

DISTRICT LANDUSE MAP AS A PLANNING TOOL

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INTRODUCTION

In a country like Sri Lanka where the arable land availability is only about 0.2 hectare per person it is of paramount importance to optimize the use of land, which is a most valuable and limited resource, by strict landuse planning to manage every agricultural crop carefully and successfully. The plantation industry-tea, rubber and coconut - being the most vital component of our economy it is important to manage the land under these crops to obtain sustained production. To achieve this goal, it is essential to have well planned development projects that should be correctly implemented.

It is scarcely possible to imagine a development project in which maximum success does not depend on a comprehensive factual examination of the area in question and of the changes occurring within it, directed towards understanding both present and anticipated potential and problems. Therefore all development plans require a basic need of sufficient, reliable data. Data and information are required universally in a multitude of substantive areas relating to planning and development.

In view of this universal need, a wide range of information generation, dissemination and analysis tools are being developed and applied. Among these, maps have a dominant appeal with many advantages for identification and visualization of correlations of land information, of sites and distribution of resources and of potential environmental conflict zones and for subsequent monitoring of development plans.

Mapping systems are extremely versatile planning tools and also perhaps, of special interest to developing nations like ours in that maps are:

- Relatively inexpensive;
- very practical;
- can be used in conjunction with a fairly wide range of computer hardware;
- envisaged to draw on any number of types of data sources, including remote sensing;
- do not require a great deal of advanced skill to use them.

In this connection various types of maps are a useful source as they collect and present many types of land information which are spatial in character such as: Topography, Geology, Landuse, Soils, Hydrology and Climate. The interaction of the above information in the planning process has been pronounced in many occasions and simultaneous consideration of the above information and factors considered vital.

The District Landuse map series of Sri Lanka, produced and published under the National Landuse mapping programme of the Centre for Remote Sensing of the Sri Lanka Survey Department are specially designed maps which include all relevant Landuse categories of Sri Lanka with the area figures at the Assistant Government Agent Division level covering the whole Island on a District basis. The Landuse Unit of the Tea Research Institute actively participated in the Landuse map production team along with the other Institutes such as the Forest Department, Urban Development Authority (UDA), Agricultural Base Mapping Project (ABMP) and the National Aquatic Resources Agency (NARA). The TRI team participated in the production of Landuse maps of the tea growing districts.

FORMS OF DATA SOURCES

The District Landuse map series was produced using the data obtained from the aerial photographs and satellite images. Black and white aerial photographs of a scale of 1:50,000 to 1: 20,000 and geometrically corrected LANDSAT 2 images of 1:100,000 were used as the main data sources.

Aerial Photography

Aerial photography is probably the best form of information storage system available. Taken with its variants, mosaics, enlargements and orthophotographs, it also offers presentation which can be inexpensive, rapidly available, up-to-date, of variable scale and resolution (according to the choice of flying height, lens and film) and complete in so far as air-recognizable information is concerned.

The aerial photograph has also a unique ability to present information which is not easily converted into the line drawing of a conventional map: Sand dunes and other desert features, scattered cultivation and marshes are typical examples.

The defects of the aerial photograph spring from the virtue of its completeness, because recognition of particular information requires interpretation and enhancement, and except on a larger scale where feature shapes are easily recognizable, this must be done by specialists. Although the "real world" complexity can be overwhelming, a longer term trend could well be away from the traditional selective symbolisation of the line map.

Satellite Images

Most present day Satellite imagery (such as LANDSAT and SPOT) is acquired by scanning in separate wave bands and not by conventional photography. This separation has led to the development of simple optical and photographic methods for presentation of the imagery in forms which emphasize particular features. It also facilitates the semi-automatic interpretation of thematic information because each picture element is stored as an electrical signal and is suitable for computer processing and manipulation. Image contrast can be selectively enhanced whilst with a limited number of identifiable control points it is possible to remove distortions in the imagery and bring it into conformance with a standard map projection.

Mapping

The value of conventional mapping, which is both a presentation of a topographical information and a base for the display of other data, has become so common place over the years as to be often overlooked; yet, however unexciting the task, any complex land development planning strategy begins with the need of a MAP.

No thematic information can ever be sealed off from its topographical context, and for effective planning there must be adequate correlation between the two. Traditionally this has been achieved by the preparation of separate maps, each dealing with one theme. On a common topographical base map, thematic versions are prepared for climate, geology, landuse and soils, etc. This is done to meet the requirements of location referencing with clarity and relevance for each subject.

LANDUSE MAP AS A DATA SOURCE

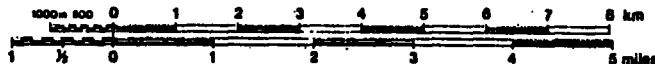
The most important feature of the District Landuse map is the area figures given for each landuse category under an AGA's Division of the District. This information not only provides data on tea but also the mode of distribution of all important landuses within a given district, specially the category like "sparsely used land" when located along with "Tea" could mostly include neglected or abandoned tea land. Such locations and distribution of "Grass land", "Natural forest" and "Forest plantations" are of prime importance when designing a development plan concerning the tea industry.

In addition to the landuse categories technical information about the map production and additional elements to facilitate orientation in the field have been added to these maps. The most important map elements are shown in Figures 1 - 4.

District Landuse maps will continue to serve as an important tool for development planning for many years to come. This does not of course mean that they can be indiscriminately applied. Their effectiveness is, as is true for all planning tools, clearly dependent upon the quality and quantity of input data and the professional interpretation of variable associations and findings.

KANDY AND NUWARA ELIYA¹ DISTRICTS LAND USE 1979/81

1:100 000⁵



The map is based on the interpretation of aerial photographs and field verification. It shows the present utilization of the land; in addition, it forms the benchmark for the monitoring of land use changes, to be mapped using satellite images or other sources.

Please contact the Center for Remote Sensing regarding the availability of updated maps.

Prepared by the Center for Remote Sensing, Survey Department, P. O. Box 506, Colombo-5, Sri Lanka, in collaboration with the Land Use Unit of the Tea Research Institute of Sri Lanka, Talawakele, under the Sri Lanka / Swiss Remote Sensing Project. The Center for Remote Sensing will be grateful if any errors or omissions are brought to its notice.

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Fig. 1 - 1 = District name; 2 = Year of data used for the production of the map; 3 = Year of publication; 4 = Publisher; 5 = Scale

LOCATION / DATA SOURCES

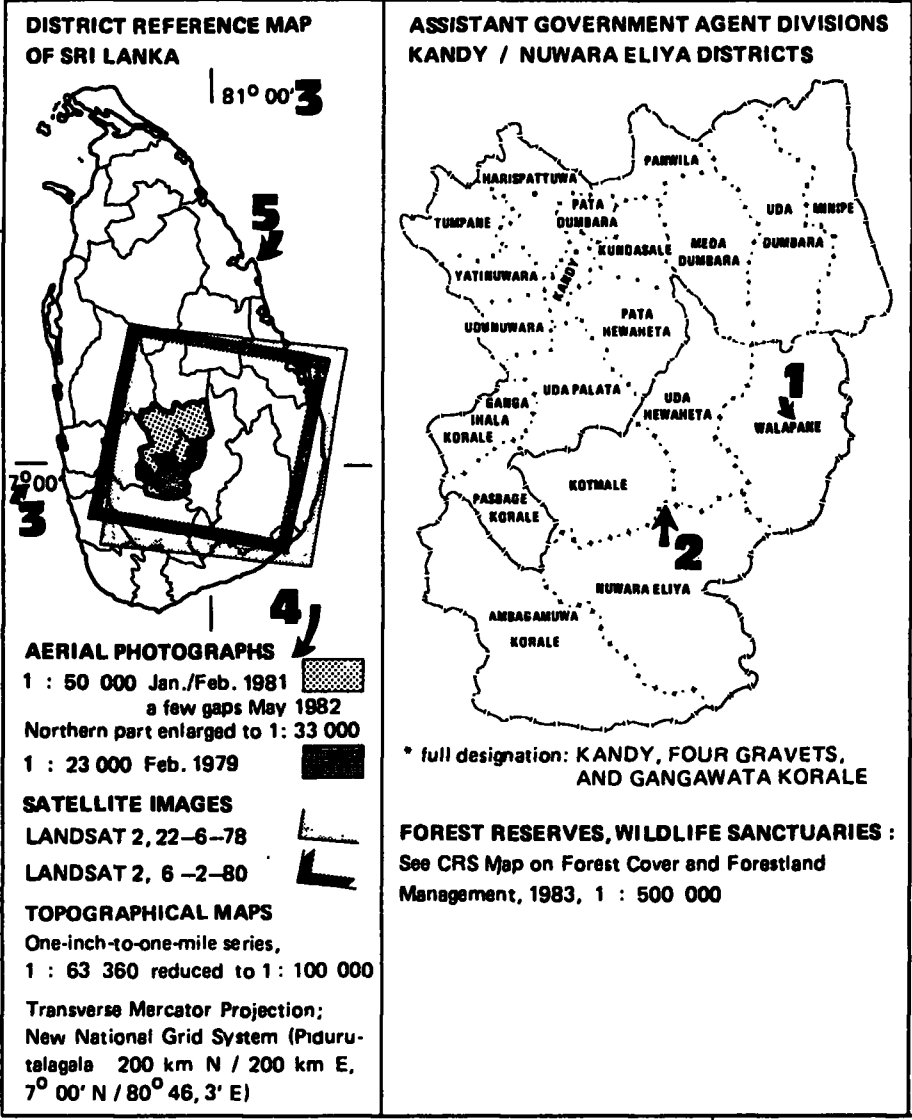


Fig. 2 - 1 = AGA centres; 2 = AGA boundary; 3 = Geographical coordinates; 4 = Data sources used for the map; 5 = A guide showing the Sri Lanka Administrative boundaries

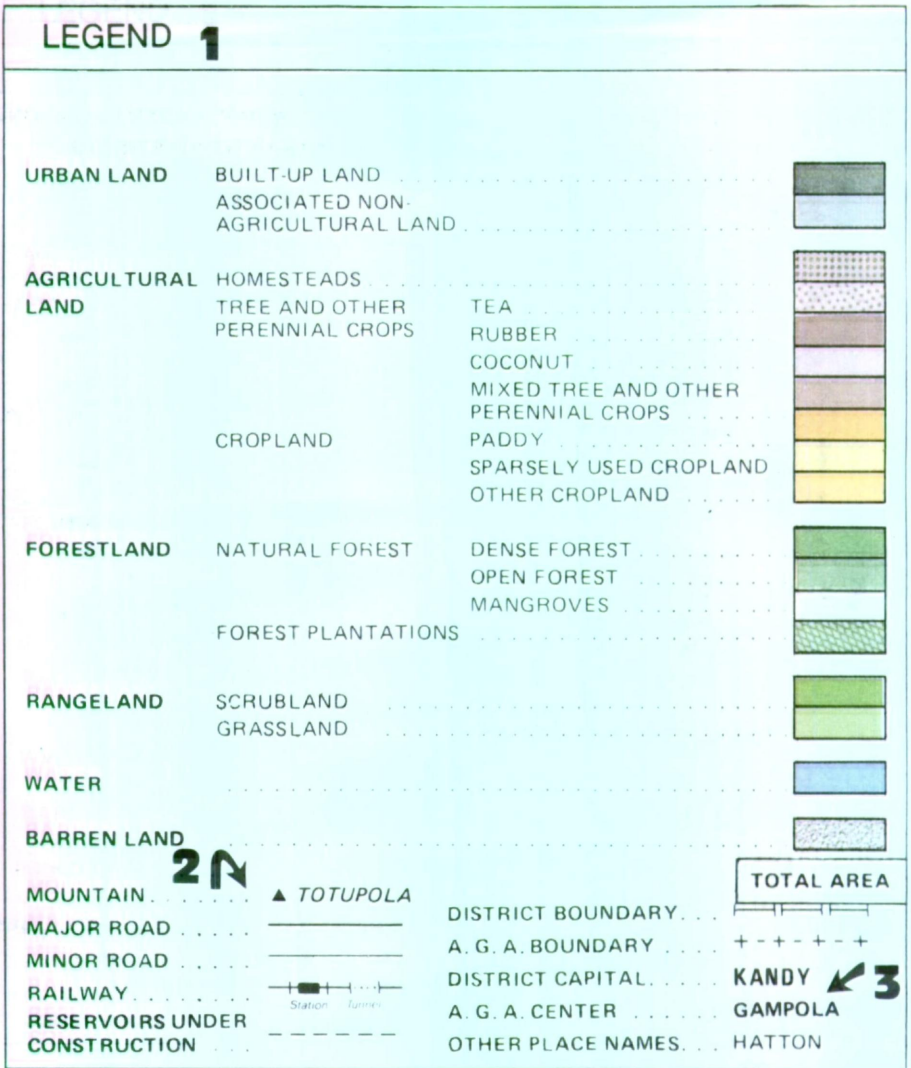


Fig. 3 – Legend of the District Landuse map indicating main features :
 1. Landuse categories; 2. Infrastructure; 3. Place names.

REMARKS

REMARKS ON THE LEGEND 1 ↓

Built-Up Land : Residential, industrial, commercial, institutional, administrative, transportation, power plants and urban open spaces.

Associated Non-Agricultural Land: Mining, archaeological sites, transmitters, salterns, and quarries.

Homesteads: Family residential units surrounded by gardens, fruit trees and open space.

Coconut: Systematic planting of coconut palms in plantations.

Rubber: Systematic planting of rubber trees in plantations.

Tea: Land under tea cultivation.

Mixed Tree and Other Perennial Crops : Continuous plots of coffee, cacao, jack, kitul, palmyrah, cinnamon, cadju and other fruit trees or spices partly mixed with coconut, tea and rubber, many of these tree-crops are also found in homesteads.

Paddy: Rainfed or irrigated paddy cultivation.

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

Other Cropland : Tobacco, vegetables, sugar cane and rainfed highland crops in continuous plots.

Dense Forest: Dense natural forest cover with a crown closure of more than approx. 75%.

Open Forest: Natural forest cover with a crown closure of approx. 45%–75% and a dense undergrowth.

Mangroves: Tree cover along sea coasts, lagoons and river mouths.

Forest Plantation: Man-made, mostly mono-cultural forests of teak, eucalyptus, pines and others.

Scrub: Low growing vegetation with more than 50% area coverage, including trees with less than approx. 45% crown closure.

Grassland: Damana, savannah and patana grassland, villus and other temporarily flooded land, and open park country with less than approx. 50% scrub coverage.

Water: Sea, lagoons, tanks, major rivers and wetlands, showing max. water level.

Barren Land: Rock outcrops, sandbars, beaches, earth slides and other bare land.

SPECIAL REMARKS ON KANDY AND NUWARA ELIYA DISTRICTS 2 ↓

- The extensive areas marked as **Other Cropland** represent mainly
 - a) seasonal tobacco cultivation in the North-East / Hanguranketa area (esp. Uda Hewaheta and Walapane A. G. A. Div.).
 - b) vegetable cultivation, frequently on terraced fields, in the mountain region (esp. Nuwara Eliya and Kotmale A. G. A. Div.).
- The scattered, tiny **Homestead** units in the tea areas indicate mainly labour lines. They include estate bungalows and tea factories which cannot be shown separately due to their small area.
- To avoid congestion a lot of **estate roads**, esp. those with dead ends, are omitted. The road network in tea areas is thus considerably denser in reality than shown on the map.
- The major **reservoirs** in the mountain region are mainly designed for hydropower generation.
- As part of the **Mahaweli Development Project** construction of several important reservoirs has started. From late 1983 onwards major re-settlements, construction of new roads etc., and flooding of the reservoir areas are planned. This map shows the situation of 1981, and outlines the expected spill levels (as obtained from Mahaweli Authority).
- The distinct landuse pattern in the North-West of Kandy District is the result of the concentration of **Paddy** cultivation in valley bottoms.

Fig. 4 - Details of the classification system and special remarks for districts