

1. Project Title : Optimization and regulation of transportation infrastructure for disaster management support for Shillong city

2. Scope and Objectives:

The ability of a disaster victim to prepare for, respond to, and recover from a disaster depends on a variety of factors like the severity and longevity of the event, the efficiency of the warning systems, access to resources and information. An ideal Disaster Management System can support the activities related to preparedness, prediction, damage assessment and rehabilitation. An efficient transportation system with location based emergency services can be the first step for taking preventive measures to minimize loss of life and damage and facilitate timely and effective rescue, relief and rehabilitation of the affected population. Transport management today comprises in-depth understanding of the potential use of informatics systems. Geographic Information System (GIS) can make transport system intelligent. GIS information can become increasingly more valuable for decision making when coupled to artificial intelligence (AI). When linked to GIS, artificial intelligence can be useful for evaluating, monitoring and decision-making. In the case of artificial neural networks (ANN), computing methodologies are being used to simulate how the human brain processes spatial data problems. It is anticipated that many future spatial applications will incorporate elements of artificial intelligence. In fact, in almost every instance where GIS is being used, AI applications could potentially be developed for the purpose of enhancing decision-making capabilities. Here, we propose to develop a Decision Support System (DSS) for optimization and regulation of transport infrastructure for disaster management support.

Main objectives of this study are:

- a) Mapping of transport infrastructure of Shillong city on 1:5,000 scale.
- b) Transport modeling and planning using spatial artificial neural network technology.
- c) To develop a Decision Support System (DSS) for optimization and regulation of transport infrastructure in the Shillong city.

3. Centre/Unit : North Eastern Space applications Centre (NESAC)

4. Collaborating Agency : Nil

5. Funding Agency : EOAM/DOS

6. Study Area:

The study will cover entire Shillong Master Plan area which has a total geographical area of 181.51 Sq. Km. Shillong is one of the major urban centres of the state with the total urban population of 2,67,662 persons whereas total population of the Master Plan area is 3,33,800 (2001 census).

7. Methodology: Orthorectified Cartosat-II data with a spatial resolution of 1 m will be used for creation of transportation network with the help of Public Works Department (PWD) road maps, Land record maps. Differential Global Positioning System (DGPS) will be used for preparation of location specific infrastructure maps. Transport parameters or inputs will be modeled using artificial neural network technique for optimization and regulation of transport infrastructure for disaster management support.

8. Data Used : Cartosat 1 & 2A with spatial resolution (pan) 2.5m and 1m respectively are used for the preparation of thematic maps along with other non spatial data.

9. Status of the Project: Preparation of GIS database containing transportation network with road parameters, public utilities, health centres, emergency services etc. from CARTOSAT-I data, field survey etc. are in progress.

10. Utilization/Success Stories:

A database containing transportation network with road parameters, public utilities, health centres, emergency service centres, etc. will be created. A ready to use Decision Support System (DSS) for emergency evacuation, supply routes and regulation of transport infrastructure in the event of disaster will be available.

11. Duration: 2 years (2010-11)