Ministry of Environment & Parliamentary Affairs, Sri Lanka

<sup>117</sup> [FAO Legal Office Databases](#)

<sup>118</sup> [FAO Legal Office Databases](#)

<sup>119</sup> [Land Commissioner General's Department](#). Ministry of Land and Land Development

<sup>120</sup> [Investment Policy Review: Sri Lanka](#). 2004. United Nations Conference on Trade and Development (UNCTAD)

<sup>121</sup> [Sunday Observer](#), 25 October, 2009

<sup>122</sup> [Bim Saviya](#). Ministry of Land and Land Development

<sup>123</sup> [Central Environmental Authority](#), Sri Lanka

### **National Environmental Regulations No. 1 (1993)**

The National Environmental Regulations<sup>124</sup> under the National Environmental Act seek to ensure environmental protection in various development activities. It requires an environmental impact assessment (EIA) for timber harvests from forests and forest plantations exceeding five hectares and prevents the conversion of forests exceeding one hectare to non-forest use<sup>125</sup>. Permission to clear natural forests has been granted for security purposes and development projects subject to the National Environmental Regulations.

### **Forestry Master Plan (FMP) – 1986<sup>126</sup>**

The Forestry Master Plan was prepared to promote integrated national forest planning. It recommended harvesting of timber in 119,000 hectares of natural forest in the wet zone and 954,000 hectares of natural forest in the dry zone<sup>127</sup>. Environmentalists criticized this plan for its primary focus on production forestry and the little attention it paid to ecological and biodiversity conservation needs of the country. The plan was developed with minimal consultation<sup>128</sup>.

### **The National Conservation Review (NCR) - 1991**

NCR was conducted by the Forest Department with technical assistance from IUCN to assess the conservation values of Sri Lanka's natural forests. The NCR revealed that although Sri Lanka had an extensive protected area network, covering almost 14% of its land area, critical gaps existed in biodiversity and hydrology conservation. Wet zone forests as the most important in terms of soil and water conservation and about 15% of indigenous terrestrial species were not found within protected areas. This study led to the declaration of 32 conservation forests<sup>129</sup> and also laid the foundation for preparing the National Forest Policy for Sri Lanka.

The NCR also led to the imposition of a logging ban on natural forests to prevent further degradation and loss of natural forest cover, rehabilitate heavily degraded forests, protect and maintain biodiversity, maintain environmental and hydrological functions of forests, and preserve recreational, aesthetic and cultural values<sup>130</sup>.

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<sup>124</sup> [Gazette Extra Ordinary No. 772/22 dated 24.06.93](#)

<sup>125</sup> [Steps in EIA process](#), Central Environmental Authority, Sri Lanka

<sup>126</sup> Forestry Master Plan for Sri Lanka – Main Report. September 1986. Ministry of Lands & Land Development. Forest Resources Development Project

<sup>127</sup> [Forest policies in Sri Lanka](#). 2002. Fernando, S. Forestry Department. Proceedings of the Forest Policy Workshop Kuala Lumpur, Malaysia 22-24 January, 2002. Edited by Thomas Enters and Robin N. Leslie. FAO, Bangkok, Thailand.

<sup>128</sup> National Forestry Policy and Executive Summary (November, 1995). Forestry Sector Development Division, Ministry of Agriculture, Lands and Forestry

<sup>129</sup> [National forest policy review Sri Lanka](#). 2003. Bandarattillake, H.M. and Fernando, M.P.S. 20 pages.

<sup>130</sup> [Impacts and effectiveness of logging bans in natural forests: Sri Lanka](#). 2001. Bandarattillake, H.M.

## **National Forest Policy - 1995<sup>131</sup>**

The National Forest Policy governs all forestry activities in the country except for the protected areas managed by the DWLC. The early 1953 National Forest Policy emphasized forest conservation, increasing supplies of small-dimension wood and maintaining sustained timber yields (Bandaratillake 2001). Policy amendment in 1980 allowed for the involvement of local communities in forestry development through social forestry.

The reformulated 1995 policy acknowledged that the natural forests were heavily depleted. It aimed to protect the remaining natural forests to conserve biodiversity, soil and water resources, to increase tree cover and productivity in other areas to meet the demand for forest products and services, and to enhance the forestry sector's contribution to rural welfare. Forests under the jurisdiction of the Forest Department were reclassified and placed under four management systems:

- a) strict conservation,
- b) non-extractive use (such as tourism and local community use of NWFPs),
- c) multiple use (sustainable management for production of fuelwood, timber and NWFPs to meet the growing demand, contribute to local welfare and meet environmental objectives), and
- d) forest plantations and agroforestry systems (150,000 hectares proposed) on degraded government lands for the production of wood and non-wood forest products by the government and other sectors.

The policy also recognized that the State agencies alone were unable to protect and manage the forests effectively, and called for participatory management and benefit sharing with community and other stakeholders in both forest protection and production. New approaches were required such as the development of partnerships with local people, communities, NGOs and the private sector; introduction of appropriate tenurial arrangements; and clearly defined roles and responsibilities for the various partners.

The establishment and management of industrial forest plantations on state lands would be entrusted progressively to local people and the private sector along with effective environmental safeguards. Degraded forest land would be rehabilitated for conservation and multiple-use production mainly for the benefit of local people. Planned conversion of forests into other land uses would take place only as per legislative procedures.

Outside forest areas, the government aimed to promote:

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<sup>131</sup> National Forestry Policy and Executive Summary (November, 1995). Forestry Sector Development Division, Ministry of Agriculture, Lands and Forestry



- a) trees in home gardens and other agroforestry systems as the main source of wood and other forest products for meeting household and market needs,
- b) industrial forest plantation development by local communities and the private sector, and,
- c) tree growing by local communities, NGOs and others to protect environmentally sensitive areas.

### **Forestry Sector Master Plan 1995<sup>132</sup>**

As different from the Forestry Master Plan of 1986, the Forestry Sector Master Plan (FSMP) of 1995 was developed with the involvement of various stakeholders including the Forest Department, other Government departments, universities, NGOs and other experts. It outlines the strategies for the development of the forestry sector until 2020 and includes 10 development programs outlining actions to develop forest conservation, multiple-use management of forests, commercial forest plantations, agroforestry, NWFPs and bio-energy. It also specifies institutional support programs including the development of legislation and institutions, human resources, research, extension services, and monitoring and evaluation.

### **The National Policy on Wildlife Conservation - 2000<sup>133</sup>**

The policy declares the government's commitment to conserve wildlife resources through promoting conservation, maintaining ecological processes and life sustaining systems, managing genetic diversity and ensuring sustainable utilization and sharing of equitable benefits arising from biodiversity. It emphasises the need for effective protected area management with the participation of local communities.

### **National Environment Policy – 2003<sup>134</sup>**

The policy aims to promote the sound management of Sri Lanka's environment while balancing social and economic development needs. It aims to manage the environment by linking together the activities, interests and perspectives of different stakeholders with equitable sharing of benefits and costs. The policy supports securing land tenure rights including use rights on state land and long-term tenure for chena farmers. It is open to alternative mechanisms and policy tools to provide incentives while minimizing compliance costs to benefit the environment, the society and the economy. It emphasizes participation, transparency and public accountability in the management of natural resources.

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<sup>132</sup> Sri Lanka Forestry Sector Master Plan. July 1995. Forestry Planning Unit, Ministry of Agriculture, Land & Forestry, Battaramulla, Sri Lanka

<sup>133</sup> [Ministry of Environment](#), Sri Lanka

<sup>134</sup> [Draft for public comments](#), Ministry of Environment & Natural Resources

### **Mahinda Chintana: Vision for the future – 2010**

The official national vision as specified in the Mahinda Chinthana Goal (MCG)<sup>135</sup> is to increase national forest cover to 43 percent by 2016. The same report mentions a target of 28% forest cover by 2015 and increases it up to 35% by 2020. REDD+ could possibly be used to achieve this goal.

### **Provision of environmental services – room for non-state actors?**

Given existing forest tenure systems, the supply of environmental services is largely in State hands and numerous government regulations attempt to protect the environment<sup>136</sup>. Other actors being involved in environmental protection helps develop markets and protect the environment. Since the 1990s there has been an emphasis on developing participatory management approaches in the national environment and other sector policies. The national forest policy further supports granting tenure over degraded forest lands to local communities.

Payments for carbon and other environmental services provided by forests and agroforestry systems are not specifically mentioned in current forest and environmental laws but most laws were last amended in the 1990s when PES and forest carbon activities were not yet common considerations. The National Environment Policy of 2003 mentions using a wider range of policy tools, including economic or market-based instruments, that provide incentives while minimizing compliance costs to achieve environmental outcomes.

These policy developments (community and private tenure, alternative financing and benefit-sharing options) in principle allow more room for public participation in and benefit from REDD+ in public and private lands. What actually happens depends on whether and how the policies are implemented, and implementation status is unclear at present.

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<sup>135</sup> [Mahinda Chintana: Vision for the future](#). 2010. Department of National Planning, Ministry of Finance and Planning, Sri Lanka

<sup>136</sup> [Financial Incentives for Ecosystem Conservation: A Review of the Development of Markets for Environmental Services in Sri Lanka](#). Mikkel F. Kallesoe and Diana De Alwis. 2005. IUCN Water, Nature and Economics Technical Paper No. 4. ISBN: 955-8177-46-6.

## 9. What Activities are Ongoing and Who are the Key Players?

*Sri Lanka has had little forest carbon, CDM and PES activity so far, both at the national level and on the ground. Awareness of global forest carbon opportunities and what they could mean for Sri Lanka, its forests and local communities is just evolving. The Forest Department believes that REDD+ could help Sri Lanka combat ongoing deforestation and forest degradation problems. It is currently finalising a nationwide forest cover assessment which will provide an updated overview of the forest resources and could help gauge Sri Lanka's REDD+ scope and opportunities. A national UN-REDD supported program for building REDD readiness over the period 2011-14 is currently being drafted with some limited stakeholder participation. Researchers have been conducting studies to determine carbon content and sequestration potential in some key forest and agroforestry systems across the country.*

### **Forest Carbon Projects**

Forest carbon activity in Sri Lanka has been limited, both in the CDM and voluntary carbon markets. Seven CDM AR Project Idea Notes were submitted to the Designated National Authority ([DNA](#))<sup>137</sup> in Sri Lanka. [Nature Solutions \(Private\) Limited](#), Sri Lanka obtained a Letter of Approval (LoA) in 2007 from the DNA for one CDM AR project (Eucalyptus plantation developed on degraded tea lands for fuelwood and timber) and a letter of non-objection for another (teak plantation on degraded and abandoned lands). However, both projects did not proceed to the validation stage because of financial constraints. There were no buyers interested in upfront purchase of the low volume of carbon credits to be generated from these small-scale projects.

Overall there were 113 CDM Project Idea Notes (PINs) submitted across all sectors in Sri Lanka and 20 were granted LoAs. A state-owned private company, the Sri Lanka Carbon Fund was established in 2008 to provide technical and financial assistance to CDM project developers. Most projects being developed are in the energy sector.

[Conservation Carbon Company](#) of Sri Lanka is now developing the [Hiniduma Biodiversity Corridor project](#) to [Plan Vivo](#), a voluntary market standard certifying community-oriented forest carbon projects. Further details are not available at present.

### **The Ministry of Environment**

The [Ministry of Environment](#) is the key player responsible for climate change-related activities and reporting in the country and is the national focal point for the United Nations Framework Convention on Climate Change (UNFCCC). The [Climate Change Secretariat](#) under the Ministry takes necessary steps towards combating climate change and has just finalized its [Second National Communication](#) to the UNFCCC. The Secretariat also

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<sup>137</sup> Climate Change Secretariat, Ministry of Environment, Sri Lanka is the Designated National Authority (DNA) for CDM projects under the Kyoto Protocol

implemented the project [Strengthening Capacity for Climate Change Adaptation](#) funded by the Asian Development Bank (ADB).

### **The Forest Department and REDD+**

Mr. Anura Sathurusinghe, Conservator of Forests at the Forest Department under the Ministry of Environment is the government focal point for REDD+. He believes that REDD+ could help Sri Lanka combat ongoing deforestation and forest degradation. However questions such as how, how much, where and by whom are yet to be answered and the Forest Department is exploring the opportunities. In 2009 the Department with the assistance of UNDP was able to obtain participatory status for Sri Lanka in the UN-REDD Programme. Participatory status provides Sri Lanka access to UN-REDD networking and information-sharing as well as observer status on the UN-REDD Programme Policy Board. A UN-REDD scoping mission visited Sri Lanka to help identify priority actions for REDD+ readiness.

The Forest Department is currently concluding a nationwide forest cover assessment which will provide an updated overview of the nation's forest resources. The Forest Inventory & Management division of the Forest Department conducted the vegetation mapping using 23.5 m resolution IRS (Indian Remote Sensing) images accompanied by field checking. Prepared maps were then sent to each range forest office for ground verification.

The Forest Department assisted by UNDP is preparing a National Programme document for UN-REDD support to get Sri Lanka ready for REDD+ implementation over the period from 2011 to 2014. A mutually-agreed set of actions are to be carried out. A draft was prepared/ coordinated by the former Conservator General of Forests Mr. H.M. Bandarattillake, and circulated to selected stakeholders. A first meeting of invited stakeholders was held in March 2011 and stakeholder comments on the draft were noted. Another meeting is to be held to finalize the draft. The draft is not open for public viewing at present.

The Department has also explored joining the World Bank's Forest Carbon Partnership Facility (FCPF). However, the FCPF is currently closed to new REDD country participants but may open up again in the future. The World Bank office in Sri Lanka has advised the Forest Department to submit a formal letter expressing its interest in becoming an FCPF participant and/or observer, and they would support and follow up on the request.

### **Private Sector**

Two domestic private companies have been involved in forest carbon activities in Sri Lanka. [Nature Solutions \(Private\) Limited](#) was the first company to develop a CDM AR Project Design Document (PDD) and obtain host country approval. However, both CDM AR projects

they worked on did not proceed to validation stage due to lack of financing. They indicate that the potential for AR projects in Sri Lanka is relatively low because clients have very small land areas (less than 200 hectares) or the areas were reforested prior to the eligible start dates for CDM AR projects. They focus more on energy projects at present.

[Conservation Carbon Company](#) is developing a forest carbon project to be certified to Plan Vivo standards. They aim to add value to carbon capture and sequestration through the principles of [Analog Forestry](#). Analog Forestry is a system which seeks to establish analog ecosystems with architectural structures and ecological functions similar to the original native vegetation while providing commercial products for socio-economic sustenance of rural communities.

There are no known foreign investors and developers involved in forest carbon projects in Sri Lanka at present.

### **NGOs**

Key NGOs and NGO groups that have been involved in forest conservation and/or forest carbon activities in Sri Lanka are the Sri Lanka Nature Group and the Green Movement of Sri Lanka Inc. [The Sri Lanka Nature Group](#) is a network of 118 organizations in Sri Lanka that are actively involved in environmental conservation and development. This facilitates knowledge and information sharing among the member organizations and work on eight thematic areas including climate change, forest resources and indigenous knowledge.

[The Green Movement of Sri Lanka Inc.](#) founded in 1998 has a People's Secretariat on Climate Change called 'Sihil Diyatha' with 20 core civil organizations working on 14 different social, economic, cultural and environmental sectors. The Green Movement is concerned that foreign financing for forest conservation could result in misappropriation of the country's genetic and other natural resources. They therefore seek to support a mechanism to reduce emissions from deforestation and degradation without the need for much foreign involvement. They focus on motivating local companies and other domestic actors to implement REDD+ as part of their corporate social responsibility (CSR) activities. They call for forest management policies and legal frameworks that incorporate REDD+ and facilitate its implementation<sup>138</sup>.

### **Bilateral/Multilateral agencies and programs**

The UNDP as mentioned above support Sri Lanka in preparing itself for REDD+ implementation through a three-year National REDD+ programme.

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<sup>138</sup> State of the Nation on Climate Change: Civil Society Position Paper on Policies and Strategies. 2010. Peoples Secretariat on Climate Change

[IUCN Sri Lanka](#) is also involved in the above National REDD+ Programme and has been involved in forestry activities in Sri Lanka since the 1980s. They have provided technical support to prepare conservation management plans for nine rainforests and mangrove forests across the country, and work closely with the Forest Department, DWLC, NGOs and local communities. They have also been working to promote better forest governance in Sri Lanka. IUCN Sri Lanka believes that REDD+ could possibly help Sri Lanka conserve its forests and the rich and unique biodiversity within.

### **Research agencies**

[The University of Peradeniya](#) is the CDM focal point for the forestry sector in Sri Lanka. Presently scientists at the University are estimating carbon stocks for various forest species and identifying activities to be carried out for Sri Lanka to benefit from REDD+. Further forest carbon-related research, awareness and capacity building are on their agenda.

[The Department of Forestry and Environmental Science](#) at the University of Sri Jayewardenapura has conducted forest carbon-related research and held numerous symposiums to generate accurate data for future forest carbon activities.

## 10. Scope and Opportunity for Forest Carbon Activities & Investments

As per the REDD+ mechanism currently negotiated under the UNFCCC, Sri Lanka will likely have to set up a national-level monitoring and accounting system for net carbon emissions or sequestration in forests in order to receive national-level rewards for reductions below an agreed reference emission level.

Does Sri Lanka have REDD+ potential? Sri Lanka's forest estate is relatively small at two million+ hectares covering 30% of the land area but the first field studies suggest that different forest and agroforestry systems hold substantial carbon stocks. However current deforestation and degradation rates in the national forest estate and their causes are unclear. Whether Sri Lanka can enhance and make substantial carbon savings from its forest areas and activities overall needs further investigation. A forest cover assessment currently being finalized could help shed light on the national situation.

If Sri Lanka has a continued high deforestation and/or forest degradation rate as is hinted at with substantial loss of carbon stocks in the process, it then has potential for both REDD or *Reducing Emissions from Deforestation and Forest Degradation* and enhancement of forest carbon stocks through reforestation on its small national forest estate. Forest carbon payments to protect forests could also help meet other environmental and socio-economic objectives as outlined in Sri Lanka's recent policy updates. This includes biodiversity conservation, soil and watershed protection, poverty alleviation; and sustainable timber, fuelwood and NWFP production. Carbon credits with substantial environmental and social co-benefits could potentially command a higher market value.

Overall decisions have to be made on whether to:

- a) adopt a nested approach with national-level accounting and sub-national activities (district, project) within,
- b) whether and what room there will be for non-state actors (private sector, NGOs, communities) to participate, and
- c) whether to be open to the full range of financing and market possibilities to fund the REDD+ efforts as and when they become available, for example existing and emerging compliance regimes, bilateral agreements, and voluntary markets.

Perhaps there is major opportunity for making significant emissions reductions and enhancing carbon sequestration in certain forest types (such as lowland rainforest, sparse forests), certain ownership types (such as multiple use forest areas or private home gardens) or specific sites (such as an area targeted for planned deforestation or a community-managed area). If deforestation pressures persist at a larger scale such as in

certain districts as suggested by the district-level analysis in 2002<sup>139</sup>, then REDD+ could be conducted in those districts to address the underlying drivers. Ground activities may seek to focus on these high-opportunity areas in a nested approach with appropriate policy directives and national-level monitoring and accounting for reducing leakage. Pilot activities on the ground in different forest types and ownership categories are always useful to help determine where and how best forest carbon emission reductions can be made.

If national forest cover and condition is found to be relatively stable, room for *Reducing Emissions from Deforestation and Forest Degradation* (REDD) is reduced though the country may still be able to benefit from sustainable management and enhancement activities. If Sri Lanka finds that carbon savings to be made are not substantial enough to warrant intensive national-level activity and investment, it could still conduct project-level activities in “high carbon-high pressure” areas using available voluntary carbon standards and markets.

#### **Scope for ground-level activities and room for different actors as per current policies**

As per current national policy directives, forest carbon activities could potentially be conducted in all categories of the national forest estate and in TROF systems with appropriate partnerships and institutional arrangements as below. In all cases, there would have to be additional carbon gains beyond any that would occur under a Reference Emissions Level for the area and as per common practice.

- a) In protected areas by the State (Forest Department and DWLC) in partnership with local communities and NGOs. Alternatively some of these areas could potentially be given out as long-term concessions to NGOs, the communities, the private sector and other groups for conservation, restoration and provision of carbon and other environmental services with appropriate safeguards in place. These stakeholders would then account for their performance as per regulations and standards and receive and share the resultant carbon benefits.
- b) In multiple use areas by the State (Forest Department and DWLC) in partnership with local communities and NGOs. Long-term tenure awards and other incentives could be provided.
- c) On degraded lands, restoration or reforestation with indigenous species for conservation and/or timber and other forest products on long-rotations or via selective harvesting could qualify for forest carbon payments if beyond common practice. Communities and the private sector could again be involved and awarded long-term tenure and support.

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<sup>139</sup> [District-wise forest area variation in Sri Lanka from 1992 to 2001 for supporting the National Physical Planning Policy](#). 2002. Ratnayake, J., Abeykoon, M. and Chemin, Y. National Physical Planning Department, Government of Sri Lanka.



- d) REDD activities may particularly be feasible and additional in natural forest areas targeted for conversion or to undergo some major development activities such as plantations, mining, roads, and other. Can carbon payments be a viable alternative in such planned development areas and can the activities be redirected to degraded areas with lower carbon and biodiversity values? District-wise evaluation of land use and economic development plans may throw some light on areas likely targeted for development and potential for saving some of the forests through carbon payments.
- e) Trees outside forest areas in the form of home gardens and other agroforestry systems, trees in tea plantations and farms are an increasingly important component of the Sri Lankan landscape, providing much needed timber and NWFPs, conserving a wide range of biodiversity, reducing pressure on natural forests, conserving soil and reducing flooding in steep areas, and sequestering carbon<sup>140</sup>. Scope for these areas to provide truly additional carbon sequestration services and receive payments for the same as per international regulations and voluntary standards is worth investigating. What species and management systems can be used – more trees, more native species, more mixed species, longer times to harvesting? Most of these areas are owned by private smallholders and additional livelihood benefits could flow to this group.
- f) Private commercial timber plantations could also earn carbon credits on the voluntary markets if altering common practices by for example planting native species and mixed species on long rotations.

However, afforestation-reforestation or improved forest management activities undertaken by the private sector, farmers or communities in home gardens and private plantations may be constrained by small size of operations as already indicated by one project developer. Small-scale operations tend to be cost ineffective and buyers are not available for small carbon volumes. These operations could become more viable if areas were aggregated and strong extension support was made available.

Commercial private sector investors will likely be attracted to large contiguous “high-carbon high-threat” areas with low tenure conflict – places where they could obtain cost-effective carbon gains. It is unclear whether the ongoing assessment will identify and classify environments on the basis of carbon and biodiversity values, degree of threat and pressure, and tenure clarity and security. Other players (NGOs, communities) with a focus on environmental and socio-economic gains may undertake low carbon generating projects if the small carbon benefits provide some support to their overall project/program objectives.

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<sup>140</sup> [Financial Incentives for Ecosystem Conservation: A Review of the Development of Markets for Environmental Services in Sri Lanka](#). Mikkel F. Kallesoe and Diana De Alwis. 2005. IUCN Water, Nature and Economics Technical Paper No. 4. ISBN: 955-8177-46-6.

## Enabling conditions

Current national policies seek to provide room for different non-government actors to be involved in forestry activities and to benefit from the same. The state has declared its intent to achieve conservation and production goals with effective participation of communities, the private sector and other stakeholders. It aims to provide appropriate tenure arrangements and is open to a wide range of economic and financial instruments that provide incentives for better management. This is in line with the results of a 2005 IUCN Sri Lanka review of case studies<sup>141</sup> which found that defining and allocating property rights was critical to ensure credible commitments and accountability in providing environmental services.

Community participation has been tested through various community forestry projects since the 1980s and they provide important lessons for community involvement in REDD+ implementation. Besides community-based organizations (CBOs) have been established through numerous community forestry projects in Sri Lanka, starting from 1985 when Village Forest Societies were established under the Social Forestry Component of ADB's Community Forestry Project<sup>142</sup>. The same IUCN review<sup>143</sup> found that organizing communities in CBOs created a more favourable institutional setup for implementing PES – it created economies of scale and facilitated forest monitoring and distribution of rewards.

Global markets and financing options are increasingly available for forest carbon activities – from funds for national REDD readiness to payments for emissions reductions made. The UN-REDD Programme is now starting up a national program to support Sri Lanka prepare for REDD+ implementation. Clear identification of national forest situation and trends, underlying drivers, REDD+ potential and strategy could help attract support from other donors and the private sector as well, both for readiness activities and for carbon financing.

However, the Sri Lankan Government has to recognize the forestry sector as a potentially-important component in its climate change mitigation and adaptation strategy. “This is not the case at present judging from the Second National Communication to the UNFCCC that has just been finalized by the Climate Change Secretariat of the Ministry of Environment,” says Mr. Sarath Fernando, Ex-Conservator General of forests. “Reference to the forestry sector is minimal and no professional forester has been included in the climate change activities”, he notes.

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<sup>141</sup> [Financial Incentives for Ecosystem Conservation: A Review of the Development of Markets for Environmental Services in Sri Lanka](#). Mikkel F. Kallesoe and Diana De Alwis. 2005. IUCN Water, Nature and Economics Technical Paper No. 4. ISBN: 955-8177-46-6.

<sup>142</sup> Carter *et al.* 1994 in [District-wise forest area variation in Sri Lanka from 1992 to 2001 for supporting the National Physical Planning Policy](#). 2002. Ratnayake, J., Abeykoon, M. and Chemin, Y. National Physical Planning Department, Government of Sri Lanka.

<sup>143</sup> [Financial Incentives for Ecosystem Conservation: A Review of the Development of Markets for Environmental Services in Sri Lanka](#). Mikkel F. Kallesoe and Diana De Alwis. 2005. IUCN Water, Nature and Economics Technical Paper No. 4.

## 11. Implementation Challenges

- a) The **development of the international climate change negotiations** and REDD+ mechanism at the UNFCCC is uncertain. Ultimate REDD+ mechanisms that will be agreed upon, methods, process and financing are unclear. Implementing national-level readiness actions given this background of uncertainty is a challenge.
- b) Among the state agencies, only the Forest Department and actually only one person in the Forest Department is officially responsible and knowledgeable about forest carbon issues and possibilities. REDD+ preparation and implementation is a cross-sectoral issue requiring **policy synchronization and coordination among various sectors** including plantation sector, infrastructure, conservation, tourism, investment and other agencies involved in land use decisions and implementation. At present, the forestry sector is not considered an important component in Sri Lanka's climate change mitigation and adaptation strategy and is not included in the activities of the Climate Change Secretariat. **Higher-level official interest** may emerge when the true forest carbon potential is known and it happens to be significant.
- c) Sri Lanka has **little real information on forest trends and condition** in the last two decades. Thus the true scope for forest carbon opportunities and investments is unclear. Is there a high deforestation rate which would make REDD a viable option? Is there potential for major forest carbon savings? Can carbon incentives be used to help conserve and improve the quality of the remaining natural forests? Can it be used to restore degraded forests and lands to meet environmental and socio-economic objectives? Can it be used to incentivize the management of home gardens and other land use systems outside forest areas for desired production and environmental benefits?
- d) If there is forest carbon to be saved, further **information is required on the deforestation and degradation drivers** in different locations and scenarios to address them appropriately. Beyond the early 1990s, there is not much ground information available on pressures on forests and forest lands, including the effects of the long civil war and post-war reconstruction efforts.
- e) There is **limited awareness of potential forest carbon opportunities**, and the requirements and safeguards to be fulfilled to benefit from the same across stakeholder groups in Sri Lanka. No forest carbon projects have been registered under the compliance or voluntary carbon schemes so far and there has been little donor support for both national and project-level forest carbon activities. Thus there is **little practical**

**experience and information** on where and what forest carbon investments would be viable and also contribute to biodiversity conservation, poverty alleviation, and/or timber production goals.

- f) **Room for community and private sector activities** is unclear particularly given official concentration of forests and forest lands in state hands. Who can implement what activities on which lands has to be clearly defined and regulatory guidelines provided to enable non-state actors to become involved.
- g) Clarification is required on the **ownership/administration** information for forest areas along with clear delineation of **land tenure and carbon rights**. Landholders usually have rights to the trees and carbon within which allows them to undertake forest carbon activities and market the resultant credits.
- h) REDD+ requires the **implementation of social safeguards** including items such as Free Prior Informed Consent (FPIC) and equitable benefit-sharing. However in Sri Lanka, statutory law has been gradually extinguishing customary rights for more than a century<sup>144</sup>. Communities have had limited access and use rights to forest resources. Non-recognition of customary law and limited enforcement of statutory law led to encroachments and illegal activities. Village forests under the administration of district authorities vanished without a trace by 2009 despite continued appearance of the category in the regulations. The country aims to revive customary law, provide tenure and management rights to local people, and enhance public participation in forest management and law enforcement to meet conservation and livelihood objectives. Implementing these policy amendments is a big challenge after a century of marginalizing local resource use.
- i) REDD+ requires the **implementation of environmental safeguards** including items such as preserving natural forests, biodiversity and other environmental services in line with national goals and concerns. Sri Lanka is a global biodiversity hotspot and REDD+ safeguards need to ensure that carbon interests do not overwhelm conservation needs.
- j) REDD+ implementation calls for good governance and safeguards to ensure the same. Strong law enforcement and control is required to show results and receive payments. However, **governance and enforcement** is reputedly weak in Sri Lanka and it is difficult

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<sup>144</sup> [Strengthening voices for better choices](#) (October, 2010) Patricia Moore, Thomas Greiber, Saima Baig. International Union for Conservation of Nature and Natural Resources

to hold public officers accountable for their decisions and actions<sup>145</sup>. Demonstration of transparency, true and effective stakeholder consultation and participation, and third-party implementation and verification of these processes will go a long way in signaling Sri Lanka's commitment.

- k) To implement REDD+ at the national scale, a **national forest monitoring system** has to be built from scratch including periodic remote sensing analysis of forest cover and change, regular national forest inventories to obtain field data and determine model parameters, a consolidated database and modeling system to provide accurate and consistent information on forest cover and carbon stock change, and institutions and skilled staff to conduct the monitoring as per prescribed guidelines. Forestry data such as volume tables, wood density, biomass expansion factors for trees species are either unavailable or fragmented and inaccessible to project developers.
- l) **Reference Emission Levels** have to be developed based on appropriate parameters such as historic trends and anticipated developments and justified. This requires first filling in the information gaps in historic forest trends and on current pressures and developments.
- m) Environmental and livelihood issues are in the laws but they do not specifically mention or allow for carbon and other environmental service evaluation and payments. There is no **legal framework and institutional process to guide** any forest carbon activities and projects undertaken at this stage except for CDM AR projects.

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<sup>145</sup> [Ibid](#)

## 12. Steps to Move Forward

- a) Joining the REDD+ Partnership and other international and regional fora and discussions that deal with forest carbon issues to see how Sri Lanka's forests and communities can fit in and benefit.
- b) Recognizing and incorporating the forestry sector in Sri Lanka's climate change mitigation and adaptation strategy and action plan, to allow Sri Lanka to effectively participate in and benefit from forest-related mitigation activities under the UNFCCC, the UN-REDD Programme or any other compliance or voluntary schemes. Ensuring effective dialogue and integration of climate change activities between the Forestry Department, the DWLC, other forestry agencies and the Climate Change Secretariat. Elaborating the potential scope and role of the forestry sector in national communications to the UNFCCC.
- c) Obtaining full and real information on forest status, ownership, trends and drivers, regional differences and how drivers and trends could change with recent economic development plans and priorities. Assessing the scope for forest carbon activities and investments in different land types by different actors, including usefulness for meeting national biodiversity conservation and poverty alleviation goals. Identifying high-carbon, high-biodiversity and high-threat areas for REDD+ investment.
- d) Based on identified scope, setting up a cross-sectoral REDD+ task force including all key stakeholders across government, NGO, private sector, research, bilateral and multilateral agencies to explore and move Sri Lanka ahead on REDD+.
- e) Developing an implementation strategy – what scale and level of activities, national plus sub-national activities or only national level, which actors, what lands, what drivers to address, which financing sources/markets and distribution mechanisms to adopt.
- f) Identifying an appropriate national Reference Emissions Level (REL) and/or sub-national RELs as comparative baselines for reducing forest-based emissions and qualifying for payment.
- g) Setting up enabling policies, regulations, institutions, processes and incentives to support REDD+ implementation and stimulate intended action in different areas by different actors. This includes clarifying tenure and carbon rights. Outlining clear procedures and institutional arrangements for forest carbon activity registration, implementation, monitoring, reporting and benefit-sharing. Setting up a national carbon registry for forest emissions accounting and crediting.

- h) Building awareness and capacity at all levels for all stakeholders that could be involved or affected.
- i) Developing consultative, participatory and transparent processes for all aspects of REDD+ implementation and evaluation to enhance results and credibility.
- j) Allowing pilots in different forest categories and ownership types to assess and demonstrate possibilities and economics, institutional and financial arrangements, and aggregation models for small-scale activities. Inviting credible domestic and international investors to invest and pilot.
- k) Land and other policy reforms and cross-sectoral coordination to allow community involvement and support livelihoods, stop unintended or inappropriate conversions and developments, and consider planned developments as well in terms of carbon costs and options.
- l) Clear and appropriate forest classification and definitions to ensure protection and sustainable use of natural forests for a range of products and services, and avoid conversion of natural forest to carbon plantations.
- m) Setting up a cost-effective Monitoring, Reporting and Verification (MRV) system with independent external verification for monitoring, control and reporting purposes. Conducting a forest inventory in different vegetation types across the country to obtain biophysical data for calculating carbon parameters. Nissanka and Pathinayake (2009)<sup>146</sup> suggest conducting more studies on wood densities and form factors for local tree species, and using advanced techniques such as LiDAR for obtaining accurate estimates.
- n) Setting up environmental, social and governance safeguards including effective FPIC processes, control and enforcement mechanisms, and external independent verification to ensure real and credible emissions reductions with positive socio-economic and environmental benefits.
- o) Setting up financing mechanisms and inviting other donors (bilateral and multilateral, private sector and NGOs) to invest in identified REDD+ readiness activities and to pay for emissions reductions achieved below the REL/RELS. Ensuring coordination of donor activities for optimal results.

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<sup>146</sup> [Estimation of above ground carbon stock in Sinharaja forest using Remote sensory data](#). 2009. S.P. Nissanka and P.S.Pathinayake, Department of Crop Science, Faculty of Agriculture, University of Peradeniya

Little of Sri Lanka's original forest cover remains, about two million hectares or 30% of the land area. Remaining natural forests are protected for their biodiversity, soil and watershed services. Most of Sri Lanka's forest products come from home gardens and other private smallholder systems, which add up to another 1.8 million hectares or 27% of the land area. First field studies suggest that some forest and agroforestry systems hold substantial carbon stocks. However, Sri Lanka has little real information on forest status, trends and pressures in the last decade. An ongoing national forest assessment may help shed more light on the true scope for forest carbon activities in Sri Lanka.

Sri Lanka has had little forest carbon activity so far, both at the national level and on the ground. Two state agencies administer 93% of Sri Lanka's forest lands. Recent policy amendments seek to enhance private and community participation in conservation and production activities and are open to exploring alternative tenure, financing and benefit-sharing options. These policy developments in principle allow more room for public participation in and benefit from REDD+ in public and private lands. The Forest Department is the key focal point for REDD+ and it is currently drafting a UN-REDD supported program for building national REDD readiness.

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*This publication is the first of a series of Asian Country Profiles by Forest Carbon Asia. This report provides an overview of the resources, policies and players in Sri Lanka; as well as the opportunities, gaps and challenges for sustainable forest carbon activities and investments. The content is peer reviewed and published on [www.forestcarbonasia.org](http://www.forestcarbonasia.org). It can be downloaded from [FCA Publications](#).*