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COUNTRY REPORTS

Country Report of Sri Lanka

(Submitted by Sri Lanka)**

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Country Report of Sri Lanka

Summary

Sri Lanka is a small island in the Indian Ocean close to the southern tip of India with an area of 65,610 sq km and a population of 1.9m having a long history of civilization over 2500 years. It is evident from the ancient irrigation schemes that Sri Lanka must have had an excellent surveying technologies in the past. Since 1505 to 1815 it was partially under the rule of Portuguese & Dutch and since 1815 to 1948 it was a colony of British.

Although there are some maps been prepared earlier, the first accurate map for the country had been published in 1840 by the Survey Department which is the National Survey and Mapping Organisation established in 1800 by the then British administration.

The history of present day surveying and mapping is extending from the British period after the establishment of the horizontal and vertical control network in the form of triangulation and level lines in 1890s. In 1995, the entire horizontal control network was re-observed with GPS equipment and completely re-adjusted with the help of computers to further increase the accuracy.

The map series of 72 maps on the scale of 1 inch to 1 mile completed in 1924 can be regarded as the first topographical mapping in the country. Many small scale maps have been derived from this map series on different scales.

With the adoption of metric (SI) system for measures, the scales of maps changed from imperial units to metric units. During the period of 1985 to 1996, a new topographic map series was published on the scale of 1: 50,000. Sri Lanka is also in the process of preparation another series of topographic maps on a larger scale of 1: 10,000.

Town maps have been prepared for major towns based on aerial photography and ground surveys. The whole country was photographed on the scale of 1: 40,000 in 1956. Since then, photography has been done from time to time depending on the need. In 1982, Sri Lanka embarked on a programme of Land Use Mapping on 1:100,000 scale on a district basis, using aerial photographs and satellite imagery.

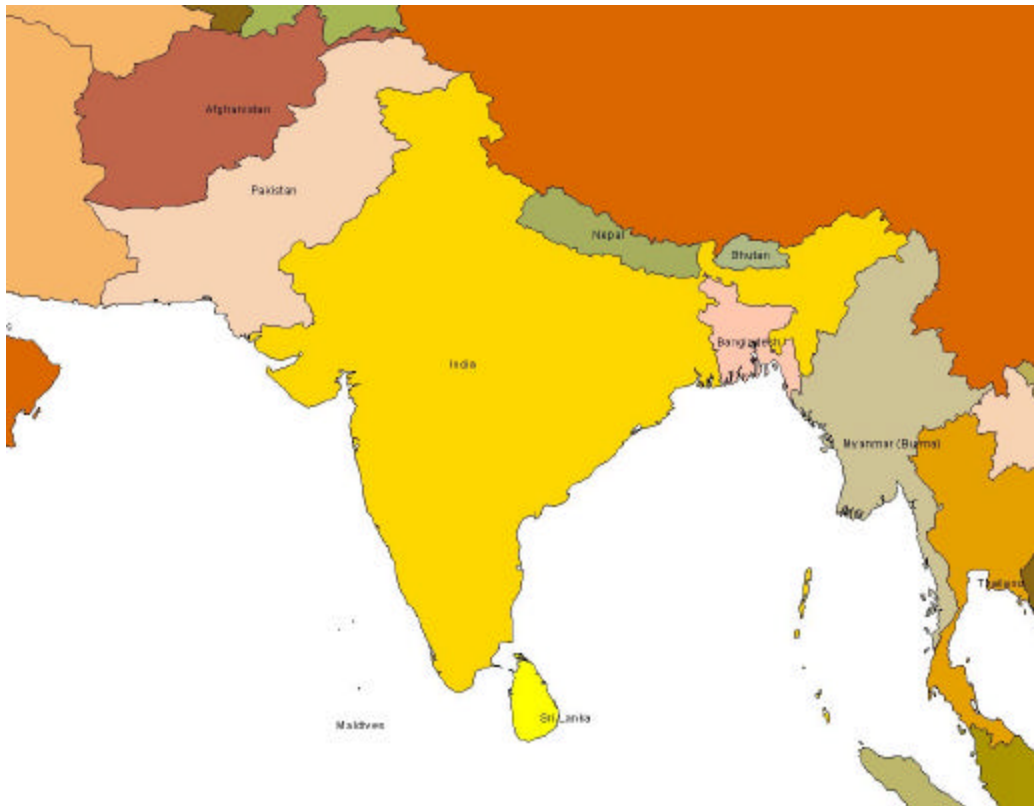
Sri Lanka embarked on Remote Sensing in 1978. A satellite image mosaic map of Sri Lanka was published on the scale of 1:500,000 in 1994. The first edition of the National Atlas of Sri Lanka was published in 1988. The production of second edition of the Atlas is now in progress.

Sri Lanka is one of the very first countries got involved into the Global Mapping program, organized by the International Steering Committee for Global Mapping. Establishment of digital topographic vector database on 1:250,000 and 1:50,000 scales has been completed, and 1:10,000 database is now in progress.

The country has two institutions for survey education conducting courses at diploma level, undergraduate level, and also post graduate level.

Introduction & Historical Background

Sri Lanka is an island in the Indian Ocean extending from the southern tip of India having an area of 65,610 sq.km, with a number of smaller islands around the main land, and having population over 1.9 m. Sri Lanka can claim a long history of civilization based on irrigation and agriculture over 2500 years.



Although there are some maps been prepared earlier, the first accurate map for the country had been published in 1840 by the Survey Department which is the National Survey and Mapping Organisation established in 1800 by the then British administration. This was called 'one inch to 4 miles map of Ceylon' (as the country was then known). And the methods of survey used in gathering the data are not known, but the map sufficed until 1881.

Around 1897 a decision was taken to make a complete topographical map series from new systematic surveys connected to the trigonometrical stations of the Triangulation of Ceylon which had recently been carried

out. This can be regarded as the beginning of ‘topographical mapping’ of Ceylon.

The most popular topographical map series was the 1” map series on the scale of 1 inch to 1 mile mainly based on Plane Table surveys completed in 1924. It contained natural and man made topographical features, geographical names, contours, administrative areas etc. existed at the time of preparation of the map series. There are 72 map sheets in this series. This map series which has been revised from time to time formed the first complete topographical cover for the country, and was lasted for a long period of time.

Based on the one inch series several other maps have been derived which are in great demand. The largest among these is the one inch to 4 mile map printed in 4 sections. Another is the Motor Map on the scale of one inch to 8 miles. Since metrication, these maps are published at the scales of 1:250,000 and 1:500,000 respectively.

In 1970, the Government of Sri Lanka decided to adopt the metric (SI) system of weights and measures. This involved fundamental changes in the work of the Survey Department, with regard to both surveying and mapping.

Geodetic Surveys

The geodetic surveys in Sri Lanka has a history as far back as late 18th century when the Triangulation was completed and the primary level lines were established based on the mean sea level which too measured prior to the level lines.

The triangulation network was later partially re-observed and readjusted in 1940s in order to upgrade the accuracy of the control points, but still the accuracy was sufficient for mapping.

In the period of 1995 to 1999, the entire control network was re-observed with GPS equipment and completely re-adjusted with the help of computers to further increase the accuracy.

1:50,000 series

During the period of 1985 to 1996, a new topographic map series was published on the scale of 1: 50,000. This was basically a metric version of former 1 inch series with up to date information collected from Aerial

Photographs or from field. There are 92 map sheets in this series. The first edition of this series was completed in 1996, and second edition is in progress. With the completion of this series, the one inch sheets lost its importance and eventually faded away.

1:10,000 series

Sri Lanka is also in the process of preparation another series of topographic maps on a larger scale of 1: 10,000. Compilation of this series was commenced in early 1980s using data from aerial photographs and data from field verifications. About 37% of the series has been completed, data for another 10% is compiled and on different stages of production. The total number of sheets in 1:10,000 series is 1834 once completed.

Town Maps

Town maps have been prepared for major towns based on ground surveys at larger scales of one inch to one chain, two chains, 1:1,000, 1:2,000 etc. The scale of mapping ranges from one inch to 8, 12, 16 chains and more recently from 1:10,000 to 1:12,500. A standard scale of 1:10,000 was used for all Town Maps prepared recently. Town Maps have been produced for few major towns including Colombo.

With the introduction of digital data compilation from aerial photographs in 1992, data for town maps have been compiled on 1:5,000 scale, from 1:20,000 aerial photographs and at the moment such data is available for 23 towns with data of 4 towns cartographically enhanced. Digital data is also available for the City of Colombo and suburbs on 1:2000 scale.

Land Use Maps 1:100,000

In 1982, Sri Lanka embarked on a programme of Land Use Mapping on 1:100,000 scale on a district basis, using aerial photographs and satellite imagery. This series was completed in 1991. A new series of land use maps is being compiled digitally on 1: 50,000 scale, using the topographic map as the base data. This series contains more detailed classification of land use than that found in 1:50,000 topographic series.

Other Thematic Maps

Apart from the Land Use Maps and the motor map referred to earlier, the following Thematic Maps had been published at the scale given against each.

Climate (1 inch : 8 miles or 1:506,880), General Soil Map (1 inch : 8 miles or 1:506,880), Land Utilization (1:1,000,000), Soil (1:1,000,000), Climate (1:1,000,000), Irrigation Development Potential (1:1,000,000), Physical (1:1,000,000), Agro Ecology (1:1,000,000), Rainfall (1:1,000,000), Water Resources Development Plan (1 inch : 4 miles or 1:253,440) and River Basins (1 inch : 4 miles or 1:253,440).

Cadastral Maps

With the introduction of Registration of Title Act in 1998, there is a need for preparation of Cadastral maps showing individual land parcels for the purpose of identification and settlement of title and finally for the registration of title. This is to be carried out in a systematic nature, covering village by village in a particular administrative area as declared by the Hon Minister of Lands from time to time. At the time of writing this some 100,000 land parcels have been surveyed and cadastral maps have been prepared in a few selected administrative divisions.

Aerial Photography

The whole country was photographed on the scale of 1: 40,000 in 1956. Subsequently photography has been done from time to time depending on the need. From 1981 to 1984, 70% of the island is covered on the scale of 1:50,000. From 1981 to 1994, 90% of island is covered on the scale of 1:20,000. From 1999 to 2001, 35% of the island is covered on the scale of 1:20,000. Colombo and few other areas are covered on the scale of 1: 10,000 for special purposes in 2000.

Remote Sensing

Sri Lanka embarked on Remote Sensing in 1978. A satellite image mosaic map of Sri Lanka was published on the scale of 1:500,000 in 1994, by digitally assembling IRS 1B LISS II imagery acquired in March 1992, by National Remote Sensing Agency, Hyderabad, India, having ground resolution of 40 m, and having four spectral bands. These images were geometrically rectified, radiometrically adjusted and assembled by Remote Sensing Laboratories of University of Zurich, Switzerland.

National Atlas of Sri Lanka.

The first edition of the National Atlas of Sri Lanka was published in 1988 with an effort of 4 years marked by team work and dedication of experts from different fields ranging from university professors to company directors and from senior management staff to trainee draughtsmen. The production of second edition of the Atlas is now in progress.

Global Mapping

Sri Lanka is one of the very first countries got involved into the Global Mapping program, organized by the International Steering Committee for Global Mapping. Global Map is a group of global geographic data sets of known and verified quality with consistent specifications which will be open to the public. Global map is considered a common asset of mankind, and will be distributed worldwide on the Internet at marginal cost. Global map data have 8 layers, namely Transportation, Boundaries, Drainage, Elevation, Population Centers, Land Use, Land Cover, & Vegetation.

GIS & Digital Mapping

Sri Lanka has commenced digital data compilation by photogrammetric methods in 1992, and commenced digitizing topographic maps in the late 1990s. The country has completed digitizing 1:250,000 scale map and 1:50,000 topographic map series, and 1:10,000 series is now in progress. With these data, the Sri Lanka has established digital topographic vector databases for GIS applications which can be supplied for the users.

The topographic vector databases comprise many different data layers that varies slightly depending on the scale.

Geographical Names

During the last 2-3 years we have digitized the entire 92 maps in the 1:50,000 map series and created a topographic vector database for GIS applications and Digital Mapping. This database is designed to contain many layers, where 'PLACES', 'ADMIN' and 'HYDRO' layers contain the names as an attribute.

This database has been used to create a digital Gazetteer of PLACES that contains the names and coordinates of places in a few different coordinate systems namely the standard grid coordinate system used in the map series, WGS, Everest and UTM.

Training

The survey education in Sri Lanka has been commenced in far back as 1896 as a course in the Technical College. The first training school for surveying was started in 1912. This was upgraded into a fully fledged Institute of Surveying and Mapping in 1969 with the help of UNDP which can handle all the subjects related to Surveying & Mapping to conduct Diploma courses. It also started a post graduate course in 1973.

In a further move funded again by the UNDP this institute was upgraded into a degree awarding institute in 1990.

In 1997 one of the Universities in Sri Lanka started a undergraduate course in Surveying and now there is a faculty of Geomatics in that University.