Land use planning for wider scale application

Land Use Notes on Visit to Sri Lanka Fuelwood Project on 3-15 November 2002

Contents

1. Introduction

The land use outputs from the Sri Lanka Fuelwood Project are:
a. the listing of areas potentially suitable for fuelwood plantations,
b. the commencement of identification of areas available for plantations, and
c. an indication of the willingness of farmers to grow fuelwood.

2. Listing of areas suitable for fuelwood plantations

The base data of potentially suitable areas have been derived from four sets of data.

2.1. Centre for Remote Sensing data

The Centre for Remote Sensing land use survey of 1980-84 published 1:100,000 scale land use maps derived from air photo interpretation of (mostly) 1979-1981 air photos at 1:20,000-1:50,000 scale. The 25 maps cover each of the 25 districts of the country, and each contains statistics of the area coverage of different land uses in the district by DS Division (Divisional Secretary's Division - formerly termed Assistant Government Agent's Division). Sixteen categories of land use are mapped, of which three have been identified as potentially containing suitable areas for fuelwood plantations. These are:

i. Sparsely used cropland: Chena (shifting cultivation), recently abandoned chena, sparsely used rainfed cropland (permanent dry cropping), neglected or abandoned tea, rubber and coconut lands, land under development.

ii. Scrub land: Low growing vegetation with more than 50 percent scrub coverage, including trees with less than approximately 45 percent crown closure.

iii. Grassland: Open park country with less than approximately 50 percent scrub coverage (damana and savannah), villus and other temporarily flooded land and patana (up-country grassland).

The CRS land use maps give the following area coverage in hectares by districts for the three land use types selected as potentially suitable for fuelwood plantations.

District	*Sparsely used crop land*	*Scrub land*	*Grass land*	*Total*
Jaffna	10,510	6,810	10	17,330
Kilinochchi	16,300	10,230	420	26,950
Vavuniya	40,150	17,750	370	58,270
Mullativu	22,400	13,010	640	36,050
Polonnaruwa	51,120	40,600	10,750	102,470
Hambantota	69,330	39,970	1,950	111,250
Ratnapura	101,570	11,970	3,150	111,690
Puttalam	58,700	19,430	4,240	82,370
Kurunagala	112,710	7,280	120	120,110
Badulla	84,430	14,240	10,230	108,900
Moneragala	186,330	44,070	14,130	244,530
Kandy	28,280	12,110	6,010	46,400
NuwaraEliya	8,630	9,880	7,560	26,070
Galle	16,320	960	910	18,190
Matara	9,690	0	200	9,890
Matale	45,600	20,180	5,580	71,360
Ampara	127,720	33,410	3,030	164,160
Colombo	750	580	700	2,030
Kalutara	14,840	650	80	15,570
Mannar	11,590	22,410	3,680	37,680
Anuradhapura	186,500	103,790	1,720	292,010
Batticaloa	38,920	35,240	15,040	89,200
Trincomalee	46,000	33,230	260	79,490
Gampaha	120	740	200	1,060
Kegalle	20	930	200	1,150
Totals	*1,288,530*	*499,470*	*91,180*	*1,879,180*

The CRS maps and statistics act as a benchmark of the status of land use throughout the country in the early 1980s. However the data are now more than 20 years old, during which time land uses have changed significantly. The closed canopy forest cover alone fell from 27 percent of the country in 1982 to 23.9 percent in 1992. More up-to-date land use data are required to indicate what areas remain that are available and may be suitable for fuel wood plantations.

2.2. 1:50,000 topographical maps

The Land Use Policy Planning Division is abstracting land use data from Survey Department 1:50,000 scale topographical maps. There are 92 of these maps providing a complete coverage of the country, and 43 maps have to date been coloured to indicate areas of chena land, scrub land, forests, marsh and grassland. Area calculations will next be made of the extents of coverage of each of these land use types, as an indication of potentially available land for fuelwood plantations. The land use data given on the maps are derived from air photo interpretation of air photos dated 1981-1987. Therefore the base data are only a few years more recent than those used to produce the CRS land use maps, and are 15-20 years before the present.

2.3. Forest Department survey

The Forest Department undertook an interpretation of satellite images and aerial photographs in 1992-94, in order to identify forested areas throughout the country. Three categories of forests were mapped, of which sparse forests and, particularly, degraded sparse forests are of interest to this project. Sparse forested areas are those where the closed canopy is less than 60 percent, and will include open forest, scrub land, regenerating chena and savanna land. Much of this sparse forest is degraded, where a loss of forest structure, productivity and ecological integrity has occurred, but where trees may still remain. The coverage in hectares of degraded sparsely forested areas by district in 1994 indicate the extent of this land use type.

District	*Total area (in hectares)*	*Extent of degraded sparse forest*	*Percentage of district*
Ampara	450,031	34,243	8
Anuradhapura	722,178	98,022	14
Badulla	285,673	18,097	6
Batticaloa	263,983	13,223	5
Colombo	68,469	0	0
Galle	161,256	373	0
Gampaha	141,890	0	0
Hambantota	262,307	49,569	19
Jaffna	107,848	268	0
Kalutara	164,391	670	0
Kandy	192,808	2,033	0
Kegalle	168,328	221	0
Kilinochchi	132,499	3,927	3
Kurunegala	489,787	8,565	2
Mannar	200,148	9,644	5
Matale	206,050	6,442	3
Matara	130,829	723	1
Moneragala	576,763	45,735	8
Mullaitivu	260,946	12,950	5
NuwaraEliya	174,109	589	0
Polonnaruwa	344,988	18,358	5
Puttalam	315,485	14,538	5
Ratnapura	327,034	1,616	0
Trincomalee	267,991	14,985	6

District	*Total area (in hectares)*	*Extent of degraded sparse forest*	*Percentage of district*
Vavuniya	200,836	14,525	7
Totals	*6,616,627*	*369,316*	*6*

When comparing the earlier data of the CRS mapping with the later data of the 1:50,000 topographical mapping and Forest Department mapping, care must be taken to note the exact areas covered by each map. Between the two sets of maps, some boundaries and names of DS Divisions have changed. The four main districts in which large extents of degraded sparse forest, and hence potentially available land for fuelwood plantations are located, are:

District	*Extent of degraded sparse forest*	*Percentage of district*
Anuradhapura	98,022	14
Hambantota	49,569	19
Moneragala	45,735	8
Ampara	34,234	8

Together these districts contain more than 225,000 ha of land covered by degraded sparse forest.

2.4 Other land use survey data

T. Somasekaran gives a total figure of 728,800 ha of sparsely used cropland, grassland and scrub covering the country in 1995 (from Land: some important facts. Ceylon Daily News 14 Nov 95). This is a decrease of approximately 1,150,000 ha or 250 percent in the coverage of these three land use types in about 15 years since the CRS land use mapping was undertaken, but double the extent of degraded sparse forest land identified by the Forest Department in 1994.

3. Identification of areas suitable for fuelwood plantations

The identification on the ground of actual areas suitable for fuelwood plantations is proceeding more slowly, using material derived from the Land Bank Project and the completion of questionnaires by District Land Use Planning Officers.

3.1.Land Bank Project

The main component of the ongoing government Land Bank Project that is relevant to the Fuelwood Project is the collecting of district-level data on many aspects of land use by GramaNiladharis (GNs) using 1:10,000 scale topographical maps. Details of important land use characteristics being collected at point locations with known land uses throughout the accessible part of the country are:

Name of the land
Total extent of land
Area of reserved land, if any
Area of encroachment, if any

Ownership status of land
Distance to main road, in km
Distance to single phase electricity line,, in km
Distance to three phase electricity line, in km
Nature of the terrain
Suitability for agriculture
Suitability for other purposes.
All data are entered into a computer by assigning a code to each item. Eg. 35. TERRAIN gives the nature of the ground surface, AGRI_RANK gives the suitability of the land for agriculture, etc. The Land Bank Project is an ongoing exercise that can at best supply background information on the extent of suitable land for fuelwood plantations in areas that a GN has surveyed.

3.2.LUPPD questionnaire

The Land Use Policy Planning Division has commenced a field exercise specifically for the Fuelwood Project, in which its District Land Use Planning Officers (DLUPOs) collect primary data directly from small farmers in the field by using a questionnaire prepared by the LUPPD. Data have so far been collected from Anuradhapura, Matara, Moneragala, NuwaraEliya and Polonnaruwa Districts, though only seven questionnaires have been completed in Anuradhapura District and the LUPPD was unable to state how many have been completed elsewhere.

In the questionnaire survey the DLUPO first identifies potentially available land for fuelwood plantations on a 1:50,000 topographical map. A farmer or, more preferably, a small community of farmers is visited who have some stake in the land that is uncultivated and usually under some form of bush or tree cover. This stake can be the collection of fuelwood, hunting, traversing between villages or similar activities. The following questions are then answered on the questionnaire with their direct involvement.

Location of land, by district, Divisional Secretary's Division (DS Division)
GN Division, Village name
Plan No, Lot No
Land ownership – private or state
Encroachments, if any
If location near forest or wildlife reserve
Natural resources of area – soil type, terrain, water availability, agro-ecological zone
Present land use – by category, extent, intensity
Socio-economic information – population data, no of families, major occupations, other income sources
Distances to motorable road, electricity line
Fuel wood presently grown in area, if any
Type of fuel wood, source of supply, distance to fuelwood source
Suitability for fuel wood cultivation
Parameters for suitability – land tenure, state or private land, land not suitable for housing, industrial use or agriculture
If degraded chena or scrub land in area
Availability of family labour
Willingness of farmers to cultivate fuel wood plantations
Families currently using fuel wood

Availability of transport
Non-availability/availability of electricity
Sketch plant of land area available for fuel wood plantation
Link to Land Bank database code.
This exercise is very thorough and, when compiled, provides valuable primary data on the availability of land for fuelwood plantations, its suitability and some indication of the willingness of the local farmers and villagers to participate in growing fuelwood on it. It is however very time consuming and cannot expect to deliver data on more than a small fraction of the country in the time available to the project.

4. The willingness of farmers to grow plantation fuel wood

The information collected to date on land availability and suitability for fuel wood plantations in the country indicates clearly that there is no shortage of land for this purpose in the Dry Zone. The primary data being collected through questionnaires by the DLUPOs in five districts are being consolidated so that they are available to be included in the final project report. From them an indication can be given of the answer to the more important question about the interest and willingness of the farmers to grow fuel wood for sale and use in power generation.

As most small farmers have access to no more than 1 ha of highland on which fuel wood trees can be grown by them, if they are to be involved in this land use they will need access to other land. A focus of work of the Forestry Department over the past 20 years has resulted in small farmers having increased capacities to produce trees on state forest land that has been leased out to them. Currently about 20,000 small farmers cultivate wood lots, with the largest concentrations being in districts that include Anuradhapura, Hambantota and Kurunegala. The large number of farmers involved indicates their willingness to grow plantation tree crops, where there is an economic return to them.

Taking this point further, the current policy of the Forestry Department for the forest plantation sub-sector is to raise forest plantations on degraded land, such as chena, abandoned tea estates, grass land and other derelict land wherever possible. In order to implement this forest plantation policy the private sector is being encouraged to become involved. This is partly in line with overall government policy to increase the role of the private sector in development activities, and partly to raise the growth and yield of forest plantations and the standard of their management and maintenance.

The identification of farmers, who are willing to grow fuel wood in plantations that they themselves manage, will best be undertaken through close community consultation with them. The aim is to design local forest management approaches that involve whoever are local farmers who will be involved at all of the plantation stages. Land use planning outputs that will indicate the willingness of the farmers for this work in any one area will include:

i. maps that show the current and future land uses in the selected area and its surroundings
ii. indication of the land that is suitable for fuel wood plantations, as identified specifically by the local community
iii. areas within this land that will be under different forest management strategies, as identified by the community

iv. a strategy for the implementation of the forest management plans that the community will endorse as their own
v. operational guidelines to assist the community continue to raise the fuel wood in plantations as required by the Fuelwood Project and its successors.

5. ADB Sri Lanka Forest Resource Management Project final report July 1999

The final report of this project has relevant and specific points to make in relation to the planning of fuelwood plantations within the national forest estate (NFE) and Forest Department (FD) land. They are given here as stated in the report.

5.1. Leasing of NFE/FD lands to NGO partners.

The Land Commissioner has authority to issue 50-year leases on surveyed, demarcated parcels with the NFE. With Cabinet approval he can issue 99-year leases. In order for this to happen, the Minister (of Forests) has to write to the Land Commissioner, laying out guidelines and procedures for the issuing of forestry leases to smallholders and private firms for forestry ventures on NFE/FD lands, for smallholder wood lots and commercial plantations.

5.2. Proposed Forest Classification.

The draft Forest Conservation Act proposes a 5-part classification system. Class IV forests within this classification are to be managed by local communities with state assistance and by the non-state sector. Most other classes define the level of conservation that should be provided to the forest estate.

5.3. Community Forestry Project, completed in 1991.

This project aimed to supply the country with much needed fuel wood and timber, and supported a small social forestry component designed to pursue tree cultivation through community involvement. Tree planting by communities can conflict with peak agricultural activities and these need to be taken into consideration in scheduling and compensation provided to farmers for their labour and outputs. Individual farm households need immediate compensation for fuel wood supplied to buyers. Issuing leases to individual families rather than communities enhanced participation considerably. Awareness and motivational campaigns are necessary to strengthen community involvement in this type of project (smallholder fuel wood plantations), as well as greater community participation in project planning and monitoring.

5.4. Land allocation and usufruct rights for social forestry.

Beneficiaries of existing social forestry projects express concern that their land use permits with FD may not be legally binding; responsibilities and rights of ownership and the benefits from harvested crops are ambiguous; permits to grow the trees require annual renewal; lease conditions are inflexible, restrictive and strongly forestry biased. As a result beneficiaries have little incentive to derive income from social forestry rotations. Beneficiaries also remain uncertain about tree ownership; their rights to manage, harvest and market the tree products; access to market information and logistics.

6. Findings from recent ADB forestry projects in Sri Lanka.

Community participation cannot be taken for granted, and will only be fully achieved when the community is involved from the planning to the implementation phases (in a fuel wood plantation). Communities need to have leases/permits prepared for them in a timely manner and extend over sufficient lengths of time. Participating families need to derive an annual benefit from growing trees. The FD needs to be given awareness training in participatory processes and gender issues.

The most successful component of participatory forestry projects has been farmer wood lots, with three important modifications. Leases must be granted to farmers for tree harvesting rights; wider spacing is needed between trees to allow farmers to intercrop where possible; and farmers should be given a say in tree selection.

The Reforestation and Watershed Management Project has provided fuel wood and alleviated poverty by reforesting 10,000 ha in the Mahaweli with closely spaced (1.8x1.8 m) eucalyptus and leucaena. However the quality of plantations has been low and growth minimal, and the whole exercise disappointing.

The private plantation estate sector is very receptive to new technologies, the transfer of knowledge and skills to improve productivity, to reduce costs and maximise values and return on investment in forest plantations.

The current land allocation and lease agreements for plantations are generally not clear and have been subject to different interpretations between FD and the Ministry of Lands. This undermines the confidence of potential investors in plantation forestry.

The FD cannot manage and protect forest resources without the active participation of small holder beneficiaries and development partners, including farmers, rural communities and NGOs. Success in growing fuel wood has been directly proportional to participation by rural households. Those most likely to benefit are the most likely to have the greatest commitment to make more effective forest management succeed.

FD management and past projects have emphasised the need to increase tree cover by expanding the forest estate in the country. This has lead to a focus on the quantity and coverage of trees, rather than on quality management. As a result encroachment continues on natural forests and the performance of forest plantations is poor. A high proportion have failed or remain untended.